

**Logiciel ICAB**

Le 4 Janvier 2010

## **CEREXAGRI**

# **CALCUL DES EFFORTS PAR ELEMENTS FINIS**

## DESCRIPTION ETUDE:

- Modification trémie cuivre.
- Matière : Acier 24.
- Charge : 5000 Kg.

### Note de calcul ICAB

Projet 1-Dessin/Cerexagri/6-Tremie Cuivre 2009/Note de calcul/Calcul 2/icab  
 Projet créé le 04-01-2010 12:29:07  
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 Version icab 4.208

La structure modélisée par la méthode des Eléments finis comprend 158 noeuds, 269 éléments.  
 sorties sur 158 NOEUDS et 269 ELEMENTS:

Ce document contient la liste des données et des résultats dans l'ordre suivant :

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COUT TOTAL: 2276.19

#### DECOMPOSITION DES PRIX PAR SECTION

LIBELLE	NOMBRE	QUANTITE (m)	COUT VARIABLE	TOTAL
UPN200	36	18.68	25.30	472.60
RE80_5X R80x80 5 - section rectangulaire creuse	88	37.7487	11.61	438.12
RI80_50C R80x50 4 - section rectangulaire creuse	51	31.3	7.55	236.43
UPN80	66	74.5604	8.70	648.68
UPN120	14	14.6	13.30	194.18
RE120_5X R120x120 5 - section rectangulaire creuse	8	16	17.89	286.18

## Liste des noeuds

Noeud	X mm	Y mm	Z mm	Couche
1	0	0	0	
2	0	2000.000	0	
3	5300.000	2000.000	0	
4	5300.000	0	0	
5	0	0	3000.000	
6	0	2000.000	3000.000	
7	5300.000	2000.000	3000.000	
8	5300.000	0	3000.000	
9	400.000	0	0	
10	400.000	2000.000	0	
11	800.000	2000.000	0	
12	800.000	0	0	
13	1200.000	0	0	
14	1200.000	2000.000	0	
15	1600.000	2000.000	0	
16	1600.000	0	0	
17	2000.000	0	0	
18	2000.000	2000.000	0	
19	5200.000	0	0	
20	5200.000	2000.000	0	
21	4800.000	2000.000	0	
22	4800.000	0	0	
23	4400.000	0	0	
24	4400.000	2000.000	0	
25	1225.000	0	0	
26	1225.000	0	3000.000	
27	2450.000	0	3000.000	
28	2450.000	0	0	
29	3675.000	0	0	
30	3675.000	0	3000.000	
31	1225.000	2000.000	0	
32	1225.000	2000.000	3000.000	
33	3675.000	2000.000	3000.000	
34	3675.000	2000.000	0	
35	2450.000	2000.000	0	
36	2450.000	2000.000	3000.000	
37	2450.000	2000.000	800.000	
38	1225.000	2000.000	800.000	
39	0	0	800.000	
40	0	2000.000	800.000	
41	3675.000	2000.000	800.000	
42	5300.000	2000.000	800.000	
43	5300.000	0	800.000	
44	0	0	400.000	
45	0	2000.000	400.000	
46	5300.000	2000.000	400.000	
47	5300.000	0	400.000	
48	0	2540.000	3000.000	
49	1225.000	2540.000	3000.000	
50	2450.000	2540.000	3000.000	
51	3675.000	2540.000	3000.000	
52	0	2112.000	1215.000	
53	1225.000	2112.000	1215.000	
54	2450.000	2112.000	1215.000	
55	3675.000	2112.000	1215.000	
56	3675.000	2224.000	1630.000	
57	0	2224.000	1630.000	
58	0	2336.000	2045.000	
59	3675.000	2336.000	2045.000	
60	3675.000	2448.000	2460.000	
61	0	2448.000	2460.000	
62	0	0	1200.000	
63	0	2000.000	1200.000	
64	5300.000	2000.000	1200.000	

65	5300.000	0	1200.000
66	0	0	1600.000
67	0	2000.000	1600.000
68	5300.000	2000.000	1600.000
69	5300.000	0	1600.000
70	0	0	2000.000
71	0	2000.000	2000.000
72	5300.000	2000.000	2000.000
73	5300.000	0	2000.000
74	0	0	2400.000
75	0	2000.000	2400.000
76	5300.000	2000.000	2400.000
77	5300.000	0	2400.000
78	3675.000	2000.000	1200.000
79	3675.000	2000.000	1600.000
80	3675.000	2000.000	2000.000
81	3675.000	2000.000	2400.000
82	0	1000.000	0
83	0	1000.000	3000.000
84	5300.000	1000.000	3000.000
85	5300.000	1000.000	0
86	5300.000	500.000	400.000
87	5300.000	1000.000	400.000
88	5300.000	1500.000	400.000
89	5300.000	1500.000	1200.000
90	5300.000	1000.000	1200.000
91	5300.000	500.000	1200.000
92	5300.000	700.000	3000.000
93	5300.000	1300.000	3000.000
94	5300.000	1300.000	1200.000
95	5300.000	700.000	1200.000
96	4800.000	0	400.000
97	4800.000	2000.000	400.000
98	4800.000	500.000	400.000
99	4800.000	1000.000	400.000
100	4800.000	1500.000	400.000
101	3675.000	0	800.000
102	3675.000	0	400.000
103	3675.000	0	1200.000
104	3675.000	0	1600.000
105	3675.000	0	2000.000
106	3675.000	0	2400.000
107	3675.000	2000.000	400.000
108	1225.000	2000.000	400.000
109	2450.000	2000.000	400.000
110	0	1000.000	800.000
111	1225.000	0	800.000
112	2450.000	0	800.000
113	0	1000.000	400.000
114	1225.000	0	400.000
115	2450.000	0	400.000
116	0	1000.000	1200.000
117	1225.000	0	1200.000
118	2450.000	0	1200.000
119	5300.000	700.000	1600.000
120	5300.000	1300.000	1600.000
121	1225.000	0	1600.000
122	2450.000	0	1600.000
123	0	1000.000	1600.000
124	5300.000	700.000	2000.000
125	5300.000	1300.000	2000.000
126	1225.000	0	2000.000
127	2450.000	0	2000.000
128	0	1000.000	2000.000
129	5300.000	700.000	2400.000
130	5300.000	1300.000	2400.000
131	1225.000	0	2400.000
132	2450.000	0	2400.000
133	0	1000.000	2400.000
134	1225.000	2224.000	1630.000
135	2450.000	2224.000	1630.000
136	2450.000	2336.000	2045.000

137	1225.000	2336.000	2045.000	
138	1225.000	2448.000	2460.000	
139	2450.000	2448.000	2460.000	
140	3520.000	0	250.000	
141	3520.000	2000.000	250.000	
142	3520.000	500.000	250.000	
143	3520.000	1000.000	250.000	
144	3520.000	1500.000	250.000	
145	4020.000	2000.000	1050.000	
146	4020.000	1500.000	1050.000	
147	4020.000	1000.000	1050.000	
148	4020.000	500.000	1050.000	
149	4020.000	0	1050.000	
150	4020.000	0	250.000	
151	4020.000	500.000	250.000	
152	4020.000	1000.000	250.000	
153	4020.000	1500.000	250.000	
154	4020.000	2000.000	250.000	
155	3675.000	2000.000	250.000	
156	3675.000	2000.000	1050.000	
157	3675.000	0	250.000	
158	3675.000	0	1050.000	

## Liste des éléments

ELEMENT(TYPE=BEAM\_LINEAR, MAT=ACIER\_24, PROP=UPN200)

1; 1,82 ; // 1000 mm  
 2; 3,85 ; // 1000 mm  
 3; 4,19 ; // 100 mm  
 4; 2,10 ; // 400 mm

ELEMENT(TYPE=BEAM\_LINEAR, MAT=ACIER\_24, PROP=UPN120)

5; 5,83 ; // 1000 mm  
 6; 7,93 ; // 700 mm  
 7; 8,30 ; // 1625 mm  
 8; 6,32 ; // 1225 mm

ELEMENT(TYPE=BEAM\_LINEAR, MAT=ACIER\_24, PROP=RE80\_5X)

9; 1,44 ; // 400 mm  
 10; 2,45 ; // 400 mm  
 11; 3,46 ; // 400 mm  
 12; 4,47 ; // 400 mm

ELEMENT(TYPE=BEAM\_LINEAR, MAT=ACIER\_24, PROP=RE120\_5X)

13; 9,10 ; // 2000 mm  
 14; 12,11 ; // 2000 mm  
 15; 13,14 ; // 2000 mm  
 16; 16,15 ; // 2000 mm  
 17; 17,18 ; // 2000 mm  
 18; 23,24 ; // 2000 mm  
 19; 22,21 ; // 2000 mm  
 20; 19,20 ; // 2000 mm

ELEMENT(TYPE=BEAM\_LINEAR, MAT=ACIER\_24, PROP=RE80\_5X)

23; 29,157 ; // 250 mm  
 24; 34,155 ; // 250 mm  
 25; 31,108 ; // 400 mm  
 26; 35,109 ; // 400 mm

ELEMENT(TYPE=BEAM\_LINEAR, MAT=ACIER\_24, PROP=UPN80)

27; 39,110 ; // 1000 mm  
 28; 40,38 ; // 1225 mm  
 30; 43,101 ; // 1625 mm  
 31; 44,113 ; // 1000 mm  
 32; 45,108 ; // 1225 mm  
 34; 47,96 ; // 500 mm

```
ELEMENT(TYPE=BEAM_LINEAR, MAT=ACIER_24, PROP=UPN200)
35;      6,48 ; // 540 mm
36;      51,33 ; // 540 mm

ELEMENT(TYPE=BEAM_LINEAR, MAT=ACIER_24, PROP=RE80_5X)
37;      32,49 ; // 540 mm
38;      36,50 ; // 540 mm
39;      40,52 ; // 429.848 mm
40;      38,53 ; // 429.848 mm
41;      37,54 ; // 429.848 mm
42;      41,55 ; // 429.848 mm

ELEMENT(TYPE=BEAM_LINEAR, MAT=ACIER_24, PROP=RI80_50C)
43;      52,53 ; // 1225 mm
44;      57,134 ; // 1225 mm
45;      58,137 ; // 1225 mm
46;      61,138 ; // 1225 mm

ELEMENT(TYPE=BEAM_LINEAR, MAT=ACIER_24, PROP=UPN80)
47;      62,116 ; // 1000 mm
49;      65,103 ; // 1625 mm
50;      68,120 ; // 700 mm
51;      69,104 ; // 1625 mm
52;      66,123 ; // 1000 mm
53;      72,125 ; // 700 mm
54;      73,105 ; // 1625 mm
55;      70,128 ; // 1000 mm
56;      76,130 ; // 700 mm
57;      77,106 ; // 1625 mm
58;      74,133 ; // 1000 mm
59;      78,64 ; // 1625 mm
60;      79,68 ; // 1625 mm
61;      80,72 ; // 1625 mm
62;      81,76 ; // 1625 mm

ELEMENT(TYPE=BEAM_LINEAR, MAT=ACIER_24, PROP=RI80_50C)
63;      82,113 ; // 400 mm
64;      65,91 ; // 500 mm
65;      95,119 ; // 400 mm
66;      94,120 ; // 400 mm

ELEMENT(TYPE=BEAM_LINEAR, MAT=ACIER_24, PROP=RE80_5X)
67;      47,86 ; // 500 mm
68;      96,98 ; // 500 mm

ELEMENT(TYPE=BEAM_LINEAR, MAT=ACIER_24, PROP=UPN200)
69;      98,86 ; // 500 mm
70;      99,87 ; // 500 mm
71;      100,88 ; // 500 mm

ELEMENT(TYPE=BEAM_LINEAR, MAT=ACIER_24, PROP=UPN80)
72;      98,91 ; // 943.398 mm
73;      99,90 ; // 943.398 mm
74;      100,89 ; // 943.398 mm

ELEMENT(TYPE=BEAM_LINEAR, MAT=ACIER_24, PROP=RI80_50C)
75;      25,114 ; // 400 mm
76;      28,115 ; // 400 mm

ELEMENT(TYPE=BEAM_LINEAR, MAT=ACIER_24, PROP=UPN80)
77;      42,43 ; // 2000 mm

ELEMENT(TYPE=BEAM_LINEAR, MAT=ACIER_24, PROP=UPN200)
78;      82,2 ; // 1000 mm
79;      85,4 ; // 1000 mm
80;      19,22 ; // 400 mm
81;      22,23 ; // 400 mm
82;      23,29 ; // 725 mm
83;      29,28 ; // 1225 mm
84;      28,17 ; // 450 mm
85;      17,16 ; // 400 mm
86;      16,25 ; // 375 mm
```

~ 6 ~

```
87;      25,13 ; // 25 mm
88;      13,12 ; // 400 mm
89;      12,9 ; // 400 mm
90;      9,1 ; // 400 mm
91;      10,11 ; // 400 mm
92;      11,14 ; // 400 mm
93;      14,31 ; // 25 mm
94;      31,15 ; // 375 mm
95;      15,18 ; // 400 mm
96;      18,35 ; // 450 mm
97;      35,34 ; // 1225 mm
98;      34,24 ; // 725 mm
99;      24,21 ; // 400 mm
100;     21,20 ; // 400 mm
101;     20,3 ; // 100 mm
```

ELEMENT(TYPE=BEAM\_LINEAR, MAT=ACIER\_24, PROP=UPN120)

```
102;     83,6 ; // 1000 mm
103;     93,84 ; // 300 mm
104;     84,92 ; // 300 mm
105;     92,8 ; // 700 mm
106;     30,27 ; // 1225 mm
107;     27,26 ; // 1225 mm
108;     26,5 ; // 1225 mm
109;     32,36 ; // 1225 mm
110;     36,33 ; // 1225 mm
111;     33,7 ; // 1625 mm
```

ELEMENT(TYPE=BEAM\_LINEAR, MAT=ACIER\_24, PROP=RE80\_5X)

```
112;     44,39 ; // 400 mm
113;     39,62 ; // 400 mm
114;     62,66 ; // 400 mm
115;     66,70 ; // 400 mm
116;     70,74 ; // 400 mm
117;     74,5 ; // 600 mm
118;     45,40 ; // 400 mm
119;     40,63 ; // 400 mm
120;     63,67 ; // 400 mm
121;     67,71 ; // 400 mm
122;     71,75 ; // 400 mm
123;     75,6 ; // 600 mm
124;     46,42 ; // 400 mm
125;     42,64 ; // 400 mm
126;     64,68 ; // 400 mm
127;     68,72 ; // 400 mm
128;     72,76 ; // 400 mm
129;     76,7 ; // 600 mm
130;     47,43 ; // 400 mm
131;     43,65 ; // 400 mm
132;     65,69 ; // 400 mm
133;     69,73 ; // 400 mm
134;     73,77 ; // 400 mm
135;     77,8 ; // 600 mm
136;     102,101 ; // 400 mm
137;     101,158 ; // 250 mm
138;     103,104 ; // 400 mm
139;     104,105 ; // 400 mm
140;     105,106 ; // 400 mm
141;     106,30 ; // 600 mm
142;     107,41 ; // 400 mm
143;     41,156 ; // 250 mm
144;     78,79 ; // 400 mm
145;     79,80 ; // 400 mm
146;     80,81 ; // 400 mm
147;     81,33 ; // 600 mm
148;     108,38 ; // 400 mm
149;     109,37 ; // 400 mm
```



ELEMENT(TYPE=BEAM\_LINEAR, MAT=ACIER\_24, PROP=UPN80)

150; 110,40 ; // 1000 mm  
151; 38,37 ;// 1225 mm  
152; 37,41 ;// 1225 mm  
153; 41,42 ;// 1625 mm  
154; 101,112 ; // 1225 mm  
155; 112,111 ; // 1225 mm  
156; 111,39 ; // 1225 mm  
157; 113,45 ; // 1000 mm  
158; 108,109 ; // 1225 mm  
159; 109,107 ; // 1225 mm  
160; 107,97 ; // 1125 mm  
161; 97,46 ;// 500 mm  
162; 96,102 ; // 1125 mm  
163; 102,115 ; // 1225 mm  
164; 115,114 ; // 1225 mm  
165; 114,44 ; // 1225 mm

ELEMENT(TYPE=BEAM\_LINEAR, MAT=ACIER\_24, PROP=RI80\_50C)

166; 53,54 ;// 1225 mm  
167; 54,55 ;// 1225 mm

ELEMENT(TYPE=BEAM\_LINEAR, MAT=ACIER\_24, PROP=UPN80)

168; 116,63 ; // 1000 mm  
169; 103,118 ; // 1225 mm  
170; 118,117 ; // 1225 mm  
171; 117,62 ; // 1225 mm  
172; 120,119 ; // 600 mm  
173; 119,69 ; // 700 mm  
174; 104,122 ; // 1225 mm  
175; 122,121 ; // 1225 mm  
176; 121,66 ; // 1225 mm  
177; 123,67 ; // 1000 mm  
178; 125,124 ; // 600 mm  
179; 124,73 ; // 700 mm  
180; 105,127 ; // 1225 mm  
181; 127,126 ; // 1225 mm  
182; 126,70 ; // 1225 mm  
183; 128,71 ; // 1000 mm  
184; 130,129 ; // 600 mm  
185; 129,77 ; // 700 mm  
186; 106,132 ; // 1225 mm  
187; 132,131 ; // 1225 mm  
188; 131,74 ; // 1225 mm  
189; 133,75 ; // 1000 mm

ELEMENT(TYPE=BEAM\_LINEAR, MAT=ACIER\_24, PROP=RI80\_50C)

190; 113,110 ; // 400 mm  
191; 110,116 ; // 400 mm  
192; 116,123 ; // 400 mm  
193; 123,128 ; // 400 mm  
194; 128,133 ; // 400 mm  
195; 133,83 ; // 600 mm  
196; 91,95 ;// 200 mm  
197; 95,90 ;// 300 mm  
198; 90,94 ;// 300 mm  
199; 94,89 ;// 200 mm  
200; 89,64 ;// 500 mm  
201; 119,124 ; // 400 mm  
202; 124,129 ; // 400 mm  
203; 129,92 ; // 600 mm  
204; 120,125 ; // 400 mm  
205; 125,130 ; // 400 mm  
206; 130,93 ; // 600 mm

ELEMENT(TYPE=BEAM\_LINEAR, MAT=ACIER\_24, PROP=RE80\_5X)

207; 86,87 ;// 500 mm  
208; 87,88 ;// 500 mm  
209; 88,46 ;// 500 mm  
210; 98,99 ;// 500 mm  
211; 99,100 ; // 500 mm  
212; 100,97 ; // 500 mm

```
ELEMENT(TYPE=BEAM_LINEAR, MAT=ACIER_24, PROP=RI80_50C)
213;      114,111 ;      // 400 mm
214;      111,117 ;      // 400 mm
215;      117,121 ;      // 400 mm
216;      121,126 ;      // 400 mm
217;      126,131 ;      // 400 mm
218;      131,26 ;       // 600 mm
219;      115,112 ;      // 400 mm
220;      112,118 ;      // 400 mm
221;      118,122 ;      // 400 mm
222;      122,127 ;      // 400 mm
223;      127,132 ;      // 400 mm
224;      132,27 ;       // 600 mm
```

```
ELEMENT(TYPE=BEAM_LINEAR, MAT=ACIER_24, PROP=RE80_5X)
225;      52,57 ; // 429.848 mm
226;      53,134 ; // 429.848 mm
227;      54,135 ; // 429.848 mm
228;      55,56 ; // 429.848 mm
```

```
ELEMENT(TYPE=BEAM_LINEAR, MAT=ACIER_24, PROP=RI80_50C)
229;      134,135 ;      // 1225 mm
230;      135,56 ;       // 1225 mm
231;      137,136 ;      // 1225 mm
232;      136,59 ;       // 1225 mm
233;      138,139 ;      // 1225 mm
234;      139,60 ;       // 1225 mm
```

```
ELEMENT(TYPE=BEAM_LINEAR, MAT=ACIER_24, PROP=RE80_5X)
235;      57,58 ; // 429.848 mm
236;      134,137 ;      // 429.848 mm
237;      135,136 ;      // 429.848 mm
238;      56,59 ; // 429.848 mm
239;      58,61 ; // 429.848 mm
240;      137,138 ;      // 429.848 mm
241;      136,139 ;      // 429.848 mm
242;      59,60 ; // 429.848 mm
243;      61,48 ; // 547.781 mm
244;      138,49 ;       // 547.781 mm
245;      139,50 ;       // 547.781 mm
246;      60,51 ; // 547.781 mm
247;      150,151 ;      // 500 mm
248;      141,144 ;      // 500 mm
```

```
ELEMENT(TYPE=BEAM_LINEAR, MAT=ACIER_24, PROP=RI80_50C)
249;      145,146 ;      // 500 mm
```

```
ELEMENT(TYPE=BEAM_LINEAR, MAT=ACIER_24, PROP=UPN80)
250;      148,142 ;      // 943.398 mm
251;      143,147 ;      // 943.398 mm
252;      144,146 ;      // 943.398 mm
```

```
ELEMENT(TYPE=BEAM_LINEAR, MAT=ACIER_24, PROP=UPN200)
253;      144,153 ;      // 500 mm
254;      143,152 ;      // 500 mm
255;      142,151 ;      // 500 mm
```

```
ELEMENT(TYPE=RIGID_BAR)
256;      155,154 ;      // 345 mm
257;      155,141 ;      // 155 mm
258;      156,145 ;      // 345 mm
259;      157,140 ;      // 155 mm
260;      157,150 ;      // 345 mm
261;      158,149 ;      // 345 mm
```

```
ELEMENT(TYPE=BEAM_LINEAR, MAT=ACIER_24, PROP=RE80_5X)
262;      157,102 ;      // 150 mm
263;      155,107 ;      // 150 mm
264;      158,103 ;      // 150 mm
265;      156,78 ;       // 150 mm
266;      151,152 ;      // 500 mm
```

```
267;      152,153 ;      // 500 mm
268;      153,154 ;      // 500 mm
269;      144,143 ;      // 500 mm
270;      143,142 ;      // 500 mm
271;      142,140 ;      // 500 mm
```

ELEMENT(TYPE=BEAM\_LINEAR, MAT=ACIER\_24, PROP=RI80\_50C)

```
272;      146,147 ;      // 500 mm
273;      147,148 ;      // 500 mm
274;      148,149 ;      // 500 mm
```

## Propriétés physiques et matériaux

PROPERTY(TYPE=ISO)

```
1,ACIER_24;      // ISO   materiau isotrope [ACIER_24]
  comment="acier 24",
  RL=5 // "CM66 Construction Métallique",
  E=    21E3, // daN/mm2   module d'Young
  NU=   0.296296, // ::      coefficient de Poisson
  A=    11E-6, // K-1      dilatation thermique
  YS=   24, // daN/mm2    limite d'élasticité
  XT=   36, // daN/mm2    contrainte de traction limite
  DEN=  0.785E-9; // daT.mm-3 densité massique
```

PROPERTY(TYPE=BEAM\_LINEAR)

```
2, UPN200;      // BEAM_LINEAR poutre droite [UPN200]
  AR=    3220, // mm2      aire de la section (A)
  IYY=   19.1E6, // mm4      moment d'inertie Y
  IZZ=   1.48E6, // mm4      moment d'inertie Z
  TC=    119E3, // mm4      constante de torsion J
  IVY=   191E3, // mm3      module de flexion élastique (I/vy=Wel.y)
  IVZ=   27E3, // mm3      module de flexion élastique (I/vz=Wel.z)
  ITC=   5947, // mm3      module de torsion pour Mx (J/r)
  SP=    114E3, // mm3      moment statique Y (Wpl.y/2)
  SPZ=   25.9E3, // mm3      moment statique Z (Wpl.z/2)
  SRY=   2.5, // ::      facteur de cisaillement Ty
  SRZ=   1.8, // ::      facteur de cisaillement Tz
  ARY=   1310, // mm2      aire de cisaillement (Av.y)
  ARZ=   1771, // mm2      aire de cisaillement (Av.z)
  TKY=   75, // mm      dimension Y (largeur b)
  TKZ=   200, // mm      dimension Z (hauteur h)
  EA=    8.5, // mm      Epaisseur de l'âme (tw)
  TF=    11.5, // mm      Epaisseur des semelles (tf)
  LKY=   5300, // mm      longueur minimale de flambement pour moment Myy
  LDY=   5300, // mm      longueur minimale de déversement pour moment Myy
  CVA=   25.3E-3; // mm-1   coût variable
```

PROPERTY(TYPE=BEAM\_LINEAR)

```
3, RE80_5X;      // BEAM_LINEAR poutre droite [RE80_5X]
  comment="R80x80 5 - section rectangulaire creuse",
  SECTION=2, // RHS80x80x5 r5 section rectangulaire creuse (RHS)
  AR=    1478.5, // mm2      aire de la section (A)
  IYY=   1.38E6, // mm4      moment d'inertie Y
  IZZ=   1.38E6, // mm4      moment d'inertie Z
  TC=    1.8781E6, // mm4      constante de torsion J
  IVY=   34.501E3, // mm3      module de flexion élastique (I/vy=Wel.y)
  IVZ=   34.501E3, // mm3      module de flexion élastique (I/vz=Wel.z)
  ITC=   52.696E3, // mm3      module de torsion pour Mx (J/r)
  SP=    20.708E3, // mm3      moment statique Y (Wpl.y/2)
  SPZ=   20.708E3, // mm3      moment statique Z (Wpl.z/2)
  SRY=   2.4, // ::      facteur de cisaillement Ty
  SRZ=   2.4, // ::      facteur de cisaillement Tz
  ARY=   666.43, // mm2      aire de cisaillement (Av.y)
  ARZ=   666.43, // mm2      aire de cisaillement (Av.z)
  TKY=   80, // mm      dimension Y (largeur b)
  TKZ=   80, // mm      dimension Z (hauteur h)
  EA=    5, // mm      Epaisseur de l'âme (tw)
```

TF=	5, // mm	Epaisseur des semelles (tf)
RE=	5, // mm	Rayon de raccordement externe (r1)
LKY=	3000, // mm	longueur minimale de flambement pour moment Myy
LKZ=	1405.97, // mm	longueur minimale de flambement pour moment Mzz
LDY=	3000, // mm	longueur minimale de déversement pour moment Myy
LDZ=	1405.97, // mm	longueur minimale de déversement pour moment Mzz
CVA=	0; // mm-1	coût variable

PROPERTY(TYPE=BEAM\_LINEAR)

```

4,RI80_50C; // BEAM_LINEAR poutre droite [RI80_50C]
  comment="R80x50 4 - section rectangulaire creuse",
  SECTION=2, // RHS80x50x4 r4 section rectangulaire creuse (RHS)
  AR= 962.27, // mm2 aire de la section (A)
  IYY= 805.95E3, // mm4 moment d'inertie Y
  IZZ= 380.82E3, // mm4 moment d'inertie Z
  TC= 708.82E3, // mm4 constante de torsion J
  IVY= 20.149E3, // mm3 module de flexion élastique (I/vy=Wel.y)
  IVZ= 15.233E3, // mm3 module de flexion élastique (I/vz=Wel.z)
  ITC= 26.117E3, // mm3 module de torsion pour Mx (J/r)
  SP= 12.515E3, // mm3 moment statique Y (Wpl.y/2)
  SPZ= 8958.5, // mm3 moment statique Z (Wpl.z/2)
  SRY= 2.4, // :: facteur de cisaillement Ty
  SRZ= 2.4, // :: facteur de cisaillement Tz
  ARY= 340.07, // mm2 aire de cisaillement (Av.y)
  ARZ= 515.17, // mm2 aire de cisaillement (Av.z)
  TKY= 50, // mm dimension Y (largeur b)
  TKZ= 80, // mm dimension Z (hauteur h)
  EA= 4, // mm Epaisseur de l'âme (tw)
  TF= 4, // mm Epaisseur des semelles (tf)
  RE= 4, // mm Rayon de raccordement externe (r1)
  LKY= 3675, // mm longueur minimale de flambement pour moment Myy
  LDY= 3675, // mm longueur minimale de déversement pour moment Myy
  CVA= 0; // mm-1 coût variable
  
```

PROPERTY(TYPE=BEAM\_LINEAR)

```

5, UPN80; // BEAM_LINEAR poutre droite [UPN80]
  AR= 1100, // mm2 aire de la section (A)
  IYY= 1.06E6, // mm4 moment d'inertie Y
  IZZ= 194E3, // mm4 moment d'inertie Z
  TC= 21.6E3, // mm4 constante de torsion J
  IVY= 26.5E3, // mm3 module de flexion élastique (I/vy=Wel.y)
  IVZ= 6400, // mm3 module de flexion élastique (I/vz=Wel.z)
  ITC= 1551.7, // mm3 module de torsion pour Mx (J/r)
  SP= 15.9E3, // mm3 moment statique Y (Wpl.y/2)
  SPZ= 6050, // mm3 moment statique Z (Wpl.z/2)
  SRY= 2.1, // :: facteur de cisaillement Ty
  SRZ= 2.2, // :: facteur de cisaillement Tz
  ARY= 513, // mm2 aire de cisaillement (Av.y)
  ARZ= 510, // mm2 aire de cisaillement (Av.z)
  TKY= 45, // mm dimension Y (largeur b)
  TKZ= 80, // mm dimension Z (hauteur h)
  EA= 6, // mm Epaisseur de l'âme (tw)
  TF= 8, // mm Epaisseur des semelles (tf)
  LKY= 5300, // mm longueur minimale de flambement pour moment Myy
  LDY= 5300, // mm longueur minimale de déversement pour moment Myy
  CVA= 8.7E-3; // mm-1 coût variable
  
```

PROPERTY(TYPE=BEAM\_LINEAR)

```

6, UPN120; // BEAM_LINEAR poutre droite [UPN120]
  AR= 1700, // mm2 aire de la section (A)
  IYY= 3.64E6, // mm4 moment d'inertie Y
  IZZ= 432E3, // mm4 moment d'inertie Z
  TC= 41.5E3, // mm4 constante de torsion J
  IVY= 60.7E3, // mm3 module de flexion élastique (I/vy=Wel.y)
  IVZ= 11.1E3, // mm3 module de flexion élastique (I/vz=Wel.z)
  ITC= 2650.1, // mm3 module de torsion pour Mx (J/r)
  SP= 36.3E3, // mm3 moment statique Y (Wpl.y/2)
  SPZ= 10.6E3, // mm3 moment statique Z (Wpl.z/2)
  SRY= 2.3, // :: facteur de cisaillement Ty
  
```

```

SRZ=      1.9, // ::      facteur de cisaillement Tz
ARY=     734, // mm2      aire de cisaillement (Av.y)
ARZ=     880, // mm2      aire de cisaillement (Av.z)
TKY=      55, // mm      dimension Y (largeur b)
TKZ=     120, // mm      dimension Z (hauteur h)
EA=       7, // mm       Epaisseur de l'âme (tw)
TF=       9, // mm       Epaisseur des semelles (tf)
LKY=     5300, // mm      longueur minimale de flambement pour moment Myy
LDY=     5300, // mm      longueur minimale de déversement pour moment Myy
CVA=    13.3E-3; // mm-1   coût variable
    
```

```

PROPERTY(TYPE=BEAM_LINEAR)
7,RE120_5X; // BEAM_LINEAR poutre droite [RE120_5X]
comment="R120x120 5 - section rectangulaire creuse",
SECTION=2, // RHS120x120x5 r5 section rectangulaire creuse (RHS)
AR= 2278.5, // mm2      aire de la section (A)
IYY= 5.0047E6, // mm4    moment d'inertie Y
IZZ= 5.0047E6, // mm4    moment d'inertie Z
TC= 7.0448E6, // mm4    constante de torsion J
IVY= 83.412E3, // mm3    module de flexion élastique (I/vy=WeI.y)
IVZ= 83.412E3, // mm3    module de flexion élastique (I/vz=WeI.z)
ITC= 126.7E3, // mm3    module de torsion pour Mx (J/r)
SP= 48.993E3, // mm3    moment statique Y (Wpl.y/2)
SPZ= 48.993E3, // mm3    moment statique Z (Wpl.z/2)
SRY= 2.4, // ::        facteur de cisaillement Ty
SRZ= 2.4, // ::        facteur de cisaillement Tz
ARY= 1021.5, // mm2      aire de cisaillement (Av.y)
ARZ= 1021.5, // mm2      aire de cisaillement (Av.z)
TKY= 120, // mm        dimension Y (largeur b)
TKZ= 120, // mm        dimension Z (hauteur h)
EA= 5, // mm          Epaisseur de l'âme (tw)
TF= 5, // mm          Epaisseur des semelles (tf)
RE= 5, // mm          Rayon de raccordement externe (r1)
CVA= 0; // mm-1       coût variable
    
```

## Conditions limites

Chargement= 0 '1'

déplacement imposé

Noeud	Chargement	X mm	Y mm	Z mm	RX rad	RY rad	RZ rad
1		0	0	0	0	0	0
2		0	0	0	0	0	0
4		0	0	0	0	0	0
3		0	0	0	0	0	0

force imposée

Noeud	Chargement	Fx daN	Fy daN	Fz daN	Mx daN.mm	My daN.mm	Mz daN.mm
143		5000.000	0	0	0	0	0

## Réactions non pondérées

Trémie Cuivre  
calcul 1 'calcul 0'

-----  
REACTIONS (FORCES ET MOMENTS)

Fx force en translation X  
Fy force en translation Y  
Fz force en translation Z  
Mx moment autour de l'axe X  
My moment autour de l'axe Y  
Mz moment autour de l'axe Z

Noeud	Fx daN	Fy daN	Fz daN	Mx daN.mm	My daN.mm	Mz daN.mm
n1-----+ 1	-974.585	0.726	-97.874	-0.607E3	-47.502E3	0.108E3
n2-----+ 2	-995.764	0.549	-104.192	0.601E3	-36.929E3	-0.106E3
n3-----+ 3	-1507.700	-3.704	104.099	0.310E3	-40.629E3	-0.157E3
n4-----+ 4	-1521.951	2.429	97.967	-0.119E3	-53.994E3	-0.017E3

-----  
Plus grande valeur négative

Fx -1521.951 daN Noeud 4, Fx force en translation X  
Fy -3.704 daN Noeud 3, Fy force en translation Y  
Fz -104.192 daN Noeud 2, Fz force en translation Z  
Mx -0.607E3 daN.mm Noeud 1, Mx moment autour de l'axe X  
My -53.994E3 daN.mm Noeud 4, My moment autour de l'axe Y  
Mz -0.157E3 daN.mm Noeud 3, Mz moment autour de l'axe Z

Plus grande valeur positive

Fy 2.429 daN Noeud 4, Fy force en translation Y  
Fz 104.099 daN Noeud 3, Fz force en translation Z  
Mx 0.601E3 daN.mm Noeud 2, Mx moment autour de l'axe X  
Mz 0.108E3 daN.mm Noeud 1, Mz moment autour de l'axe Z

Somme des réactions des forces F et moments M calculés à l'origine

Fx,y,z -5000, 10.587E-12, 13.216E-12,  
Mx,y,z -4.7018E-9, -1.25E6, 5E6,

## Réactions ELS

-----  
Trémie Cuivre  
calcul 2 'calcul 0'

REACTIONS (FORCES ET MOMENTS)

Plus grande valeur négative

Fx -1521.951 daN Noeud 4, Fx force en translation X  
Fy -3.704 daN Noeud 3, Fy force en translation Y  
Fz -104.192 daN Noeud 2, Fz force en translation Z  
Mx -0.607E3 daN.mm Noeud 1, Mx moment autour de l'axe X  
My -53.994E3 daN.mm Noeud 4, My moment autour de l'axe Y  
Mz -0.157E3 daN.mm Noeud 3, Mz moment autour de l'axe Z

Plus grande valeur positive

Fy 2.429 daN Noeud 4, Fy force en translation Y  
Fz 104.099 daN Noeud 3, Fz force en translation Z  
Mx 0.601E3 daN.mm Noeud 2, Mx moment autour de l'axe X  
Mz 0.108E3 daN.mm Noeud 1, Mz moment autour de l'axe Z

Somme des réactions des forces F et moments M calculés à l'origine

Fx,y,z -5000, 10.587E-12, 13.216E-12,  
Mx,y,z -4.7018E-9, -1.25E6, 5E6,

## Réactions ELU

Enveloppe des résultats extrêmes sur tous les calculs

REACTIONS (FORCES ET MOMENTS)

Fx force en translation X

Fy force en translation Y

Fz force en translation Z

Mx moment autour de l'axe X

My moment autour de l'axe Y

Mz moment autour de l'axe Z

Noeud		Fx daN	Fy daN	Fz daN	Mx daN.mm	My daN.mm	Mz daN.mm
1	min	-974.585	0.726	-97.874	-0.607E3	-47.502E3	0.108E3
	max	-974.585	0.726	-97.874	-0.607E3	-47.502E3	0.108E3
2	min	-995.764	0.549	-104.192	0.601E3	-36.929E3	-0.106E3
	max	-995.764	0.549	-104.192	0.601E3	-36.929E3	-0.106E3
3	min	-1507.700	-3.704	104.099	0.310E3	-40.629E3	-0.157E3
	max	-1507.700	-3.704	104.099	0.310E3	-40.629E3	-0.157E3
4	min	-1521.951	2.429	97.967	-0.119E3	-53.994E3	-0.017E3
	max	-1521.951	2.429	97.967	-0.119E3	-53.994E3	-0.017E3

Plus grande valeur négative

Fx	-1521.951 daN	Calcul 1	Noeud 4, Fx force en translation X
Fy	-3.704 daN	Calcul 1	Noeud 3, Fy force en translation Y
Fz	-104.192 daN	Calcul 1	Noeud 2, Fz force en translation Z
Mx	-0.607E3 daN.mm	Calcul 1	Noeud 1, Mx moment autour de l'axe X
My	-53.994E3 daN.mm	Calcul 1	Noeud 4, My moment autour de l'axe Y
Mz	-0.157E3 daN.mm	Calcul 1	Noeud 3, Mz moment autour de l'axe Z

Plus grande valeur positive

Fy	2.429 daN	Calcul 1	Noeud 4, Fy force en translation Y
Fz	104.099 daN	Calcul 1	Noeud 3, Fz force en translation Z
Mx	0.601E3 daN.mm	Calcul 1	Noeud 2, Mx moment autour de l'axe X
Mz	0.108E3 daN.mm	Calcul 1	Noeud 1, Mz moment autour de l'axe Z

## Déplacements ELS

Trémie Cuivre  
calcul 2 'calcul 0'

DEPLACEMENT (TRANSLATIONS ET ROTATIONS)

X déplacement en translation X

Y déplacement en translation Y

Z déplacement en translation Z

RX rotation autour de l'axe X

RY rotation autour de l'axe Y

RZ rotation autour de l'axe Z

D déplacement total (x,y,z)

R rotation totale (rx,ry,rz)

Noeud	X mm	Y mm	Z mm	RX rad	RY rad	RZ rad	D mm	R rad
n5								
5	0.220057	-0.004133	0.001354	0.000E-3	-0.007E-3	0.090E-3	0.220100	0.090E-3
n6								
6	0.202107	-0.004282	0.001306	0.002E-3	-0.017E-3	-0.045E-3	0.202156	0.048E-3
n7								
7	0.202832	-0.000382	0.000114	-0.002E-3	-0.002E-3	0.116E-3	0.202832	0.116E-3
n8								
8	0.220677	-0.000350	0.000166	0.003E-3	0.003E-3	-0.096E-3	0.220677	0.096E-3
n9								
9	0.004244	-0.000313	0.004464	0.000E-3	-0.015E-3	-0.001E-3	0.006167	0.015E-3
n10								
10	0.004571	-0.000316	0.004782	0.000E-3	-0.015E-3	-0.001E-3	0.006623	0.015E-3
n11								
11	0.009141	-0.000851	0.012220	0.000E-3	-0.013E-3	-0.001E-3	0.015284	0.013E-3
n12								
12	0.008489	-0.000885	0.012071	-0.000E-3	-0.016E-3	-0.001E-3	0.014783	0.016E-3
n13								
13	0.012735	-0.001498	0.017121	-0.015E-3	-0.002E-3	-0.000E-3	0.021390	0.015E-3
n14								
14	0.013709	-0.001594	0.015480	0.012E-3	0.006E-3	-0.003E-3	0.020739	0.014E-3
n15								
15	0.016919	-0.002327	0.018340	-0.001E-3	-0.012E-3	-0.001E-3	0.025060	0.012E-3
n16								
16	0.015874	-0.002346	0.022140	-0.003E-3	-0.017E-3	-0.002E-3	0.027344	0.017E-3
n17								
17	0.018941	-0.003027	0.030856	-0.008E-3	-0.018E-3	0.002E-3	0.036332	0.020E-3
n18								
18	0.020037	-0.003282	0.025536	0.002E-3	-0.012E-3	-0.005E-3	0.032625	0.013E-3
n19								
19	0.001723	0.000003	-0.001020	-0.000E-3	-0.009E-3	-0.000E-3	0.002002	0.009E-3
n20								
20	0.001742	0.000029	-0.001130	-0.000E-3	-0.010E-3	-0.000E-3	0.002077	0.010E-3
n21								
21	0.008711	-0.000135	-0.012444	-0.001E-3	-0.028E-3	0.003E-3	0.015191	0.029E-3
n22								
22	0.008614	0.000638	-0.010622	-0.001E-3	-0.022E-3	-0.004E-3	0.013691	0.023E-3
n23								
23	0.015505	-0.000531	-0.019124	-0.005E-3	-0.003E-3	0.028E-3	0.024625	0.029E-3
n24								
24	0.015679	0.001588	-0.024127	0.000E-3	-0.012E-3	-0.029E-3	0.028818	0.031E-3
n25								
25	0.013001	-0.001501	0.017221	-0.056E-3	-0.001E-3	-0.000E-3	0.021630	0.056E-3
n26								
26	0.220144	0.167065	0.017393	0.017E-3	-0.014E-3	0.155E-3	0.276906	0.156E-3
n27								
27	0.220392	0.300305	0.033078	0.056E-3	0.003E-3	0.044E-3	0.373965	0.072E-3
n28								
28	0.022393	-0.001097	0.036764	-0.325E-3	0.001E-3	0.002E-3	0.043061	0.325E-3
n29								
29	0.027998	-0.031179	0.011297	-0.251E-3	0.117E-3	-0.044E-3	0.043401	0.280E-3
n30								
30	0.220618	0.239962	0.012891	0.018E-3	0.012E-3	-0.148E-3	0.326221	0.149E-3
n31								
31	0.013994	-0.001674	0.015389	0.046E-3	0.007E-3	-0.003E-3	0.020867	0.047E-3
n32								
32	0.202175	-0.107785	0.018968	0.023E-3	-0.007E-3	-0.059E-3	0.229896	0.063E-3
n33								
33	0.202829	-0.225682	0.000591	0.033E-3	0.006E-3	0.040E-3	0.303434	0.052E-3
n34								
34	0.028308	0.031366	-0.000982	0.225E-3	0.107E-3	0.049E-3	0.042263	0.254E-3
n35								
35	0.023542	-0.007277	0.027850	0.182E-3	0.014E-3	-0.006E-3	0.037186	0.183E-3
n36								
36	0.202457	-0.203122	0.017244	0.053E-3	0.012E-3	-0.049E-3	0.287306	0.073E-3
n37								
37	0.178312	-0.136556	0.027103	0.117E-3	0.032E-3	-0.079E-3	0.226224	0.144E-3
n38								
38	0.173445	-0.046394	0.015121	0.055E-3	0.061E-3	-0.044E-3	0.180178	0.093E-3



n39																	
39		0.193479		-0.000211		0.001093		0.000E-3		0.092E-3		0.056E-3		0.193482		0.107E-3	
n40																	
40		0.171485		-0.000141		0.001096		0.002E-3		0.077E-3		-0.031E-3		0.171488		0.083E-3	
n41																	
41		0.183435		-0.150961		-0.000298		0.137E-3		0.072E-3		0.318E-3		0.237566		0.353E-3	
n42																	
42		0.187953		0.000478		-0.000172		-0.001E-3		0.042E-3		0.014E-3		0.187953		0.045E-3	
n43																	
43		0.205064		0.000672		-0.000125		-0.001E-3		0.043E-3		-0.007E-3		0.205065		0.044E-3	
n44																	
44		0.118549		-0.000039		0.000785		0.000E-3		0.256E-3		0.032E-3		0.118551		0.258E-3	
n45																	
45		0.103451		0.000017		0.000776		0.000E-3		0.225E-3		-0.020E-3		0.103454		0.226E-3	
n46																	
46		0.141039		0.000126		-0.000207		0.003E-3		0.270E-3		0.008E-3		0.141039		0.270E-3	
n47																	
47		0.153185		0.000278		-0.000196		-0.004E-3		0.294E-3		0.001E-3		0.153186		0.294E-3	
n48																	
48		0.224370		-0.004291		0.002515		0.002E-3		0.015E-3		-0.043E-3		0.224425		0.045E-3	
n49																	
49		0.227391		-0.107796		0.030627		0.019E-3		0.018E-3		-0.047E-3		0.253505		0.054E-3	
n50																	
50		0.225794		-0.203135		0.043349		0.037E-3		0.018E-3		-0.043E-3		0.306799		0.059E-3	
n51																	
51		0.194385		-0.225697		0.018728		0.032E-3		-0.044E-3		0.006E-3		0.298455		0.055E-3	
n52																	
52		0.192839		-0.001820		0.001665		0.006E-3		0.013E-3		-0.045E-3		0.192854		0.047E-3	
n53																	
53		0.192535		-0.067110		0.020639		0.043E-3		0.004E-3		-0.069E-3		0.204938		0.082E-3	
n54																	
54		0.191982		-0.172053		0.036528		0.057E-3		-0.001E-3		-0.082E-3		0.260372		0.100E-3	
n55																	
55		0.191002		-0.190864		0.010437		0.065E-3		0.062E-3		0.138E-3		0.270221		0.165E-3	
n56																	
56		0.200505		-0.208654		0.015211		0.026E-3		0.037E-3		0.063E-3		0.289776		0.077E-3	
n57																	
57		0.200958		-0.003900		0.002298		0.004E-3		-0.002E-3		-0.057E-3		0.201009		0.057E-3	
n58																	
58		0.207253		-0.005057		0.002656		0.001E-3		-0.004E-3		-0.064E-3		0.207332		0.065E-3	
n59																	
59		0.207942		-0.214668		0.016800		0.007E-3		0.025E-3		0.026E-3		0.299340		0.037E-3	
n60																	
60		0.212515		-0.216725		0.017306		0.007E-3		-0.002E-3		0.011E-3		0.304026		0.013E-3	
n61																	
61		0.213898		-0.004916		0.002639		-0.001E-3		-0.001E-3		-0.064E-3		0.213971		0.064E-3	
n62																	
62		0.214362		-0.000608		0.001214		0.001E-3		0.019E-3		0.068E-3		0.214366		0.070E-3	
n63																	
63		0.195323		-0.000624		0.001136		0.001E-3		0.045E-3		-0.033E-3		0.195328		0.056E-3	
n64																	
64		0.201840		0.001043		-0.000063		-0.003E-3		0.020E-3		0.028E-3		0.201843		0.034E-3	
n65																	
65		0.215514		0.000866		0.000002		0.002E-3		0.015E-3		-0.029E-3		0.215516		0.033E-3	
n66																	
66		0.218531		-0.001056		0.001278		0.001E-3		0.002E-3		0.074E-3		0.218538		0.074E-3	
n67																	
67		0.208029		-0.001070		0.001176		0.001E-3		0.021E-3		-0.033E-3		0.208035		0.039E-3	
n68																	
68		0.205234		0.001075		0.000001		-0.000E-3		0.002E-3		0.046E-3		0.205237		0.046E-3	
n69																	
69		0.218341		0.000934		0.000065		0.000E-3		0.004E-3		-0.052E-3		0.218343		0.052E-3	
n70																	
70		0.219516		-0.001653		0.001319		0.001E-3		-0.000E-3		0.080E-3		0.219526		0.080E-3	
n71																	
71		0.212411		-0.001677		0.001215		0.002E-3		0.003E-3		-0.033E-3		0.212421		0.033E-3	
n72																	
72		0.205140		0.000812		0.000056		-0.000E-3		-0.002E-3		0.068E-3		0.205141		0.068E-3	
n73																	
73		0.219437		0.000791		0.000113		0.001E-3		0.002E-3		-0.071E-3		0.219439		0.071E-3	
n74																	
74		0.220011		-0.002531		0.001343		0.002E-3		-0.001E-3		0.084E-3		0.220029		0.084E-3	

n75	75	0.210830	-0.002548	0.001253	0.002E-3	-0.009E-3	-0.036E-3	0.210849	0.037E-3
n76	76	0.204068	0.000392	0.000092	0.001E-3	-0.002E-3	0.089E-3	0.204068	0.089E-3
n77	77	0.219924	0.000425	0.000145	0.001E-3	0.002E-3	-0.085E-3	0.219925	0.085E-3
n78	78	0.202245	-0.183113	0.000048	0.041E-3	0.006E-3	0.481E-3	0.272825	0.482E-3
n79	79	0.204955	-0.196724	0.000169	0.027E-3	0.004E-3	0.335E-3	0.284089	0.336E-3
n80	80	0.205151	-0.205418	0.000286	0.018E-3	-0.001E-3	0.235E-3	0.290316	0.236E-3
n81	81	0.203951	-0.211900	0.000406	0.017E-3	-0.004E-3	0.156E-3	0.294105	0.157E-3
n82	82	0.006040	0.000000	0.000323	0.000E-3	0.175E-3	0.000E-3	0.006048	0.175E-3
n83	83	0.180251	-0.004199	0.000542	-0.000E-3	-0.018E-3	0.002E-3	0.180300	0.018E-3
n84	84	0.265640	-0.000360	0.002479	-0.000E-3	0.010E-3	0.009E-3	0.265652	0.013E-3
n86	86	0.151208	0.000259	-0.005748	-0.011E-3	0.123E-3	0.005E-3	0.151317	0.123E-3
n87	87	0.148152	0.000208	-0.008161	0.000E-3	0.113E-3	0.006E-3	0.148376	0.113E-3
n88	88	0.144707	0.000154	-0.005375	0.011E-3	0.117E-3	0.007E-3	0.144807	0.118E-3
n89	89	0.219885	0.001005	0.004056	0.001E-3	0.072E-3	0.025E-3	0.219924	0.076E-3
n90	90	0.225440	0.000958	0.000495	-0.000E-3	0.077E-3	0.011E-3	0.225442	0.077E-3
n91	91	0.229882	0.000908	0.004254	-0.001E-3	0.074E-3	-0.010E-3	0.229923	0.075E-3
n92	92	0.263357	-0.000358	0.002281	0.002E-3	0.009E-3	-0.024E-3	0.263368	0.025E-3
n93	93	0.258176	-0.000363	0.002160	-0.002E-3	0.011E-3	0.041E-3	0.258185	0.043E-3
n94	94	0.222957	0.000994	0.002409	0.007E-3	0.048E-3	0.012E-3	0.222972	0.050E-3
n95	95	0.229385	0.000920	0.002535	-0.008E-3	0.049E-3	0.008E-3	0.229401	0.050E-3
n96	96	0.162216	-0.003053	0.076977	-0.053E-3	0.054E-3	0.025E-3	0.179579	0.079E-3
n97	97	0.149452	-0.002726	0.071137	0.045E-3	0.050E-3	-0.014E-3	0.165541	0.069E-3
n98	98	0.151204	-0.002994	0.054184	-0.028E-3	0.118E-3	0.011E-3	0.160647	0.122E-3
n99	99	0.148150	-0.002898	0.048352	-0.002E-3	0.113E-3	0.006E-3	0.155867	0.113E-3
n100	100	0.144704	-0.002796	0.051756	0.023E-3	0.113E-3	0.002E-3	0.153707	0.115E-3
n101	101	0.201227	0.181389	0.012094	-0.199E-3	0.060E-3	-0.413E-3	0.271184	0.462E-3
n102	102	0.182753	0.077687	0.011627	-0.289E-3	-0.060E-3	-0.295E-3	0.198920	0.418E-3
n103	103	0.215214	0.228003	0.012450	-0.060E-3	0.004E-3	-0.465E-3	0.313779	0.469E-3
n104	104	0.218098	0.245012	0.012588	-0.027E-3	0.008E-3	-0.309E-3	0.328262	0.310E-3
n105	105	0.219457	0.250928	0.012703	-0.004E-3	0.005E-3	-0.229E-3	0.333598	0.229E-3
n106	106	0.219894	0.249351	0.012794	0.010E-3	0.003E-3	-0.185E-3	0.332706	0.185E-3
n107	107	0.168574	-0.066785	-0.000724	0.255E-3	-0.083E-3	0.269E-3	0.181323	0.380E-3
n108	108	0.113704	-0.023114	0.015233	0.058E-3	0.168E-3	-0.025E-3	0.117025	0.180E-3
n109	109	0.134112	-0.078823	0.027302	0.166E-3	0.190E-3	-0.054E-3	0.157939	0.258E-3
n110	110	0.132431	-0.000182	0.000412	0.000E-3	0.118E-3	0.008E-3	0.132432	0.119E-3
n111	111	0.194891	0.082657	0.017068	-0.118E-3	0.056E-3	0.100E-3	0.212382	0.165E-3

n112																	
112		0.198240		0.243481		0.034961		-0.237E-3		0.037E-3		0.117E-3		0.315918		0.267E-3	
n113																	
113		0.075373		-0.000014		0.000370		0.000E-3		0.162E-3		0.006E-3		0.075374		0.162E-3	
n114																	
114		0.131052		0.034732		0.017088		-0.113E-3		0.153E-3		0.052E-3		0.136649		0.197E-3	
n115																	
115		0.151481		0.130629		0.035625		-0.316E-3		0.185E-3		0.073E-3		0.203174		0.374E-3	
n116																	
116		0.169288		-0.000615		0.000450		0.000E-3		0.067E-3		0.005E-3		0.169290		0.067E-3	
n117																	
117		0.214143		0.125808		0.017134		-0.093E-3		0.010E-3		0.138E-3		0.248955		0.167E-3	
n118																	
118		0.214347		0.316417		0.034402		-0.126E-3		0.017E-3		0.124E-3		0.383728		0.178E-3	
n119																	
119		0.243946		0.000996		0.002442		0.002E-3		0.027E-3		-0.009E-3		0.243961		0.029E-3	
n120																	
120		0.237347		0.001000		0.002321		-0.002E-3		0.027E-3		0.029E-3		0.237361		0.040E-3	
n121																	
121		0.218376		0.155936		0.017200		-0.056E-3		-0.002E-3		0.162E-3		0.268887		0.172E-3	
n122																	
122		0.218256		0.346641		0.033962		-0.033E-3		0.004E-3		0.094E-3		0.411034		0.099E-3	
n123																	
123		0.187447		-0.001066		0.000482		0.000E-3		0.027E-3		-0.001E-3		0.187451		0.027E-3	
n124																	
124		0.252216		0.000791		0.002371		0.001E-3		0.016E-3		-0.016E-3		0.252228		0.023E-3	
n125																	
125		0.245688		0.000801		0.002251		-0.001E-3		0.017E-3		0.036E-3		0.245700		0.040E-3	
n126																	
126		0.219475		0.171265		0.017260		-0.022E-3		-0.004E-3		0.170E-3		0.278925		0.172E-3	
n127																	
127		0.219451		0.347248		0.033610		0.022E-3		0.002E-3		0.069E-3		0.412153		0.072E-3	
n128																	
128		0.192491		-0.001670		0.000507		0.001E-3		0.002E-3		-0.004E-3		0.192499		0.005E-3	
n129																	
129		0.257511		0.000413		0.002323		0.002E-3		0.011E-3		-0.020E-3		0.257522		0.023E-3	
n130																	
130		0.251354		0.000408		0.002202		-0.001E-3		0.013E-3		0.039E-3		0.251364		0.041E-3	
n131																	
131		0.219956		0.174496		0.017315		0.003E-3		-0.004E-3		0.167E-3		0.281299		0.167E-3	
n132																	
132		0.219923		0.332511		0.033344		0.047E-3		0.001E-3		0.054E-3		0.400052		0.072E-3	
n133																	
133		0.189972		-0.002537		0.000525		0.001E-3		-0.012E-3		-0.004E-3		0.189989		0.012E-3	
n134																	
134		0.200813		-0.082300		0.024687		0.030E-3		-0.008E-3		-0.080E-3		0.218423		0.086E-3	
n135																	
135		0.200622		-0.186538		0.040300		0.018E-3		-0.001E-3		-0.072E-3		0.276893		0.074E-3	
n136																	
136		0.207485		-0.189800		0.041063		0.003E-3		-0.001E-3		-0.060E-3		0.284184		0.060E-3	
n137																	
137		0.207293		-0.092277		0.027340		0.019E-3		-0.010E-3		-0.082E-3		0.228545		0.085E-3	
n138																	
138		0.213814		-0.099097		0.029157		0.015E-3		-0.003E-3		-0.078E-3		0.237459		0.080E-3	
n139																	
139		0.213385		-0.191454		0.041416		0.009E-3		0.007E-3		-0.052E-3		0.289660		0.054E-3	
n140																	
140		0.208923		0.079959		0.043960		-0.290E-3		0.210E-3		-0.301E-3		0.227980		0.468E-3	
n141																	
141		0.200551		-0.074212		0.026269		0.267E-3		0.175E-3		0.306E-3		0.215449		0.443E-3	
n142																	
142		1.226484		0.055736		-0.203600		-0.569E-3		-0.178E-3		-1.551E-3		1.244517		1.661E-3	
n143																	
143		2.174810		0.002830		-0.388035		-0.008E-3		-0.537E-3		0.004E-3		2.209158		0.537E-3	
n144																	
144		1.221769		-0.050051		-0.211724		0.552E-3		-0.200E-3		1.558E-3		1.240988		1.665E-3	
n145																	
145		0.201229		0.019096		-0.003126		0.045E-3		0.009E-3		0.567E-3		0.202157		0.569E-3	
n146																	
146		0.808078		0.018394		0.049280		-0.175E-3		-0.657E-3		1.374E-3		0.809789		1.533E-3	
n147																	
147		1.284822		0.016961		0.156859		-0.002E-3		-1.228E-3		0.014E-3		1.294473		1.228E-3	

n148																		
148		0.820562		0.015536		0.052704		0.159E-3		-0.655E-3		-1.354E-3		0.822400		1.512E-3		
n149																		
149		0.215396		0.014853		0.012669		-0.075E-3		-0.001E-3		-0.589E-3		0.216279		0.594E-3		
n150																		
150		0.208923		-0.070618		-0.060965		-0.290E-3		0.210E-3		-0.301E-3		0.228807		0.468E-3		
n151																		
151		1.226320		-0.047321		-0.120830		-0.038E-3		-0.163E-3		-1.545E-3		1.233167		1.554E-3		
n152																		
152		2.157237		0.004174		-0.127147		0.004E-3		-0.509E-3		0.004E-3		2.160985		0.509E-3		
n153																		
153		1.221610		0.055640		-0.117884		0.040E-3		-0.186E-3		1.552E-3		1.228545		1.564E-3		
n154																		
154		0.200551		0.078861		-0.061391		0.267E-3		0.175E-3		0.306E-3		0.224072		0.443E-3		
n155																		
155		0.200551		-0.026759		-0.000905		0.267E-3		0.175E-3		0.306E-3		0.202330		0.443E-3		
n156																		
156		0.201229		-0.176592		-0.000004		0.045E-3		0.009E-3		0.567E-3		0.267727		0.569E-3		
n157																		
157		0.208923		0.033280		0.011434		-0.290E-3		0.210E-3		-0.301E-3		0.211866		0.468E-3		
n158																		
158		0.215396		0.217963		0.012392		-0.075E-3		-0.001E-3		-0.589E-3		0.306687		0.594E-3		

Plus grande valeur négative

Y	-0.225697 mm	Noeud 51, Y déplacement en translation Y
Z	-0.388035 mm	Noeud 143, Z déplacement en translation Z
RX	-0.569E-3 rad	Noeud 142, RX rotation autour de l'axe X
RY	-1.228E-3 rad	Noeud 147, RY rotation autour de l'axe Y
RZ	-1.551E-3 rad	Noeud 142, RZ rotation autour de l'axe Z

Plus grande valeur positive

X	2.174810 mm	Noeud 143, X déplacement en translation X
Y	0.347248 mm	Noeud 127, Y déplacement en translation Y
Z	0.156859 mm	Noeud 147, Z déplacement en translation Z
RX	0.552E-3 rad	Noeud 144, RX rotation autour de l'axe X
RY	0.294E-3 rad	Noeud 47, RY rotation autour de l'axe Y
RZ	1.558E-3 rad	Noeud 144, RZ rotation autour de l'axe Z
D	2.209158 mm	Noeud 143, D déplacement total (x,y,z)
R	1.665E-3 rad	Noeud 144, R rotation totale (rx,ry,rz)

## Flèches ELS

Propriété 2 UPN200  
Trémie Cuivre  
calcul 2 'calcul 0'

FLÈCHES - DÉPLACEMENTS NORMAUX À LA FIBRE NEUTRE

W flèche, déplacement perpendiculaire à l'âme  
Wy déplacement (y) perpendiculaire à l'âme  
Wz déplacement (z) perpendiculaire à l'âme  
Thy rotation (y) de la fibre neutre  
Thz rotation (z) de la fibre neutre

Elément	W mm	Wy mm	Wz mm	Thy rad	Thz rad													
e1																		
1		0		-0.006040		0		0		0								
e2																		
2		0		0		0		0		0		0						
e3																		
3		0		-0.000003		0		0		0		0						
e4																		
4		0		-0.000316		0		0		0		0						
e35																		
35		0.202111		-0.224370		0.001306		-0.002E-3		-0.045E-3								
e36																		
36		0.195286		0.202829		0.018728		0.032E-3		0.006E-3								
e69																		
69		0.054266		-0.002994		0.054184		0.118E-3		0.011E-3								

e70						
70	0.048439	-0.002898	0.048352	0.113E-3	0.006E-3	
e71						
71	0.051832	-0.002796	0.051756	0.113E-3	0.002E-3	
e78						
78	0.006048	-0.006040	0.000323	-0.000E-3	0.000E-3	
e79						
79	0	0	0	0	0	
e80						
80	0.001020	-0.000638	-0.001020	0.009E-3	-0.000E-3	
e81						
81	0.010641	-0.001669	-0.010622	0.022E-3	-0.004E-3	
e82						
82	0.019131	0.031577	-0.019124	0.003E-3	0.028E-3	
e83						
83	0.033162	0.031179	0.011297	-0.117E-3	-0.044E-3	
e84						
84	0.036780	0.003027	0.036764	-0.001E-3	0.002E-3	
e85						
85	0.031004	0.003051	0.030856	0.018E-3	0.002E-3	
e86						
86	0.022264	0.002346	0.022140	0.017E-3	-0.002E-3	
e87						
87	0.017287	0.001501	0.017221	0.001E-3	-0.000E-3	
e88						
88	0.017186	0.001498	0.017121	0.002E-3	-0.000E-3	
e89						
89	0.012104	0.000885	0.012071	0.016E-3	-0.001E-3	
e90						
90	0.004475	0.000313	0.004464	0.015E-3	-0.001E-3	
e91						
91	0.004792	-0.000851	0.004782	-0.015E-3	-0.001E-3	
e92						
92	0.012250	-0.001594	0.012220	-0.013E-3	-0.001E-3	
e93						
93	0.015562	-0.001674	0.015480	0.006E-3	-0.003E-3	
e94						
94	0.015480	-0.002327	0.015389	0.007E-3	-0.003E-3	
e95						
95	0.018487	-0.003282	0.018340	-0.012E-3	-0.001E-3	
e96						
96	0.025747	-0.007277	0.025536	-0.012E-3	-0.005E-3	
e97						
97	0.028785	0.031366	0.027850	0.014E-3	-0.006E-3	
e98						
98	0.031382	0.032517	-0.000982	0.107E-3	0.049E-3	
e99						
99	0.024179	0.001588	-0.024127	-0.012E-3	-0.029E-3	
e100						
100	0.012445	-0.000135	-0.012444	-0.028E-3	0.003E-3	
e101						
101	0.001130	0.000029	-0.001130	-0.010E-3	-0.000E-3	
e253						
253	0.217560	0.055640	-0.211724	-0.200E-3	1.558E-3	
e254						
254	0.388045	0.004174	-0.388035	-0.537E-3	0.004E-3	
e255						
255	0.211091	0.055736	-0.203600	-0.178E-3	-1.551E-3	

Plus grande valeur négative

Wy	-0.224370 mm	Elément 35, Wy déplacement (y) perpendiculaire à l'âme
Wz	-0.388035 mm	Elément 254, Wz déplacement (z) perpendiculaire à l'âme
Thy	-0.537E-3 rad	Elément 254, Thy rotation (y) de la fibre neutre
Thz	-1.551E-3 rad	Elément 255, Thz rotation (z) de la fibre neutre

Plus grande valeur positive

W	0.388045 mm	Elément 254, W flèche, déplacement perpendiculaire à l'âme
Wy	0.202829 mm	Elément 36, Wy déplacement (y) perpendiculaire à l'âme
Wz	0.054184 mm	Elément 69, Wz déplacement (z) perpendiculaire à l'âme
Thy	0.123E-3 rad	Elément 69, Thy rotation (y) de la fibre neutre
Thz	1.558E-3 rad	Elément 253, Thz rotation (z) de la fibre neutre

Propriété 3 RE80\_5X R80x80 5 - section rectangulaire creuse  
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FLÈCHES - DÉPLACEMENTS NORMAUX À LA FIBRE NEUTRE

W flèche, déplacement perpendiculaire à l'âme

Wy déplacement (y) perpendiculaire à l'âme

Wz déplacement (z) perpendiculaire à l'âme

Thy rotation (y) de la fibre neutre

Thz rotation (z) de la fibre neutre

Elément	W mm	Wy mm	Wz mm	Thy rad	Thz rad
e9	0	-0.000039	0	0	0
e10	0	0.000017	0	0	0
e11	0	0.000240	0	0	0
e12	0	0.000278	0	0	0
e23	0.041905	0.033280	-0.027998	0.117E-3	0.251E-3
e24	0.042252	0.031366	-0.028308	0.107E-3	-0.225E-3
e25	0.014094	-0.023114	-0.013994	0.007E-3	-0.046E-3
e26	0.024642	-0.078823	-0.023542	0.014E-3	-0.182E-3
e37	0.203063	-0.227391	0.018968	-0.023E-3	-0.059E-3
e38	0.203190	-0.225794	0.017244	-0.053E-3	-0.049E-3
e39	0.171485	-0.192839	0.000422	-0.002E-3	-0.082E-3
e40	0.180160	-0.192535	0.048731	-0.055E-3	-0.070E-3
e41	0.226028	-0.191982	0.138901	-0.117E-3	-0.052E-3
e42	0.234239	-0.191002	0.145669	-0.137E-3	0.013E-3
e67	0.153185	-0.153185	-0.000196	0.004E-3	0.001E-3
e68	0.179553	-0.162216	0.076977	0.053E-3	0.025E-3
e112	0.118549	-0.000211	-0.118549	0.256E-3	-0.000E-3
e113	0.193479	-0.000608	-0.193479	0.092E-3	-0.000E-3
e114	0.214363	-0.001056	-0.214362	0.019E-3	-0.001E-3
e115	0.218534	-0.001653	-0.218531	0.002E-3	-0.001E-3
e116	0.219522	-0.002531	-0.219516	-0.000E-3	-0.001E-3
e117	0.220025	-0.004133	-0.220011	-0.001E-3	-0.002E-3
e118	0.103451	-0.000141	-0.103451	0.225E-3	-0.000E-3
e119	0.171485	-0.000624	-0.171485	0.077E-3	-0.002E-3
e120	0.195324	-0.001070	-0.195323	0.045E-3	-0.001E-3
e121	0.208032	-0.001677	-0.208029	0.021E-3	-0.001E-3
e122	0.212418	-0.002548	-0.212411	0.003E-3	-0.002E-3
e123	0.210846	-0.004282	-0.210830	-0.009E-3	-0.002E-3
e124	0.141039	0.000478	-0.141039	0.270E-3	-0.003E-3

e125						
125	0.187953	0.001043	-0.187953	0.042E-3	0.001E-3	
e126						
126	0.201843	0.001210	-0.201840	0.020E-3	0.003E-3	
e127						
127	0.205237	0.001075	-0.205234	0.002E-3	0.000E-3	
e128						
128	0.205141	0.000812	-0.205140	-0.002E-3	0.000E-3	
e129						
129	0.204068	-0.000414	-0.204068	-0.002E-3	-0.001E-3	
e130						
130	0.153185	0.000672	-0.153185	0.294E-3	0.004E-3	
e131						
131	0.205065	0.000955	-0.205064	0.043E-3	0.001E-3	
e132						
132	0.215516	0.000934	-0.215514	0.015E-3	-0.002E-3	
e133						
133	0.218343	0.000934	-0.218341	0.004E-3	-0.000E-3	
e134						
134	0.219439	0.000791	-0.219437	0.002E-3	-0.001E-3	
e135						
135	0.219925	0.000425	-0.219924	0.002E-3	-0.001E-3	
e136						
136	0.198579	0.181389	-0.182753	-0.060E-3	0.289E-3	
e137						
137	0.270914	0.217963	-0.201227	0.060E-3	0.199E-3	
e138						
138	0.313532	0.245012	-0.215214	0.004E-3	0.060E-3	
e139						
139	0.328021	0.250928	-0.218098	0.008E-3	0.027E-3	
e140						
140	0.333357	0.251104	-0.219457	0.005E-3	0.004E-3	
e141						
141	0.332459	0.249351	-0.219894	0.003E-3	-0.010E-3	
e142						
142	0.181321	-0.150961	-0.168574	-0.083E-3	-0.255E-3	
e143						
143	0.237566	-0.176592	-0.183435	0.072E-3	-0.137E-3	
e144						
144	0.272825	-0.196724	-0.202245	0.006E-3	-0.041E-3	
e145						
145	0.284089	-0.205418	-0.204955	0.004E-3	-0.027E-3	
e146						
146	0.290316	-0.211900	-0.205151	-0.001E-3	-0.018E-3	
e147						
147	0.294105	-0.225682	-0.203951	-0.004E-3	-0.017E-3	
e148						
148	0.116029	-0.046394	-0.113704	0.168E-3	-0.058E-3	
e149						
149	0.155561	-0.136556	-0.134112	0.190E-3	-0.166E-3	
e207						
207	0.151317	-0.151208	-0.005748	0.011E-3	0.005E-3	
e208						
208	0.148376	-0.148152	-0.008161	-0.000E-3	0.006E-3	
e209						
209	0.144807	-0.144707	-0.005375	-0.011E-3	0.007E-3	
e210						
210	0.160619	-0.151204	0.054184	0.028E-3	0.011E-3	
e211						
211	0.155840	-0.148150	0.048352	0.002E-3	0.006E-3	
e212						
212	0.153681	-0.149452	0.051756	-0.023E-3	0.002E-3	
e225						
225	0.192851	-0.200958	0.002191	-0.006E-3	-0.025E-3	
e226						
226	0.204923	-0.200813	0.070169	-0.043E-3	-0.022E-3	
e227						
227	0.260196	-0.200622	0.175627	-0.057E-3	-0.021E-3	
e228						
228	0.267296	-0.200505	0.186990	-0.065E-3	-0.024E-3	
e235						
235	0.201005	-0.207253	0.004364	-0.004E-3	-0.013E-3	

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e236-----+-----+-----+-----+-----+-----+-----+
236      | 0.218410|-0.207293| 0.085890|-0.030E-3|-0.014E-3|
e237-----+-----+-----+-----+-----+-----+-----+
237      | 0.276723|-0.207485| 0.190596|-0.018E-3|-0.018E-3|
e238-----+-----+-----+-----+-----+-----+-----+
238      | 0.287046|-0.207942| 0.205410|-0.026E-3|-0.019E-3|
e239-----+-----+-----+-----+-----+-----+-----+
239      | 0.207328|-0.213898| 0.005574|-0.001E-3|-0.013E-3|
e240-----+-----+-----+-----+-----+-----+-----+
240      | 0.228533|-0.213814| 0.096213|-0.019E-3|-0.012E-3|
e241-----+-----+-----+-----+-----+-----+-----+
241      | 0.284014|-0.213385| 0.193944|-0.003E-3|-0.014E-3|
e242-----+-----+-----+-----+-----+-----+-----+
242      | 0.296694|-0.212515| 0.211631|-0.007E-3|-0.018E-3|
e243-----+-----+-----+-----+-----+-----+-----+
243      | 0.213963|-0.005290|-0.213898| 0.010E-3| 0.001E-3|
e244-----+-----+-----+-----+-----+-----+-----+
244      | 0.237151|-0.111409|-0.213814| 0.010E-3|-0.015E-3|
e245-----+-----+-----+-----+-----+-----+-----+
245      | 0.289531|-0.207530|-0.213385| 0.015E-3|-0.009E-3|
e246-----+-----+-----+-----+-----+-----+-----+
246      | 0.303410|-0.225636|-0.212515|-0.004E-3|-0.007E-3|
e247-----+-----+-----+-----+-----+-----+-----+
247      | 0.217636|-1.226320|-0.060965| 0.290E-3|-0.301E-3|
e248-----+-----+-----+-----+-----+-----+-----+
248      | 0.202264| 1.221769| 0.026269| 0.267E-3| 0.306E-3|
e262-----+-----+-----+-----+-----+-----+-----+
262      | 0.211557| 0.077687|-0.208923| 0.210E-3| 0.290E-3|
e263-----+-----+-----+-----+-----+-----+-----+
263      | 0.202328|-0.066785|-0.200551| 0.175E-3|-0.267E-3|
e264-----+-----+-----+-----+-----+-----+-----+
264      | 0.306437| 0.228003|-0.215396|-0.001E-3| 0.075E-3|
e265-----+-----+-----+-----+-----+-----+-----+
265      | 0.267727|-0.183113|-0.201229| 0.009E-3|-0.045E-3|
e266-----+-----+-----+-----+-----+-----+-----+
266      | 1.232258|-2.157237|-0.120830| 0.038E-3|-1.545E-3|
e267-----+-----+-----+-----+-----+-----+-----+
267      | 2.160981|-2.157237|-0.127147|-0.004E-3| 0.004E-3|
e268-----+-----+-----+-----+-----+-----+-----+
268      | 1.227284|-1.221610|-0.117884|-0.040E-3| 1.552E-3|
e269-----+-----+-----+-----+-----+-----+-----+
269      | 1.239978| 2.174810|-0.211724| 0.552E-3| 1.558E-3|
e270-----+-----+-----+-----+-----+-----+-----+
270      | 2.209156| 2.174810|-0.388035|-0.008E-3| 0.004E-3|
e271-----+-----+-----+-----+-----+-----+-----+
271      | 1.243268| 1.226484|-0.203600|-0.569E-3|-1.551E-3|

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Plus grande valeur négative

Wy -2.157237 mm Elément 266, Wy déplacement (y) perpendiculaire à l'âme  
Wz -0.388035 mm Elément 270, Wz déplacement (z) perpendiculaire à l'âme  
Thy -0.569E-3 rad Elément 270, Thy rotation (y) de la fibre neutre  
Thz -2.227E-3 rad Elément 247, Thz rotation (z) de la fibre neutre

Plus grande valeur positive

W 2.209156 mm Elément 269, W flèche, déplacement perpendiculaire à l'âme  
Wy 2.174810 mm Elément 269, Wy déplacement (y) perpendiculaire à l'âme  
Wz 0.213748 mm Elément 242, Wz déplacement (z) perpendiculaire à l'âme  
Thy 0.561E-3 rad Elément 23, Thy rotation (y) de la fibre neutre  
Thz 2.235E-3 rad Elément 268, Thz rotation (z) de la fibre neutre

Propriété 4 RI80\_50C R80x50 4 - section rectangulaire creuse  
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FLÈCHES - DÉPLACEMENTS NORMAUX À LA FIBRE NEUTRE

W flèche, déplacement perpendiculaire à l'âme  
Wy déplacement (y) perpendiculaire à l'âme  
Wz déplacement (z) perpendiculaire à l'âme  
Thy rotation (y) de la fibre neutre  
Thz rotation (z) de la fibre neutre



Elément	W mm	Wy mm	Wz mm	Thy rad	Thz rad
e43					
43	0.002467	-0.067110	0.001665	0.013E-3	-0.045E-3
e44					
44	0.004526	-0.082300	0.002298	-0.002E-3	-0.057E-3
e45					
45	0.005712	-0.092277	0.002656	-0.004E-3	-0.064E-3
e46					
46	0.005580	-0.099097	0.002639	-0.001E-3	-0.064E-3
e63					
63	0.006040	-0.000014	-0.006040	0.175E-3	-0.000E-3
e64					
64	0.215514	-0.229882	0.000002	-0.002E-3	-0.029E-3
e65					
65	0.229387	0.001450	-0.229385	0.049E-3	0.008E-3
e66					
66	0.222959	0.001000	-0.222957	0.048E-3	-0.007E-3
e75					
75	0.013087	0.034732	-0.013001	-0.001E-3	0.056E-3
e76					
76	0.022420	0.130629	-0.022393	0.001E-3	0.325E-3
e166					
166	0.070212	-0.172053	0.020639	0.004E-3	-0.069E-3
e167					
167	0.175888	-0.216307	0.036528	-0.001E-3	-0.082E-3
e190					
190	0.075373	-0.000182	-0.075373	0.162E-3	-0.000E-3
e191					
191	0.132432	-0.000615	-0.132431	0.118E-3	-0.000E-3
e192					
192	0.169289	-0.001066	-0.169288	0.067E-3	-0.000E-3
e193					
193	0.187450	-0.001670	-0.187447	0.027E-3	-0.000E-3
e194					
194	0.192498	-0.002537	-0.192491	0.002E-3	-0.001E-3
e195					
195	0.189988	-0.004199	-0.189972	-0.012E-3	-0.001E-3
e196					
196	0.229921	-0.230125	0.004254	0.001E-3	-0.010E-3
e197					
197	0.229399	-0.229385	0.002535	0.008E-3	0.008E-3
e198					
198	0.225440	-0.225440	0.000495	0.000E-3	0.011E-3
e199					
199	0.222970	-0.222957	0.002409	-0.007E-3	0.012E-3
e200					
200	0.219922	-0.219885	0.004056	-0.001E-3	0.025E-3
e201					
201	0.243948	0.000996	-0.243946	0.027E-3	-0.002E-3
e202					
202	0.252217	0.000791	-0.252216	0.016E-3	-0.001E-3
e203					
203	0.257512	0.000413	-0.257511	0.011E-3	-0.002E-3
e204					
204	0.237349	0.001062	-0.237347	0.027E-3	0.002E-3
e205					
205	0.245690	0.000801	-0.245688	0.017E-3	0.001E-3
e206					
206	0.251355	0.000408	-0.251354	0.013E-3	0.001E-3
e213					
213	0.135576	0.082657	-0.131052	0.153E-3	0.113E-3
e214					
214	0.211695	0.125808	-0.194891	0.056E-3	0.118E-3
e215					
215	0.248364	0.155936	-0.214143	0.010E-3	0.093E-3
e216					
216	0.268336	0.171265	-0.218376	-0.002E-3	0.056E-3
e217					
217	0.278390	0.174574	-0.219475	-0.004E-3	0.022E-3

e218					
218	0.280766	0.174496	-0.219956	-0.004E-3	-0.003E-3
e219					
219	0.200027	0.243481	-0.151481	0.185E-3	0.316E-3
e220					
220	0.313977	0.316417	-0.198240	0.037E-3	0.237E-3
e221					
221	0.382183	0.346641	-0.214347	0.017E-3	0.126E-3
e222					
222	0.409629	0.349687	-0.218256	0.004E-3	0.033E-3
e223					
223	0.410780	0.347248	-0.219451	0.002E-3	-0.022E-3
e224					
224	0.398660	0.332511	-0.219923	0.001E-3	-0.047E-3
e229					
229	0.085923	-0.186538	0.024687	-0.008E-3	-0.080E-3
e230					
230	0.190842	-0.220125	0.040300	-0.001E-3	-0.072E-3
e231					
231	0.096242	-0.189800	0.027340	-0.010E-3	-0.082E-3
e232					
232	0.194192	-0.218723	0.041063	-0.001E-3	-0.060E-3
e233					
233	0.103297	-0.191454	0.029157	-0.003E-3	-0.078E-3
e234					
234	0.195882	-0.217728	0.041416	0.007E-3	-0.052E-3
e249					
249	0.201253	0.808078	-0.003126	0.045E-3	0.567E-3
e272					
272	0.809580	1.284822	0.049280	-0.175E-3	1.374E-3
e273					
273	1.294362	1.284822	0.156859	-0.002E-3	0.014E-3
e274					
274	0.822253	0.820562	0.052704	0.159E-3	-1.354E-3

Plus grande valeur négative

Wy	-0.230125 mm	Elément 196, Wy déplacement (y) perpendiculaire à l'âme
Wz	-0.263357 mm	Elément 203, Wz déplacement (z) perpendiculaire à l'âme
Thy	-0.246E-3 rad	Elément 272, Thy rotation (y) de la fibre neutre
Thz	-1.403E-3 rad	Elément 274, Thz rotation (z) de la fibre neutre

Plus grande valeur positive

W	1.294362 mm	Elément 272, W flèche, déplacement perpendiculaire à l'âme
Wy	1.284822 mm	Elément 272, Wy déplacement (y) perpendiculaire à l'âme
Wz	0.156859 mm	Elément 273, Wz déplacement (z) perpendiculaire à l'âme
Thy	0.341E-3 rad	Elément 76, Thy rotation (y) de la fibre neutre
Thz	1.417E-3 rad	Elément 249, Thz rotation (z) de la fibre neutre

Propriété 5 UPN80  
Trémie Cuivre  
calcul 2 'calcul 0'

FLÈCHES - DÉPLACEMENTS NORMAUX À LA FIBRE NEUTRE

W flèche, déplacement perpendiculaire à l'âme  
Wy déplacement (y) perpendiculaire à l'âme  
Wz déplacement (z) perpendiculaire à l'âme  
Thy rotation (y) de la fibre neutre  
Thz rotation (z) de la fibre neutre

Elément	W mm	Wy mm	Wz mm	Thy rad	Thz rad
e27					
27	0.193482	-0.193479	0.001093	-0.000E-3	0.056E-3
e28					
28	0.001105	-0.046394	0.001096	0.077E-3	-0.031E-3
e30					
30	0.000684	-0.181389	-0.000125	-0.043E-3	-0.007E-3
e31					
31	0.118551	-0.118549	0.000785	-0.000E-3	0.032E-3
e32					
32	0.000777	-0.023114	0.000776	0.225E-3	-0.020E-3

e34					
34	0.000340	0.003053	-0.000196	-0.294E-3	0.001E-3
e47					
47	0.214366	-0.214362	0.001214	-0.001E-3	0.068E-3
e49					
49	0.000866	-0.228003	0.000002	-0.015E-3	-0.029E-3
e50					
50	0.205234	0.237347	0.000001	-0.000E-3	0.046E-3
e51					
51	0.000936	-0.245012	0.000065	-0.004E-3	-0.052E-3
e52					
52	0.218535	-0.218531	0.001278	-0.001E-3	0.074E-3
e53					
53	0.205140	0.245688	0.000056	-0.000E-3	0.068E-3
e54					
54	0.000799	-0.250928	0.000113	-0.002E-3	-0.071E-3
e55					
55	0.219520	-0.219516	0.001319	-0.001E-3	0.080E-3
e56					
56	0.204068	0.251354	0.000092	0.001E-3	0.089E-3
e57					
57	0.000449	-0.249351	0.000145	-0.002E-3	-0.085E-3
e58					
58	0.220015	-0.220011	0.001343	-0.002E-3	0.084E-3
e59					
59	0.183113	-0.183113	0.000048	0.006E-3	0.481E-3
e60					
60	0.196724	-0.196724	0.000169	0.004E-3	0.335E-3
e61					
61	0.205419	-0.205418	0.000286	-0.001E-3	0.235E-3
e62					
62	0.211900	-0.211900	0.000406	-0.004E-3	0.156E-3
e72					
72	0.099549	-0.002994	-0.099503	0.118E-3	0.030E-3
e73					
73	0.100046	-0.002898	-0.100004	0.113E-3	0.005E-3
e74					
74	0.095319	-0.005131	-0.095278	0.113E-3	-0.018E-3
e77					
77	0.187953	0.205546	-0.000172	-0.001E-3	0.014E-3
e150					
150	0.132432	-0.171485	0.000412	-0.000E-3	0.008E-3
e151					
151	0.048796	-0.136556	0.015121	0.061E-3	-0.044E-3
e152					
152	0.139220	-0.207805	0.027103	0.032E-3	-0.079E-3
e153					
153	0.150961	-0.150961	-0.000298	0.072E-3	0.318E-3
e154					
154	0.181792	-0.293687	0.012094	-0.060E-3	-0.413E-3
e155					
155	0.245978	-0.243481	0.034961	-0.037E-3	0.117E-3
e156					
156	0.084401	-0.082657	0.017068	-0.056E-3	0.100E-3
e157					
157	0.075374	-0.103451	0.000370	-0.000E-3	0.006E-3
e158					
158	0.027682	-0.078823	0.015233	0.168E-3	-0.025E-3
e159					
159	0.083418	-0.122312	0.027302	0.190E-3	-0.054E-3
e160					
160	0.066789	-0.066785	-0.000724	-0.083E-3	0.269E-3
e161					
161	0.071189	-0.003417	0.071137	0.050E-3	-0.014E-3
e162					
162	0.077037	-0.077687	0.076977	-0.054E-3	0.025E-3
e163					
163	0.078552	-0.160501	0.011627	0.060E-3	-0.295E-3
e164					
164	0.135400	-0.130629	0.035625	-0.185E-3	0.073E-3
e165					
165	0.038708	-0.034732	0.017088	-0.153E-3	0.052E-3

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e168-----+-----+-----+-----+-----+-----+
168      | 0.169289|-0.195323| 0.000450|-0.000E-3| 0.005E-3|
e169-----+-----+-----+-----+-----+-----+
169      | 0.228342|-0.362363| 0.012450|-0.004E-3|-0.465E-3|
e170-----+-----+-----+-----+-----+-----+
170      | 0.318281|-0.316417| 0.034402|-0.017E-3| 0.124E-3|
e171-----+-----+-----+-----+-----+-----+
171      | 0.126969|-0.125808| 0.017134|-0.010E-3| 0.138E-3|
e172-----+-----+-----+-----+-----+-----+
172      | 0.237359| 0.244513| 0.002321|-0.002E-3| 0.029E-3|
e173-----+-----+-----+-----+-----+-----+
173      | 0.243959| 0.243946| 0.002442| 0.002E-3|-0.009E-3|
e174-----+-----+-----+-----+-----+-----+
174      | 0.245336|-0.364644| 0.012588|-0.008E-3|-0.309E-3|
e175-----+-----+-----+-----+-----+-----+
175      | 0.348301|-0.346641| 0.033962|-0.004E-3| 0.094E-3|
e176-----+-----+-----+-----+-----+-----+
176      | 0.156882|-0.155936| 0.017200| 0.002E-3| 0.162E-3|
e177-----+-----+-----+-----+-----+-----+
177      | 0.187448|-0.208029| 0.000482|-0.000E-3|-0.001E-3|
e178-----+-----+-----+-----+-----+-----+
178      | 0.245699| 0.253561| 0.002251|-0.001E-3| 0.036E-3|
e179-----+-----+-----+-----+-----+-----+
179      | 0.252227| 0.252216| 0.002371| 0.001E-3|-0.016E-3|
e180-----+-----+-----+-----+-----+-----+
180      | 0.251250|-0.357212| 0.012703|-0.005E-3|-0.229E-3|
e181-----+-----+-----+-----+-----+-----+
181      | 0.348871|-0.347248| 0.033610|-0.002E-3| 0.069E-3|
e182-----+-----+-----+-----+-----+-----+
182      | 0.172133|-0.171265| 0.017260| 0.004E-3| 0.170E-3|
e183-----+-----+-----+-----+-----+-----+
183      | 0.192492|-0.212411| 0.000507|-0.001E-3|-0.004E-3|
e184-----+-----+-----+-----+-----+-----+
184      | 0.251364| 0.259310| 0.002202|-0.001E-3| 0.039E-3|
e185-----+-----+-----+-----+-----+-----+
185      | 0.257522| 0.257511| 0.002323| 0.002E-3|-0.020E-3|
e186-----+-----+-----+-----+-----+-----+
186      | 0.249679|-0.339511| 0.012794|-0.003E-3|-0.185E-3|
e187-----+-----+-----+-----+-----+-----+
187      | 0.334179|-0.332511| 0.033344|-0.001E-3| 0.054E-3|
e188-----+-----+-----+-----+-----+-----+
188      | 0.175353|-0.174496| 0.017315| 0.004E-3| 0.167E-3|
e189-----+-----+-----+-----+-----+-----+
189      | 0.189972|-0.210830| 0.000525|-0.001E-3|-0.004E-3|
e250-----+-----+-----+-----+-----+-----+
250      | 0.668083|-0.119268|-0.667902| 0.655E-3|-0.852E-3|
e251-----+-----+-----+-----+-----+-----+
251      | 2.049895| 0.016961|-2.049894|-0.537E-3| 0.009E-3|
e252-----+-----+-----+-----+-----+-----+
252      | 1.149362|-0.092119|-1.148272|-0.200E-3| 0.358E-3|

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Plus grande valeur négative

Wy	-0.364644 mm	Elément 174, Wy déplacement (y) perpendiculaire à l'âme
Wz	-2.049894 mm	Elément 251, Wz déplacement (z) perpendiculaire à l'âme
Thy	-1.290E-3 rad	Elément 251, Thy rotation (y) de la fibre neutre
Thz	-0.852E-3 rad	Elément 250, Thz rotation (z) de la fibre neutre

Plus grande valeur positive

W	2.049895 mm	Elément 251, W flèche, déplacement perpendiculaire à l'âme
Wy	0.259310 mm	Elément 184, Wy déplacement (y) perpendiculaire à l'âme
Wz	0.078149 mm	Elément 162, Wz déplacement (z) perpendiculaire à l'âme
Thy	0.655E-3 rad	Elément 250, Thy rotation (y) de la fibre neutre
Thz	0.876E-3 rad	Elément 252, Thz rotation (z) de la fibre neutre

Propriété 6 UPN120  
Trémie Cuivre  
calcul 2 'calcul 0'

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FLÈCHES - DÉPLACEMENTS NORMAUX À LA FIBRE NEUTRE

W flèche, déplacement perpendiculaire à l'âme  
Wy déplacement (y) perpendiculaire à l'âme  
Wz déplacement (z) perpendiculaire à l'âme  
Thy rotation (y) de la fibre neutre  
Thz rotation (z) de la fibre neutre

Elément	W	Wy	Wz	Thy	Thz
	mm	mm	mm	rad	rad
e5-----+					
5	0.220061	-0.220057	0.001354	-0.000E-3	0.090E-3
e6-----+					
6	0.202832	0.258176	0.000114	-0.002E-3	0.116E-3
e7-----+					
7	0.000388	-0.239962	0.000166	-0.003E-3	-0.096E-3
e8-----+					
8	0.004477	-0.107785	0.001306	-0.017E-3	-0.045E-3
e102-----+					
102	0.180251	-0.202107	0.000542	0.000E-3	0.002E-3
e103-----+					
103	0.258185	0.265640	0.002160	-0.002E-3	0.041E-3
e104-----+					
104	0.265651	0.265980	0.002479	-0.000E-3	0.009E-3
e105-----+					
105	0.263367	0.263357	0.002281	0.002E-3	-0.024E-3
e106-----+					
106	0.240308	-0.307004	0.012891	-0.012E-3	-0.148E-3
e107-----+					
107	0.302121	-0.300305	0.033078	-0.003E-3	0.044E-3
e108-----+					
108	0.167968	-0.167065	0.017393	0.014E-3	0.155E-3
e109-----+					
109	0.109442	-0.203122	0.018968	-0.007E-3	-0.059E-3
e110-----+					
110	0.203853	-0.231769	0.017244	0.012E-3	-0.049E-3
e111-----+					
111	0.225683	-0.225682	0.000591	0.006E-3	0.040E-3

Plus grande valeur négative

Wy -0.307004 mm Elément 106, Wy déplacement (y) perpendiculaire à l'âme  
Wz -0.001276 mm Elément 111, Wz déplacement (z) perpendiculaire à l'âme  
Thy -0.020E-3 rad Elément 106, Thy rotation (y) de la fibre neutre  
Thz -0.164E-3 rad Elément 7, Thz rotation (z) de la fibre neutre

Plus grande valeur positive

W 0.308475 mm Elément 106, W flèche, déplacement perpendiculaire à l'âme  
Wy 0.265980 mm Elément 104, Wy déplacement (y) perpendiculaire à l'âme  
Wz 0.033078 mm Elément 106, Wz déplacement (z) perpendiculaire à l'âme  
Thy 0.017E-3 rad Elément 107, Thy rotation (y) de la fibre neutre  
Thz 0.169E-3 rad Elément 111, Thz rotation (z) de la fibre neutre

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Propriété 7 RE120\_5X R120x120 5 - section rectangulaire creuse  
Trémie Cuivre  
calcul 2 'calcul 0'

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FLÈCHES - DÉPLACEMENTS NORMAUX À LA FIBRE NEUTRE

W flèche, déplacement perpendiculaire à l'âme  
Wy déplacement (y) perpendiculaire à l'âme  
Wz déplacement (z) perpendiculaire à l'âme  
Thy rotation (y) de la fibre neutre  
Thz rotation (z) de la fibre neutre

Elément	W mm	Wy mm	Wz mm	Thy rad	Thz rad
e13					
13	0.006159	-0.004571	0.004464	-0.000E-3	-0.001E-3
e14					
14	0.014757	-0.009141	0.012071	0.000E-3	-0.001E-3
e15					
15	0.021338	-0.013709	0.017121	0.015E-3	-0.000E-3
e16					
16	0.027243	-0.016919	0.022140	0.003E-3	-0.002E-3
e17					
17	0.036205	-0.020037	0.030856	0.008E-3	0.002E-3
e18					
18	0.024620	-0.015679	-0.019124	0.005E-3	0.028E-3
e19					
19	0.013676	-0.010418	-0.010622	0.001E-3	-0.004E-3
e20					
20	0.002002	-0.001742	-0.001020	0.000E-3	-0.000E-3

Plus grande valeur négative

Wy -0.020037 mm      Elément 17, Wy déplacement (y) perpendiculaire à l'âme  
Wz -0.024127 mm      Elément 18, Wz déplacement (z) perpendiculaire à l'âme  
Thy -0.012E-3 rad      Elément 15, Thy rotation (y) de la fibre neutre  
Thz -0.029E-3 rad      Elément 18, Thz rotation (z) de la fibre neutre

Plus grande valeur positive

W 0.036205 mm      Elément 17, W flèche, déplacement perpendiculaire à l'âme  
Wz 0.030856 mm      Elément 17, Wz déplacement (z) perpendiculaire à l'âme  
Thy 0.015E-3 rad      Elément 15, Thy rotation (y) de la fibre neutre  
Thz 0.028E-3 rad      Elément 18, Thz rotation (z) de la fibre neutre

## Efforts résultants

Propriété 2 UPN200  
Trémie Cuivre  
calcul 1 'calcul 0'

EFFORTS RESULTANTS [BEAM poutre]

Nx effort axial de traction ou compression

Ty effort tranchant

Tz effort tranchant

Mx moment de torsion

My moment fléchissant

Mz moment fléchissant

W flèche, déplacement perpendiculaire à l'âme

Elément	Nx daN	Ty daN	Tz daN	Mx daN.mm	My daN.mm	Mz daN.mm	W mm
e1							
1	0.005	-2.240	1.168	0.17E3	-0.58E3	1.13E3	0
e2							
2	0	0	0	0	0	0	0
e3							
3	-1164.860	0.320	-82.747	0.00E3	38.74E3	-0.06E3	0
e4							
4	772.710	-0.660	42.753	0.00E3	-23.76E3	-0.20E3	0
e35							
35	-1.135	2.920	1.221	0.06E3	0.54E3	0.91E3	0.202111
e36							
36	-1.837	-8.346	-6.327	-0.09E3	2.15E3	4.16E3	0.195286
e69							
69	0.524	-1.924	4.286	0.03E3	4.93E3	-0.83E3	0.054266
e70							
70	0.291	-0.244	-0.157	0.01E3	0.48E3	0.07E3	0.048439
e71							
71	0.397	1.652	3.978	-0.02E3	4.54E3	0.74E3	0.051832

e78							
78	-0.005	2.110	-1.168	-0.17E3	0.58E3	-1.07E3	0.006048
e79							
79	0	0	0	0	0	0	0
e80							
80	-1164.922	0.942	-82.748	0.00E3	30.42E3	-0.49E3	0.001020
e81							
81	-1165.063	-17.556	-82.750	0.01E3	-35.95E3	6.02E3	0.010641
e82							
82	-1165.166	33.155	-82.760	0.33E3	-96.20E3	-15.10E3	0.019131
e83							
83	309.370	-0.964	-99.782	0.06E3	98.93E3	1.76E3	0.033162
e84							
84	518.800	3.529	-42.219	-0.68E3	26.39E3	-0.84E3	0.036780
e85							
85	518.457	-2.574	-42.362	-0.01E3	-9.39E3	-0.83E3	0.031004
e86							
86	518.136	-2.112	-42.373	0.14E3	-25.15E3	0.58E3	0.022264
e87							
87	718.181	0.894	-35.651	-1.60E3	21.36E3	-0.19E3	0.017287
e88							
88	717.872	-1.396	-35.799	-0.04E3	20.70E3	-0.36E3	0.017186
e89							
89	717.609	-0.599	-35.802	-0.00E3	-7.88E3	0.16E3	0.012104
e90							
90	717.391	-0.653	-35.803	0.00E3	-22.20E3	0.20E3	0.004475
e91							
91	772.492	-0.714	42.754	0.00E3	10.44E3	-0.16E3	0.004792
e92							
92	772.229	0.082	42.757	0.03E3	27.61E3	-0.15E3	0.012250
e93							
93	771.920	-2.207	42.905	1.30E3	28.91E3	-0.59E3	0.015562
e94							
94	527.427	0.531	54.984	-0.12E3	-31.62E3	0.30E3	0.015480
e95							
95	527.107	0.994	54.995	0.01E3	11.12E3	-0.53E3	0.018487
e96							
96	526.764	-5.110	55.138	0.39E3	36.10E3	-1.23E3	0.025747
e97							
97	263.063	2.415	97.639	0.03E3	90.22E3	2.89E3	0.028785
e98							
98	-1177.862	-34.007	88.052	-0.30E3	-97.80E3	-15.69E3	0.031382
e99							
99	-1177.965	16.704	88.062	-0.00E3	-34.21E3	5.84E3	0.024179
e100							
100	-1178.105	-1.794	88.064	0.00E3	36.07E3	-0.61E3	0.012445
e101							
101	-1178.168	-1.171	88.066	0.00E3	44.83E3	0.15E3	0.001130
e253							
253	-21.524	-1753.904	-40.752	-0.99E3	21.52E3	-438.87E3	0.217560
e254							
254	-2376.598	-1.792	-8.532	0.02E3	24.61E3	-0.46E3	0.388045
e255							
255	-22.174	1751.066	-43.372	1.02E3	22.54E3	438.15E3	0.211091

Plus grande valeur négative

Nx	-2376.598 daN	Elément 254, Nx effort axial de traction ou compression
Ty	-1753.904 daN	Elément 253, Ty effort tranchant
Tz	-99.782 daN	Elément 83, Tz effort tranchant
Mx	-1.60E3 daN.mm	Elément 87, Mx moment de torsion
My	-97.80E3 daN.mm	Elément 98, My moment fléchissant
Mz	-438.87E3 daN.mm	Elément 253, Mz moment fléchissant

Plus grande valeur positive

Nx	772.710 daN	Elément 4, Nx effort axial de traction ou compression
Ty	1751.066 daN	Elément 255, Ty effort tranchant
Tz	97.639 daN	Elément 97, Tz effort tranchant
Mx	1.30E3 daN.mm	Elément 93, Mx moment de torsion
My	98.93E3 daN.mm	Elément 83, My moment fléchissant
Mz	438.15E3 daN.mm	Elément 255, Mz moment fléchissant
W	0.388045 mm	Elément 254, W flèche, déplacement perpendiculaire à l'âme

Propriété 3 RE80\_5X R80x80 5 - section rectangulaire creuse  
 Trémie Cuivre  
 calcul 1 'calcul 0'

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 EFFORTS RESULTANTS [BEAM poutre]  
 Nx effort axial de traction ou compression  
 Ty effort tranchant  
 Tz effort tranchant  
 Mx moment de torsion  
 My moment fléchissant  
 Mz moment fléchissant  
 W flèche, déplacement perpendiculaire à l'âme  
 -----

Elément	Nx daN	Ty daN	Tz daN	Mx daN.mm	My daN.mm	Mz daN.mm	W mm
e9							
9	60.903	-0.078	-254.954	1.20E3	69.53E3	-0.02E3	0
e10							
10	60.270	0.106	-220.944	-0.76E3	60.52E3	-0.03E3	0
e11							
11	-16.033	2.533	-329.532	0.31E3	85.46E3	-0.70E3	0
e12							
12	-15.220	-2.109	-357.091	0.04E3	92.73E3	0.72E3	0
e23							
23	17.022	-34.119	-1474.535	-15.67E3	195.13E3	8.80E3	0.041905
e24							
24	9.586	36.421	-1440.924	15.62E3	188.02E3	-9.44E3	0.042252
e25							
25	-12.079	-2.738	-244.492	-0.84E3	60.53E3	-1.42E3	0.014094
e26							
26	-42.501	-7.524	-263.701	-1.82E3	65.49E3	2.66E3	0.024642
e37							
37	-0.634	6.243	0.760	0.71E3	0.41E3	2.30E3	0.203063
e38							
38	-0.732	2.598	3.343	0.17E3	1.79E3	1.05E3	0.203190
e39							
39	8.062	5.194	0.670	-1.08E3	-0.41E3	5.00E3	0.171485
e40							
40	-5.044	1.843	0.754	-1.40E3	0.98E3	3.67E3	0.180160
e41							
41	-10.763	6.106	-2.173	-0.42E3	4.47E3	3.41E3	0.226028
e42							
42	-2.375	-16.560	-6.474	-6.22E3	6.22E3	-6.10E3	0.234239
e67							
67	-1.209	0.850	-4.087	-5.22E3	1.39E3	0.45E3	0.153185
e68							
68	3.627	4.476	-5.588	1.95E3	-2.81E3	-1.95E3	0.179553
e112							
112	23.916	-0.219	-20.346	0.91E3	-15.96E3	-0.07E3	0.118549
e113							
113	9.378	-0.567	4.866	0.46E3	-6.25E3	-0.13E3	0.193479
e114							
114	5.034	-0.417	0.298	0.25E3	-1.28E3	-0.10E3	0.214363
e115							
115	3.172	-0.503	-2.368	0.20E3	-0.67E3	-0.13E3	0.218534
e116							
116	1.819	-0.628	-2.632	0.18E3	-0.54E3	-0.18E3	0.219522
e117							
117	0.590	-1.103	-3.171	0.14E3	-1.27E3	0.41E3	0.220025
e118							
118	24.793	0.713	-28.636	-0.41E3	-16.48E3	-0.26E3	0.103451
e119							
119	3.094	0.216	1.791	-0.10E3	-2.70E3	0.09E3	0.171485
e120							
120	3.088	0.011	1.227	0.02E3	-1.99E3	-0.02E3	0.195324
e121							
121	3.054	-0.091	1.054	-0.02E3	-1.50E3	-0.05E3	0.208032
e122							
122	2.940	-0.237	1.003	-0.11E3	-1.08E3	-0.10E3	0.212418
e123							
123	2.734	-0.487	0.960	-0.22E3	-0.68E3	0.15E3	0.210846



e124														
124		2.711		2.403		58.793		0.22E3		-28.24E3		0.77E3		0.141039
e125														
125		8.416		-1.171		-5.370		0.53E3		-2.69E3		0.36E3		0.187953
e126														
126		5.010		-2.231		3.755		0.71E3		-2.06E3		-0.67E3		0.201843
e127														
127		4.222		-1.024		0.577		0.84E3		-0.37E3		-0.21E3		0.205237
e128														
128		2.794		-1.125		1.282		0.79E3		-0.28E3		-0.27E3		0.205141
e129														
129		1.161		-1.524		-0.047		0.68E3		-0.02E3		0.57E3		0.204068
e130														
130		5.537		-2.104		59.272		-0.30E3		-30.02E3		-0.68E3		0.153185
e131														
131		9.825		1.952		4.670		-0.86E3		-3.00E3		-0.59E3		0.205065
e132														
132		4.906		2.228		3.631		-0.88E3		-1.52E3		0.57E3		0.215516
e133														
133		3.753		0.731		0.750		-0.73E3		-0.26E3		-0.21E3		0.218343
e134														
134		2.426		0.645		1.341		-0.50E3		-0.32E3		-0.14E3		0.219439
e135														
135		1.125		0.683		1.069		-0.29E3		0.40E3		-0.27E3		0.219925
e136														
136		36.265		23.224		-69.870		-4.49E3		22.62E3		-11.22E3		0.198579
e137														
137		37.012		24.549		-71.663		-10.68E3		-15.97E3		-17.34E3		0.270914
e138														
138		10.707		-1.842		-1.711		5.95E3		0.66E3		-2.73E3		0.313532
e139														
139		8.919		-1.606		4.726		3.03E3		-1.20E3		-2.00E3		0.328021
e140														
140		7.005		-1.491		4.327		1.67E3		-0.98E3		-1.35E3		0.333357
e141														
141		5.062		-1.235		5.306		0.95E3		2.04E3		-0.75E3		0.332459
e142														
142		33.119		-22.375		-64.963		1.83E3		24.24E3		13.02E3		0.181321
e143														
143		36.537		-30.914		-80.779		15.19E3		-17.38E3		14.51E3		0.237566
e144														
144		9.388		0.055		-3.052		-5.55E3		-0.78E3		0.98E3		0.272825
e145														
145		9.126		1.323		0.912		-3.79E3		-0.54E3		0.95E3		0.284089
e146														
146		9.290		1.781		0.756		-3.00E3		-0.31E3		0.42E3		0.290316
e147														
147		9.586		1.632		2.412		-2.96E3		1.18E3		-1.27E3		0.294105
e148														
148		-8.749		-2.428		-52.982		-0.72E3		-18.38E3		0.66E3		0.116029
e149														
149		-15.480		-4.551		1.294		-0.93E3		-11.69E3		4.48E3		0.155561
e207														
207		-3.132		0.326		0.199		-0.29E3		-0.69E3		0.15E3		0.151317
e208														
208		-3.377		0.035		0.042		0.11E3		-0.59E3		0.06E3		0.148376
e209														
209		-1.725		-0.362		4.020		4.65E3		1.46E3		0.14E3		0.144807
e210														
210		6.012		-2.673		3.844		-0.16E3		-2.47E3		-0.92E3		0.160619
e211														
211		6.335		2.955		-3.667		-0.01E3		-2.35E3		-0.99E3		0.155840
e212														
212		4.309		-3.946		5.228		-1.89E3		-2.63E3		-1.90E3		0.153681
e225														
225		4.994		0.189		0.103		-0.55E3		0.10E3		0.80E3		0.192851
e226														
226		-3.621		-2.273		0.229		-0.47E3		0.97E3		1.02E3		0.204923
e227														
227		-9.610		-0.951		-4.032		0.34E3		3.51E3		0.38E3		0.260196
e228														
228		-1.881		-0.381		-3.523		-2.80E3		3.40E3		0.42E3		0.267296

e235							
235	3.193	-2.197	-0.075	-0.27E3	0.22E3	0.52E3	0.201005
e236							
236	-2.758	-3.053	-0.431	-0.10E3	0.80E3	0.77E3	0.218410
e237							
237	-8.161	0.295	-3.936	0.40E3	1.86E3	0.32E3	0.276723
e238							
238	-2.393	1.539	-2.782	-1.36E3	1.85E3	0.46E3	0.287046
e239							
239	1.511	-1.543	-0.383	0.05E3	0.27E3	-0.55E3	0.207328
e240							
240	-1.642	-0.540	-0.823	0.21E3	0.46E3	-0.49E3	0.228533
e241							
241	-6.548	4.670	-3.178	0.33E3	-1.10E3	-1.39E3	0.284014
e242							
242	-3.439	-6.003	-2.840	-0.76E3	0.64E3	2.81E3	0.296694
e243							
243	-1.013	1.324	-2.920	0.65E3	1.43E3	-0.54E3	0.213963
e244							
244	-0.643	0.753	-6.243	0.94E3	2.54E3	-0.41E3	0.237151
e245							
245	-3.173	1.283	-2.598	0.32E3	1.20E3	-1.79E3	0.289531
e246							
246	-5.928	2.873	8.346	-0.33E3	-4.43E3	-2.15E3	0.303410
e247							
247	1446.622	-1209.517	48.224	-11.36E3	-26.70E3	-374.45E3	0.217636
e248							
248	-1500.336	1207.659	-72.253	11.41E3	34.54E3	374.49E3	0.202264
e262							
262	39.958	23.449	941.506	0.60E3	-122.67E3	-1.96E3	0.211557
e263							
263	37.407	-21.924	977.514	-3.73E3	-123.30E3	4.12E3	0.202328
e264							
264	12.132	-3.046	10.381	12.55E3	1.68E3	-3.19E3	0.306437
e265							
265	10.660	-2.541	2.698	-8.79E3	-0.81E3	0.98E3	0.267727
e266							
266	3197.688	-1187.343	4.852	-10.51E3	-3.61E3	386.59E3	1.232258
e267							
267	3195.895	1189.255	-3.680	9.84E3	-3.05E3	387.03E3	2.160981
e268							
268	1441.991	1210.780	-44.432	10.98E3	-24.28E3	-374.90E3	1.227284
e269							
269	-3283.778	1223.604	-87.948	10.26E3	-54.44E3	-395.98E3	1.239978
e270							
270	-3285.259	-1221.939	87.309	-10.91E3	-54.34E3	-395.61E3	2.209156
e271							
271	-1504.190	-1206.524	71.159	-11.80E3	33.94E3	374.06E3	1.243268

Plus grande valeur négative

Nx	-3285.259 daN	Elément 270, Nx effort axial de traction ou compression
Ty	-1221.939 daN	Elément 270, Ty effort tranchant
Tz	-1474.535 daN	Elément 23, Tz effort tranchant
Mx	-15.67E3 daN.mm	Elément 23, Mx moment de torsion
My	-173.50E3 daN.mm	Elément 23, My moment fléchissant
Mz	-395.98E3 daN.mm	Elément 269, Mz moment fléchissant

Plus grande valeur positive

Nx	3197.688 daN	Elément 266, Nx effort axial de traction ou compression
Ty	1223.604 daN	Elément 269, Ty effort tranchant
Tz	977.514 daN	Elément 263, Tz effort tranchant
Mx	15.62E3 daN.mm	Elément 24, Mx moment de torsion
My	195.13E3 daN.mm	Elément 23, My moment fléchissant
Mz	387.03E3 daN.mm	Elément 267, Mz moment fléchissant
W	2.209156 mm	Elément 269, W flèche, déplacement perpendiculaire à l'âme

Propriété 4 RI80\_50C R80x50 4 - section rectangulaire creuse  
 Trémie Cuivre  
 calcul 1 'calcul 0'

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 EFFORTS RESULTANTS [BEAM poutre]  
 Nx effort axial de traction ou compression  
 Ty effort tranchant  
 Tz effort tranchant  
 Mx moment de torsion  
 My moment fléchissant  
 Mz moment fléchissant  
 W flèche, déplacement perpendiculaire à l'âme  
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Elément	Nx daN	Ty daN	Tz daN	Mx daN.mm	My daN.mm	Mz daN.mm	W mm
e43							
43	-5.005	0.252	3.110	0.18E3	-2.04E3	-0.31E3	0.002467
e44							
44	-2.386	0.298	1.785	0.12E3	-1.18E3	-0.33E3	0.004526
e45							
45	0.654	0.141	1.704	0.08E3	-1.12E3	-0.20E3	0.005712
e46							
46	-1.377	-0.372	2.580	0.08E3	-1.61E3	-0.32E3	0.005580
e63							
63	2.336	0.010	-4.350	0.09E3	-1.40E3	-0.00E3	0.006040
e64							
64	1.701	-3.221	5.092	0.68E3	1.38E3	1.12E3	0.215514
e65							
65	-4.717	-1.272	1.531	-0.25E3	-1.24E3	-0.45E3	0.229387
e66							
66	-4.436	1.273	1.508	0.25E3	-1.21E3	0.44E3	0.222959
e75							
75	-6.723	3.005	-200.045	0.75E3	46.51E3	1.74E3	0.013087
e76							
76	-57.564	4.493	-209.431	1.01E3	49.69E3	-1.06E3	0.022420
e166							
166	-9.121	-0.625	1.873	0.07E3	-1.21E3	-0.46E3	0.070212
e167							
167	-16.178	-2.720	1.245	0.04E3	1.63E3	3.10E3	0.175888
e190							
190	2.125	-0.144	-2.151	0.02E3	-2.29E3	-0.03E3	0.075373
e191							
191	1.933	-0.407	0.603	-0.05E3	-2.28E3	-0.09E3	0.132432
e192							
192	1.603	-0.360	1.600	-0.08E3	-2.03E3	-0.07E3	0.169289
e193							
193	1.267	-0.493	1.511	-0.05E3	-1.38E3	-0.10E3	0.187450
e194							
194	0.923	-0.746	1.052	0.01E3	-0.78E3	-0.15E3	0.192498
e195							
195	0.559	-0.625	0.601	0.05E3	-0.36E3	0.20E3	0.189988
e196							
196	1.240	4.452	-8.625	-0.72E3	1.44E3	1.15E3	0.229921
e197							
197	2.512	2.921	-3.908	0.53E3	-1.01E3	0.51E3	0.229399
e198							
198	2.433	-2.416	3.759	-0.54E3	-0.98E3	0.38E3	0.225440
e199							
199	1.161	-3.924	8.195	0.67E3	1.35E3	0.92E3	0.222970
e200							
200	1.536	3.375	-4.679	-0.59E3	1.31E3	0.89E3	0.219922
e201							
201	-3.593	0.646	0.826	-0.10E3	-0.62E3	0.15E3	0.243948
e202							
202	-2.438	0.267	0.419	-0.05E3	-0.29E3	-0.06E3	0.252217
e203							
203	-1.382	0.081	0.199	-0.04E3	-0.12E3	-0.03E3	0.257512
e204							
204	-3.513	-1.067	0.850	0.10E3	-0.60E3	-0.24E3	0.237349
e205							
205	-2.483	-1.027	0.404	0.04E3	-0.26E3	0.21E3	0.245690

e206	-----+-----+-----+-----+-----+-----+-----+-----+-----
206	-1.429  -0.673  0.140  0.02E3  -0.09E3  0.21E3  0.251355
e213	-----+-----+-----+-----+-----+-----+-----+-----+-----
213	-1.023  2.058  -50.583  0.69E3  -14.23E3  0.52E3  0.135576
e214	-----+-----+-----+-----+-----+-----+-----+-----+-----
214	3.349  1.000  -14.062  0.55E3  -4.75E3  -0.70E3  0.211695
e215	-----+-----+-----+-----+-----+-----+-----+-----+-----
215	3.310  0.216  -6.077  0.34E3  -1.72E3  -0.78E3  0.248364
e216	-----+-----+-----+-----+-----+-----+-----+-----+-----
216	3.056  -0.360  -5.422  0.12E3  -1.18E3  -0.77E3  0.268336
e217	-----+-----+-----+-----+-----+-----+-----+-----+-----
217	2.780  -0.614  -5.090  -0.04E3  -1.02E3  -0.62E3  0.278390
e218	-----+-----+-----+-----+-----+-----+-----+-----+-----
218	2.602  -0.596  -4.670  -0.12E3  -1.68E3  -0.36E3  0.280766
e219	-----+-----+-----+-----+-----+-----+-----+-----+-----
219	-33.536  2.810  -4.983  0.64E3  -7.26E3  -2.15E3  0.200027
e220	-----+-----+-----+-----+-----+-----+-----+-----+-----
220	-28.213  0.391  -11.795  0.09E3  -3.21E3  -2.29E3  0.313977
e221	-----+-----+-----+-----+-----+-----+-----+-----+-----
221	-22.242  -1.999  0.707  -0.43E3  -0.71E3  -2.27E3  0.382183
e222	-----+-----+-----+-----+-----+-----+-----+-----+-----
222	-17.813  -1.894  -0.001  -0.36E3  -0.07E3  -1.48E3  0.409629
e223	-----+-----+-----+-----+-----+-----+-----+-----+-----
223	-13.405  -1.162  0.554  -0.21E3  -0.14E3  -0.73E3  0.410780
e224	-----+-----+-----+-----+-----+-----+-----+-----+-----
224	-8.955  -0.493  0.616  -0.10E3  0.22E3  -0.27E3  0.398660
e229	-----+-----+-----+-----+-----+-----+-----+-----+-----
229	-3.166  -0.564  1.124  -0.05E3  0.78E3  0.40E3  0.085923
e230	-----+-----+-----+-----+-----+-----+-----+-----+-----
230	-1.920  -0.849  -0.301  0.04E3  0.70E3  1.40E3  0.190842
e231	-----+-----+-----+-----+-----+-----+-----+-----+-----
231	3.167  -0.528  0.729  -0.07E3  0.56E3  0.47E3  0.096242
e232	-----+-----+-----+-----+-----+-----+-----+-----+-----
232	7.542  -0.217  -1.025  0.02E3  0.99E3  0.69E3  0.194192
e233	-----+-----+-----+-----+-----+-----+-----+-----+-----
233	-7.080  -0.640  1.541  -0.03E3  1.07E3  0.56E3  0.103297
e234	-----+-----+-----+-----+-----+-----+-----+-----+-----
234	-14.349  -0.009  -2.267  -0.01E3  -1.51E3  0.42E3  0.195882
e249	-----+-----+-----+-----+-----+-----+-----+-----+-----
249	28.372  83.476  25.877  7.65E3  -13.91E3  33.77E3  0.201253
e272	-----+-----+-----+-----+-----+-----+-----+-----+-----
272	57.910  89.056  82.324  6.56E3  26.43E3  -44.01E3  0.809580
e273	-----+-----+-----+-----+-----+-----+-----+-----+-----
273	57.598  -88.803  -84.401  -6.58E3  26.55E3  -44.08E3  1.294362
e274	-----+-----+-----+-----+-----+-----+-----+-----+-----
274	27.595  -82.043  -24.879  -7.51E3  -14.15E3  32.75E3  0.822253
	-----+-----+-----+-----+-----+-----+-----+-----+-----

Plus grande valeur négative

Nx	-57.564 daN	Elément 76, Nx effort axial de traction ou compression
Ty	-88.803 daN	Elément 273, Ty effort tranchant
Tz	-209.431 daN	Elément 76, Tz effort tranchant
Mx	-7.51E3 daN.mm	Elément 274, Mx moment de torsion
My	-34.08E3 daN.mm	Elément 76, My moment fléchissant
Mz	-44.08E3 daN.mm	Elément 273, Mz moment fléchissant

Plus grande valeur positive

Nx	57.910 daN	Elément 272, Nx effort axial de traction ou compression
Ty	89.056 daN	Elément 272, Ty effort tranchant
Tz	82.324 daN	Elément 272, Tz effort tranchant
Mx	7.65E3 daN.mm	Elément 249, Mx moment de torsion
My	49.69E3 daN.mm	Elément 76, My moment fléchissant
Mz	33.77E3 daN.mm	Elément 249, Mz moment fléchissant
W	1.294362 mm	Elément 272, W flèche, déplacement perpendiculaire à l'âme

Propriété 5 UPN80  
Trémie Cuivre  
calcul 1 'calcul 0'

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EFFORTS RESULTANTS [BEAM poutre]  
Nx effort axial de traction ou compression  
Ty effort tranchant  
Tz effort tranchant  
Mx moment de torsion  
My moment fléchissant  
Mz moment fléchissant  
W flèche, déplacement perpendiculaire à l'âme  
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Elément	Nx daN	Ty daN	Tz daN	Mx daN.mm	My daN.mm	Mz daN.mm	W mm
e27							
27	0.681	1.413	-0.251	0.00E3	0.13E3	-0.90E3	0.193482
e28							
28	36.961	-0.013	13.682	0.01E3	-8.68E3	-0.05E3	0.001105
e30							
30	54.542	1.820	-4.348	0.02E3	-3.75E3	-2.50E3	0.000684
e31							
31	0.573	1.169	-0.129	-0.02E3	-0.07E3	-0.69E3	0.118551
e32							
32	193.338	0.120	35.558	0.01E3	-22.82E3	-0.09E3	0.000777
e34							
34	-417.213	-1.204	-16.671	0.02E3	14.87E3	0.50E3	0.000340
e47							
47	-0.158	0.434	-0.336	0.01E3	0.18E3	-0.47E3	0.214366
e49							
49	4.260	1.977	-0.173	0.01E3	0.29E3	-2.70E3	0.000866
e50							
50	2.476	0.787	1.050	-0.01E3	-0.44E3	-0.38E3	0.205234
e51							
51	3.456	0.556	0.155	0.00E3	-0.19E3	-1.09E3	0.000936
e52							
52	-0.235	-0.262	-0.371	0.00E3	0.20E3	-0.44E3	0.218535
e53							
53	0.356	0.548	1.264	-0.00E3	-0.47E3	-0.38E3	0.205140
e54							
54	-0.287	-0.069	0.407	0.00E3	-0.36E3	-0.45E3	0.000799
e55							
55	-0.399	-0.510	-0.458	0.00E3	0.25E3	-0.60E3	0.219520
e56							
56	-0.546	0.328	1.336	-0.00E3	-0.52E3	-0.41E3	0.204068
e57							
57	0.429	-0.339	0.528	-0.00E3	-0.45E3	-0.53E3	0.000449
e58							
58	-0.130	-0.494	-0.570	-0.00E3	0.32E3	-0.61E3	0.220015
e59							
59	-5.750	-2.596	1.273	-0.00E3	1.23E3	-3.24E3	0.183113
e60							
60	3.965	-1.269	0.262	-0.00E3	-0.24E3	-1.75E3	0.196724
e61							
61	-0.156	-0.457	-0.164	-0.00E3	-0.14E3	-0.79E3	0.205419
e62							
62	1.656	0.148	-0.296	-0.00E3	0.26E3	-0.29E3	0.211900
e72							
72	-15.699	-0.461	-0.764	-0.00E3	-1.40E3	-0.36E3	0.099549
e73							
73	9.331	-0.079	-0.462	0.00E3	-1.07E3	0.04E3	0.100046
e74							
74	-14.785	0.375	-0.633	0.00E3	-1.26E3	0.31E3	0.095319
e77							
77	-2.237	0.060	-0.060	-0.00E3	0.07E3	-0.10E3	0.187953
e150							
150	0.944	-1.340	-0.059	-0.01E3	-0.06E3	-0.83E3	0.132432
e151							
151	91.786	-0.399	9.606	0.01E3	-6.40E3	-0.36E3	0.048796
e152							
152	96.599	-4.244	5.084	0.00E3	3.83E3	3.92E3	0.139220

e153							
153	64.223	-1.337	5.645	-0.01E3	-4.99E3	-1.85E3	0.150961
e154							
154	56.334	3.144	-5.095	0.01E3	3.53E3	3.69E3	0.181792
e155							
155	63.146	0.725	-10.418	-0.02E3	-6.71E3	-0.50E3	0.245978
e156							
156	26.625	-0.333	-14.789	-0.02E3	-9.72E3	-0.35E3	0.084401
e157							
157	0.727	-1.030	0.081	0.01E3	0.04E3	-0.62E3	0.075374
e158							
158	384.849	-0.191	32.228	0.02E3	20.14E3	-0.21E3	0.027682
e159							
159	649.843	-3.164	5.207	0.01E3	-8.16E3	3.01E3	0.083418
e160							
160	-392.634	-2.713	9.496	-0.03E3	7.99E3	-2.55E3	0.066789
e161							
161	-388.687	1.596	14.724	-0.01E3	13.46E3	0.58E3	0.071189
e162							
162	-421.689	2.423	-11.082	0.04E3	8.48E3	-2.52E3	0.077037
e163							
163	589.687	2.199	-7.389	0.00E3	-8.98E3	2.57E3	0.078552
e164							
164	385.240	0.515	-31.417	-0.03E3	19.84E3	-0.38E3	0.135400
e165							
165	235.777	-0.432	-37.117	-0.02E3	-24.61E3	-0.33E3	0.038708
e168							
168	-0.205	-0.564	-0.006	-0.00E3	-0.02E3	-0.44E3	0.169289
e169							
169	16.352	3.181	1.252	0.01E3	-1.01E3	3.91E3	0.228342
e170							
170	3.849	0.792	-4.719	-0.00E3	3.02E3	0.53E3	0.318281
e171							
171	-4.135	0.007	-4.680	-0.01E3	-3.03E3	-0.24E3	0.126969
e172							
172	0.135	0.129	0.127	-0.00E3	0.20E3	-0.30E3	0.237359
e173							
173	2.054	-0.576	-0.997	0.01E3	-0.41E3	-0.45E3	0.243959
e174							
174	-2.980	0.792	1.943	0.00E3	1.27E3	1.82E3	0.245336
e175							
175	-2.272	0.896	-2.486	0.00E3	1.63E3	0.78E3	0.348301
e176							
176	-2.928	0.321	-2.232	-0.01E3	-1.44E3	-0.49E3	0.156882
e177							
177	-0.102	-0.173	-0.034	-0.00E3	-0.03E3	-0.21E3	0.187448
e178							
178	0.396	0.102	0.235	0.00E3	0.16E3	-0.38E3	0.245699
e179							
179	0.016	-0.305	-0.920	0.00E3	-0.33E3	-0.43E3	0.252227
e180							
180	0.113	0.046	2.320	-0.00E3	1.47E3	1.02E3	0.251250
e181							
181	-0.442	0.778	-2.088	0.01E3	1.40E3	0.81E3	0.348871
e182							
182	-0.774	0.524	-1.811	-0.00E3	-1.18E3	-0.62E3	0.172133
e183							
183	-0.146	-0.052	-0.114	0.00E3	-0.08E3	-0.14E3	0.192492
e184							
184	-0.192	0.063	0.282	0.00E3	0.18E3	-0.42E3	0.251364
e185							
185	-0.377	-0.156	-0.773	0.00E3	-0.28E3	-0.43E3	0.257522
e186							
186	-0.551	-0.083	2.472	-0.01E3	1.55E3	0.85E3	0.249679
e187							
187	-0.612	0.587	-1.977	0.01E3	1.32E3	0.73E3	0.334179
e188							
188	-1.033	0.605	-1.799	0.00E3	-1.17E3	-0.65E3	0.175353
e189							
189	-0.250	-0.043	-0.206	0.00E3	-0.14E3	-0.15E3	0.189972
e250							
250	54.057	30.003	-25.814	0.10E3	-23.43E3	16.37E3	0.668083

```

e251-----+-----+-----+-----+-----+-----+-----+-----+
251 | -235.647| 0.311| 62.460| 0.00E3| -45.78E3| 0.15E3| 2.049895|
e252-----+-----+-----+-----+-----+-----+-----+-----+
252 | 50.824| -29.538| 25.186| -0.10E3| -22.67E3| 16.17E3| 1.149362|
  
```

Plus grande valeur négative

```

Nx -421.689 daN Elément 162, Nx effort axial de traction ou compression
Ty -29.538 daN Elément 252, Ty effort tranchant
Tz -37.117 daN Elément 165, Tz effort tranchant
Mx -0.10E3 daN.mm Elément 252, Mx moment de torsion
My -45.78E3 daN.mm Elément 251, My moment fléchissant
Mz -11.94E3 daN.mm Elément 250, Mz moment fléchissant
  
```

Plus grande valeur positive

```

Nx 649.843 daN Elément 159, Nx effort axial de traction ou compression
Ty 30.003 daN Elément 250, Ty effort tranchant
Tz 62.460 daN Elément 251, Tz effort tranchant
Mx 0.10E3 daN.mm Elément 250, Mx moment de torsion
My 20.86E3 daN.mm Elément 165, My moment fléchissant
Mz 16.37E3 daN.mm Elément 250, Mz moment fléchissant
W 2.049895 mm Elément 251, W flèche, déplacement perpendiculaire à l'âme
  
```

Propriété 6 UPN120  
Trémie Cuivre  
calcul 1 'calcul 0'

EFFORTS RESULTANTS [BEAM poutre]

Nx effort axial de traction ou compression  
Ty effort tranchant  
Tz effort tranchant  
Mx moment de torsion  
My moment fléchissant  
Mz moment fléchissant  
W flèche, déplacement perpendiculaire à l'âme

```

Elément | Nx | Ty | Tz | Mx | My | Mz | W |
         | daN | daN | daN | daN.mm | daN.mm | daN.mm | mm |
e5-----+-----+-----+-----+-----+-----+-----+-----+
5 | -2.361| -0.627| -0.727| -0.00E3| 0.42E3| -1.11E3| 0.220061|
e6-----+-----+-----+-----+-----+-----+-----+-----+
6 | -0.973| 0.117| 1.661| -0.01E3| 0.58E3| -1.01E3| 0.202832|
e7-----+-----+-----+-----+-----+-----+-----+-----+
7 | 1.291| -1.065| -0.026| -0.00E3| -0.44E3| -1.15E3| 0.000388|
e8-----+-----+-----+-----+-----+-----+-----+-----+
8 | 1.987| -2.338| 1.344| 0.01E3| 1.49E3| -1.54E3| 0.004477|
e102-----+-----+-----+-----+-----+-----+-----+-----+
102 | -2.986| -0.026| -0.169| 0.00E3| -0.28E3| -0.43E3| 0.180251|
e103-----+-----+-----+-----+-----+-----+-----+-----+
103 | -0.300| -0.023| 0.232| 0.00E3| 0.44E3| -0.99E3| 0.258185|
e104-----+-----+-----+-----+-----+-----+-----+-----+
104 | -0.300| -0.023| 0.232| 0.00E3| 0.51E3| -0.98E3| 0.265651|
e105-----+-----+-----+-----+-----+-----+-----+-----+
105 | -0.382| -0.222| -1.150| 0.00E3| 0.53E3| -1.02E3| 0.263367|
e106-----+-----+-----+-----+-----+-----+-----+-----+
106 | 6.597| 0.170| 5.036| -0.01E3| 3.69E3| 1.53E3| 0.240308|
e107-----+-----+-----+-----+-----+-----+-----+-----+
107 | 7.213| 0.663| -3.919| 0.01E3| 3.47E3| 1.22E3| 0.302121|
e108-----+-----+-----+-----+-----+-----+-----+-----+
108 | 2.543| 1.258| -1.317| 0.00E3| -1.26E3| -1.25E3| 0.167968|
e109-----+-----+-----+-----+-----+-----+-----+-----+
109 | 8.230| -1.704| 0.584| 0.01E3| 1.50E3| 1.12E3| 0.109442|
e110-----+-----+-----+-----+-----+-----+-----+-----+
110 | 10.829| -0.972| -2.759| -0.01E3| -2.05E3| 1.25E3| 0.203853|
e111-----+-----+-----+-----+-----+-----+-----+-----+
111 | 0.070| 2.497| 0.500| -0.01E3| -0.78E3| 2.45E3| 0.225683|
  
```

Plus grande valeur négative

Nx -2.986 daN Elément 102, Nx effort axial de traction ou compression  
 Ty -2.338 daN Elément 8, Ty effort tranchant  
 Tz -3.919 daN Elément 107, Tz effort tranchant  
 Mx -0.01E3 daN.mm Elément 106, Mx moment de torsion  
 My -2.48E3 daN.mm Elément 106, My moment fléchissant  
 Mz -1.60E3 daN.mm Elément 111, Mz moment fléchissant

Plus grande valeur positive

Nx 10.829 daN Elément 110, Nx effort axial de traction ou compression  
 Ty 2.497 daN Elément 111, Ty effort tranchant  
 Tz 5.036 daN Elément 106, Tz effort tranchant  
 Mx 0.01E3 daN.mm Elément 107, Mx moment de torsion  
 My 3.69E3 daN.mm Elément 106, My moment fléchissant  
 Mz 2.45E3 daN.mm Elément 111, Mz moment fléchissant  
 W 0.308475 mm Elément 106, W flèche, déplacement perpendiculaire à l'âme

Propriété 7 RE120\_5X R120x120 5 - section rectangulaire creuse

Trémie Cuivre  
 calcul 1 'calcul 0'

EFFORTS RESULTANTS [BEAM poutre]

Nx effort axial de traction ou compression  
 Ty effort tranchant  
 Tz effort tranchant  
 Mx moment de torsion  
 My moment fléchissant  
 Mz moment fléchissant  
 W flèche, déplacement perpendiculaire à l'âme

Elément	Nx daN	Ty daN	Tz daN	Mx daN.mm	My daN.mm	Mz daN.mm	W mm
e13	-0.054	0.218	0.001	-0.00E3	-0.00E3	-0.22E3	0.006159
e14	0.796	0.263	0.003	0.07E3	-0.03E3	0.28E3	0.014757
e15	-2.290	0.309	0.148	0.23E3	-1.56E3	-0.44E3	0.021338
e16	0.462	0.321	0.011	0.13E3	-0.15E3	0.41E3	0.027243
e17	-6.103	0.343	0.143	0.16E3	-0.67E3	-0.70E3	0.036205
e18	50.711	0.103	0.010	-0.25E3	-0.32E3	-3.12E3	0.024620
e19	-18.498	0.141	0.002	-0.17E3	-0.01E3	0.51E3	0.013676
e20	0.622	0.062	0.001	-0.04E3	-0.00E3	-0.07E3	0.002002

Plus grande valeur négative

Nx -18.498 daN Elément 19, Nx effort axial de traction ou compression  
 Mx -0.25E3 daN.mm Elément 18, Mx moment de torsion  
 My -1.56E3 daN.mm Elément 15, My moment fléchissant  
 Mz -3.12E3 daN.mm Elément 18, Mz moment fléchissant

Plus grande valeur positive

Nx 50.711 daN Elément 18, Nx effort axial de traction ou compression  
 Ty 0.343 daN Elément 17, Ty effort tranchant  
 Tz 0.148 daN Elément 15, Tz effort tranchant  
 Mx 0.23E3 daN.mm Elément 15, Mx moment de torsion  
 My 0.00E3 daN.mm Elément 20, My moment fléchissant  
 Mz 0.51E3 daN.mm Elément 19, Mz moment fléchissant  
 W 0.036205 mm Elément 17, W flèche, déplacement perpendiculaire à l'âme



Propriété 2 UPN200  
Trémie Cuivre  
calcul 2 'calcul 0'

-----  
EFFORTS RESULTANTS [BEAM poutre]  
Nx effort axial de traction ou compression  
Ty effort tranchant  
Tz effort tranchant  
Mx moment de torsion  
My moment fléchissant  
Mz moment fléchissant  
W flèche, déplacement perpendiculaire à l'âme  
-----

Elément	Nx daN	Ty daN	Tz daN	Mx daN.mm	My daN.mm	Mz daN.mm	W mm
e1							
1	0.005	-2.240	1.168	0.17E3	-0.58E3	1.13E3	0
e2							
2	0	0	0	0	0	0	0
e3							
3	-1164.860	0.320	-82.747	0.00E3	38.74E3	-0.06E3	0
e4							
4	772.710	-0.660	42.753	0.00E3	-23.76E3	-0.20E3	0
e35							
35	-1.135	2.920	1.221	0.06E3	0.54E3	0.91E3	0.202111
e36							
36	-1.837	-8.346	-6.327	-0.09E3	2.15E3	4.16E3	0.195286
e69							
69	0.524	-1.924	4.286	0.03E3	4.93E3	-0.83E3	0.054266
e70							
70	0.291	-0.244	-0.157	0.01E3	0.48E3	0.07E3	0.048439
e71							
71	0.397	1.652	3.978	-0.02E3	4.54E3	0.74E3	0.051832
e78							
78	-0.005	2.110	-1.168	-0.17E3	0.58E3	-1.07E3	0.006048
e79							
79	0	0	0	0	0	0	0
e80							
80	-1164.922	0.942	-82.748	0.00E3	30.42E3	-0.49E3	0.001020
e81							
81	-1165.063	-17.556	-82.750	0.01E3	-35.95E3	6.02E3	0.010641
e82							
82	-1165.166	33.155	-82.760	0.33E3	-96.20E3	-15.10E3	0.019131
e83							
83	309.370	-0.964	-99.782	0.06E3	98.93E3	1.76E3	0.033162
e84							
84	518.800	3.529	-42.219	-0.68E3	26.39E3	-0.84E3	0.036780
e85							
85	518.457	-2.574	-42.362	-0.01E3	-9.39E3	-0.83E3	0.031004
e86							
86	518.136	-2.112	-42.373	0.14E3	-25.15E3	0.58E3	0.022264
e87							
87	718.181	0.894	-35.651	-1.60E3	21.36E3	-0.19E3	0.017287
e88							
88	717.872	-1.396	-35.799	-0.04E3	20.70E3	-0.36E3	0.017186
e89							
89	717.609	-0.599	-35.802	-0.00E3	-7.88E3	0.16E3	0.012104
e90							
90	717.391	-0.653	-35.803	0.00E3	-22.20E3	0.20E3	0.004475
e91							
91	772.492	-0.714	42.754	0.00E3	10.44E3	-0.16E3	0.004792
e92							
92	772.229	0.082	42.757	0.03E3	27.61E3	-0.15E3	0.012250
e93							
93	771.920	-2.207	42.905	1.30E3	28.91E3	-0.59E3	0.015562
e94							
94	527.427	0.531	54.984	-0.12E3	-31.62E3	0.30E3	0.015480
e95							
95	527.107	0.994	54.995	0.01E3	11.12E3	-0.53E3	0.018487
e96							
96	526.764	-5.110	55.138	0.39E3	36.10E3	-1.23E3	0.025747

e97	263.063	2.415	97.639	0.03E3	90.22E3	2.89E3	0.028785
e98	-1177.862	-34.007	88.052	-0.30E3	-97.80E3	-15.69E3	0.031382
e99	-1177.965	16.704	88.062	-0.00E3	-34.21E3	5.84E3	0.024179
e100	-1178.105	-1.794	88.064	0.00E3	36.07E3	-0.61E3	0.012445
e101	-1178.168	-1.171	88.066	0.00E3	44.83E3	0.15E3	0.001130
e253	-21.524	-1753.904	-40.752	-0.99E3	21.52E3	-438.87E3	0.217560
e254	-2376.598	-1.792	-8.532	0.02E3	24.61E3	-0.46E3	0.388045
e255	-22.174	1751.066	-43.372	1.02E3	22.54E3	438.15E3	0.211091

Plus grande valeur négative

Nx	-2376.598 daN	Elément 254, Nx effort axial de traction ou compression
Ty	-1753.904 daN	Elément 253, Ty effort tranchant
Tz	-99.782 daN	Elément 83, Tz effort tranchant
Mx	-1.60E3 daN.mm	Elément 87, Mx moment de torsion
My	-97.80E3 daN.mm	Elément 98, My moment fléchissant
Mz	-438.87E3 daN.mm	Elément 253, Mz moment fléchissant

Plus grande valeur positive

Nx	772.710 daN	Elément 4, Nx effort axial de traction ou compression
Ty	1751.066 daN	Elément 255, Ty effort tranchant
Tz	97.639 daN	Elément 97, Tz effort tranchant
Mx	1.30E3 daN.mm	Elément 93, Mx moment de torsion
My	98.93E3 daN.mm	Elément 83, My moment fléchissant
Mz	438.15E3 daN.mm	Elément 255, Mz moment fléchissant
W	0.388045 mm	Elément 254, W flèche, déplacement perpendiculaire à l'âme

Propriété 3 RE80\_5X R80x80 5 - section rectangulaire creuse

Trémie Cuivre

calcul 2 'calcul 0'

EFFORTS RESULTANTS [BEAM poutre]

Nx effort axial de traction ou compression

Ty effort tranchant

Tz effort tranchant

Mx moment de torsion

My moment fléchissant

Mz moment fléchissant

W flèche, déplacement perpendiculaire à l'âme

Elément	Nx daN	Ty daN	Tz daN	Mx daN.mm	My daN.mm	Mz daN.mm	W mm
e9	60.903	-0.078	-254.954	1.20E3	69.53E3	-0.02E3	0
e10	60.270	0.106	-220.944	-0.76E3	60.52E3	-0.03E3	0
e11	-16.033	2.533	-329.532	0.31E3	85.46E3	-0.70E3	0
e12	-15.220	-2.109	-357.091	0.04E3	92.73E3	0.72E3	0
e23	17.022	-34.119	-1474.535	-15.67E3	195.13E3	8.80E3	0.041905
e24	9.586	36.421	-1440.924	15.62E3	188.02E3	-9.44E3	0.042252
e25	-12.079	-2.738	-244.492	-0.84E3	60.53E3	-1.42E3	0.014094
e26	-42.501	-7.524	-263.701	-1.82E3	65.49E3	2.66E3	0.024642
e37	-0.634	6.243	0.760	0.71E3	0.41E3	2.30E3	0.203063
e38	-0.732	2.598	3.343	0.17E3	1.79E3	1.05E3	0.203190
e39	8.062	5.194	0.670	-1.08E3	-0.41E3	5.00E3	0.171485

e40							
40	-5.044	1.843	0.754	-1.40E3	0.98E3	3.67E3	0.180160
e41							
41	-10.763	6.106	-2.173	-0.42E3	4.47E3	3.41E3	0.226028
e42							
42	-2.375	-16.560	-6.474	-6.22E3	6.22E3	-6.10E3	0.234239
e67							
67	-1.209	0.850	-4.087	-5.22E3	1.39E3	0.45E3	0.153185
e68							
68	3.627	4.476	-5.588	1.95E3	-2.81E3	-1.95E3	0.179553
e112							
112	23.916	-0.219	-20.346	0.91E3	-15.96E3	-0.07E3	0.118549
e113							
113	9.378	-0.567	4.866	0.46E3	-6.25E3	-0.13E3	0.193479
e114							
114	5.034	-0.417	0.298	0.25E3	-1.28E3	-0.10E3	0.214363
e115							
115	3.172	-0.503	-2.368	0.20E3	-0.67E3	-0.13E3	0.218534
e116							
116	1.819	-0.628	-2.632	0.18E3	-0.54E3	-0.18E3	0.219522
e117							
117	0.590	-1.103	-3.171	0.14E3	-1.27E3	0.41E3	0.220025
e118							
118	24.793	0.713	-28.636	-0.41E3	-16.48E3	-0.26E3	0.103451
e119							
119	3.094	0.216	1.791	-0.10E3	-2.70E3	0.09E3	0.171485
e120							
120	3.088	0.011	1.227	0.02E3	-1.99E3	-0.02E3	0.195324
e121							
121	3.054	-0.091	1.054	-0.02E3	-1.50E3	-0.05E3	0.208032
e122							
122	2.940	-0.237	1.003	-0.11E3	-1.08E3	-0.10E3	0.212418
e123							
123	2.734	-0.487	0.960	-0.22E3	-0.68E3	0.15E3	0.210846
e124							
124	2.711	2.403	58.793	0.22E3	-28.24E3	0.77E3	0.141039
e125							
125	8.416	-1.171	-5.370	0.53E3	-2.69E3	0.36E3	0.187953
e126							
126	5.010	-2.231	3.755	0.71E3	-2.06E3	-0.67E3	0.201843
e127							
127	4.222	-1.024	0.577	0.84E3	-0.37E3	-0.21E3	0.205237
e128							
128	2.794	-1.125	1.282	0.79E3	-0.28E3	-0.27E3	0.205141
e129							
129	1.161	-1.524	-0.047	0.68E3	-0.02E3	0.57E3	0.204068
e130							
130	5.537	-2.104	59.272	-0.30E3	-30.02E3	-0.68E3	0.153185
e131							
131	9.825	1.952	4.670	-0.86E3	-3.00E3	-0.59E3	0.205065
e132							
132	4.906	2.228	3.631	-0.88E3	-1.52E3	0.57E3	0.215516
e133							
133	3.753	0.731	0.750	-0.73E3	-0.26E3	-0.21E3	0.218343
e134							
134	2.426	0.645	1.341	-0.50E3	-0.32E3	-0.14E3	0.219439
e135							
135	1.125	0.683	1.069	-0.29E3	0.40E3	-0.27E3	0.219925
e136							
136	36.265	23.224	-69.870	-4.49E3	22.62E3	-11.22E3	0.198579
e137							
137	37.012	24.549	-71.663	-10.68E3	-15.97E3	-17.34E3	0.270914
e138							
138	10.707	-1.842	-1.711	5.95E3	0.66E3	-2.73E3	0.313532
e139							
139	8.919	-1.606	4.726	3.03E3	-1.20E3	-2.00E3	0.328021
e140							
140	7.005	-1.491	4.327	1.67E3	-0.98E3	-1.35E3	0.333357
e141							
141	5.062	-1.235	5.306	0.95E3	2.04E3	-0.75E3	0.332459
e142							
142	33.119	-22.375	-64.963	1.83E3	24.24E3	13.02E3	0.181321

e143							
143	36.537	-30.914	-80.779	15.19E3	-17.38E3	14.51E3	0.237566
e144							
144	9.388	0.055	-3.052	-5.55E3	-0.78E3	0.98E3	0.272825
e145							
145	9.126	1.323	0.912	-3.79E3	-0.54E3	0.95E3	0.284089
e146							
146	9.290	1.781	0.756	-3.00E3	-0.31E3	0.42E3	0.290316
e147							
147	9.586	1.632	2.412	-2.96E3	1.18E3	-1.27E3	0.294105
e148							
148	-8.749	-2.428	-52.982	-0.72E3	-18.38E3	0.66E3	0.116029
e149							
149	-15.480	-4.551	1.294	-0.93E3	-11.69E3	4.48E3	0.155561
e207							
207	-3.132	0.326	0.199	-0.29E3	-0.69E3	0.15E3	0.151317
e208							
208	-3.377	0.035	0.042	0.11E3	-0.59E3	0.06E3	0.148376
e209							
209	-1.725	-0.362	4.020	4.65E3	1.46E3	0.14E3	0.144807
e210							
210	6.012	-2.673	3.844	-0.16E3	-2.47E3	-0.92E3	0.160619
e211							
211	6.335	2.955	-3.667	-0.01E3	-2.35E3	-0.99E3	0.155840
e212							
212	4.309	-3.946	5.228	-1.89E3	-2.63E3	-1.90E3	0.153681
e225							
225	4.994	0.189	0.103	-0.55E3	0.10E3	0.80E3	0.192851
e226							
226	-3.621	-2.273	0.229	-0.47E3	0.97E3	1.02E3	0.204923
e227							
227	-9.610	-0.951	-4.032	0.34E3	3.51E3	0.38E3	0.260196
e228							
228	-1.881	-0.381	-3.523	-2.80E3	3.40E3	0.42E3	0.267296
e235							
235	3.193	-2.197	-0.075	-0.27E3	0.22E3	0.52E3	0.201005
e236							
236	-2.758	-3.053	-0.431	-0.10E3	0.80E3	0.77E3	0.218410
e237							
237	-8.161	0.295	-3.936	0.40E3	1.86E3	0.32E3	0.276723
e238							
238	-2.393	1.539	-2.782	-1.36E3	1.85E3	0.46E3	0.287046
e239							
239	1.511	-1.543	-0.383	0.05E3	0.27E3	-0.55E3	0.207328
e240							
240	-1.642	-0.540	-0.823	0.21E3	0.46E3	-0.49E3	0.228533
e241							
241	-6.548	4.670	-3.178	0.33E3	-1.10E3	-1.39E3	0.284014
e242							
242	-3.439	-6.003	-2.840	-0.76E3	0.64E3	2.81E3	0.296694
e243							
243	-1.013	1.324	-2.920	0.65E3	1.43E3	-0.54E3	0.213963
e244							
244	-0.643	0.753	-6.243	0.94E3	2.54E3	-0.41E3	0.237151
e245							
245	-3.173	1.283	-2.598	0.32E3	1.20E3	-1.79E3	0.289531
e246							
246	-5.928	2.873	8.346	-0.33E3	-4.43E3	-2.15E3	0.303410
e247							
247	1446.622	-1209.517	48.224	-11.36E3	-26.70E3	-374.45E3	0.217636
e248							
248	-1500.336	1207.659	-72.253	11.41E3	34.54E3	374.49E3	0.202264
e262							
262	39.958	23.449	941.506	0.60E3	-122.67E3	-1.96E3	0.211557
e263							
263	37.407	-21.924	977.514	-3.73E3	-123.30E3	4.12E3	0.202328
e264							
264	12.132	-3.046	10.381	12.55E3	1.68E3	-3.19E3	0.306437
e265							
265	10.660	-2.541	2.698	-8.79E3	-0.81E3	0.98E3	0.267727
e266							
266	3197.688	-1187.343	4.852	-10.51E3	-3.61E3	386.59E3	1.232258

e267	267	3195.895	1189.255	-3.680	9.84E3	-3.05E3	387.03E3	2.160981
e268	268	1441.991	1210.780	-44.432	10.98E3	-24.28E3	-374.90E3	1.227284
e269	269	-3283.778	1223.604	-87.948	10.26E3	-54.44E3	-395.98E3	1.239978
e270	270	-3285.259	-1221.939	87.309	-10.91E3	-54.34E3	-395.61E3	2.209156
e271	271	-1504.190	-1206.524	71.159	-11.80E3	33.94E3	374.06E3	1.243268

Plus grande valeur négative

Nx	-3285.259 daN	Elément 270, Nx effort axial de traction ou compression
Ty	-1221.939 daN	Elément 270, Ty effort tranchant
Tz	-1474.535 daN	Elément 23, Tz effort tranchant
Mx	-15.67E3 daN.mm	Elément 23, Mx moment de torsion
My	-173.50E3 daN.mm	Elément 23, My moment fléchissant
Mz	-395.98E3 daN.mm	Elément 269, Mz moment fléchissant

Plus grande valeur positive

Nx	3197.688 daN	Elément 266, Nx effort axial de traction ou compression
Ty	1223.604 daN	Elément 269, Ty effort tranchant
Tz	977.514 daN	Elément 263, Tz effort tranchant
Mx	15.62E3 daN.mm	Elément 24, Mx moment de torsion
My	195.13E3 daN.mm	Elément 23, My moment fléchissant
Mz	387.03E3 daN.mm	Elément 267, Mz moment fléchissant
W	2.209156 mm	Elément 269, W flèche, déplacement perpendiculaire à l'âme

Propriété 4 RI80\_50C R80x50 4 - section rectangulaire creuse

Trémie Cuivre

calcul 2 'calcul 0'

EFFORTS RESULTANTS [BEAM poutre]

Nx effort axial de traction ou compression

Ty effort tranchant

Tz effort tranchant

Mx moment de torsion

My moment fléchissant

Mz moment fléchissant

W flèche, déplacement perpendiculaire à l'âme

Elément	Nx daN	Ty daN	Tz daN	Mx daN.mm	My daN.mm	Mz daN.mm	W mm	
e43	43	-5.005	0.252	3.110	0.18E3	-2.04E3	-0.31E3	0.002467
e44	44	-2.386	0.298	1.785	0.12E3	-1.18E3	-0.33E3	0.004526
e45	45	0.654	0.141	1.704	0.08E3	-1.12E3	-0.20E3	0.005712
e46	46	-1.377	-0.372	2.580	0.08E3	-1.61E3	-0.32E3	0.005580
e63	63	2.336	0.010	-4.350	0.09E3	-1.40E3	-0.00E3	0.006040
e64	64	1.701	-3.221	5.092	0.68E3	1.38E3	1.12E3	0.215514
e65	65	-4.717	-1.272	1.531	-0.25E3	-1.24E3	-0.45E3	0.229387
e66	66	-4.436	1.273	1.508	0.25E3	-1.21E3	0.44E3	0.222959
e75	75	-6.723	3.005	-200.045	0.75E3	46.51E3	1.74E3	0.013087
e76	76	-57.564	4.493	-209.431	1.01E3	49.69E3	-1.06E3	0.022420
e166	166	-9.121	-0.625	1.873	0.07E3	-1.21E3	-0.46E3	0.070212
e167	167	-16.178	-2.720	1.245	0.04E3	1.63E3	3.10E3	0.175888
e190	190	2.125	-0.144	-2.151	0.02E3	-2.29E3	-0.03E3	0.075373
e191	191	1.933	-0.407	0.603	-0.05E3	-2.28E3	-0.09E3	0.132432

e192														
192		1.603		-0.360		1.600		-0.08E3		-2.03E3		-0.07E3		0.169289
e193														
193		1.267		-0.493		1.511		-0.05E3		-1.38E3		-0.10E3		0.187450
e194														
194		0.923		-0.746		1.052		0.01E3		-0.78E3		-0.15E3		0.192498
e195														
195		0.559		-0.625		0.601		0.05E3		-0.36E3		0.20E3		0.189988
e196														
196		1.240		4.452		-8.625		-0.72E3		1.44E3		1.15E3		0.229921
e197														
197		2.512		2.921		-3.908		0.53E3		-1.01E3		0.51E3		0.229399
e198														
198		2.433		-2.416		3.759		-0.54E3		-0.98E3		0.38E3		0.225440
e199														
199		1.161		-3.924		8.195		0.67E3		1.35E3		0.92E3		0.222970
e200														
200		1.536		3.375		-4.679		-0.59E3		1.31E3		0.89E3		0.219922
e201														
201		-3.593		0.646		0.826		-0.10E3		-0.62E3		0.15E3		0.243948
e202														
202		-2.438		0.267		0.419		-0.05E3		-0.29E3		-0.06E3		0.252217
e203														
203		-1.382		0.081		0.199		-0.04E3		-0.12E3		-0.03E3		0.257512
e204														
204		-3.513		-1.067		0.850		0.10E3		-0.60E3		-0.24E3		0.237349
e205														
205		-2.483		-1.027		0.404		0.04E3		-0.26E3		0.21E3		0.245690
e206														
206		-1.429		-0.673		0.140		0.02E3		-0.09E3		0.21E3		0.251355
e213														
213		-1.023		2.058		-50.583		0.69E3		-14.23E3		0.52E3		0.135576
e214														
214		3.349		1.000		-14.062		0.55E3		-4.75E3		-0.70E3		0.211695
e215														
215		3.310		0.216		-6.077		0.34E3		-1.72E3		-0.78E3		0.248364
e216														
216		3.056		-0.360		-5.422		0.12E3		-1.18E3		-0.77E3		0.268336
e217														
217		2.780		-0.614		-5.090		-0.04E3		-1.02E3		-0.62E3		0.278390
e218														
218		2.602		-0.596		-4.670		-0.12E3		-1.68E3		-0.36E3		0.280766
e219														
219		-33.536		2.810		-4.983		0.64E3		-7.26E3		-2.15E3		0.200027
e220														
220		-28.213		0.391		-11.795		0.09E3		-3.21E3		-2.29E3		0.313977
e221														
221		-22.242		-1.999		0.707		-0.43E3		-0.71E3		-2.27E3		0.382183
e222														
222		-17.813		-1.894		-0.001		-0.36E3		-0.07E3		-1.48E3		0.409629
e223														
223		-13.405		-1.162		0.554		-0.21E3		-0.14E3		-0.73E3		0.410780
e224														
224		-8.955		-0.493		0.616		-0.10E3		0.22E3		-0.27E3		0.398660
e229														
229		-3.166		-0.564		1.124		-0.05E3		0.78E3		0.40E3		0.085923
e230														
230		-1.920		-0.849		-0.301		0.04E3		0.70E3		1.40E3		0.190842
e231														
231		3.167		-0.528		0.729		-0.07E3		0.56E3		0.47E3		0.096242
e232														
232		7.542		-0.217		-1.025		0.02E3		0.99E3		0.69E3		0.194192
e233														
233		-7.080		-0.640		1.541		-0.03E3		1.07E3		0.56E3		0.103297
e234														
234		-14.349		-0.009		-2.267		-0.01E3		-1.51E3		0.42E3		0.195882
e249														
249		28.372		83.476		25.877		7.65E3		-13.91E3		33.77E3		0.201253
e272														
272		57.910		89.056		82.324		6.56E3		26.43E3		-44.01E3		0.809580
e273														
273		57.598		-88.803		-84.401		-6.58E3		26.55E3		-44.08E3		1.294362

```
e274-----+-----+-----+-----+-----+-----+-----+-----+
274      | 27.595| -82.043| -24.879| -7.51E3| -14.15E3| 32.75E3| 0.822253|
-----+-----+-----+-----+-----+-----+-----+-----+
```

Plus grande valeur négative

```
Nx      -57.564 daN      Elément 76, Nx effort axial de traction ou compression
Ty      -88.803 daN      Elément 273, Ty effort tranchant
Tz      -209.431 daN     Elément 76, Tz effort tranchant
Mx      -7.51E3 daN.mm   Elément 274, Mx moment de torsion
My      -34.08E3 daN.mm  Elément 76, My moment fléchissant
Mz      -44.08E3 daN.mm  Elément 273, Mz moment fléchissant
```

Plus grande valeur positive

```
Nx      57.910 daN      Elément 272, Nx effort axial de traction ou compression
Ty      89.056 daN      Elément 272, Ty effort tranchant
Tz      82.324 daN      Elément 272, Tz effort tranchant
Mx      7.65E3 daN.mm   Elément 249, Mx moment de torsion
My      49.69E3 daN.mm  Elément 76, My moment fléchissant
Mz      33.77E3 daN.mm  Elément 249, Mz moment fléchissant
W       1.294362 mm     Elément 272, W flèche, déplacement perpendiculaire à l'âme
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Propriété 5 UPN80
Trémie Cuivre
calcul 2 'calcul 0'
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EFFORTS RESULTANTS [BEAM poutre]

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Nx effort axial de traction ou compression
Ty effort tranchant
Tz effort tranchant
Mx moment de torsion
My moment fléchissant
Mz moment fléchissant
W flèche, déplacement perpendiculaire à l'âme
```

Elément	Nx daN	Ty daN	Tz daN	Mx daN.mm	My daN.mm	Mz daN.mm	W mm
e27							
27	0.681	1.413	-0.251	0.00E3	0.13E3	-0.90E3	0.193482
e28							
28	36.961	-0.013	13.682	0.01E3	-8.68E3	-0.05E3	0.001105
e30							
30	54.542	1.820	-4.348	0.02E3	-3.75E3	-2.50E3	0.000684
e31							
31	0.573	1.169	-0.129	-0.02E3	-0.07E3	-0.69E3	0.118551
e32							
32	193.338	0.120	35.558	0.01E3	-22.82E3	-0.09E3	0.000777
e34							
34	-417.213	-1.204	-16.671	0.02E3	14.87E3	0.50E3	0.000340
e47							
47	-0.158	0.434	-0.336	0.01E3	0.18E3	-0.47E3	0.214366
e49							
49	4.260	1.977	-0.173	0.01E3	0.29E3	-2.70E3	0.000866
e50							
50	2.476	0.787	1.050	-0.01E3	-0.44E3	-0.38E3	0.205234
e51							
51	3.456	0.556	0.155	0.00E3	-0.19E3	-1.09E3	0.000936
e52							
52	-0.235	-0.262	-0.371	0.00E3	0.20E3	-0.44E3	0.218535
e53							
53	0.356	0.548	1.264	-0.00E3	-0.47E3	-0.38E3	0.205140
e54							
54	-0.287	-0.069	0.407	0.00E3	-0.36E3	-0.45E3	0.000799
e55							
55	-0.399	-0.510	-0.458	0.00E3	0.25E3	-0.60E3	0.219520
e56							
56	-0.546	0.328	1.336	-0.00E3	-0.52E3	-0.41E3	0.204068
e57							
57	0.429	-0.339	0.528	-0.00E3	-0.45E3	-0.53E3	0.000449
e58							
58	-0.130	-0.494	-0.570	-0.00E3	0.32E3	-0.61E3	0.220015
e59							
59	-5.750	-2.596	1.273	-0.00E3	1.23E3	-3.24E3	0.183113

e60							
60	3.965	-1.269	0.262	-0.00E3	-0.24E3	-1.75E3	0.196724
e61							
61	-0.156	-0.457	-0.164	-0.00E3	-0.14E3	-0.79E3	0.205419
e62							
62	1.656	0.148	-0.296	-0.00E3	0.26E3	-0.29E3	0.211900
e72							
72	-15.699	-0.461	-0.764	-0.00E3	-1.40E3	-0.36E3	0.099549
e73							
73	9.331	-0.079	-0.462	0.00E3	-1.07E3	0.04E3	0.100046
e74							
74	-14.785	0.375	-0.633	0.00E3	-1.26E3	0.31E3	0.095319
e77							
77	-2.237	0.060	-0.060	-0.00E3	0.07E3	-0.10E3	0.187953
e150							
150	0.944	-1.340	-0.059	-0.01E3	-0.06E3	-0.83E3	0.132432
e151							
151	91.786	-0.399	9.606	0.01E3	-6.40E3	-0.36E3	0.048796
e152							
152	96.599	-4.244	5.084	0.00E3	3.83E3	3.92E3	0.139220
e153							
153	64.223	-1.337	5.645	-0.01E3	-4.99E3	-1.85E3	0.150961
e154							
154	56.334	3.144	-5.095	0.01E3	3.53E3	3.69E3	0.181792
e155							
155	63.146	0.725	-10.418	-0.02E3	-6.71E3	-0.50E3	0.245978
e156							
156	26.625	-0.333	-14.789	-0.02E3	-9.72E3	-0.35E3	0.084401
e157							
157	0.727	-1.030	0.081	0.01E3	0.04E3	-0.62E3	0.075374
e158							
158	384.849	-0.191	32.228	0.02E3	20.14E3	-0.21E3	0.027682
e159							
159	649.843	-3.164	5.207	0.01E3	-8.16E3	3.01E3	0.083418
e160							
160	-392.634	-2.713	9.496	-0.03E3	7.99E3	-2.55E3	0.066789
e161							
161	-388.687	1.596	14.724	-0.01E3	13.46E3	0.58E3	0.071189
e162							
162	-421.689	2.423	-11.082	0.04E3	8.48E3	-2.52E3	0.077037
e163							
163	589.687	2.199	-7.389	0.00E3	-8.98E3	2.57E3	0.078552
e164							
164	385.240	0.515	-31.417	-0.03E3	19.84E3	-0.38E3	0.135400
e165							
165	235.777	-0.432	-37.117	-0.02E3	-24.61E3	-0.33E3	0.038708
e168							
168	-0.205	-0.564	-0.006	-0.00E3	-0.02E3	-0.44E3	0.169289
e169							
169	16.352	3.181	1.252	0.01E3	-1.01E3	3.91E3	0.228342
e170							
170	3.849	0.792	-4.719	-0.00E3	3.02E3	0.53E3	0.318281
e171							
171	-4.135	0.007	-4.680	-0.01E3	-3.03E3	-0.24E3	0.126969
e172							
172	0.135	0.129	0.127	-0.00E3	0.20E3	-0.30E3	0.237359
e173							
173	2.054	-0.576	-0.997	0.01E3	-0.41E3	-0.45E3	0.243959
e174							
174	-2.980	0.792	1.943	0.00E3	1.27E3	1.82E3	0.245336
e175							
175	-2.272	0.896	-2.486	0.00E3	1.63E3	0.78E3	0.348301
e176							
176	-2.928	0.321	-2.232	-0.01E3	-1.44E3	-0.49E3	0.156882
e177							
177	-0.102	-0.173	-0.034	-0.00E3	-0.03E3	-0.21E3	0.187448
e178							
178	0.396	0.102	0.235	0.00E3	0.16E3	-0.38E3	0.245699
e179							
179	0.016	-0.305	-0.920	0.00E3	-0.33E3	-0.43E3	0.252227
e180							
180	0.113	0.046	2.320	-0.00E3	1.47E3	1.02E3	0.251250



e181							
181	-0.442	0.778	-2.088	0.01E3	1.40E3	0.81E3	0.348871
e182							
182	-0.774	0.524	-1.811	-0.00E3	-1.18E3	-0.62E3	0.172133
e183							
183	-0.146	-0.052	-0.114	0.00E3	-0.08E3	-0.14E3	0.192492
e184							
184	-0.192	0.063	0.282	0.00E3	0.18E3	-0.42E3	0.251364
e185							
185	-0.377	-0.156	-0.773	0.00E3	-0.28E3	-0.43E3	0.257522
e186							
186	-0.551	-0.083	2.472	-0.01E3	1.55E3	0.85E3	0.249679
e187							
187	-0.612	0.587	-1.977	0.01E3	1.32E3	0.73E3	0.334179
e188							
188	-1.033	0.605	-1.799	0.00E3	-1.17E3	-0.65E3	0.175353
e189							
189	-0.250	-0.043	-0.206	0.00E3	-0.14E3	-0.15E3	0.189972
e250							
250	54.057	30.003	-25.814	0.10E3	-23.43E3	16.37E3	0.668083
e251							
251	-235.647	0.311	62.460	0.00E3	-45.78E3	0.15E3	2.049895
e252							
252	50.824	-29.538	25.186	-0.10E3	-22.67E3	16.17E3	1.149362

Plus grande valeur négative

Nx	-421.689 daN	Elément 162, Nx effort axial de traction ou compression
Ty	-29.538 daN	Elément 252, Ty effort tranchant
Tz	-37.117 daN	Elément 165, Tz effort tranchant
Mx	-0.10E3 daN.mm	Elément 252, Mx moment de torsion
My	-45.78E3 daN.mm	Elément 251, My moment fléchissant
Mz	-11.94E3 daN.mm	Elément 250, Mz moment fléchissant

Plus grande valeur positive

Nx	649.843 daN	Elément 159, Nx effort axial de traction ou compression
Ty	30.003 daN	Elément 250, Ty effort tranchant
Tz	62.460 daN	Elément 251, Tz effort tranchant
Mx	0.10E3 daN.mm	Elément 250, Mx moment de torsion
My	20.86E3 daN.mm	Elément 165, My moment fléchissant
Mz	16.37E3 daN.mm	Elément 250, Mz moment fléchissant
W	2.049895 mm	Elément 251, W flèche, déplacement perpendiculaire à l'âme

Propriété 6 UPN120  
Trémie Cuivre  
calcul 2 'calcul 0'

EFFORTS RESULTANTS [BEAM poutre]

Nx effort axial de traction ou compression  
Ty effort tranchant  
Tz effort tranchant  
Mx moment de torsion  
My moment fléchissant  
Mz moment fléchissant  
W flèche, déplacement perpendiculaire à l'âme

Elément	Nx daN	Ty daN	Tz daN	Mx daN.mm	My daN.mm	Mz daN.mm	W mm
e5							
5	-2.361	-0.627	-0.727	-0.00E3	0.42E3	-1.11E3	0.220061
e6							
6	-0.973	0.117	1.661	-0.01E3	0.58E3	-1.01E3	0.202832
e7							
7	1.291	-1.065	-0.026	-0.00E3	-0.44E3	-1.15E3	0.000388
e8							
8	1.987	-2.338	1.344	0.01E3	1.49E3	-1.54E3	0.004477
e102							
102	-2.986	-0.026	-0.169	0.00E3	-0.28E3	-0.43E3	0.180251
e103							
103	-0.300	-0.023	0.232	0.00E3	0.44E3	-0.99E3	0.258185
e104							
104	-0.300	-0.023	0.232	0.00E3	0.51E3	-0.98E3	0.265651

e105							
105	-0.382	-0.222	-1.150	0.00E3	0.53E3	-1.02E3	0.263367
e106							
106	6.597	0.170	5.036	-0.01E3	3.69E3	1.53E3	0.240308
e107							
107	7.213	0.663	-3.919	0.01E3	3.47E3	1.22E3	0.302121
e108							
108	2.543	1.258	-1.317	0.00E3	-1.26E3	-1.25E3	0.167968
e109							
109	8.230	-1.704	0.584	0.01E3	1.50E3	1.12E3	0.109442
e110							
110	10.829	-0.972	-2.759	-0.01E3	-2.05E3	1.25E3	0.203853
e111							
111	0.070	2.497	0.500	-0.01E3	-0.78E3	2.45E3	0.225683

Plus grande valeur négative

Nx	-2.986 daN	Elément 102, Nx effort axial de traction ou compression
Ty	-2.338 daN	Elément 8, Ty effort tranchant
Tz	-3.919 daN	Elément 107, Tz effort tranchant
Mx	-0.01E3 daN.mm	Elément 106, Mx moment de torsion
My	-2.48E3 daN.mm	Elément 106, My moment fléchissant
Mz	-1.60E3 daN.mm	Elément 111, Mz moment fléchissant

Plus grande valeur positive

Nx	10.829 daN	Elément 110, Nx effort axial de traction ou compression
Ty	2.497 daN	Elément 111, Ty effort tranchant
Tz	5.036 daN	Elément 106, Tz effort tranchant
Mx	0.01E3 daN.mm	Elément 107, Mx moment de torsion
My	3.69E3 daN.mm	Elément 106, My moment fléchissant
Mz	2.45E3 daN.mm	Elément 111, Mz moment fléchissant
W	0.308475 mm	Elément 106, W flèche, déplacement perpendiculaire à l'âme

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Trémie Cuivre

calcul 2 'calcul 0'

EFFORTS RESULTANTS [BEAM poutre]

Nx effort axial de traction ou compression

Ty effort tranchant

Tz effort tranchant

Mx moment de torsion

My moment fléchissant

Mz moment fléchissant

W flèche, déplacement perpendiculaire à l'âme

Elément	Nx daN	Ty daN	Tz daN	Mx daN.mm	My daN.mm	Mz daN.mm	W mm
e13							
13	-0.054	0.218	0.001	-0.00E3	-0.00E3	-0.22E3	0.006159
e14							
14	0.796	0.263	0.003	0.07E3	-0.03E3	0.28E3	0.014757
e15							
15	-2.290	0.309	0.148	0.23E3	-1.56E3	-0.44E3	0.021338
e16							
16	0.462	0.321	0.011	0.13E3	-0.15E3	0.41E3	0.027243
e17							
17	-6.103	0.343	0.143	0.16E3	-0.67E3	-0.70E3	0.036205
e18							
18	50.711	0.103	0.010	-0.25E3	-0.32E3	-3.12E3	0.024620
e19							
19	-18.498	0.141	0.002	-0.17E3	-0.01E3	0.51E3	0.013676
e20							
20	0.622	0.062	0.001	-0.04E3	-0.00E3	-0.07E3	0.002002

Plus grande valeur négative

Nx	-18.498 daN	Elément 19, Nx effort axial de traction ou compression
Mx	-0.25E3 daN.mm	Elément 18, Mx moment de torsion
My	-1.56E3 daN.mm	Elément 15, My moment fléchissant
Mz	-3.12E3 daN.mm	Elément 18, Mz moment fléchissant

Plus grande valeur positive

Nx	50.711 daN	Elément 18, Nx effort axial de traction ou compression
Ty	0.343 daN	Elément 17, Ty effort tranchant
Tz	0.148 daN	Elément 15, Tz effort tranchant
Mx	0.23E3 daN.mm	Elément 15, Mx moment de torsion
My	0.00E3 daN.mm	Elément 20, My moment fléchissant
Mz	0.51E3 daN.mm	Elément 19, Mz moment fléchissant
W	0.036205 mm	Elément 17, W flèche, déplacement perpendiculaire à l'âme

## Contraintes

Propriété 2 UPN200  
Trémie Cuivre  
calcul 1 'calcul 0'

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CONTRAINTES [BEAM poutre]

Sx contrainte d'effort axial Nx  
Sty contrainte d'effort tranchant Ty  
Stz contrainte d'effort tranchant Tz  
Stx contrainte du moment de torsion Mx  
Sfy contrainte du moment fléchissant My  
Sfz contrainte du moment fléchissant Mz  
Sm contrainte de Mises (poutre)  
Stt contrainte de membrane (pression interne)

Elément	Sx daN/mm2	Sty daN/mm2	Stz daN/mm2	Stx daN/mm2	Sfy daN/mm2	Sfz daN/mm2	Sm daN/mm2	Stt daN/mm2
e1								
1	0.00000	-0.00171	0.00066	0.02834	-0.00306	0.04189	0.06878	0
e2								
2	0	0	0	0	0	0	0	0
e3								
3	-0.36176	0.00024	-0.04672	0.00010	0.20283	-0.00219	0.57138	0
e4								
4	0.23997	-0.00050	0.02414	0.00007	-0.12439	-0.00744	0.37416	0
e35								
35	-0.00035	0.00223	0.00069	0.00972	0.00284	0.03363	0.04034	0
e36								
36	-0.00057	-0.00637	-0.00357	-0.01495	0.01123	0.15398	0.16550	0
e69								
69	0.00016	-0.00147	0.00242	0.00574	0.02579	-0.03068	0.04763	0
e70								
70	0.00009	-0.00019	-0.00009	0.00086	0.00251	0.00245	0.00502	0
e71								
71	0.00012	0.00126	0.00225	-0.00388	0.02378	0.02746	0.04235	0
e78								
78	-0.00000	0.00161	-0.00066	-0.02834	0.00306	-0.03949	0.06711	0
e79								
79	0	0	0	0	0	0	0	0
e80								
80	-0.36178	0.00072	-0.04672	0.00037	0.15929	-0.01816	0.53157	0
e81								
81	-0.36182	-0.01340	-0.04673	0.00181	-0.18820	0.22306	0.77798	0
e82								
82	-0.36185	0.02531	-0.04673	0.05495	-0.50366	-0.55923	1.43625	0
e83								
83	0.09608	-0.00074	-0.05634	0.00969	0.51798	0.06503	0.64559	0
e84								
84	0.16112	0.00269	-0.02384	-0.11397	0.13817	-0.03120	0.40480	0
e85								
85	0.16101	-0.00196	-0.02392	-0.00197	-0.04917	-0.03080	0.23568	0
e86								
86	0.16091	-0.00161	-0.02393	0.02292	-0.13169	0.02164	0.32455	0
e87								
87	0.22304	0.00068	-0.02013	-0.26895	0.11183	-0.00687	0.60574	0
e88								
88	0.22294	-0.00107	-0.02021	-0.00590	0.10835	-0.01346	0.34772	0

e89	89	0.22286	-0.00046	-0.02022	-0.00015	-0.04123	0.00577	0.27216	0
e90	90	0.22279	-0.00050	-0.02022	0.00006	-0.11624	0.00737	0.34818	0
e91	91	0.23990	-0.00054	0.02414	0.00008	0.05466	-0.00574	0.30232	0
e92	92	0.23982	0.00006	0.02414	0.00478	0.14456	-0.00554	0.39313	0
e93	93	0.23973	-0.00168	0.02423	0.21804	0.15137	-0.02186	0.58731	0
e94	94	0.16380	0.00041	0.03105	-0.02007	-0.16556	0.01117	0.35185	0
e95	95	0.16370	0.00076	0.03105	0.00100	0.05825	-0.01966	0.24791	0
e96	96	0.16359	-0.00390	0.03113	0.06484	0.18899	-0.04548	0.42609	0
e97	97	0.08170	0.00184	0.05513	0.00574	0.47234	0.10699	0.56651	0
e98	98	-0.36580	-0.02596	0.04972	-0.05028	-0.51204	-0.58126	1.47003	0
e99	99	-0.36583	0.01275	0.04972	-0.00050	-0.17913	0.21626	0.76648	0
e100	100	-0.36587	-0.00137	0.04973	0.00032	0.18882	-0.02276	0.56520	0
e101	101	-0.36589	-0.00089	0.04973	0.00010	0.23471	0.00554	0.61226	0
e253	253	-0.00668	-1.33886	-0.02301	-0.16580	0.11267	-16.25453	16.58004	0
e254	254	-0.73807	-0.00137	-0.00482	0.00381	0.12883	-0.01689	0.88393	0
e255	255	-0.00689	1.33669	-0.02449	0.17222	0.11801	16.22775	16.56023	0

Plus grande valeur négative

Sx	-0.73807 daN/mm2	Elément 254, Sx	contrainte d'effort axial Nx
Sty	-1.33886 daN/mm2	Elément 253, Sty	contrainte d'effort tranchant Ty
Stz	-0.05634 daN/mm2	Elément 83, Stz	contrainte d'effort tranchant Tz
Stx	-0.26895 daN/mm2	Elément 87, Stx	contrainte du moment de torsion Mx
Sfy	-0.51204 daN/mm2	Elément 98, Sfy	contrainte du moment fléchissant My
Sfz	-16.25453 daN/mm2	Elément 253, Sfz	contrainte du moment fléchissant Mz

Plus grande valeur positive

Sx	0.23997 daN/mm2	Elément 4, Sx	contrainte d'effort axial Nx
Sty	1.33669 daN/mm2	Elément 255, Sty	contrainte d'effort tranchant Ty
Stz	0.05513 daN/mm2	Elément 97, Stz	contrainte d'effort tranchant Tz
Stx	0.21804 daN/mm2	Elément 93, Stx	contrainte du moment de torsion Mx
Sfy	0.51798 daN/mm2	Elément 83, Sfy	contrainte du moment fléchissant My
Sfz	16.22775 daN/mm2	Elément 255, Sfz	contrainte du moment fléchissant Mz
Sm	16.58004 daN/mm2	Elément 253, Sm	contrainte de Mises (poutre)

Propriété 3 RE80\_5X R80x80 5 - section rectangulaire creuse  
Trémie Cuivre  
calcul 1 'calcul 0'

CONTRAINTES [BEAM poutre]

Sx contrainte d'effort axial Nx  
Sty contrainte d'effort tranchant Ty  
Stz contrainte d'effort tranchant Tz  
Stx contrainte du moment de torsion Mx  
Sfy contrainte du moment fléchissant My  
Sfz contrainte du moment fléchissant Mz  
Sm contrainte de Mises (poutre)  
Stt contrainte de membrane (pression interne)

Elément	Sx	Sty	Stz	Stx	Sfy	Sfz	Sm	Stt	
	daN/mm2	daN/mm2	daN/mm2	daN/mm2	daN/mm2	daN/mm2	daN/mm2	daN/mm2	
e9	9	0.04119	-0.00012	-0.38257	0.02276	2.01544	-0.00065	2.17376	0
e10	10	0.04076	0.00016	-0.33153	-0.01442	1.75411	-0.00073	1.89272	0
e11	11	-0.01084	0.00380	-0.49447	0.00582	2.47702	-0.02038	2.64295	0

e12									
12	-0.01029	-0.00316	-0.53583	0.00084	2.68787	0.02100	2.85706	0	
e23									
23	0.01151	-0.05120	-2.21259	-0.29745	5.65589	0.25503	7.14960	0	
e24									
24	0.00648	0.05465	-2.16215	0.29650	5.44961	-0.27357	6.92953	0	
e25									
25	-0.00817	-0.00411	-0.36687	-0.01587	1.75453	-0.04104	1.92173	0	
e26									
26	-0.02875	-0.01129	-0.39569	-0.03448	1.89815	0.07705	2.07553	0	
e37									
37	-0.00043	0.00937	0.00114	0.01338	0.01198	0.06666	0.07790	0	
e38									
38	-0.00049	0.00390	0.00502	0.00320	0.05192	0.03056	0.06449	0	
e39									
39	0.00545	0.00779	0.00101	-0.02053	-0.01178	0.14497	0.16948	0	
e40									
40	-0.00341	0.00277	0.00113	-0.02648	0.02848	0.10623	0.13836	0	
e41									
41	-0.00728	0.00916	-0.00326	-0.00804	0.12956	0.09878	0.23756	0	
e42									
42	-0.00161	-0.02485	-0.00971	-0.11807	0.18032	-0.17671	0.43611	0	
e67									
67	-0.00082	0.00128	-0.00613	-0.09898	0.04027	0.01292	0.18991	0	
e68									
68	0.00245	0.00672	-0.00839	0.03699	-0.08156	-0.05641	0.16134	0	
e112									
112	0.01618	-0.00033	-0.03053	0.01734	-0.46261	-0.00208	0.48636	0	
e113									
113	0.00634	-0.00085	0.00730	0.00865	-0.18109	-0.00387	0.19329	0	
e114									
114	0.00340	-0.00063	0.00045	0.00484	-0.03701	-0.00278	0.04423	0	
e115									
115	0.00215	-0.00075	-0.00355	0.00387	-0.01928	-0.00388	0.02671	0	
e116									
116	0.00123	-0.00094	-0.00395	0.00339	-0.01558	-0.00527	0.02498	0	
e117									
117	0.00040	-0.00166	-0.00476	0.00262	-0.03671	0.01201	0.05083	0	
e118									
118	0.01677	0.00107	-0.04297	-0.00775	-0.47772	-0.00754	0.50966	0	
e119									
119	0.00209	0.00032	0.00269	-0.00195	-0.07830	0.00263	0.08341	0	
e120									
120	0.00209	0.00002	0.00184	0.00045	-0.05765	-0.00049	0.06023	0	
e121									
121	0.00207	-0.00014	0.00158	-0.00035	-0.04345	-0.00150	0.04713	0	
e122									
122	0.00199	-0.00036	0.00150	-0.00208	-0.03122	-0.00277	0.03652	0	
e123									
123	0.00185	-0.00073	0.00144	-0.00418	-0.01958	0.00442	0.02731	0	
e124									
124	0.00183	0.00361	0.08822	0.00420	-0.81864	0.02237	0.85794	0	
e125									
125	0.00569	-0.00176	-0.00806	0.01002	-0.07806	0.01049	0.09936	0	
e126									
126	0.00339	-0.00335	0.00563	0.01342	-0.05971	-0.01930	0.08894	0	
e127									
127	0.00286	-0.00154	0.00087	0.01592	-0.01084	-0.00601	0.03612	0	
e128									
128	0.00189	-0.00169	0.00192	0.01496	-0.00824	-0.00783	0.03445	0	
e129									
129	0.00079	-0.00229	-0.00007	0.01283	-0.00066	0.01664	0.03183	0	
e130									
130	0.00375	-0.00316	0.08894	-0.00560	-0.87013	-0.01976	0.90854	0	
e131									
131	0.00665	0.00293	0.00701	-0.01624	-0.08698	-0.01711	0.10714	0	
e132									
132	0.00332	0.00334	0.00545	-0.01662	-0.04406	0.01662	0.07478	0	
e133									
133	0.00254	0.00110	0.00113	-0.01392	-0.00750	-0.00600	0.02896	0	
e134									
134	0.00164	0.00097	0.00201	-0.00946	-0.00938	-0.00408	0.02461	0	

e135																
135		0.00076		0.00103		0.00160		-0.00557		0.01169		-0.00795		0.02395		0
e136																
136		0.02453		0.03485		-0.10484		-0.08520		0.65551		-0.32524		0.80852		0
e137																
137		0.02503		0.03684		-0.10753		-0.20263		-0.46284		-0.50266		1.12864		0
e138																
138		0.00724		-0.00276		-0.00257		0.11284		0.01916		-0.07927		0.22645		0
e139																
139		0.00603		-0.00241		0.00709		0.05747		-0.03478		-0.05785		0.14919		0
e140																
140		0.00474		-0.00224		0.00649		0.03170		-0.02849		-0.03910		0.09810		0
e141																
141		0.00342		-0.00185		0.00796		0.01800		0.05908		-0.02169		0.07724		0
e142																
142		0.02240		-0.03357		-0.09748		0.03478		0.70267		0.37738		0.87554		0
e143																
143		0.02471		-0.04639		-0.12121		0.28831		-0.50379		0.42055		1.18754		0
e144																
144		0.00635		0.00008		-0.00458		-0.10524		-0.02261		0.02840		0.19849		0
e145																
145		0.00617		0.00199		0.00137		-0.07196		-0.01578		0.02768		0.13738		0
e146																
146		0.00628		0.00267		0.00113		-0.05698		-0.00897		0.01228		0.10695		0
e147																
147		0.00648		0.00245		0.00362		-0.05608		0.03414		-0.03680		0.12925		0
e148																
148		-0.00592		-0.00364		-0.07950		-0.01357		-0.53277		0.01906		0.58061		0
e149																
149		-0.01047		-0.00683		0.00194		-0.01771		-0.33878		0.12973		0.46593		0
e207																
207		-0.00212		0.00049		0.00030		-0.00549		-0.01995		0.00447		0.02849		0
e208																
208		-0.00228		0.00005		0.00006		0.00212		-0.01722		0.00166		0.02150		0
e209																
209		-0.00117		-0.00054		0.00603		0.08830		0.04232		0.00395		0.17014		0
e210																
210		0.00407		-0.00401		0.00577		-0.00303		-0.07163		-0.02679		0.10384		0
e211																
211		0.00428		0.00443		-0.00550		-0.00012		-0.06806		-0.02875		0.10185		0
e212																
212		0.00291		-0.00592		0.00784		-0.03592		-0.07627		-0.05500		0.15446		0
e225																
225		0.00338		0.00028		0.00015		-0.01038		0.00296		0.02320		0.03375		0
e226																
226		-0.00245		-0.00341		0.00034		-0.00898		0.02813		0.02949		0.06379		0
e227																
227		-0.00650		-0.00143		-0.00605		0.00653		0.10161		0.01111		0.11104		0
e228																
228		-0.00127		-0.00057		-0.00529		-0.05316		0.09862		0.01205		0.14745		0
e235																
235		0.00216		-0.00330		-0.00011		-0.00514		0.00639		0.01508		0.02699		0
e236																
236		-0.00187		-0.00458		-0.00065		-0.00183		0.02316		0.02228		0.04340		0
e237																
237		-0.00552		0.00044		-0.00591		0.00767		0.05395		0.00924		0.07263		0
e238																
238		-0.00162		0.00231		-0.00417		-0.02585		0.05369		0.01321		0.08611		0
e239																
239		0.00102		-0.00232		-0.00057		0.00100		0.00786		-0.01605		0.02561		0
e240																
240		-0.00111		-0.00081		-0.00123		0.00406		0.01322		-0.01420		0.03000		0
e241																
241		-0.00443		0.00701		-0.00477		0.00631		-0.03197		-0.04025		0.08047		0
e242																
242		-0.00233		-0.00901		-0.00426		-0.01442		0.01848		0.08138		0.10874		0
e243																
243		-0.00069		0.00199		-0.00438		0.01233		0.04146		-0.01570		0.05570		0
e244																
244		-0.00043		0.00113		-0.00937		0.01780		0.07376		-0.01198		0.08790		0
e245																
245		-0.00215		0.00192		-0.00390		0.00599		0.03473		-0.05192		0.07063		0

e246	246	-0.00401	0.00431	0.01252	-0.00625	-0.12827	-0.06217	0.15253	0
e247	247	0.97844	-1.81492	0.07236	-0.21556	-0.77380	-10.85336	13.08760	0
e248	248	-1.01477	1.81213	-0.10842	0.21651	1.00114	10.85454	13.34278	0
e262	262	0.02703	0.03519	1.41276	0.01146	-3.55558	-0.05693	4.38732	0
e263	263	0.02530	-0.03290	1.46679	-0.07082	-3.57373	0.11928	4.49690	0
e264	264	0.00821	-0.00457	0.01558	0.23820	0.04878	-0.09244	0.46023	0
e265	265	0.00721	-0.00381	0.00405	-0.16681	-0.02334	0.02854	0.29987	0
e266	266	2.16279	-1.78165	0.00728	-0.19937	-0.10460	11.20532	13.83465	0
e267	267	2.16158	1.78452	-0.00552	0.18664	-0.08827	11.21807	13.84224	0
e268	268	0.97531	1.81681	-0.06667	0.20835	-0.70361	-10.86644	13.02702	0
e269	269	-2.22102	1.83606	-0.13197	0.19466	-1.57785	-11.47746	15.67769	0
e270	270	-2.22202	-1.83356	0.13101	-0.20713	-1.57491	-11.46657	15.66904	0
e271	271	-1.01738	-1.81043	0.10678	-0.22398	0.98381	10.84202	13.31910	0

Plus grande valeur négative

Sx	-2.22202 daN/mm2	Elément 270, Sx	contrainte d'effort axial Nx
Sty	-1.83356 daN/mm2	Elément 270, Sty	contrainte d'effort tranchant Ty
Stz	-2.21259 daN/mm2	Elément 23, Stz	contrainte d'effort tranchant Tz
Stx	-0.29745 daN/mm2	Elément 23, Stx	contrainte du moment de torsion Mx
Sfy	-5.02884 daN/mm2	Elément 23, Sfy	contrainte du moment fléchissant My
Sfz	-11.47746 daN/mm2	Elément 269, Sfz	contrainte du moment fléchissant Mz

Plus grande valeur positive

Sx	2.16279 daN/mm2	Elément 266, Sx	contrainte d'effort axial Nx
Sty	1.83606 daN/mm2	Elément 269, Sty	contrainte d'effort tranchant Ty
Stz	1.46679 daN/mm2	Elément 263, Stz	contrainte d'effort tranchant Tz
Stx	0.29650 daN/mm2	Elément 24, Stx	contrainte du moment de torsion Mx
Sfy	5.65589 daN/mm2	Elément 23, Sfy	contrainte du moment fléchissant My
Sfz	11.21807 daN/mm2	Elément 267, Sfz	contrainte du moment fléchissant Mz
Sm	15.67769 daN/mm2	Elément 269, Sm	contrainte de Mises (poutre)

Propriété 4 RI80\_50C R80x50 4 - section rectangulaire creuse

Trémie Cuivre  
calcul 1 'calcul 0'

CONTRAINTES [BEAM poutre]

Sx contrainte d'effort axial Nx  
Sty contrainte d'effort tranchant Ty  
Stz contrainte d'effort tranchant Tz  
Stx contrainte du moment de torsion Mx  
Sfy contrainte du moment fléchissant My  
Sfz contrainte du moment fléchissant Mz  
Sm contrainte de Mises (poutre)  
Stt contrainte de membrane (pression interne)

Elément	Sx	Sty	Stz	Stx	Sfy	Sfz	Sm	Stt	
	daN/mm2	daN/mm2	daN/mm2	daN/mm2	daN/mm2	daN/mm2	daN/mm2	daN/mm2	
e43	43	-0.00520	0.00074	0.00604	0.00676	-0.10125	-0.02053	0.11570	0
e44	44	-0.00248	0.00088	0.00347	0.00452	-0.05835	-0.02188	0.07584	0
e45	45	0.00068	0.00041	0.00331	0.00318	-0.05563	-0.01341	0.06308	0
e46	46	-0.00143	-0.00109	0.00501	0.00294	-0.07997	-0.02107	0.10340	0
e63	63	0.00243	0.00003	-0.00844	0.00334	-0.06962	-0.00027	0.07514	0
e64	64	0.00177	-0.00947	0.00988	0.02601	0.06828	0.07333	0.15714	0

e65								
65	-0.00490	-0.00374	0.00297	-0.00952	-0.06169	-0.02962	0.09906	0
e66								
66	-0.00461	0.00374	0.00293	0.00966	-0.06010	0.02909	0.09676	0
e75								
75	-0.00699	0.00884	-0.38831	0.02861	2.30842	0.11395	2.53445	0
e76								
76	-0.05982	0.01321	-0.40653	0.03867	2.46610	-0.06970	2.68730	0
e166								
166	-0.00948	-0.00184	0.00364	0.00253	-0.05983	-0.03050	0.10043	0
e167								
167	-0.01681	-0.00800	0.00242	0.00138	0.08110	0.20363	0.30202	0
e190								
190	0.00221	-0.00042	-0.00417	0.00089	-0.11368	-0.00195	0.11804	0
e191								
191	0.00201	-0.00120	0.00117	-0.00187	-0.11309	-0.00565	0.12089	0
e192								
192	0.00167	-0.00106	0.00311	-0.00324	-0.10051	-0.00477	0.10752	0
e193								
193	0.00132	-0.00145	0.00293	-0.00177	-0.06848	-0.00674	0.07701	0
e194								
194	0.00096	-0.00219	0.00204	0.00037	-0.03848	-0.00994	0.04970	0
e195								
195	0.00058	-0.00184	0.00117	0.00197	-0.01771	0.01321	0.03049	0
e196								
196	0.00129	0.01309	-0.01674	-0.02742	0.07126	0.07576	0.16841	0
e197								
197	0.00261	0.00859	-0.00759	0.02017	-0.05015	0.03363	0.09236	0
e198								
198	0.00253	-0.00710	0.00730	-0.02074	-0.04849	0.02513	0.08893	0
e199								
199	0.00121	-0.01154	0.01591	0.02562	0.06683	0.06008	0.14829	0
e200								
200	0.00160	0.00992	-0.00908	-0.02272	0.06486	0.05857	0.13812	0
e201								
201	-0.00373	0.00190	0.00160	-0.00372	-0.03101	0.00962	0.04550	0
e202								
202	-0.00253	0.00078	0.00081	-0.00202	-0.01445	-0.00380	0.02082	0
e203								
203	-0.00144	0.00024	0.00039	-0.00151	-0.00602	-0.00165	0.00960	0
e204								
204	-0.00365	-0.00314	0.00165	0.00381	-0.02985	-0.01560	0.05064	0
e205								
205	-0.00258	-0.00302	0.00078	0.00167	-0.01274	0.01359	0.02986	0
e206								
206	-0.00149	-0.00198	0.00027	0.00073	-0.00452	0.01388	0.01920	0
e213								
213	-0.00106	0.00605	-0.09819	0.02660	-0.70625	0.03418	0.75870	0
e214								
214	0.00348	0.00294	-0.02730	0.02093	-0.23551	-0.04613	0.29715	0
e215								
215	0.00344	0.00063	-0.01180	0.01308	-0.08535	-0.05122	0.14649	0
e216								
216	0.00318	-0.00106	-0.01052	0.00444	-0.05869	-0.05046	0.10612	0
e217								
217	0.00289	-0.00181	-0.00988	-0.00164	-0.05061	-0.04039	0.09588	0
e218								
218	0.00270	-0.00175	-0.00906	-0.00463	-0.08355	-0.02387	0.08991	0
e219								
219	-0.03485	0.00826	-0.00967	0.02453	-0.36034	-0.14131	0.53995	0
e220								
220	-0.02932	0.00115	-0.02290	0.00353	-0.15938	-0.15010	0.34189	0
e221								
221	-0.02311	-0.00588	0.00137	-0.01655	-0.03527	-0.14917	0.21117	0
e222								
222	-0.01851	-0.00557	-0.00000	-0.01364	-0.00351	-0.09685	0.12342	0
e223								
223	-0.01393	-0.00342	0.00108	-0.00796	-0.00704	-0.04777	0.07153	0
e224								
224	-0.00931	-0.00145	0.00120	-0.00367	0.01097	-0.01801	0.03586	0
e229								
229	-0.00329	-0.00166	0.00218	-0.00204	0.03885	0.02629	0.06889	0



e230									
230	-0.00200	-0.00250	-0.00058	0.00137	0.03498	0.09189	0.11080	0	
e231									
231	0.00329	-0.00155	0.00141	-0.00286	0.02797	0.03094	0.06272	0	
e232									
232	0.00784	-0.00064	-0.00199	0.00073	0.04936	0.04559	0.08551	0	
e233									
233	-0.00736	-0.00188	0.00299	-0.00100	0.05335	0.03678	0.09779	0	
e234									
234	-0.01491	-0.00003	-0.00440	-0.00046	-0.07490	0.02762	0.11773	0	
e249									
249	0.02948	0.24547	0.05023	0.29286	-0.69016	2.21696	3.08230	0	
e272									
272	0.06018	0.26187	0.15980	0.25119	1.31162	-2.88909	4.36137	0	
e273									
273	0.05986	-0.26113	-0.16383	-0.25213	1.31782	-2.89405	4.37247	0	
e274									
274	0.02868	-0.24125	-0.04829	-0.28758	-0.70243	2.14996	3.02432	0	

Plus grande valeur négative

Sx	-0.05982 daN/mm2	Elément 76, Sx	contrainte d'effort axial Nx
Sty	-0.26113 daN/mm2	Elément 273, Sty	contrainte d'effort tranchant Ty
Stz	-0.40653 daN/mm2	Elément 76, Stz	contrainte d'effort tranchant Tz
Stx	-0.28758 daN/mm2	Elément 274, Stx	contrainte du moment de torsion Mx
Sfy	-1.69154 daN/mm2	Elément 76, Sfy	contrainte du moment fléchissant My
Sfz	-2.89405 daN/mm2	Elément 273, Sfz	contrainte du moment fléchissant Mz

Plus grande valeur positive

Sx	0.06018 daN/mm2	Elément 272, Sx	contrainte d'effort axial Nx
Sty	0.26187 daN/mm2	Elément 272, Sty	contrainte d'effort tranchant Ty
Stz	0.15980 daN/mm2	Elément 272, Stz	contrainte d'effort tranchant Tz
Stx	0.29286 daN/mm2	Elément 249, Stx	contrainte du moment de torsion Mx
Sfy	2.46610 daN/mm2	Elément 76, Sfy	contrainte du moment fléchissant My
Sfz	2.21696 daN/mm2	Elément 249, Sfz	contrainte du moment fléchissant Mz
Sm	4.37247 daN/mm2	Elément 273, Sm	contrainte de Mises (poutre)

Propriété 5 UPN80  
Trémie Cuivre  
calcul 1 'calcul 0'

CONTRAINTES [BEAM poutre]

Sx contrainte d'effort axial Nx  
Sty contrainte d'effort tranchant Ty  
Stz contrainte d'effort tranchant Tz  
Stx contrainte du moment de torsion Mx  
Sfy contrainte du moment fléchissant My  
Sfz contrainte du moment fléchissant Mz  
Sm contrainte de Mises (poutre)  
Stt contrainte de membrane (pression interne)

Elément	Sx	Sty	Stz	Stx	Sfy	Sfz	Sm	Stt
	daN/mm2	daN/mm2	daN/mm2	daN/mm2	daN/mm2	daN/mm2	daN/mm2	daN/mm2
e27								
27	0.00062	0.00275	-0.00049	0.00299	0.00500	-0.14063	0.14605	0
e28								
28	0.03360	-0.00003	0.02683	0.00495	-0.32742	-0.00815	0.37325	0
e30								
30	0.04958	0.00355	-0.00853	0.01374	-0.14169	-0.39030	0.58288	0
e31								
31	0.00052	0.00228	-0.00025	-0.01056	-0.00246	-0.10730	0.11250	0
e32								
32	0.17576	0.00023	0.06972	0.00531	-0.86116	-0.01419	1.05372	0
e34								
34	-0.37928	-0.00235	-0.03269	0.01094	0.56098	0.07743	0.95987	0
e47								
47	-0.00014	0.00085	-0.00066	0.00544	0.00664	-0.07389	0.08082	0
e49								
49	0.00387	0.00385	-0.00034	0.00432	0.01102	-0.42173	0.42626	0
e50								
50	0.00225	0.00153	0.00206	-0.00402	-0.01649	-0.05860	0.07292	0
e51								
51	0.00314	0.00108	0.00030	0.00193	-0.00698	-0.17107	0.17683	0

e52								
52	-0.00021	-0.00051	-0.00073	0.00279	0.00741	-0.06850	0.07638	0
e53								
53	0.00032	0.00107	0.00248	-0.00295	-0.01790	-0.05930	0.07572	0
e54								
54	-0.00026	-0.00013	0.00080	0.00039	-0.01365	-0.07046	0.08439	0
e55								
55	-0.00036	-0.00099	-0.00090	0.00022	0.00927	-0.09335	0.10302	0
e56								
56	-0.00050	0.00064	0.00262	-0.00234	-0.01969	-0.06335	0.07992	0
e57								
57	0.00039	-0.00066	0.00104	-0.00061	-0.01693	-0.08244	0.09981	0
e58								
58	-0.00012	-0.00096	-0.00112	-0.00127	0.01196	-0.09467	0.10683	0
e59								
59	-0.00523	-0.00506	0.00250	-0.00304	0.04629	-0.50693	0.54410	0
e60								
60	0.00360	-0.00247	0.00051	-0.00190	-0.00890	-0.27401	0.28661	0
e61								
61	-0.00014	-0.00089	-0.00032	-0.00124	-0.00516	-0.12332	0.12843	0
e62								
62	0.00151	0.00029	-0.00058	-0.00113	0.00990	-0.04501	0.05487	0
e72								
72	-0.01427	-0.00090	-0.00150	-0.00033	-0.05266	-0.05693	0.09674	0
e73								
73	0.00848	-0.00015	-0.00091	0.00059	-0.04032	0.00625	0.05512	0
e74								
74	-0.01344	0.00073	-0.00124	0.00094	-0.04765	0.04810	0.08673	0
e77								
77	-0.00203	0.00012	-0.00012	-0.00006	0.00258	-0.01588	0.01988	0
e150								
150	0.00086	-0.00261	-0.00012	-0.00466	-0.00239	-0.12938	0.13102	0
e151								
151	0.08344	-0.00078	0.01884	0.00564	-0.24133	-0.05613	0.38326	0
e152								
152	0.08782	-0.00827	0.00997	0.00184	0.14452	0.61199	0.84469	0
e153								
153	0.05838	-0.00261	0.01107	-0.00957	-0.18834	-0.28866	0.53659	0
e154								
154	0.05121	0.00613	-0.00999	0.00352	0.13302	0.57663	0.76130	0
e155								
155	0.05741	0.00141	-0.02043	-0.01089	-0.25323	-0.07826	0.39266	0
e156								
156	0.02420	-0.00065	-0.02900	-0.01095	-0.36669	-0.05513	0.40544	0
e157								
157	0.00066	-0.00201	0.00016	0.00712	0.00158	-0.09729	0.10068	0
e158								
158	0.34986	-0.00037	0.06319	0.00995	0.76009	-0.03318	1.12043	0
e159								
159	0.59077	-0.00617	0.01021	0.00816	-0.30799	0.47082	1.12936	0
e160								
160	-0.35694	-0.00529	0.01862	-0.02097	0.30141	-0.39861	0.86007	0
e161								
161	-0.35335	0.00311	0.02887	-0.00962	0.50778	0.09007	0.89822	0
e162								
162	-0.38335	0.00472	-0.02173	0.02372	0.31999	-0.39420	0.93140	0
e163								
163	0.53608	0.00429	-0.01449	0.00249	-0.33883	0.40162	0.94095	0
e164								
164	0.35022	0.00100	-0.06160	-0.01872	0.74855	-0.06013	1.14575	0
e165								
165	0.21434	-0.00084	-0.07278	-0.01041	-0.92863	-0.05192	1.18249	0
e168								
168	-0.00019	-0.00110	-0.00001	-0.00256	-0.00064	-0.06828	0.06916	0
e169								
169	0.01487	0.00620	0.00246	0.00610	-0.03813	0.61042	0.66377	0
e170								
170	0.00350	0.00154	-0.00925	-0.00304	0.11413	0.08338	0.20215	0
e171								
171	-0.00376	0.00001	-0.00918	-0.00866	-0.11444	-0.03752	0.15875	0
e172								
172	0.00012	0.00025	0.00025	-0.00002	0.00765	-0.04685	0.05463	0

e173																
173		0.00187		-0.00112		-0.00195		0.00371		-0.01533		-0.07052		0.08400		0
e174																
174		-0.00271		0.00154		0.00381		0.00049		0.04798		0.28484		0.32951		0
e175																
175		-0.00207		0.00175		-0.00487		0.00219		0.06146		0.12140		0.18536		0
e176																
176		-0.00266		0.00063		-0.00438		-0.00528		-0.05450		-0.07645		0.13466		0
e177																
177		-0.00009		-0.00034		-0.00007		-0.00073		-0.00131		-0.03359		0.03375		0
e178																
178		0.00036		0.00020		0.00046		0.00010		0.00597		-0.06014		0.06648		0
e179																
179		0.00001		-0.00059		-0.00180		0.00220		-0.01227		-0.06708		0.07944		0
e180																
180		0.00010		0.00009		0.00455		-0.00244		0.05542		0.15918		0.21147		0
e181																
181		-0.00040		0.00152		-0.00409		0.00403		0.05273		0.12720		0.18089		0
e182																
182		-0.00070		0.00102		-0.00355		-0.00212		-0.04456		-0.09729		0.14290		0
e183																
183		-0.00013		-0.00010		-0.00022		0.00014		-0.00303		-0.02237		0.02378		0
e184																
184		-0.00017		0.00012		0.00055		0.00024		0.00694		-0.06544		0.07256		0
e185																
185		-0.00034		-0.00030		-0.00152		0.00153		-0.01040		-0.06754		0.07807		0
e186																
186		-0.00050		-0.00016		0.00485		-0.00338		0.05831		0.13233		0.19168		0
e187																
187		-0.00056		0.00114		-0.00388		0.00404		0.04969		0.11481		0.16564		0
e188																
188		-0.00094		0.00118		-0.00353		0.00008		-0.04421		-0.10102		0.14632		0
e189																
189		-0.00023		-0.00008		-0.00040		0.00028		-0.00524		-0.02400		0.02679		0
e250																
250		0.04914		0.05849		-0.05062		0.06607		-0.88404		2.55749		2.80801		0
e251																
251		-0.21422		0.00061		0.12247		0.00141		-1.72753		0.02312		1.97655		0
e252																
252		0.04620		-0.05758		0.04938		-0.06472		-0.85554		2.52675		2.73855		0

Plus grande valeur négative

Sx -0.38335 daN/mm2 Elément 162, Sx contrainte d'effort axial Nx  
 Sty -0.05758 daN/mm2 Elément 252, Sty contrainte d'effort tranchant Ty  
 Stz -0.07278 daN/mm2 Elément 165, Stz contrainte d'effort tranchant Tz  
 Stx -0.06472 daN/mm2 Elément 252, Stx contrainte du moment de torsion Mx  
 Sfy -1.72753 daN/mm2 Elément 251, Sfy contrainte du moment fléchissant My  
 Sfz -1.86515 daN/mm2 Elément 250, Sfz contrainte du moment fléchissant Mz

Plus grande valeur positive

Sx 0.59077 daN/mm2 Elément 159, Sx contrainte d'effort axial Nx  
 Sty 0.05849 daN/mm2 Elément 250, Sty contrainte d'effort tranchant Ty  
 Stz 0.12247 daN/mm2 Elément 251, Stz contrainte d'effort tranchant Tz  
 Stx 0.06607 daN/mm2 Elément 250, Stx contrainte du moment de torsion Mx  
 Sfy 0.78714 daN/mm2 Elément 165, Sfy contrainte du moment fléchissant My  
 Sfz 2.55749 daN/mm2 Elément 250, Sfz contrainte du moment fléchissant Mz  
 Sm 2.80801 daN/mm2 Elément 250, Sm contrainte de Mises (poutre)

Propriété 6 UPN120  
 Trémie Cuivre  
 calcul 1 'calcul 0'

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 CONTRAINTES [BEAM poutre]

Sx contrainte d'effort axial Nx  
 Sty contrainte d'effort tranchant Ty  
 Stz contrainte d'effort tranchant Tz  
 Stx contrainte du moment de torsion Mx  
 Sfy contrainte du moment fléchissant My  
 Sfz contrainte du moment fléchissant Mz  
 Sm contrainte de Mises (poutre)  
 Stt contrainte de membrane (pression interne)  
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Elément	Sx	Sty	Stz	Stx	Sfy	Sfz	Sm	Stt
	daN/mm2	daN/mm2	daN/mm2	daN/mm2	daN/mm2	daN/mm2	daN/mm2	daN/mm2
e5								
5	-0.00139	-0.00085	-0.00083	-0.00139	0.00690	-0.10030	0.10867	0
e6								
6	-0.00057	0.00016	0.00189	-0.00236	0.00958	-0.09082	0.10124	0
e7								
7	0.00076	-0.00145	-0.00003	-0.00119	-0.00728	-0.10389	0.11134	0
e8								
8	0.00117	-0.00319	0.00153	0.00212	0.02453	-0.13842	0.14565	0
e102								
102	-0.00176	-0.00004	-0.00019	0.00009	-0.00454	-0.03913	0.04308	0
e103								
103	-0.00018	-0.00003	0.00026	0.00036	0.00724	-0.08912	0.09593	0
e104								
104	-0.00018	-0.00003	0.00026	0.00036	0.00839	-0.08851	0.09647	0
e105								
105	-0.00022	-0.00030	-0.00131	0.00102	0.00880	-0.09144	0.10055	0
e106								
106	0.00388	0.00023	0.00572	-0.00397	0.06078	0.13748	0.18418	0
e107								
107	0.00424	0.00090	-0.00445	0.00409	0.05713	0.11013	0.17215	0
e108								
108	0.00150	0.00171	-0.00150	0.00170	-0.02080	-0.11273	0.13518	0
e109								
109	0.00484	-0.00232	0.00066	0.00315	0.02469	0.10050	0.13038	0
e110								
110	0.00637	-0.00132	-0.00314	-0.00208	-0.03378	0.11284	0.15327	0
e111								
111	0.00004	0.00340	0.00057	-0.00272	-0.01291	0.22115	0.23434	0

Plus grande valeur négative

Sx -0.00176 daN/mm2 Elément 102, Sx contrainte d'effort axial Nx  
 Sty -0.00319 daN/mm2 Elément 8, Sty contrainte d'effort tranchant Ty  
 Stz -0.00445 daN/mm2 Elément 107, Stz contrainte d'effort tranchant Tz  
 Stx -0.00397 daN/mm2 Elément 106, Stx contrainte du moment de torsion Mx  
 Sfy -0.04087 daN/mm2 Elément 106, Sfy contrainte du moment fléchissant My  
 Sfz -0.14437 daN/mm2 Elément 111, Sfz contrainte du moment fléchissant Mz

Plus grande valeur positive

Sx 0.00637 daN/mm2 Elément 110, Sx contrainte d'effort axial Nx  
 Sty 0.00340 daN/mm2 Elément 111, Sty contrainte d'effort tranchant Ty  
 Stz 0.00572 daN/mm2 Elément 106, Stz contrainte d'effort tranchant Tz  
 Stx 0.00409 daN/mm2 Elément 107, Stx contrainte du moment de torsion Mx  
 Sfy 0.06078 daN/mm2 Elément 106, Sfy contrainte du moment fléchissant My  
 Sfz 0.22115 daN/mm2 Elément 111, Sfz contrainte du moment fléchissant Mz  
 Sm 0.23434 daN/mm2 Elément 111, Sm contrainte de Mises (poutre)

Propriété 7 RE120\_5X R120x120 5 - section rectangulaire creuse  
 Trémie Cuivre  
 calcul 1 'calcul 0'

CONTRAINTES [BEAM poutre]

Sx contrainte d'effort axial Nx  
 Sty contrainte d'effort tranchant Ty  
 Stz contrainte d'effort tranchant Tz  
 Stx contrainte du moment de torsion Mx  
 Sfy contrainte du moment fléchissant My  
 Sfz contrainte du moment fléchissant Mz  
 Sm contrainte de Mises (poutre)  
 Stt contrainte de membrane (pression interne)

Elément	Sx	Sty	Stz	Stx	Sfy	Sfz	Sm	Stt
	daN/mm2	daN/mm2	daN/mm2	daN/mm2	daN/mm2	daN/mm2	daN/mm2	daN/mm2
e13								
13	-0.00002	0.00021	0.00000	-0.00004	-0.00002	-0.00262	0.00269	0
e14								
14	0.00035	0.00026	0.00000	0.00055	-0.00041	0.00334	0.00433	0
e15								
15	-0.00100	0.00030	0.00014	0.00179	-0.01875	-0.00528	0.02219	0
e16								
16	0.00020	0.00031	0.00001	0.00103	-0.00177	0.00486	0.00723	0

e17									
17	-0.00268	0.00034	0.00014	0.00126	-0.00798	-0.00836	0.01583	0	
e18									
18	0.02226	0.00010	0.00001	-0.00198	-0.00379	-0.03743	0.06334	0	
e19									
19	-0.00812	0.00014	0.00000	-0.00136	-0.00010	0.00611	0.01456	0	
e20									
20	0.00027	0.00006	0.00000	-0.00033	-0.00002	-0.00085	0.00132	0	

Plus grande valeur négative

Sx -0.00812 daN/mm2 Elément 19, Sx contrainte d'effort axial Nx  
 Stx -0.00198 daN/mm2 Elément 18, Stx contrainte du moment de torsion Mx  
 Sfy -0.01875 daN/mm2 Elément 15, Sfy contrainte du moment fléchissant My  
 Sfz -0.03743 daN/mm2 Elément 18, Sfz contrainte du moment fléchissant Mz

Plus grande valeur positive

Sx 0.02226 daN/mm2 Elément 18, Sx contrainte d'effort axial Nx  
 Sty 0.00034 daN/mm2 Elément 17, Sty contrainte d'effort tranchant Ty  
 Stz 0.00014 daN/mm2 Elément 15, Stz contrainte d'effort tranchant Tz  
 Stx 0.00179 daN/mm2 Elément 15, Stx contrainte du moment de torsion Mx  
 Sfy 0.00002 daN/mm2 Elément 20, Sfy contrainte du moment fléchissant My  
 Sfz 0.00611 daN/mm2 Elément 19, Sfz contrainte du moment fléchissant Mz  
 Sm 0.06334 daN/mm2 Elément 18, Sm contrainte de Mises (poutre)

Propriété 2 UPN200

Trémie Cuivre

calcul 2 'calcul 0'

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 CONTRAINTES [BEAM poutre]

Sx contrainte d'effort axial Nx  
 Sty contrainte d'effort tranchant Ty  
 Stz contrainte d'effort tranchant Tz  
 Stx contrainte du moment de torsion Mx  
 Sfy contrainte du moment fléchissant My  
 Sfz contrainte du moment fléchissant Mz  
 Sm contrainte de Mises (poutre)  
 Stt contrainte de membrane (pression interne)

Elément	Sx	Sty	Stz	Stx	Sfy	Sfz	Sm	Stt
	daN/mm2	daN/mm2	daN/mm2	daN/mm2	daN/mm2	daN/mm2	daN/mm2	daN/mm2
e1	0.00000	-0.00171	0.00066	0.02834	-0.00306	0.04189	0.06878	0
e2	0	0	0	0	0	0	0	0
e3	-0.36176	0.00024	-0.04672	0.00010	0.20283	-0.00219	0.57138	0
e4	0.23997	-0.00050	0.02414	0.00007	-0.12439	-0.00744	0.37416	0
e35	-0.00035	0.00223	0.00069	0.00972	0.00284	0.03363	0.04034	0
e36	-0.00057	-0.00637	-0.00357	-0.01495	0.01123	0.15398	0.16550	0
e69	0.00016	-0.00147	0.00242	0.00574	0.02579	-0.03068	0.04763	0
e70	0.00009	-0.00019	-0.00009	0.00086	0.00251	0.00245	0.00502	0
e71	0.00012	0.00126	0.00225	-0.00388	0.02378	0.02746	0.04235	0
e78	-0.00000	0.00161	-0.00066	-0.02834	0.00306	-0.03949	0.06711	0
e79	0	0	0	0	0	0	0	0
e80	-0.36178	0.00072	-0.04672	0.00037	0.15929	-0.01816	0.53157	0
e81	-0.36182	-0.01340	-0.04673	0.00181	-0.18820	0.22306	0.77798	0
e82	-0.36185	0.02531	-0.04673	0.05495	-0.50366	-0.55923	1.43625	0
e83	0.09608	-0.00074	-0.05634	0.00969	0.51798	0.06503	0.64559	0
e84	0.16112	0.00269	-0.02384	-0.11397	0.13817	-0.03120	0.40480	0

e85																
85		0.16101		-0.00196		-0.02392		-0.00197		-0.04917		-0.03080		0.23568		0
e86																
86		0.16091		-0.00161		-0.02393		0.02292		-0.13169		0.02164		0.32455		0
e87																
87		0.22304		0.00068		-0.02013		-0.26895		0.11183		-0.00687		0.60574		0
e88																
88		0.22294		-0.00107		-0.02021		-0.00590		0.10835		-0.01346		0.34772		0
e89																
89		0.22286		-0.00046		-0.02022		-0.00015		-0.04123		0.00577		0.27216		0
e90																
90		0.22279		-0.00050		-0.02022		0.00006		-0.11624		0.00737		0.34818		0
e91																
91		0.23990		-0.00054		0.02414		0.00008		0.05466		-0.00574		0.30232		0
e92																
92		0.23982		0.00006		0.02414		0.00478		0.14456		-0.00554		0.39313		0
e93																
93		0.23973		-0.00168		0.02423		0.21804		0.15137		-0.02186		0.58731		0
e94																
94		0.16380		0.00041		0.03105		-0.02007		-0.16556		0.01117		0.35185		0
e95																
95		0.16370		0.00076		0.03105		0.00100		0.05825		-0.01966		0.24791		0
e96																
96		0.16359		-0.00390		0.03113		0.06484		0.18899		-0.04548		0.42609		0
e97																
97		0.08170		0.00184		0.05513		0.00574		0.47234		0.10699		0.56651		0
e98																
98		-0.36580		-0.02596		0.04972		-0.05028		-0.51204		-0.58126		1.47003		0
e99																
99		-0.36583		0.01275		0.04972		-0.00050		-0.17913		0.21626		0.76648		0
e100																
100		-0.36587		-0.00137		0.04973		0.00032		0.18882		-0.02276		0.56520		0
e101																
101		-0.36589		-0.00089		0.04973		0.00010		0.23471		0.00554		0.61226		0
e253																
253		-0.00668		-1.33886		-0.02301		-0.16580		0.11267		-16.25453		16.58004		0
e254																
254		-0.73807		-0.00137		-0.00482		0.00381		0.12883		-0.01689		0.88393		0
e255																
255		-0.00689		1.33669		-0.02449		0.17222		0.11801		16.22775		16.56023		0

Plus grande valeur négative

Sx -0.73807 daN/mm2 Elément 254, Sx contrainte d'effort axial Nx  
 Sty -1.33886 daN/mm2 Elément 253, Sty contrainte d'effort tranchant Ty  
 Stz -0.05634 daN/mm2 Elément 83, Stz contrainte d'effort tranchant Tz  
 Stx -0.26895 daN/mm2 Elément 87, Stx contrainte du moment de torsion Mx  
 Sfy -0.51204 daN/mm2 Elément 98, Sfy contrainte du moment fléchissant My  
 Sfz -16.25453 daN/mm2 Elément 253, Sfz contrainte du moment fléchissant Mz

Plus grande valeur positive

Sx 0.23997 daN/mm2 Elément 4, Sx contrainte d'effort axial Nx  
 Sty 1.33669 daN/mm2 Elément 255, Sty contrainte d'effort tranchant Ty  
 Stz 0.05513 daN/mm2 Elément 97, Stz contrainte d'effort tranchant Tz  
 Stx 0.21804 daN/mm2 Elément 93, Stx contrainte du moment de torsion Mx  
 Sfy 0.51798 daN/mm2 Elément 83, Sfy contrainte du moment fléchissant My  
 Sfz 16.22775 daN/mm2 Elément 255, Sfz contrainte du moment fléchissant Mz  
 Sm 16.58004 daN/mm2 Elément 253, Sm contrainte de Mises (poutre)

Propriété 3 RE80\_5X R80x80 5 - section rectangulaire creuse

Trémie Cuivre  
 calcul 2 'calcul 0'

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 CONTRAINTES [BEAM poutre]

Sx contrainte d'effort axial Nx  
 Sty contrainte d'effort tranchant Ty  
 Stz contrainte d'effort tranchant Tz  
 Stx contrainte du moment de torsion Mx  
 Sfy contrainte du moment fléchissant My  
 Sfz contrainte du moment fléchissant Mz  
 Sm contrainte de Mises (poutre)  
 Stt contrainte de membrane (pression interne)  
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Elément	Sx daN/mm2	Sty daN/mm2	Stz daN/mm2	Stx daN/mm2	Sfy daN/mm2	Sfz daN/mm2	Sm daN/mm2	Stt daN/mm2
e9								
9	0.04119	-0.00012	-0.38257	0.02276	2.01544	-0.00065	2.17376	0
e10								
10	0.04076	0.00016	-0.33153	-0.01442	1.75411	-0.00073	1.89272	0
e11								
11	-0.01084	0.00380	-0.49447	0.00582	2.47702	-0.02038	2.64295	0
e12								
12	-0.01029	-0.00316	-0.53583	0.00084	2.68787	0.02100	2.85706	0
e23								
23	0.01151	-0.05120	-2.21259	-0.29745	5.65589	0.25503	7.14960	0
e24								
24	0.00648	0.05465	-2.16215	0.29650	5.44961	-0.27357	6.92953	0
e25								
25	-0.00817	-0.00411	-0.36687	-0.01587	1.75453	-0.04104	1.92173	0
e26								
26	-0.02875	-0.01129	-0.39569	-0.03448	1.89815	0.07705	2.07553	0
e37								
37	-0.00043	0.00937	0.00114	0.01338	0.01198	0.06666	0.07790	0
e38								
38	-0.00049	0.00390	0.00502	0.00320	0.05192	0.03056	0.06449	0
e39								
39	0.00545	0.00779	0.00101	-0.02053	-0.01178	0.14497	0.16948	0
e40								
40	-0.00341	0.00277	0.00113	-0.02648	0.02848	0.10623	0.13836	0
e41								
41	-0.00728	0.00916	-0.00326	-0.00804	0.12956	0.09878	0.23756	0
e42								
42	-0.00161	-0.02485	-0.00971	-0.11807	0.18032	-0.17671	0.43611	0
e67								
67	-0.00082	0.00128	-0.00613	-0.09898	0.04027	0.01292	0.18991	0
e68								
68	0.00245	0.00672	-0.00839	0.03699	-0.08156	-0.05641	0.16134	0
e112								
112	0.01618	-0.00033	-0.03053	0.01734	-0.46261	-0.00208	0.48636	0
e113								
113	0.00634	-0.00085	0.00730	0.00865	-0.18109	-0.00387	0.19329	0
e114								
114	0.00340	-0.00063	0.00045	0.00484	-0.03701	-0.00278	0.04423	0
e115								
115	0.00215	-0.00075	-0.00355	0.00387	-0.01928	-0.00388	0.02671	0
e116								
116	0.00123	-0.00094	-0.00395	0.00339	-0.01558	-0.00527	0.02498	0
e117								
117	0.00040	-0.00166	-0.00476	0.00262	-0.03671	0.01201	0.05083	0
e118								
118	0.01677	0.00107	-0.04297	-0.00775	-0.47772	-0.00754	0.50966	0
e119								
119	0.00209	0.00032	0.00269	-0.00195	-0.07830	0.00263	0.08341	0
e120								
120	0.00209	0.00002	0.00184	0.00045	-0.05765	-0.00049	0.06023	0
e121								
121	0.00207	-0.00014	0.00158	-0.00035	-0.04345	-0.00150	0.04713	0
e122								
122	0.00199	-0.00036	0.00150	-0.00208	-0.03122	-0.00277	0.03652	0
e123								
123	0.00185	-0.00073	0.00144	-0.00418	-0.01958	0.00442	0.02731	0
e124								
124	0.00183	0.00361	0.08822	0.00420	-0.81864	0.02237	0.85794	0
e125								
125	0.00569	-0.00176	-0.00806	0.01002	-0.07806	0.01049	0.09936	0
e126								
126	0.00339	-0.00335	0.00563	0.01342	-0.05971	-0.01930	0.08894	0
e127								
127	0.00286	-0.00154	0.00087	0.01592	-0.01084	-0.00601	0.03612	0
e128								
128	0.00189	-0.00169	0.00192	0.01496	-0.00824	-0.00783	0.03445	0
e129								
129	0.00079	-0.00229	-0.00007	0.01283	-0.00066	0.01664	0.03183	0
e130								
130	0.00375	-0.00316	0.08894	-0.00560	-0.87013	-0.01976	0.90854	0

e131																
131		0.00665		0.00293		0.00701		-0.01624		-0.08698		-0.01711		0.10714		0
e132																
132		0.00332		0.00334		0.00545		-0.01662		-0.04406		0.01662		0.07478		0
e133																
133		0.00254		0.00110		0.00113		-0.01392		-0.00750		-0.00600		0.02896		0
e134																
134		0.00164		0.00097		0.00201		-0.00946		-0.00938		-0.00408		0.02461		0
e135																
135		0.00076		0.00103		0.00160		-0.00557		0.01169		-0.00795		0.02395		0
e136																
136		0.02453		0.03485		-0.10484		-0.08520		0.65551		-0.32524		0.80852		0
e137																
137		0.02503		0.03684		-0.10753		-0.20263		-0.46284		-0.50266		1.12864		0
e138																
138		0.00724		-0.00276		-0.00257		0.11284		0.01916		-0.07927		0.22645		0
e139																
139		0.00603		-0.00241		0.00709		0.05747		-0.03478		-0.05785		0.14919		0
e140																
140		0.00474		-0.00224		0.00649		0.03170		-0.02849		-0.03910		0.09810		0
e141																
141		0.00342		-0.00185		0.00796		0.01800		0.05908		-0.02169		0.07724		0
e142																
142		0.02240		-0.03357		-0.09748		0.03478		0.70267		0.37738		0.87554		0
e143																
143		0.02471		-0.04639		-0.12121		0.28831		-0.50379		0.42055		1.18754		0
e144																
144		0.00635		0.00008		-0.00458		-0.10524		-0.02261		0.02840		0.19849		0
e145																
145		0.00617		0.00199		0.00137		-0.07196		-0.01578		0.02768		0.13738		0
e146																
146		0.00628		0.00267		0.00113		-0.05698		-0.00897		0.01228		0.10695		0
e147																
147		0.00648		0.00245		0.00362		-0.05608		0.03414		-0.03680		0.12925		0
e148																
148		-0.00592		-0.00364		-0.07950		-0.01357		-0.53277		0.01906		0.58061		0
e149																
149		-0.01047		-0.00683		0.00194		-0.01771		-0.33878		0.12973		0.46593		0
e207																
207		-0.00212		0.00049		0.00030		-0.00549		-0.01995		0.00447		0.02849		0
e208																
208		-0.00228		0.00005		0.00006		0.00212		-0.01722		0.00166		0.02150		0
e209																
209		-0.00117		-0.00054		0.00603		0.08830		0.04232		0.00395		0.17014		0
e210																
210		0.00407		-0.00401		0.00577		-0.00303		-0.07163		-0.02679		0.10384		0
e211																
211		0.00428		0.00443		-0.00550		-0.00012		-0.06806		-0.02875		0.10185		0
e212																
212		0.00291		-0.00592		0.00784		-0.03592		-0.07627		-0.05500		0.15446		0
e225																
225		0.00338		0.00028		0.00015		-0.01038		0.00296		0.02320		0.03375		0
e226																
226		-0.00245		-0.00341		0.00034		-0.00898		0.02813		0.02949		0.06379		0
e227																
227		-0.00650		-0.00143		-0.00605		0.00653		0.10161		0.01111		0.11104		0
e228																
228		-0.00127		-0.00057		-0.00529		-0.05316		0.09862		0.01205		0.14745		0
e235																
235		0.00216		-0.00330		-0.00011		-0.00514		0.00639		0.01508		0.02699		0
e236																
236		-0.00187		-0.00458		-0.00065		-0.00183		0.02316		0.02228		0.04340		0
e237																
237		-0.00552		0.00044		-0.00591		0.00767		0.05395		0.00924		0.07263		0
e238																
238		-0.00162		0.00231		-0.00417		-0.02585		0.05369		0.01321		0.08611		0
e239																
239		0.00102		-0.00232		-0.00057		0.00100		0.00786		-0.01605		0.02561		0
e240																
240		-0.00111		-0.00081		-0.00123		0.00406		0.01322		-0.01420		0.03000		0
e241																
241		-0.00443		0.00701		-0.00477		0.00631		-0.03197		-0.04025		0.08047		0



e242									
242	-0.00233	-0.00901	-0.00426	-0.01442	0.01848	0.08138	0.10874	0	
e243									
243	-0.00069	0.00199	-0.00438	0.01233	0.04146	-0.01570	0.05570	0	
e244									
244	-0.00043	0.00113	-0.00937	0.01780	0.07376	-0.01198	0.08790	0	
e245									
245	-0.00215	0.00192	-0.00390	0.00599	0.03473	-0.05192	0.07063	0	
e246									
246	-0.00401	0.00431	0.01252	-0.00625	-0.12827	-0.06217	0.15253	0	
e247									
247	0.97844	-1.81492	0.07236	-0.21556	-0.77380	-10.85336	13.08760	0	
e248									
248	-1.01477	1.81213	-0.10842	0.21651	1.00114	10.85454	13.34278	0	
e262									
262	0.02703	0.03519	1.41276	0.01146	-3.55558	-0.05693	4.38732	0	
e263									
263	0.02530	-0.03290	1.46679	-0.07082	-3.57373	0.11928	4.49690	0	
e264									
264	0.00821	-0.00457	0.01558	0.23820	0.04878	-0.09244	0.46023	0	
e265									
265	0.00721	-0.00381	0.00405	-0.16681	-0.02334	0.02854	0.29987	0	
e266									
266	2.16279	-1.78165	0.00728	-0.19937	-0.10460	11.20532	13.83465	0	
e267									
267	2.16158	1.78452	-0.00552	0.18664	-0.08827	11.21807	13.84224	0	
e268									
268	0.97531	1.81681	-0.06667	0.20835	-0.70361	-10.86644	13.02702	0	
e269									
269	-2.22102	1.83606	-0.13197	0.19466	-1.57785	-11.47746	15.67769	0	
e270									
270	-2.22202	-1.83356	0.13101	-0.20713	-1.57491	-11.46657	15.66904	0	
e271									
271	-1.01738	-1.81043	0.10678	-0.22398	0.98381	10.84202	13.31910	0	

Plus grande valeur négative

Sx	-2.22202 daN/mm2	Elément 270, Sx	contrainte d'effort axial Nx
Sty	-1.83356 daN/mm2	Elément 270, Sty	contrainte d'effort tranchant Ty
Stz	-2.21259 daN/mm2	Elément 23, Stz	contrainte d'effort tranchant Tz
Stx	-0.29745 daN/mm2	Elément 23, Stx	contrainte du moment de torsion Mx
Sfy	-5.02884 daN/mm2	Elément 23, Sfy	contrainte du moment fléchissant My
Sfz	-11.47746 daN/mm2	Elément 269, Sfz	contrainte du moment fléchissant Mz

Plus grande valeur positive

Sx	2.16279 daN/mm2	Elément 266, Sx	contrainte d'effort axial Nx
Sty	1.83606 daN/mm2	Elément 269, Sty	contrainte d'effort tranchant Ty
Stz	1.46679 daN/mm2	Elément 263, Stz	contrainte d'effort tranchant Tz
Stx	0.29650 daN/mm2	Elément 24, Stx	contrainte du moment de torsion Mx
Sfy	5.65589 daN/mm2	Elément 23, Sfy	contrainte du moment fléchissant My
Sfz	11.21807 daN/mm2	Elément 267, Sfz	contrainte du moment fléchissant Mz
Sm	15.67769 daN/mm2	Elément 269, Sm	contrainte de Mises (poutre)

Propriété 4 RI80\_50C R80x50 4 - section rectangulaire creuse  
Trémie Cuivre  
calcul 2 'calcul 0'

CONTRAINTES [BEAM poutre]

Sx contrainte d'effort axial Nx  
Sty contrainte d'effort tranchant Ty  
Stz contrainte d'effort tranchant Tz  
Stx contrainte du moment de torsion Mx  
Sfy contrainte du moment fléchissant My  
Sfz contrainte du moment fléchissant Mz  
Sm contrainte de Mises (poutre)  
Stt contrainte de membrane (pression interne)

Elément	Sx	Sty	Stz	Stx	Sfy	Sfz	Sm	Stt
	daN/mm2	daN/mm2	daN/mm2	daN/mm2	daN/mm2	daN/mm2	daN/mm2	daN/mm2
e43								
43	-0.00520	0.00074	0.00604	0.00676	-0.10125	-0.02053	0.11570	0
e44								
44	-0.00248	0.00088	0.00347	0.00452	-0.05835	-0.02188	0.07584	0

e45																
45		0.00068		0.00041		0.00331		0.00318		-0.05563		-0.01341		0.06308		0
e46																
46		-0.00143		-0.00109		0.00501		0.00294		-0.07997		-0.02107		0.10340		0
e63																
63		0.00243		0.00003		-0.00844		0.00334		-0.06962		-0.00027		0.07514		0
e64																
64		0.00177		-0.00947		0.00988		0.02601		0.06828		0.07333		0.15714		0
e65																
65		-0.00490		-0.00374		0.00297		-0.00952		-0.06169		-0.02962		0.09906		0
e66																
66		-0.00461		0.00374		0.00293		0.00966		-0.06010		0.02909		0.09676		0
e75																
75		-0.00699		0.00884		-0.38831		0.02861		2.30842		0.11395		2.53445		0
e76																
76		-0.05982		0.01321		-0.40653		0.03867		2.46610		-0.06970		2.68730		0
e166																
166		-0.00948		-0.00184		0.00364		0.00253		-0.05983		-0.03050		0.10043		0
e167																
167		-0.01681		-0.00800		0.00242		0.00138		0.08110		0.20363		0.30202		0
e190																
190		0.00221		-0.00042		-0.00417		0.00089		-0.11368		-0.00195		0.11804		0
e191																
191		0.00201		-0.00120		0.00117		-0.00187		-0.11309		-0.00565		0.12089		0
e192																
192		0.00167		-0.00106		0.00311		-0.00324		-0.10051		-0.00477		0.10752		0
e193																
193		0.00132		-0.00145		0.00293		-0.00177		-0.06848		-0.00674		0.07701		0
e194																
194		0.00096		-0.00219		0.00204		0.00037		-0.03848		-0.00994		0.04970		0
e195																
195		0.00058		-0.00184		0.00117		0.00197		-0.01771		0.01321		0.03049		0
e196																
196		0.00129		0.01309		-0.01674		-0.02742		0.07126		0.07576		0.16841		0
e197																
197		0.00261		0.00859		-0.00759		0.02017		-0.05015		0.03363		0.09236		0
e198																
198		0.00253		-0.00710		0.00730		-0.02074		-0.04849		0.02513		0.08893		0
e199																
199		0.00121		-0.01154		0.01591		0.02562		0.06683		0.06008		0.14829		0
e200																
200		0.00160		0.00992		-0.00908		-0.02272		0.06486		0.05857		0.13812		0
e201																
201		-0.00373		0.00190		0.00160		-0.00372		-0.03101		0.00962		0.04550		0
e202																
202		-0.00253		0.00078		0.00081		-0.00202		-0.01445		-0.00380		0.02082		0
e203																
203		-0.00144		0.00024		0.00039		-0.00151		-0.00602		-0.00165		0.00960		0
e204																
204		-0.00365		-0.00314		0.00165		0.00381		-0.02985		-0.01560		0.05064		0
e205																
205		-0.00258		-0.00302		0.00078		0.00167		-0.01274		0.01359		0.02986		0
e206																
206		-0.00149		-0.00198		0.00027		0.00073		-0.00452		0.01388		0.01920		0
e213																
213		-0.00106		0.00605		-0.09819		0.02660		-0.70625		0.03418		0.75870		0
e214																
214		0.00348		0.00294		-0.02730		0.02093		-0.23551		-0.04613		0.29715		0
e215																
215		0.00344		0.00063		-0.01180		0.01308		-0.08535		-0.05122		0.14649		0
e216																
216		0.00318		-0.00106		-0.01052		0.00444		-0.05869		-0.05046		0.10612		0
e217																
217		0.00289		-0.00181		-0.00988		-0.00164		-0.05061		-0.04039		0.09588		0
e218																
218		0.00270		-0.00175		-0.00906		-0.00463		-0.08355		-0.02387		0.08991		0
e219																
219		-0.03485		0.00826		-0.00967		0.02453		-0.36034		-0.14131		0.53995		0
e220																
220		-0.02932		0.00115		-0.02290		0.00353		-0.15938		-0.15010		0.34189		0
e221																
221		-0.02311		-0.00588		0.00137		-0.01655		-0.03527		-0.14917		0.21117		0

e222	222	-0.01851	-0.00557	-0.00000	-0.01364	-0.00351	-0.09685	0.12342	0
e223	223	-0.01393	-0.00342	0.00108	-0.00796	-0.00704	-0.04777	0.07153	0
e224	224	-0.00931	-0.00145	0.00120	-0.00367	0.01097	-0.01801	0.03586	0
e229	229	-0.00329	-0.00166	0.00218	-0.00204	0.03885	0.02629	0.06889	0
e230	230	-0.00200	-0.00250	-0.00058	0.00137	0.03498	0.09189	0.11080	0
e231	231	0.00329	-0.00155	0.00141	-0.00286	0.02797	0.03094	0.06272	0
e232	232	0.00784	-0.00064	-0.00199	0.00073	0.04936	0.04559	0.08551	0
e233	233	-0.00736	-0.00188	0.00299	-0.00100	0.05335	0.03678	0.09779	0
e234	234	-0.01491	-0.00003	-0.00440	-0.00046	-0.07490	0.02762	0.11773	0
e249	249	0.02948	0.24547	0.05023	0.29286	-0.69016	2.21696	3.08230	0
e272	272	0.06018	0.26187	0.15980	0.25119	1.31162	-2.88909	4.36137	0
e273	273	0.05986	-0.26113	-0.16383	-0.25213	1.31782	-2.89405	4.37247	0
e274	274	0.02868	-0.24125	-0.04829	-0.28758	-0.70243	2.14996	3.02432	0

Plus grande valeur négative

Sx	-0.05982 daN/mm2	Elément 76, Sx	contrainte d'effort axial Nx
Sty	-0.26113 daN/mm2	Elément 273, Sty	contrainte d'effort tranchant Ty
Stz	-0.40653 daN/mm2	Elément 76, Stz	contrainte d'effort tranchant Tz
Stx	-0.28758 daN/mm2	Elément 274, Stx	contrainte du moment de torsion Mx
Sfy	-1.69154 daN/mm2	Elément 76, Sfy	contrainte du moment fléchissant My
Sfz	-2.89405 daN/mm2	Elément 273, Sfz	contrainte du moment fléchissant Mz

Plus grande valeur positive

Sx	0.06018 daN/mm2	Elément 272, Sx	contrainte d'effort axial Nx
Sty	0.26187 daN/mm2	Elément 272, Sty	contrainte d'effort tranchant Ty
Stz	0.15980 daN/mm2	Elément 272, Stz	contrainte d'effort tranchant Tz
Stx	0.29286 daN/mm2	Elément 249, Stx	contrainte du moment de torsion Mx
Sfy	2.46610 daN/mm2	Elément 76, Sfy	contrainte du moment fléchissant My
Sfz	2.21696 daN/mm2	Elément 249, Sfz	contrainte du moment fléchissant Mz
Sm	4.37247 daN/mm2	Elément 273, Sm	contrainte de Mises (poutre)

Propriété 5 UPN80  
Trémie Cuivre  
calcul 2 'calcul 0'

CONTRAINTES [BEAM poutre]

Sx contrainte d'effort axial Nx  
Sty contrainte d'effort tranchant Ty  
Stz contrainte d'effort tranchant Tz  
Stx contrainte du moment de torsion Mx  
Sfy contrainte du moment fléchissant My  
Sfz contrainte du moment fléchissant Mz  
Sm contrainte de Mises (poutre)  
Stt contrainte de membrane (pression interne)

Elément	Sx	Sty	Stz	Stx	Sfy	Sfz	Sm	Stt	
	daN/mm2	daN/mm2	daN/mm2	daN/mm2	daN/mm2	daN/mm2	daN/mm2	daN/mm2	
e27	27	0.00062	0.00275	-0.00049	0.00299	0.00500	-0.14063	0.14605	0
e28	28	0.03360	-0.00003	0.02683	0.00495	-0.32742	-0.00815	0.37325	0
e30	30	0.04958	0.00355	-0.00853	0.01374	-0.14169	-0.39030	0.58288	0
e31	31	0.00052	0.00228	-0.00025	-0.01056	-0.00246	-0.10730	0.11250	0
e32	32	0.17576	0.00023	0.06972	0.00531	-0.86116	-0.01419	1.05372	0
e34	34	-0.37928	-0.00235	-0.03269	0.01094	0.56098	0.07743	0.95987	0

e47								
47	-0.00014	0.00085	-0.00066	0.00544	0.00664	-0.07389	0.08082	0
e49								
49	0.00387	0.00385	-0.00034	0.00432	0.01102	-0.42173	0.42626	0
e50								
50	0.00225	0.00153	0.00206	-0.00402	-0.01649	-0.05860	0.07292	0
e51								
51	0.00314	0.00108	0.00030	0.00193	-0.00698	-0.17107	0.17683	0
e52								
52	-0.00021	-0.00051	-0.00073	0.00279	0.00741	-0.06850	0.07638	0
e53								
53	0.00032	0.00107	0.00248	-0.00295	-0.01790	-0.05930	0.07572	0
e54								
54	-0.00026	-0.00013	0.00080	0.00039	-0.01365	-0.07046	0.08439	0
e55								
55	-0.00036	-0.00099	-0.00090	0.00022	0.00927	-0.09335	0.10302	0
e56								
56	-0.00050	0.00064	0.00262	-0.00234	-0.01969	-0.06335	0.07992	0
e57								
57	0.00039	-0.00066	0.00104	-0.00061	-0.01693	-0.08244	0.09981	0
e58								
58	-0.00012	-0.00096	-0.00112	-0.00127	0.01196	-0.09467	0.10683	0
e59								
59	-0.00523	-0.00506	0.00250	-0.00304	0.04629	-0.50693	0.54410	0
e60								
60	0.00360	-0.00247	0.00051	-0.00190	-0.00890	-0.27401	0.28661	0
e61								
61	-0.00014	-0.00089	-0.00032	-0.00124	-0.00516	-0.12332	0.12843	0
e62								
62	0.00151	0.00029	-0.00058	-0.00113	0.00990	-0.04501	0.05487	0
e72								
72	-0.01427	-0.00090	-0.00150	-0.00033	-0.05266	-0.05693	0.09674	0
e73								
73	0.00848	-0.00015	-0.00091	0.00059	-0.04032	0.00625	0.05512	0
e74								
74	-0.01344	0.00073	-0.00124	0.00094	-0.04765	0.04810	0.08673	0
e77								
77	-0.00203	0.00012	-0.00012	-0.00006	0.00258	-0.01588	0.01988	0
e150								
150	0.00086	-0.00261	-0.00012	-0.00466	-0.00239	-0.12938	0.13102	0
e151								
151	0.08344	-0.00078	0.01884	0.00564	-0.24133	-0.05613	0.38326	0
e152								
152	0.08782	-0.00827	0.00997	0.00184	0.14452	0.61199	0.84469	0
e153								
153	0.05838	-0.00261	0.01107	-0.00957	-0.18834	-0.28866	0.53659	0
e154								
154	0.05121	0.00613	-0.00999	0.00352	0.13302	0.57663	0.76130	0
e155								
155	0.05741	0.00141	-0.02043	-0.01089	-0.25323	-0.07826	0.39266	0
e156								
156	0.02420	-0.00065	-0.02900	-0.01095	-0.36669	-0.05513	0.40544	0
e157								
157	0.00066	-0.00201	0.00016	0.00712	0.00158	-0.09729	0.10068	0
e158								
158	0.34986	-0.00037	0.06319	0.00995	0.76009	-0.03318	1.12043	0
e159								
159	0.59077	-0.00617	0.01021	0.00816	-0.30799	0.47082	1.12936	0
e160								
160	-0.35694	-0.00529	0.01862	-0.02097	0.30141	-0.39861	0.86007	0
e161								
161	-0.35335	0.00311	0.02887	-0.00962	0.50778	0.09007	0.89822	0
e162								
162	-0.38335	0.00472	-0.02173	0.02372	0.31999	-0.39420	0.93140	0
e163								
163	0.53608	0.00429	-0.01449	0.00249	-0.33883	0.40162	0.94095	0
e164								
164	0.35022	0.00100	-0.06160	-0.01872	0.74855	-0.06013	1.14575	0
e165								
165	0.21434	-0.00084	-0.07278	-0.01041	-0.92863	-0.05192	1.18249	0
e168								
168	-0.00019	-0.00110	-0.00001	-0.00256	-0.00064	-0.06828	0.06916	0

e169																		
169		0.01487		0.00620		0.00246		0.00610		-0.03813		0.61042		0.66377		0		
e170																		
170		0.00350		0.00154		-0.00925		-0.00304		0.11413		0.08338		0.20215		0		
e171																		
171		-0.00376		0.00001		-0.00918		-0.00866		-0.11444		-0.03752		0.15875		0		
e172																		
172		0.00012		0.00025		0.00025		-0.00002		0.00765		-0.04685		0.05463		0		
e173																		
173		0.00187		-0.00112		-0.00195		0.00371		-0.01533		-0.07052		0.08400		0		
e174																		
174		-0.00271		0.00154		0.00381		0.00049		0.04798		0.28484		0.32951		0		
e175																		
175		-0.00207		0.00175		-0.00487		0.00219		0.06146		0.12140		0.18536		0		
e176																		
176		-0.00266		0.00063		-0.00438		-0.00528		-0.05450		-0.07645		0.13466		0		
e177																		
177		-0.00009		-0.00034		-0.00007		-0.00073		-0.00131		-0.03359		0.03375		0		
e178																		
178		0.00036		0.00020		0.00046		0.00010		0.00597		-0.06014		0.06648		0		
e179																		
179		0.00001		-0.00059		-0.00180		0.00220		-0.01227		-0.06708		0.07944		0		
e180																		
180		0.00010		0.00009		0.00455		-0.00244		0.05542		0.15918		0.21147		0		
e181																		
181		-0.00040		0.00152		-0.00409		0.00403		0.05273		0.12720		0.18089		0		
e182																		
182		-0.00070		0.00102		-0.00355		-0.00212		-0.04456		-0.09729		0.14290		0		
e183																		
183		-0.00013		-0.00010		-0.00022		0.00014		-0.00303		-0.02237		0.02378		0		
e184																		
184		-0.00017		0.00012		0.00055		0.00024		0.00694		-0.06544		0.07256		0		
e185																		
185		-0.00034		-0.00030		-0.00152		0.00153		-0.01040		-0.06754		0.07807		0		
e186																		
186		-0.00050		-0.00016		0.00485		-0.00338		0.05831		0.13233		0.19168		0		
e187																		
187		-0.00056		0.00114		-0.00388		0.00404		0.04969		0.11481		0.16564		0		
e188																		
188		-0.00094		0.00118		-0.00353		0.00008		-0.04421		-0.10102		0.14632		0		
e189																		
189		-0.00023		-0.00008		-0.00040		0.00028		-0.00524		-0.02400		0.02679		0		
e250																		
250		0.04914		0.05849		-0.05062		0.06607		-0.88404		2.55749		2.80801		0		
e251																		
251		-0.21422		0.00061		0.12247		0.00141		-1.72753		0.02312		1.97655		0		
e252																		
252		0.04620		-0.05758		0.04938		-0.06472		-0.85554		2.52675		2.73855		0		

Plus grande valeur négative

Sx -0.38335 daN/mm2 Elément 162, Sx contrainte d'effort axial Nx  
 Sty -0.05758 daN/mm2 Elément 252, Sty contrainte d'effort tranchant Ty  
 Stz -0.07278 daN/mm2 Elément 165, Stz contrainte d'effort tranchant Tz  
 Stx -0.06472 daN/mm2 Elément 252, Stx contrainte du moment de torsion Mx  
 Sfy -1.72753 daN/mm2 Elément 251, Sfy contrainte du moment fléchissant My  
 Sfz -1.86515 daN/mm2 Elément 250, Sfz contrainte du moment fléchissant Mz

Plus grande valeur positive

Sx 0.59077 daN/mm2 Elément 159, Sx contrainte d'effort axial Nx  
 Sty 0.05849 daN/mm2 Elément 250, Sty contrainte d'effort tranchant Ty  
 Stz 0.12247 daN/mm2 Elément 251, Stz contrainte d'effort tranchant Tz  
 Stx 0.06607 daN/mm2 Elément 250, Stx contrainte du moment de torsion Mx  
 Sfy 0.78714 daN/mm2 Elément 165, Sfy contrainte du moment fléchissant My  
 Sfz 2.55749 daN/mm2 Elément 250, Sfz contrainte du moment fléchissant Mz  
 Sm 2.80801 daN/mm2 Elément 250, Sm contrainte de Mises (poutre)

Propriété 6 UPN120  
Trémie Cuivre  
calcul 2 'calcul 0'

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CONTRAINTES [BEAM poutre]

Sx contrainte d'effort axial Nx  
Sty contrainte d'effort tranchant Ty  
Stz contrainte d'effort tranchant Tz  
Stx contrainte du moment de torsion Mx  
Sfy contrainte du moment fléchissant My  
Sfz contrainte du moment fléchissant Mz  
Sm contrainte de Mises (poutre)  
Stt contrainte de membrane (pression interne)

Elément	Sx	Sty	Stz	Stx	Sfy	Sfz	Sm	Stt
	daN/mm2	daN/mm2	daN/mm2	daN/mm2	daN/mm2	daN/mm2	daN/mm2	daN/mm2
e5								
5	-0.00139	-0.00085	-0.00083	-0.00139	0.00690	-0.10030	0.10867	0
e6								
6	-0.00057	0.00016	0.00189	-0.00236	0.00958	-0.09082	0.10124	0
e7								
7	0.00076	-0.00145	-0.00003	-0.00119	-0.00728	-0.10389	0.11134	0
e8								
8	0.00117	-0.00319	0.00153	0.00212	0.02453	-0.13842	0.14565	0
e102								
102	-0.00176	-0.00004	-0.00019	0.00009	-0.00454	-0.03913	0.04308	0
e103								
103	-0.00018	-0.00003	0.00026	0.00036	0.00724	-0.08912	0.09593	0
e104								
104	-0.00018	-0.00003	0.00026	0.00036	0.00839	-0.08851	0.09647	0
e105								
105	-0.00022	-0.00030	-0.00131	0.00102	0.00880	-0.09144	0.10055	0
e106								
106	0.00388	0.00023	0.00572	-0.00397	0.06078	0.13748	0.18418	0
e107								
107	0.00424	0.00090	-0.00445	0.00409	0.05713	0.11013	0.17215	0
e108								
108	0.00150	0.00171	-0.00150	0.00170	-0.02080	-0.11273	0.13518	0
e109								
109	0.00484	-0.00232	0.00066	0.00315	0.02469	0.10050	0.13038	0
e110								
110	0.00637	-0.00132	-0.00314	-0.00208	-0.03378	0.11284	0.15327	0
e111								
111	0.00004	0.00340	0.00057	-0.00272	-0.01291	0.22115	0.23434	0

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Plus grande valeur négative

Sx -0.00176 daN/mm2 Elément 102, Sx contrainte d'effort axial Nx  
Sty -0.00319 daN/mm2 Elément 8, Sty contrainte d'effort tranchant Ty  
Stz -0.00445 daN/mm2 Elément 107, Stz contrainte d'effort tranchant Tz  
Stx -0.00397 daN/mm2 Elément 106, Stx contrainte du moment de torsion Mx  
Sfy -0.04087 daN/mm2 Elément 106, Sfy contrainte du moment fléchissant My  
Sfz -0.14437 daN/mm2 Elément 111, Sfz contrainte du moment fléchissant Mz

Plus grande valeur positive

Sx 0.00637 daN/mm2 Elément 110, Sx contrainte d'effort axial Nx  
Sty 0.00340 daN/mm2 Elément 111, Sty contrainte d'effort tranchant Ty  
Stz 0.00572 daN/mm2 Elément 106, Stz contrainte d'effort tranchant Tz  
Stx 0.00409 daN/mm2 Elément 107, Stx contrainte du moment de torsion Mx  
Sfy 0.06078 daN/mm2 Elément 106, Sfy contrainte du moment fléchissant My  
Sfz 0.22115 daN/mm2 Elément 111, Sfz contrainte du moment fléchissant Mz  
Sm 0.23434 daN/mm2 Elément 111, Sm contrainte de Mises (poutre)

Propriété 7 RE120\_5X R120x120 5 - section rectangulaire creuse  
Trémie Cuivre  
calcul 2 'calcul 0'

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CONTRAINTES [BEAM poutre]

Sx contrainte d'effort axial Nx  
Sty contrainte d'effort tranchant Ty  
Stz contrainte d'effort tranchant Tz  
Stx contrainte du moment de torsion Mx  
Sfy contrainte du moment fléchissant My  
Sfz contrainte du moment fléchissant Mz  
Sm contrainte de Mises (poutre)  
Stt contrainte de membrane (pression interne)

Elément	Sx daN/mm2	Sty daN/mm2	Stz daN/mm2	Stx daN/mm2	Sfy daN/mm2	Sfz daN/mm2	Sm daN/mm2	Stt daN/mm2
e13-----								
13	-0.00002	0.00021	0.00000	-0.00004	-0.00002	-0.00262	0.00269	0
e14-----								
14	0.00035	0.00026	0.00000	0.00055	-0.00041	0.00334	0.00433	0
e15-----								
15	-0.00100	0.00030	0.00014	0.00179	-0.01875	-0.00528	0.02219	0
e16-----								
16	0.00020	0.00031	0.00001	0.00103	-0.00177	0.00486	0.00723	0
e17-----								
17	-0.00268	0.00034	0.00014	0.00126	-0.00798	-0.00836	0.01583	0
e18-----								
18	0.02226	0.00010	0.00001	-0.00198	-0.00379	-0.03743	0.06334	0
e19-----								
19	-0.00812	0.00014	0.00000	-0.00136	-0.00010	0.00611	0.01456	0
e20-----								
20	0.00027	0.00006	0.00000	-0.00033	-0.00002	-0.00085	0.00132	0

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Plus grande valeur négative

Sx -0.00812 daN/mm2 Elément 19, Sx contrainte d'effort axial Nx  
Stx -0.00198 daN/mm2 Elément 18, Stx contrainte du moment de torsion Mx  
Sfy -0.01875 daN/mm2 Elément 15, Sfy contrainte du moment fléchissant My  
Sfz -0.03743 daN/mm2 Elément 18, Sfz contrainte du moment fléchissant Mz

Plus grande valeur positive

Sx 0.02226 daN/mm2 Elément 18, Sx contrainte d'effort axial Nx  
Sty 0.00034 daN/mm2 Elément 17, Sty contrainte d'effort tranchant Ty  
Stz 0.00014 daN/mm2 Elément 15, Stz contrainte d'effort tranchant Tz  
Stx 0.00179 daN/mm2 Elément 15, Stx contrainte du moment de torsion Mx  
Sfy 0.00002 daN/mm2 Elément 20, Sfy contrainte du moment fléchissant My  
Sfz 0.00611 daN/mm2 Elément 19, Sfz contrainte du moment fléchissant Mz  
Sm 0.06334 daN/mm2 Elément 18, Sm contrainte de Mises (poutre)

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Critères de ruine - DTU

Propriété 2 UPN200  
Trémie Cuivre  
calcul 1 'calcul 0'

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CRITERES DE RUINE (CRITIQUES SI VALEUR > 1)  
Sc critère de contrainte axiale (CM66, CB71)  
Tc contrainte de cisaillement/(0.65 S0), (CM66)  
Mc critère de Mises (ou Tsai-Wu)  
F\_cm66 flambement simple (CM66 ou CB71)  
D\_cm66 flambement avec déversement (CM66)  
V\_cm66 voile CM66 pour profil en I (CM66)

Elément	Sc	Tc	Mc	F_cm66	D_cm66	V_cm66
e1-----						
1	0.0018729	0.0019269	0.0028660	0.0018729	0.0020543	0.0000000
e2-----						
2	0	0	0	0	0	0

e3						
3	0.0235663	0.0030015	0.0238074	0.0237136	0.0399120	0.0000002
e4						
4	0.0154916	0.0015521	0.0155899	0.0054928	0.0127065	0.0000001
e35						
35	0.0014418	0.0007670	0.0016806	0.0014418	0.0014828	0.0000000
e36						
36	0.0067171	0.0013857	0.0068958	0.0067171	0.0071146	0.0000000
e69						
69	0.0018924	0.0005315	0.0019847	0.0018856	0.0027768	0.0000000
e70						
70	0.0001948	0.0000676	0.0002091	0.0001910	0.0003366	0.0000000
e71						
71	0.0017059	0.0004008	0.0017646	0.0017008	0.0024999	0.0000000
e78						
78	0.0017728	0.0019205	0.0027961	0.0017728	0.0019541	0.0000000
e79						
79	0	0	0	0	0	0
e80						
80	0.0218862	0.0030194	0.0221486	0.0220101	0.0356511	0.0000002
e81						
81	0.0322116	0.0032276	0.0324159	0.0323598	0.0477036	0.0000003
e82						
82	0.0593642	0.0067170	0.0598439	0.0597462	0.0936479	0.0000011
e83						
83	0.0264740	0.0042334	0.0268996	0.0224708	0.0525130	0.0000003
e84						
84	0.0136214	0.0088354	0.0168668	0.0069082	0.0149217	0.0000004
e85						
85	0.0096396	0.0016646	0.0098201	0.0029308	0.0052244	0.0000000
e86						
86	0.0130931	0.0030048	0.0135230	0.0063884	0.0140256	0.0000001
e87						
87	0.0142046	0.0185308	0.0252392	0.0049114	0.0113968	0.0000018
e88						
88	0.0143649	0.0016752	0.0144881	0.0050756	0.0113595	0.0000001
e89						
89	0.0112444	0.0013061	0.0113401	0.0019585	0.0043499	0.0000000
e90						
90	0.0144335	0.0013002	0.0145075	0.0051505	0.0118915	0.0000001
e91						
91	0.0124748	0.0015530	0.0125967	0.0024788	0.0056487	0.0000000
e92						
92	0.0162470	0.0018543	0.0163806	0.0062544	0.0146382	0.0000001
e93						
93	0.0171212	0.0155302	0.0244712	0.0071326	0.0159107	0.0000013
e94						
94	0.0141886	0.0032768	0.0146603	0.0073637	0.0169651	0.0000001
e95						
95	0.0100670	0.0020556	0.0103295	0.0032462	0.0066244	0.0000000
e96						
96	0.0163444	0.0061571	0.0177536	0.0095281	0.0204889	0.0000003
e97						
97	0.0231919	0.0039041	0.0236047	0.0197879	0.0471802	0.0000002
e98						
98	0.0607957	0.0066225	0.0612512	0.0611897	0.0956357	0.0000011
e99						
99	0.0317172	0.0033216	0.0319369	0.0318622	0.0467214	0.0000003
e100						
100	0.0232712	0.0032094	0.0235501	0.0234131	0.0388387	0.0000002
e101						
101	0.0252561	0.0031942	0.0255109	0.0254229	0.0435449	0.0000002
e253						
253	0.6822452	0.0964636	0.6908349	0.6822647	0.6893065	0.0001581
e254						
254	0.0368250	0.0005597	0.0368304	0.0371297	0.0534586	0.0000003
e255						
255	0.6813603	0.0967380	0.6900098	0.6813805	0.6887335	0.0001581



Plus grande valeur positive

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Sc      0.6822452      Elément 253, Sc critère de contrainte axiale (CM66, CB71)
Tc      0.0967380      Elément 255, Tc contrainte de cisaillement/(0.65 S0), (CM66)
Mc      0.6908349      Elément 253, Mc critère de Mises (ou Tsai-Wu)
F_cm66  0.6822647      Elément 253, F_cm66 flambement simple (CM66 ou CB71)
D_cm66  0.6893065      Elément 253, D_cm66 flambement avec déversement (CM66)
V_cm66  0.0001581      Elément 253, V_cm66 voile CM66 pour profil en I (CM66)
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Propriété 3 RE80\_5X R80x80 5 - section rectangulaire creuse

Trémie Cuivre  
calcul 1 'calcul 0'

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CRITERES DE RUINE (CRITIQUES SI VALEUR > 1)
Sc critère de contrainte axiale (CM66, CB71)
Tc contrainte de cisaillement/(0.65 S0), (CM66)
Mc critère de Mises (ou Tsai-Wu)
F_cm66 flambement simple (CM66 ou CB71)
D_cm66 flambement avec déversement (CM66)
V_cm66 voile CM66 pour profil en I (CM66)
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Elément	Sc	Tc	Mc	F_cm66	D_cm66	V_cm66
e9						
9	0.0857198	0.0259825	0.0905735	0.0840035	0.0840035	0.0000011
e10						
10	0.0748072	0.0221763	0.0788635	0.0731086	0.0731086	0.0000008
e11						
11	0.1040353	0.0320710	0.1101228	0.1041162	0.1044988	0.0000016
e12						
12	0.1125674	0.0344022	0.1190442	0.1126507	0.1130139	0.0000019
e23						
23	0.2364670	0.1609336	0.2979000	0.2359873	0.2359873	0.0000304
e24						
24	0.2277396	0.1576451	0.2887303	0.2274694	0.2274694	0.0000291
e25						
25	0.0751561	0.0245363	0.0800719	0.0751994	0.0754877	0.0000009
e26						
26	0.0807119	0.0275849	0.0864806	0.0808768	0.0818908	0.0000011
e37						
37	0.0027987	0.0014601	0.0032457	0.0027987	0.0028138	0.0000000
e38						
38	0.0026055	0.0005832	0.0026869	0.0026055	0.0026230	0.0000000
e39						
39	0.0067588	0.0018168	0.0070616	0.0065316	0.0065316	0.0000000
e40						
40	0.0053641	0.0018760	0.0057649	0.0053645	0.0054849	0.0000000
e41						
41	0.0098175	0.0011226	0.0098985	0.0098208	0.0100777	0.0000000
e42						
42	0.0149435	0.0091829	0.0181712	0.0149446	0.0150013	0.0000001
e67						
67	0.0022502	0.0067384	0.0079130	0.0022503	0.0022792	0.0000000
e68						
68	0.0058510	0.0029404	0.0067226	0.0057488	0.0057488	0.0000000
e112						
112	0.0199684	0.0030685	0.0202651	0.0192944	0.0192944	0.0000000
e113						
113	0.0079710	0.0010238	0.0080539	0.0077067	0.0077067	0.0000000
e114						
114	0.0018000	0.0003512	0.0018429	0.0016581	0.0016581	0.0000000
e115						
115	0.0009738	0.0004783	0.0011128	0.0008844	0.0008844	0.0000000
e116						
116	0.0008934	0.0004744	0.0010409	0.0008421	0.0008421	0.0000000
e117						
117	0.0020464	0.0004846	0.0021179	0.0020298	0.0020298	0.0000000
e118						
118	0.0209179	0.0032518	0.0212359	0.0202192	0.0202192	0.0000000
e119						
119	0.0034593	0.0002980	0.0034755	0.0033721	0.0033721	0.0000000

e120						
120	0.0025042	0.0001471	0.0025097	0.0024172	0.0024172	0.0000000
e121						
121	0.0019590	0.0001239	0.0019639	0.0018729	0.0018729	0.0000000
e122						
122	0.0014994	0.0002312	0.0015218	0.0014166	0.0014166	0.0000000
e123						
123	0.0010619	0.0003631	0.0011379	0.0009849	0.0009849	0.0000000
e124						
124	0.0351186	0.0059291	0.0357473	0.0350422	0.0350422	0.0000001
e125						
125	0.0039268	0.0011645	0.0041399	0.0036897	0.0036897	0.0000000
e126						
126	0.0034330	0.0012399	0.0037059	0.0032918	0.0032918	0.0000000
e127						
127	0.0008210	0.0011204	0.0015051	0.0007020	0.0007020	0.0000000
e128						
128	0.0007485	0.0010879	0.0014354	0.0006697	0.0006697	0.0000000
e129						
129	0.0007537	0.0009693	0.0013263	0.0007210	0.0007210	0.0000000
e130						
130	0.0372351	0.0060637	0.0378558	0.0370791	0.0370791	0.0000001
e131						
131	0.0041314	0.0015020	0.0044641	0.0038545	0.0038545	0.0000000
e132						
132	0.0026667	0.0014311	0.0031156	0.0025285	0.0025285	0.0000000
e133						
133	0.0005211	0.0009667	0.0012067	0.0004153	0.0004153	0.0000000
e134						
134	0.0006013	0.0007379	0.0010255	0.0005329	0.0005329	0.0000000
e135						
135	0.0008498	0.0004646	0.0009979	0.0008181	0.0008181	0.0000000
e136						
136	0.0306671	0.0123852	0.0336882	0.0296451	0.0296451	0.0000002
e137						
137	0.0412723	0.0200221	0.0470269	0.0402293	0.0402293	0.0000005
e138						
138	0.0044031	0.0074124	0.0094355	0.0041014	0.0041014	0.0000001
e139						
139	0.0041111	0.0041414	0.0062162	0.0038598	0.0038598	0.0000000
e140						
140	0.0030138	0.0024526	0.0040875	0.0028164	0.0028164	0.0000000
e141						
141	0.0026134	0.0016683	0.0032184	0.0024708	0.0024708	0.0000000
e142						
142	0.0351266	0.0087470	0.0364809	0.0341933	0.0341933	0.0000001
e143						
143	0.0395437	0.0264190	0.0494810	0.0385140	0.0385140	0.0000008
e144						
144	0.0023635	0.0070396	0.0082704	0.0020990	0.0020990	0.0000001
e145						
145	0.0020679	0.0047409	0.0057240	0.0018107	0.0018107	0.0000000
e146						
146	0.0011475	0.0038247	0.0044562	0.0008857	0.0008857	0.0000000
e147						
147	0.0032262	0.0038303	0.0053855	0.0029560	0.0029560	0.0000000
e148						
148	0.0232396	0.0059706	0.0241922	0.0232492	0.0234580	0.0000001
e149						
149	0.0193322	0.0015781	0.0194137	0.0193434	0.0197128	0.0000000
e207						
207	0.0011058	0.0003836	0.0011871	0.0011059	0.0011807	0.0000000
e208						
208	0.0008817	0.0001400	0.0008957	0.0008819	0.0009624	0.0000000
e209						
209	0.0019765	0.0060470	0.0070890	0.0019767	0.0020179	0.0000000
e210						
210	0.0042701	0.0006197	0.0043267	0.0041007	0.0041007	0.0000000
e211						
211	0.0042123	0.0004588	0.0042439	0.0040338	0.0040338	0.0000000
e212						
212	0.0055913	0.0028311	0.0064360	0.0054698	0.0054698	0.0000000

e225						
225	0.0011774	0.0006834	0.0014065	0.0010366	0.0010366	0.0000000
e226						
226	0.0025027	0.0007949	0.0026579	0.0025030	0.0025894	0.0000000
e227						
227	0.0045355	0.0008118	0.0046267	0.0045375	0.0047669	0.0000000
e228						
228	0.0044665	0.0037470	0.0061437	0.0044669	0.0045118	0.0000000
e235						
235	0.0009454	0.0005406	0.0011244	0.0008554	0.0008554	0.0000000
e236						
236	0.0017475	0.0004129	0.0018083	0.0017476	0.0018135	0.0000000
e237						
237	0.0028629	0.0008708	0.0030261	0.0028638	0.0030586	0.0000000
e238						
238	0.0028548	0.0019305	0.0035879	0.0028550	0.0029122	0.0000000
e239						
239	0.0010390	0.0002154	0.0010670	0.0009964	0.0009964	0.0000000
e240						
240	0.0011885	0.0003435	0.0012498	0.0011885	0.0012277	0.0000000
e241						
241	0.0031935	0.0009069	0.0033528	0.0031941	0.0033504	0.0000000
e242						
242	0.0041920	0.0015264	0.0045306	0.0041923	0.0042744	0.0000000
e243						
243	0.0019777	0.0010787	0.0023208	0.0019778	0.0020020	0.0000000
e244						
244	0.0030924	0.0017429	0.0036624	0.0030925	0.0031079	0.0000000
e245						
245	0.0028516	0.0006458	0.0029429	0.0028519	0.0029276	0.0000000
e246						
246	0.0062013	0.0012347	0.0063552	0.0062029	0.0063444	0.0000000
e247						
247	0.5252332	0.1302416	0.5453168	0.4844649	0.4844649	0.0000322
e248						
248	0.5362688	0.1302268	0.5559494	0.5475271	0.5827015	0.0000328
e262						
262	0.1511510	0.0913239	0.1828049	0.1500249	0.1500249	0.0000100
e263						
263	0.1509583	0.0985871	0.1873707	0.1499041	0.1499041	0.0000115
e264						
264	0.0056739	0.0162702	0.0191762	0.0053320	0.0053320	0.0000003
e265						
265	0.0020015	0.0109549	0.0124947	0.0017010	0.0017010	0.0000001
e266						
266	0.5584330	0.1269891	0.5764437	0.4683167	0.4683167	0.0000332
e267						
267	0.5589413	0.1263566	0.5767601	0.4688755	0.4688755	0.0000330
e268						
268	0.5227232	0.1298888	0.5427925	0.4820854	0.4820854	0.0000320
e269						
269	0.6365139	0.1304486	0.6532372	0.6693251	0.7443936	0.0000389
e270						
270	0.6359789	0.1310825	0.6528768	0.6687685	0.7438692	0.0000390
e271						
271	0.5351335	0.1305902	0.5549626	0.5463583	0.5816213	0.0000328

Plus grande valeur positive

Sc	0.6365139	Elément 269, Sc critère de contrainte axiale (CM66, CB71)
Tc	0.1609336	Elément 23, Tc contrainte de cisaillement/(0.65 S0), (CM66)
Mc	0.6532372	Elément 269, Mc critère de Mises (ou Tsai-Wu)
F_cm66	0.6693251	Elément 269, F_cm66 flambement simple (CM66 ou CB71)
D_cm66	0.7443936	Elément 269, D_cm66 flambement avec déversement (CM66)
V_cm66	0.0000390	Elément 270, V_cm66 voile CM66 pour profil en I (CM66)

Propriété 4 RI80\_50C R80x50 4 - section rectangulaire creuse  
 Trémie Cuivre  
 calcul 1 'calcul 0'

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 CRITERES DE RUINE (CRITIQUES SI VALEUR > 1)  
 Sc critère de contrainte axiale (CM66, CB71)  
 Tc contrainte de cisaillement/(0.65 S0), (CM66)  
 Mc critère de Mises (ou Tsai-Wu)  
 F\_cm66 flambement simple (CM66 ou CB71)  
 D\_cm66 flambement avec déversement (CM66)  
 V\_cm66 voile CM66 pour profil en I (CM66)  
 -----

Elément	Sc	Tc	Mc	F_cm66	D_cm66	V_cm66
e43						
43	0.0047311	0.0008216	0.0048207	0.0047336	0.0051123	0.0000000
e44						
44	0.0031062	0.0005150	0.0031599	0.0031069	0.0032875	0.0000000
e45						
45	0.0025859	0.0004169	0.0026281	0.0025576	0.0025576	0.0000000
e46						
46	0.0042694	0.0005145	0.0043085	0.0042700	0.0043742	0.0000000
e63						
63	0.0030132	0.0007555	0.0031310	0.0029121	0.0029121	0.0000000
e64						
64	0.0059742	0.0023796	0.0065474	0.0059006	0.0059006	0.0000000
e65						
65	0.0040092	0.0008714	0.0041275	0.0040108	0.0043677	0.0000000
e66						
66	0.0039084	0.0008794	0.0040318	0.0039098	0.0042455	0.0000000
e75						
75	0.1012229	0.0267316	0.1056021	0.1013041	0.1018129	0.0000031
e76						
76	0.1072581	0.0285510	0.1119710	0.1080078	0.1123609	0.0000036
e166						
166	0.0041588	0.0004126	0.0041846	0.0041621	0.0048523	0.0000000
e167						
167	0.0125645	0.0006210	0.0125840	0.0125757	0.0137999	0.0000000
e190						
190	0.0049045	0.0003258	0.0049182	0.0048125	0.0048125	0.0000000
e191						
191	0.0050313	0.0002101	0.0050369	0.0049476	0.0049476	0.0000000
e192						
192	0.0044561	0.0004124	0.0044802	0.0043866	0.0043866	0.0000000
e193						
193	0.0031891	0.0003153	0.0032088	0.0031342	0.0031342	0.0000000
e194						
194	0.0020574	0.0002101	0.0020709	0.0020174	0.0020174	0.0000000
e195						
195	0.0012377	0.0002554	0.0012706	0.0012135	0.0012135	0.0000000
e196						
196	0.0061796	0.0029530	0.0070172	0.0061259	0.0061259	0.0000000
e197						
197	0.0031940	0.0019068	0.0038484	0.0030852	0.0030852	0.0000000
e198						
198	0.0030613	0.0018543	0.0037053	0.0029559	0.0029559	0.0000000
e199						
199	0.0053384	0.0027630	0.0061786	0.0052882	0.0052882	0.0000000
e200						
200	0.0052094	0.0021723	0.0057549	0.0051429	0.0051429	0.0000000
e201						
201	0.0018484	0.0003748	0.0018960	0.0018490	0.0021209	0.0000000
e202						
202	0.0008410	0.0001886	0.0008674	0.0008412	0.0010257	0.0000000
e203						
203	0.0003754	0.0001224	0.0003999	0.0003754	0.0004801	0.0000000
e204						
204	0.0020461	0.0004581	0.0021101	0.0020467	0.0023125	0.0000000
e205						
205	0.0011961	0.0003048	0.0012443	0.0011963	0.0013842	0.0000000

e206						
206	0.0007758	0.0001742	0.0008002	0.0007758	0.0008840	0.0000000
e213						
213	0.0302995	0.0080083	0.0316125	0.0303033	0.0303807	0.0000003
e214						
214	0.0118800	0.0030971	0.0123811	0.0117350	0.0117350	0.0000000
e215						
215	0.0058338	0.0015949	0.0061039	0.0056905	0.0056905	0.0000000
e216						
216	0.0042869	0.0009619	0.0044215	0.0041545	0.0041545	0.0000000
e217						
217	0.0039052	0.0007475	0.0039948	0.0037848	0.0037848	0.0000000
e218						
218	0.0036112	0.0008853	0.0037462	0.0034986	0.0034986	0.0000000
e219						
219	0.0223542	0.0022554	0.0224980	0.0224194	0.0249563	0.0000001
e220						
220	0.0141168	0.0016954	0.0142453	0.0141418	0.0162762	0.0000000
e221						
221	0.0086481	0.0014401	0.0087987	0.0086531	0.0103360	0.0000000
e222						
222	0.0049522	0.0012314	0.0051426	0.0049531	0.0063010	0.0000000
e223						
223	0.0028642	0.0007325	0.0029806	0.0028650	0.0038794	0.0000000
e224						
224	0.0014454	0.0003367	0.0014943	0.0014459	0.0021236	0.0000000
e229						
229	0.0028516	0.0002908	0.0028704	0.0028524	0.0030920	0.0000000
e230						
230	0.0046081	0.0002504	0.0046167	0.0046085	0.0047538	0.0000000
e231						
231	0.0025916	0.0002973	0.0026132	0.0024545	0.0024545	0.0000000
e232						
232	0.0035572	0.0001790	0.0035629	0.0032307	0.0032307	0.0000000
e233						
233	0.0040619	0.0002829	0.0040744	0.0040643	0.0046001	0.0000000
e234						
234	0.0048928	0.0003116	0.0049053	0.0048991	0.0059849	0.0000000
e249						
249	0.1223584	0.0346581	0.1284293	0.1211299	0.1211299	0.0000050
e272						
272	0.1775374	0.0344470	0.1817238	0.1750299	0.1750299	0.0000070
e273						
273	0.1779885	0.0345371	0.1821861	0.1754945	0.1754945	0.0000071
e274						
274	0.1200442	0.0340409	0.1260133	0.1188493	0.1188493	0.0000048

Plus grande valeur positive

Sc	0.1779885	Elément 273, Sc critère de contrainte axiale (CM66, CB71)
Tc	0.0346581	Elément 249, Tc contrainte de cisaillement/(0.65 S0), (CM66)
Mc	0.1821861	Elément 273, Mc critère de Mises (ou Tsai-Wu)
F_cm66	0.1754945	Elément 273, F_cm66 flambement simple (CM66 ou CB71)
D_cm66	0.1754945	Elément 273, D_cm66 flambement avec déversement (CM66)
V_cm66	0.0000071	Elément 273, V_cm66 voile CM66 pour profil en I (CM66)

Propriété 5 UPN80  
Trémie Cuivre  
calcul 1 'calcul 0'

CRITERES DE RUINE (CRITIQUES SI VALEUR > 1)  
Sc critère de contrainte axiale (CM66, CB71)  
Tc contrainte de cisaillement/(0.65 S0), (CM66)  
Mc critère de Mises (ou Tsai-Wu)  
F\_cm66 flambement simple (CM66 ou CB71)  
D\_cm66 flambement avec déversement (CM66)  
V\_cm66 voile CM66 pour profil en I (CM66)

Elément	Sc	Tc	Mc	F_cm66	D_cm66	V_cm66
e27						
27	0.0060713	0.0003693	0.0060855	0.0060455	0.0061759	0.0000000

e28							
28	0.0153820	0.0020367	0.0155520	0.0139820	0.0235494	0.0000000	
e30							
30	0.0242322	0.0014450	0.0242867	0.0221662	0.0263063	0.0000000	
e31							
31	0.0045947	0.0008233	0.0046873	0.0045730	0.0046448	0.0000000	
e32							
32	0.0435699	0.0048100	0.0439052	0.0362465	0.0614099	0.0000001	
e34							
34	0.0398703	0.0028004	0.0399948	0.0422215	0.1177088	0.0000000	
e47							
47	0.0033365	0.0004053	0.0033676	0.0033365	0.0035349	0.0000000	
e49							
49	0.0177512	0.0005244	0.0177610	0.0175898	0.0176022	0.0000000	
e50							
50	0.0030045	0.0004019	0.0030384	0.0029107	0.0032396	0.0000000	
e51							
51	0.0073649	0.0001943	0.0073681	0.0072339	0.0073083	0.0000000	
e52							
52	0.0031721	0.0002281	0.0031825	0.0031722	0.0034214	0.0000000	
e53							
53	0.0031298	0.0003548	0.0031551	0.0031163	0.0035689	0.0000000	
e54							
54	0.0035154	0.0000763	0.0035164	0.0035155	0.0039542	0.0000000	
e55							
55	0.0042910	0.0000968	0.0042924	0.0042911	0.0046175	0.0000000	
e56							
56	0.0033103	0.0003209	0.0033300	0.0033104	0.0038423	0.0000000	
e57							
57	0.0041567	0.0001137	0.0041586	0.0041404	0.0046352	0.0000000	
e58							
58	0.0044475	0.0001650	0.0044514	0.0044476	0.0048149	0.0000000	
e59							
59	0.0226627	0.0005433	0.0226709	0.0226766	0.0244035	0.0000000	
e60							
60	0.0119380	0.0002824	0.0119422	0.0117878	0.0120477	0.0000000	
e61							
61	0.0053489	0.0001381	0.0053512	0.0053490	0.0055143	0.0000000	
e62							
62	0.0022829	0.0001113	0.0022864	0.0022202	0.0024621	0.0000000	
e72							
72	0.0040282	0.0001306	0.0040309	0.0040332	0.0069780	0.0000000	
e73							
73	0.0022940	0.0000965	0.0022966	0.0019406	0.0031189	0.0000000	
e74							
74	0.0036099	0.0001476	0.0036137	0.0036143	0.0064017	0.0000000	
e77							
77	0.0008281	0.0000138	0.0008282	0.0008283	0.0011962	0.0000000	
e150							
150	0.0054337	0.0004664	0.0054590	0.0053979	0.0054027	0.0000000	
e151							
151	0.0158710	0.0015699	0.0159692	0.0123943	0.0194462	0.0000000	
e152							
152	0.0351802	0.0009241	0.0351956	0.0315212	0.0357442	0.0000000	
e153							
153	0.0223076	0.0013338	0.0223581	0.0198749	0.0253782	0.0000000	
e154							
154	0.0317026	0.0009511	0.0317207	0.0295687	0.0334556	0.0000000	
e155							
155	0.0162036	0.0020096	0.0163608	0.0138117	0.0212110	0.0000000	
e156							
156	0.0166453	0.0025610	0.0168932	0.0156368	0.0263515	0.0000000	
e157							
157	0.0041432	0.0005850	0.0041952	0.0041156	0.0041592	0.0000000	
e158							
158	0.0463850	0.0046890	0.0466844	0.0318074	0.0540174	0.0000001	
e159							
159	0.0470359	0.0012424	0.0470567	0.0224206	0.0274490	0.0000001	
e160							
160	0.0357200	0.0025605	0.0358362	0.0366359	0.0958403	0.0000000	
e161							
161	0.0373219	0.0024755	0.0374258	0.0393043	0.1090803	0.0000000	

e162	162	0.0386681	0.0029289	0.0388085	0.0398533	0.1028997	0.0000000
e163	163	0.0391857	0.0011226	0.0392061	0.0168491	0.0248195	0.0000000
e164	164	0.0473864	0.0051490	0.0477396	0.0327940	0.0546669	0.0000001
e165	165	0.0489034	0.0053329	0.0492706	0.0399725	0.0671073	0.0000001
e168	168	0.0028697	0.0002345	0.0028819	0.0028698	0.0029102	0.0000000
e169	169	0.0276424	0.0008041	0.0276572	0.0270230	0.0281373	0.0000000
e170	170	0.0083754	0.0007940	0.0084230	0.0082296	0.0115646	0.0000000
e171	171	0.0064883	0.0011434	0.0066147	0.0064926	0.0104133	0.0000000
e172	172	0.0022760	0.0000238	0.0022761	0.0022708	0.0024945	0.0000000
e173	173	0.0034750	0.0003701	0.0034999	0.0033972	0.0037189	0.0000000
e174	174	0.0137256	0.0002926	0.0137296	0.0137287	0.0153663	0.0000000
e175	175	0.0077054	0.0004664	0.0077232	0.0077072	0.0098194	0.0000000
e176	176	0.0055674	0.0006204	0.0056110	0.0055693	0.0075692	0.0000000
e177	177	0.0014042	0.0000684	0.0014063	0.0014042	0.0014189	0.0000000
e178	178	0.0027696	0.0000382	0.0027699	0.0027546	0.0029290	0.0000000
e179	179	0.0032972	0.0002595	0.0033101	0.0032966	0.0036484	0.0000000
e180	180	0.0087968	0.0004478	0.0088113	0.0087926	0.0103074	0.0000000
e181	181	0.0075136	0.0005297	0.0075372	0.0075139	0.0091162	0.0000000
e182	182	0.0059398	0.0003692	0.0059543	0.0059403	0.0073500	0.0000000
e183	183	0.0009906	0.0000241	0.0009910	0.0009906	0.0010480	0.0000000
e184	184	0.0030229	0.0000515	0.0030234	0.0030229	0.0032522	0.0000000
e185	185	0.0032455	0.0001965	0.0032530	0.0032455	0.0035904	0.0000000
e186	186	0.0079644	0.0005275	0.0079865	0.0079649	0.0097454	0.0000000
e187	187	0.0068775	0.0005129	0.0069017	0.0068780	0.0084152	0.0000000
e188	188	0.0060904	0.0002433	0.0060965	0.0060910	0.0075263	0.0000000
e189	189	0.0011152	0.0000442	0.0011163	0.0011152	0.0012242	0.0000000
e250	250	0.1165974	0.0086182	0.1170004	0.1145498	0.1403819	0.0000004
e251	251	0.0818697	0.0079414	0.0823564	0.0854601	0.1710172	0.0000002
e252	252	0.1137084	0.0084547	0.1141061	0.1117833	0.1367825	0.0000004

Plus grande valeur positive

Sc	0.1165974	Elément 250, Sc critère de contrainte axiale (CM66, CB71)
Tc	0.0086182	Elément 250, Tc contrainte de cisaillement/(0.65 S0), (CM66)
Mc	0.1170004	Elément 250, Mc critère de Mises (ou Tsai-Wu)
F_cm66	0.1145498	Elément 250, F_cm66 flambement simple (CM66 ou CB71)
D_cm66	0.1710172	Elément 251, D_cm66 flambement avec déversement (CM66)
V_cm66	0.0000004	Elément 250, V_cm66 voile CM66 pour profil en I (CM66)

Propriété 6 UPN120  
Trémie Cuivre  
calcul 1 'calcul 0'

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CRITERES DE RUINE (CRITIQUES SI VALEUR > 1)  
Sc critère de contrainte axiale (CM66, CB71)  
Tc contrainte de cisaillement/(0.65 S0), (CM66)  
Mc critère de Mises (ou Tsai-Wu)  
F\_cm66 flambement simple (CM66 ou CB71)  
D\_cm66 flambement avec déversement (CM66)  
V\_cm66 voile CM66 pour profil en I (CM66)  
-----

Elément	Sc	Tc	Mc	F_cm66	D_cm66	V_cm66
e5-----						
5	0.0045245	0.0001535	0.0045278	0.0045247	0.0049121	0.0000000
e6-----						
6	0.0042073	0.0002722	0.0042185	0.0042074	0.0046622	0.0000000
e7-----						
7	0.0046353	0.0001690	0.0046392	0.0046036	0.0049126	0.0000000
e8-----						
8	0.0060557	0.0003542	0.0060688	0.0060070	0.0070939	0.0000000
e102-----						
102	0.0017950	0.0000182	0.0017951	0.0017951	0.0020938	0.0000000
e103-----						
103	0.0039969	0.0000403	0.0039972	0.0039969	0.0043240	0.0000000
e104-----						
104	0.0040193	0.0000403	0.0040195	0.0040193	0.0043964	0.0000000
e105-----						
105	0.0041863	0.0001505	0.0041898	0.0041863	0.0045881	0.0000000
e106-----						
106	0.0076421	0.0006218	0.0076741	0.0074804	0.0101507	0.0000000
e107-----						
107	0.0071462	0.0005508	0.0071730	0.0069694	0.0094796	0.0000000
e108-----						
108	0.0056263	0.0002392	0.0056327	0.0055639	0.0064872	0.0000000
e109-----						
109	0.0054179	0.0003532	0.0054325	0.0052162	0.0063078	0.0000000
e110-----						
110	0.0063746	0.0003450	0.0063865	0.0061092	0.0075995	0.0000000
e111-----						
111	0.0097542	0.0003942	0.0097643	0.0097525	0.0103604	0.0000000

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Plus grande valeur positive

Sc 0.0097542 Elément 111, Sc critère de contrainte axiale (CM66, CB71)  
Tc 0.0006218 Elément 106, Tc contrainte de cisaillement/(0.65 S0), (CM66)  
Mc 0.0097643 Elément 111, Mc critère de Mises (ou Tsai-Wu)  
F\_cm66 0.0097525 Elément 111, F\_cm66 flambement simple (CM66 ou CB71)  
D\_cm66 0.0103604 Elément 111, D\_cm66 flambement avec déversement (CM66)  
V\_cm66 0.0000000 Elément 111, V\_cm66 voile CM66 pour profil en I (CM66)  
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Propriété 7 RE120\_5X R120x120 5 - section rectangulaire creuse  
Trémie Cuivre  
calcul 1 'calcul 0'

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CRITERES DE RUINE (CRITIQUES SI VALEUR > 1)  
Sc critère de contrainte axiale (CM66, CB71)  
Tc contrainte de cisaillement/(0.65 S0), (CM66)  
Mc critère de Mises (ou Tsai-Wu)  
F\_cm66 flambement simple (CM66 ou CB71)  
D\_cm66 flambement avec déversement (CM66)  
V\_cm66 voile CM66 pour profil en I (CM66)  
-----

Elément	Sc	Tc	Mc	F_cm66	D_cm66	V_cm66
e13-----						
13	0.0001105	0.0000161	0.0001119	0.0001105	0.0001105	0.0000000
e14-----						
14	0.0001709	0.0000516	0.0001805	0.0001563	0.0001563	0.0000000



e15	15	0.0009123	0.0001344	0.0009247	0.0009123	0.0009156	0.0000000
e16	16	0.0002851	0.0000861	0.0003011	0.0002766	0.0002766	0.0000000
e17	17	0.0006494	0.0001029	0.0006597	0.0006494	0.0006582	0.0000000
e18	18	0.0026348	0.0001336	0.0026390	0.0017074	0.0017074	0.0000000
e19	19	0.0005971	0.0000957	0.0006067	0.0005971	0.0006237	0.0000000
e20	20	0.0000473	0.0000249	0.0000549	0.0000359	0.0000359	0.0000000

Plus grande valeur positive

Sc	0.0026348	Elément 18, Sc critère de contrainte axiale (CM66, CB71)
Tc	0.0001344	Elément 15, Tc contrainte de cisaillement/(0.65 S0), (CM66)
Mc	0.0026390	Elément 18, Mc critère de Mises (ou Tsai-Wu)
F_cm66	0.0017074	Elément 18, F_cm66 flambement simple (CM66 ou CB71)
D_cm66	0.0017074	Elément 18, D_cm66 flambement avec déversement (CM66)
V_cm66	0.0000000	Elément 18, V_cm66 voile CM66 pour profil en I (CM66)

Propriété 2 UPN200  
Trémie Cuivre  
calcul 2 'calcul 0'

CRITERES DE RUINE (CRITIQUES SI VALEUR > 1)  
Sc critère de contrainte axiale (CM66, CB71)  
Tc contrainte de cisaillement/(0.65 S0), (CM66)  
Mc critère de Mises (ou Tsai-Wu)  
F\_cm66 flambement simple (CM66 ou CB71)  
D\_cm66 flambement avec déversement (CM66)  
V\_cm66 voile CM66 pour profil en I (CM66)

Elément	Sc	Tc	Mc	F_cm66	D_cm66	V_cm66	
e1	1	0.0018729	0.0019269	0.0028660	0.0018729	0.0020543	0.0000000
e2	2	0	0	0	0	0	0
e3	3	0.0235663	0.0030015	0.0238074	0.0237136	0.0399120	0.0000002
e4	4	0.0154916	0.0015521	0.0155899	0.0054928	0.0127065	0.0000001
e35	35	0.0014418	0.0007670	0.0016806	0.0014418	0.0014828	0.0000000
e36	36	0.0067171	0.0013857	0.0068958	0.0067171	0.0071146	0.0000000
e69	69	0.0018924	0.0005315	0.0019847	0.0018856	0.0027768	0.0000000
e70	70	0.0001948	0.0000676	0.0002091	0.0001910	0.0003366	0.0000000
e71	71	0.0017059	0.0004008	0.0017646	0.0017008	0.0024999	0.0000000
e78	78	0.0017728	0.0019205	0.0027961	0.0017728	0.0019541	0.0000000
e79	79	0	0	0	0	0	0
e80	80	0.0218862	0.0030194	0.0221486	0.0220101	0.0356511	0.0000002
e81	81	0.0322116	0.0032276	0.0324159	0.0323598	0.0477036	0.0000003
e82	82	0.0593642	0.0067170	0.0598439	0.0597462	0.0936479	0.0000011
e83	83	0.0264740	0.0042334	0.0268996	0.0224708	0.0525130	0.0000003
e84	84	0.0136214	0.0088354	0.0168668	0.0069082	0.0149217	0.0000004
e85	85	0.0096396	0.0016646	0.0098201	0.0029308	0.0052244	0.0000000
e86	86	0.0130931	0.0030048	0.0135230	0.0063884	0.0140256	0.0000001

e87	87	0.0142046	0.0185308	0.0252392	0.0049114	0.0113968	0.0000018
e88	88	0.0143649	0.0016752	0.0144881	0.0050756	0.0113595	0.0000001
e89	89	0.0112444	0.0013061	0.0113401	0.0019585	0.0043499	0.0000000
e90	90	0.0144335	0.0013002	0.0145075	0.0051505	0.0118915	0.0000001
e91	91	0.0124748	0.0015530	0.0125967	0.0024788	0.0056487	0.0000000
e92	92	0.0162470	0.0018543	0.0163806	0.0062544	0.0146382	0.0000001
e93	93	0.0171212	0.0155302	0.0244712	0.0071326	0.0159107	0.0000013
e94	94	0.0141886	0.0032768	0.0146603	0.0073637	0.0169651	0.0000001
e95	95	0.0100670	0.0020556	0.0103295	0.0032462	0.0066244	0.0000000
e96	96	0.0163444	0.0061571	0.0177536	0.0095281	0.0204889	0.0000003
e97	97	0.0231919	0.0039041	0.0236047	0.0197879	0.0471802	0.0000002
e98	98	0.0607957	0.0066225	0.0612512	0.0611897	0.0956357	0.0000011
e99	99	0.0317172	0.0033216	0.0319369	0.0318622	0.0467214	0.0000003
e100	100	0.0232712	0.0032094	0.0235501	0.0234131	0.0388387	0.0000002
e101	101	0.0252561	0.0031942	0.0255109	0.0254229	0.0435449	0.0000002
e253	253	0.6822452	0.0964636	0.6908349	0.6822647	0.6893065	0.0001581
e254	254	0.0368250	0.0005597	0.0368304	0.0371297	0.0534586	0.0000003
e255	255	0.6813603	0.0967380	0.6900098	0.6813805	0.6887335	0.0001581

Plus grande valeur positive

Sc	0.6822452	Elément 253, Sc critère de contrainte axiale (CM66, CB71)
Tc	0.0967380	Elément 255, Tc contrainte de cisaillement/(0.65 S0), (CM66)
Mc	0.6908349	Elément 253, Mc critère de Mises (ou Tsai-Wu)
F_cm66	0.6822647	Elément 253, F_cm66 flambement simple (CM66 ou CB71)
D_cm66	0.6893065	Elément 253, D_cm66 flambement avec déversement (CM66)
V_cm66	0.0001581	Elément 253, V_cm66 voile CM66 pour profil en I (CM66)

Propriété 3 RE80\_5X R80x80 5 - section rectangulaire creuse  
Trémie Cuivre  
calcul 2 'calcul 0'

CRITERES DE RUINE (CRITIQUES SI VALEUR > 1)

Sc	critère de contrainte axiale (CM66, CB71)
Tc	contrainte de cisaillement/(0.65 S0), (CM66)
Mc	critère de Mises (ou Tsai-Wu)
F_cm66	flambement simple (CM66 ou CB71)
D_cm66	flambement avec déversement (CM66)
V_cm66	voile CM66 pour profil en I (CM66)

Elément	Sc	Tc	Mc	F_cm66	D_cm66	V_cm66	
e9	9	0.0857198	0.0259825	0.0905735	0.0840035	0.0840035	0.0000011
e10	10	0.0748072	0.0221763	0.0788635	0.0731086	0.0731086	0.0000008
e11	11	0.1040353	0.0320710	0.1101228	0.1041162	0.1044988	0.0000016
e12	12	0.1125674	0.0344022	0.1190442	0.1126507	0.1130139	0.0000019
e23	23	0.2364670	0.1609336	0.2979000	0.2359873	0.2359873	0.0000304
e24	24	0.2277396	0.1576451	0.2887303	0.2274694	0.2274694	0.0000291

e25						
25	0.0751561	0.0245363	0.0800719	0.0751994	0.0754877	0.0000009
e26						
26	0.0807119	0.0275849	0.0864806	0.0808768	0.0818908	0.0000011
e37						
37	0.0027987	0.0014601	0.0032457	0.0027987	0.0028138	0.0000000
e38						
38	0.0026055	0.0005832	0.0026869	0.0026055	0.0026230	0.0000000
e39						
39	0.0067588	0.0018168	0.0070616	0.0065316	0.0065316	0.0000000
e40						
40	0.0053641	0.0018760	0.0057649	0.0053645	0.0054849	0.0000000
e41						
41	0.0098175	0.0011226	0.0098985	0.0098208	0.0100777	0.0000000
e42						
42	0.0149435	0.0091829	0.0181712	0.0149446	0.0150013	0.0000001
e67						
67	0.0022502	0.0067384	0.0079130	0.0022503	0.0022792	0.0000000
e68						
68	0.0058510	0.0029404	0.0067226	0.0057488	0.0057488	0.0000000
e112						
112	0.0199684	0.0030685	0.0202651	0.0192944	0.0192944	0.0000000
e113						
113	0.0079710	0.0010238	0.0080539	0.0077067	0.0077067	0.0000000
e114						
114	0.0018000	0.0003512	0.0018429	0.0016581	0.0016581	0.0000000
e115						
115	0.0009738	0.0004783	0.0011128	0.0008844	0.0008844	0.0000000
e116						
116	0.0008934	0.0004744	0.0010409	0.0008421	0.0008421	0.0000000
e117						
117	0.0020464	0.0004846	0.0021179	0.0020298	0.0020298	0.0000000
e118						
118	0.0209179	0.0032518	0.0212359	0.0202192	0.0202192	0.0000000
e119						
119	0.0034593	0.0002980	0.0034755	0.0033721	0.0033721	0.0000000
e120						
120	0.0025042	0.0001471	0.0025097	0.0024172	0.0024172	0.0000000
e121						
121	0.0019590	0.0001239	0.0019639	0.0018729	0.0018729	0.0000000
e122						
122	0.0014994	0.0002312	0.0015218	0.0014166	0.0014166	0.0000000
e123						
123	0.0010619	0.0003631	0.0011379	0.0009849	0.0009849	0.0000000
e124						
124	0.0351186	0.0059291	0.0357473	0.0350422	0.0350422	0.0000001
e125						
125	0.0039268	0.0011645	0.0041399	0.0036897	0.0036897	0.0000000
e126						
126	0.0034330	0.0012399	0.0037059	0.0032918	0.0032918	0.0000000
e127						
127	0.0008210	0.0011204	0.0015051	0.0007020	0.0007020	0.0000000
e128						
128	0.0007485	0.0010879	0.0014354	0.0006697	0.0006697	0.0000000
e129						
129	0.0007537	0.0009693	0.0013263	0.0007210	0.0007210	0.0000000
e130						
130	0.0372351	0.0060637	0.0378558	0.0370791	0.0370791	0.0000001
e131						
131	0.0041314	0.0015020	0.0044641	0.0038545	0.0038545	0.0000000
e132						
132	0.0026667	0.0014311	0.0031156	0.0025285	0.0025285	0.0000000
e133						
133	0.0005211	0.0009667	0.0012067	0.0004153	0.0004153	0.0000000
e134						
134	0.0006013	0.0007379	0.0010255	0.0005329	0.0005329	0.0000000
e135						
135	0.0008498	0.0004646	0.0009979	0.0008181	0.0008181	0.0000000
e136						
136	0.0306671	0.0123852	0.0336882	0.0296451	0.0296451	0.0000002
e137						
137	0.0412723	0.0200221	0.0470269	0.0402293	0.0402293	0.0000005

e138						
138	0.0044031	0.0074124	0.0094355	0.0041014	0.0041014	0.0000001
e139						
139	0.0041111	0.0041414	0.0062162	0.0038598	0.0038598	0.0000000
e140						
140	0.0030138	0.0024526	0.0040875	0.0028164	0.0028164	0.0000000
e141						
141	0.0026134	0.0016683	0.0032184	0.0024708	0.0024708	0.0000000
e142						
142	0.0351266	0.0087470	0.0364809	0.0341933	0.0341933	0.0000001
e143						
143	0.0395437	0.0264190	0.0494810	0.0385140	0.0385140	0.0000008
e144						
144	0.0023635	0.0070396	0.0082704	0.0020990	0.0020990	0.0000001
e145						
145	0.0020679	0.0047409	0.0057240	0.0018107	0.0018107	0.0000000
e146						
146	0.0011475	0.0038247	0.0044562	0.0008857	0.0008857	0.0000000
e147						
147	0.0032262	0.0038303	0.0053855	0.0029560	0.0029560	0.0000000
e148						
148	0.0232396	0.0059706	0.0241922	0.0232492	0.0234580	0.0000001
e149						
149	0.0193322	0.0015781	0.0194137	0.0193434	0.0197128	0.0000000
e207						
207	0.0011058	0.0003836	0.0011871	0.0011059	0.0011807	0.0000000
e208						
208	0.0008817	0.0001400	0.0008957	0.0008819	0.0009624	0.0000000
e209						
209	0.0019765	0.0060470	0.0070890	0.0019767	0.0020179	0.0000000
e210						
210	0.0042701	0.0006197	0.0043267	0.0041007	0.0041007	0.0000000
e211						
211	0.0042123	0.0004588	0.0042439	0.0040338	0.0040338	0.0000000
e212						
212	0.0055913	0.0028311	0.0064360	0.0054698	0.0054698	0.0000000
e225						
225	0.0011774	0.0006834	0.0014065	0.0010366	0.0010366	0.0000000
e226						
226	0.0025027	0.0007949	0.0026579	0.0025030	0.0025894	0.0000000
e227						
227	0.0045355	0.0008118	0.0046267	0.0045375	0.0047669	0.0000000
e228						
228	0.0044665	0.0037470	0.0061437	0.0044669	0.0045118	0.0000000
e235						
235	0.0009454	0.0005406	0.0011244	0.0008554	0.0008554	0.0000000
e236						
236	0.0017475	0.0004129	0.0018083	0.0017476	0.0018135	0.0000000
e237						
237	0.0028629	0.0008708	0.0030261	0.0028638	0.0030586	0.0000000
e238						
238	0.0028548	0.0019305	0.0035879	0.0028550	0.0029122	0.0000000
e239						
239	0.0010390	0.0002154	0.0010670	0.0009964	0.0009964	0.0000000
e240						
240	0.0011885	0.0003435	0.0012498	0.0011885	0.0012277	0.0000000
e241						
241	0.0031935	0.0009069	0.0033528	0.0031941	0.0033504	0.0000000
e242						
242	0.0041920	0.0015264	0.0045306	0.0041923	0.0042744	0.0000000
e243						
243	0.0019777	0.0010787	0.0023208	0.0019778	0.0020020	0.0000000
e244						
244	0.0030924	0.0017429	0.0036624	0.0030925	0.0031079	0.0000000
e245						
245	0.0028516	0.0006458	0.0029429	0.0028519	0.0029276	0.0000000
e246						
246	0.0062013	0.0012347	0.0063552	0.0062029	0.0063444	0.0000000
e247						
247	0.5252332	0.1302416	0.5453168	0.4844649	0.4844649	0.0000322
e248						
248	0.5362688	0.1302268	0.5559494	0.5475271	0.5827015	0.0000328

e262	262	0.1511510	0.0913239	0.1828049	0.1500249	0.1500249	0.0000100
e263	263	0.1509583	0.0985871	0.1873707	0.1499041	0.1499041	0.0000115
e264	264	0.0056739	0.0162702	0.0191762	0.0053320	0.0053320	0.0000003
e265	265	0.0020015	0.0109549	0.0124947	0.0017010	0.0017010	0.0000001
e266	266	0.5584330	0.1269891	0.5764437	0.4683167	0.4683167	0.0000332
e267	267	0.5589413	0.1263566	0.5767601	0.4688755	0.4688755	0.0000330
e268	268	0.5227232	0.1298888	0.5427925	0.4820854	0.4820854	0.0000320
e269	269	0.6365139	0.1304486	0.6532372	0.6693251	0.7443936	0.0000389
e270	270	0.6359789	0.1310825	0.6528768	0.6687685	0.7438692	0.0000390
e271	271	0.5351335	0.1305902	0.5549626	0.5463583	0.5816213	0.0000328

Plus grande valeur positive

Sc	0.6365139	Elément 269, Sc critère de contrainte axiale (CM66, CB71)
Tc	0.1609336	Elément 23, Tc contrainte de cisaillement/(0.65 S0), (CM66)
Mc	0.6532372	Elément 269, Mc critère de Mises (ou Tsai-Wu)
F_cm66	0.6693251	Elément 269, F_cm66 flambement simple (CM66 ou CB71)
D_cm66	0.7443936	Elément 269, D_cm66 flambement avec déversement (CM66)
V_cm66	0.0000390	Elément 270, V_cm66 voile CM66 pour profil en I (CM66)

Propriété 4 RI80\_50C R80x50 4 - section rectangulaire creuse  
Trémie Cuivre  
calcul 2 'calcul 0'

CRITERES DE RUINE (CRITIQUES SI VALEUR > 1)  
Sc critère de contrainte axiale (CM66, CB71)  
Tc contrainte de cisaillement/(0.65 S0), (CM66)  
Mc critère de Mises (ou Tsai-Wu)  
F\_cm66 flambement simple (CM66 ou CB71)  
D\_cm66 flambement avec déversement (CM66)  
V\_cm66 voile CM66 pour profil en I (CM66)

Elément	Sc	Tc	Mc	F_cm66	D_cm66	V_cm66	
e43	43	0.0047311	0.0008216	0.0048207	0.0047336	0.0051123	0.0000000
e44	44	0.0031062	0.0005150	0.0031599	0.0031069	0.0032875	0.0000000
e45	45	0.0025859	0.0004169	0.0026281	0.0025576	0.0025576	0.0000000
e46	46	0.0042694	0.0005145	0.0043085	0.0042700	0.0043742	0.0000000
e63	63	0.0030132	0.0007555	0.0031310	0.0029121	0.0029121	0.0000000
e64	64	0.0059742	0.0023796	0.0065474	0.0059006	0.0059006	0.0000000
e65	65	0.0040092	0.0008714	0.0041275	0.0040108	0.0043677	0.0000000
e66	66	0.0039084	0.0008794	0.0040318	0.0039098	0.0042455	0.0000000
e75	75	0.1012229	0.0267316	0.1056021	0.1013041	0.1018129	0.0000031
e76	76	0.1072581	0.0285510	0.1119710	0.1080078	0.1123609	0.0000036
e166	166	0.0041588	0.0004126	0.0041846	0.0041621	0.0048523	0.0000000
e167	167	0.0125645	0.0006210	0.0125840	0.0125757	0.0137999	0.0000000
e190	190	0.0049045	0.0003258	0.0049182	0.0048125	0.0048125	0.0000000
e191	191	0.0050313	0.0002101	0.0050369	0.0049476	0.0049476	0.0000000

e192						
192	0.0044561	0.0004124	0.0044802	0.0043866	0.0043866	0.0000000
e193						
193	0.0031891	0.0003153	0.0032088	0.0031342	0.0031342	0.0000000
e194						
194	0.0020574	0.0002101	0.0020709	0.0020174	0.0020174	0.0000000
e195						
195	0.0012377	0.0002554	0.0012706	0.0012135	0.0012135	0.0000000
e196						
196	0.0061796	0.0029530	0.0070172	0.0061259	0.0061259	0.0000000
e197						
197	0.0031940	0.0019068	0.0038484	0.0030852	0.0030852	0.0000000
e198						
198	0.0030613	0.0018543	0.0037053	0.0029559	0.0029559	0.0000000
e199						
199	0.0053384	0.0027630	0.0061786	0.0052882	0.0052882	0.0000000
e200						
200	0.0052094	0.0021723	0.0057549	0.0051429	0.0051429	0.0000000
e201						
201	0.0018484	0.0003748	0.0018960	0.0018490	0.0021209	0.0000000
e202						
202	0.0008410	0.0001886	0.0008674	0.0008412	0.0010257	0.0000000
e203						
203	0.0003754	0.0001224	0.0003999	0.0003754	0.0004801	0.0000000
e204						
204	0.0020461	0.0004581	0.0021101	0.0020467	0.0023125	0.0000000
e205						
205	0.0011961	0.0003048	0.0012443	0.0011963	0.0013842	0.0000000
e206						
206	0.0007758	0.0001742	0.0008002	0.0007758	0.0008840	0.0000000
e213						
213	0.0302995	0.0080083	0.0316125	0.0303033	0.0303807	0.0000003
e214						
214	0.0118800	0.0030971	0.0123811	0.0117350	0.0117350	0.0000000
e215						
215	0.0058338	0.0015949	0.0061039	0.0056905	0.0056905	0.0000000
e216						
216	0.0042869	0.0009619	0.0044215	0.0041545	0.0041545	0.0000000
e217						
217	0.0039052	0.0007475	0.0039948	0.0037848	0.0037848	0.0000000
e218						
218	0.0036112	0.0008853	0.0037462	0.0034986	0.0034986	0.0000000
e219						
219	0.0223542	0.0022554	0.0224980	0.0224194	0.0249563	0.0000001
e220						
220	0.0141168	0.0016954	0.0142453	0.0141418	0.0162762	0.0000000
e221						
221	0.0086481	0.0014401	0.0087987	0.0086531	0.0103360	0.0000000
e222						
222	0.0049522	0.0012314	0.0051426	0.0049531	0.0063010	0.0000000
e223						
223	0.0028642	0.0007325	0.0029806	0.0028650	0.0038794	0.0000000
e224						
224	0.0014454	0.0003367	0.0014943	0.0014459	0.0021236	0.0000000
e229						
229	0.0028516	0.0002908	0.0028704	0.0028524	0.0030920	0.0000000
e230						
230	0.0046081	0.0002504	0.0046167	0.0046085	0.0047538	0.0000000
e231						
231	0.0025916	0.0002973	0.0026132	0.0024545	0.0024545	0.0000000
e232						
232	0.0035572	0.0001790	0.0035629	0.0032307	0.0032307	0.0000000
e233						
233	0.0040619	0.0002829	0.0040744	0.0040643	0.0046001	0.0000000
e234						
234	0.0048928	0.0003116	0.0049053	0.0048991	0.0059849	0.0000000
e249						
249	0.1223584	0.0346581	0.1284293	0.1211299	0.1211299	0.0000050
e272						
272	0.1775374	0.0344470	0.1817238	0.1750299	0.1750299	0.0000070
e273						
273	0.1779885	0.0345371	0.1821861	0.1754945	0.1754945	0.0000071

```
e274-----+-----+-----+-----+-----+-----+-----+
274      |0.1200442|0.0340409|0.1260133|0.1188493|0.1188493|0.0000048|
```

Plus grande valeur positive

```
Sc      0.1779885      Elément 273, Sc critère de contrainte axiale (CM66, CB71)
Tc      0.0346581      Elément 249, Tc contrainte de cisaillement/(0.65 S0), (CM66)
Mc      0.1821861      Elément 273, Mc critère de Mises (ou Tsai-Wu)
F_cm66 0.1754945      Elément 273, F_cm66 flambement simple (CM66 ou CB71)
D_cm66 0.1754945      Elément 273, D_cm66 flambement avec déversement (CM66)
V_cm66 0.0000071      Elément 273, V_cm66 voile CM66 pour profil en I (CM66)
```

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Propriété 5 UPN80
Trémie Cuivre
calcul 2 'calcul 0'
```

```
-----+-----+-----+-----+-----+-----+-----+
CRITERES DE RUINE (CRITIQUES SI VALEUR > 1)
Sc critère de contrainte axiale (CM66, CB71)
Tc contrainte de cisaillement/(0.65 S0), (CM66)
Mc critère de Mises (ou Tsai-Wu)
F_cm66 flambement simple (CM66 ou CB71)
D_cm66 flambement avec déversement (CM66)
V_cm66 voile CM66 pour profil en I (CM66)
```

Elément	Sc	Tc	Mc	F_cm66	D_cm66	V_cm66
e27-----+-----+-----+-----+-----+-----+-----+						
27       0.0060713 0.0003693 0.0060855 0.0060455 0.0061759 0.0000000						
e28-----+-----+-----+-----+-----+-----+-----+						
28       0.0153820 0.0020367 0.0155520 0.0139820 0.0235494 0.0000000						
e30-----+-----+-----+-----+-----+-----+-----+						
30       0.0242322 0.0014450 0.0242867 0.0221662 0.0263063 0.0000000						
e31-----+-----+-----+-----+-----+-----+-----+						
31       0.0045947 0.0008233 0.0046873 0.0045730 0.0046448 0.0000000						
e32-----+-----+-----+-----+-----+-----+-----+						
32       0.0435699 0.0048100 0.0439052 0.0362465 0.0614099 0.0000001						
e34-----+-----+-----+-----+-----+-----+-----+						
34       0.0398703 0.0028004 0.0399948 0.0422215 0.1177088 0.0000000						
e47-----+-----+-----+-----+-----+-----+-----+						
47       0.0033365 0.0004053 0.0033676 0.0033365 0.0035349 0.0000000						
e49-----+-----+-----+-----+-----+-----+-----+						
49       0.0177512 0.0005244 0.0177610 0.0175898 0.0176022 0.0000000						
e50-----+-----+-----+-----+-----+-----+-----+						
50       0.0030045 0.0004019 0.0030384 0.0029107 0.0032396 0.0000000						
e51-----+-----+-----+-----+-----+-----+-----+						
51       0.0073649 0.0001943 0.0073681 0.0072339 0.0073083 0.0000000						
e52-----+-----+-----+-----+-----+-----+-----+						
52       0.0031721 0.0002281 0.0031825 0.0031722 0.0034214 0.0000000						
e53-----+-----+-----+-----+-----+-----+-----+						
53       0.0031298 0.0003548 0.0031551 0.0031163 0.0035689 0.0000000						
e54-----+-----+-----+-----+-----+-----+-----+						
54       0.0035154 0.0000763 0.0035164 0.0035155 0.0039542 0.0000000						
e55-----+-----+-----+-----+-----+-----+-----+						
55       0.0042910 0.0000968 0.0042924 0.0042911 0.0046175 0.0000000						
e56-----+-----+-----+-----+-----+-----+-----+						
56       0.0033103 0.0003209 0.0033300 0.0033104 0.0038423 0.0000000						
e57-----+-----+-----+-----+-----+-----+-----+						
57       0.0041567 0.0001137 0.0041586 0.0041404 0.0046352 0.0000000						
e58-----+-----+-----+-----+-----+-----+-----+						
58       0.0044475 0.0001650 0.0044514 0.0044476 0.0048149 0.0000000						
e59-----+-----+-----+-----+-----+-----+-----+						
59       0.0226627 0.0005433 0.0226709 0.0226766 0.0244035 0.0000000						
e60-----+-----+-----+-----+-----+-----+-----+						
60       0.0119380 0.0002824 0.0119422 0.0117878 0.0120477 0.0000000						
e61-----+-----+-----+-----+-----+-----+-----+						
61       0.0053489 0.0001381 0.0053512 0.0053490 0.0055143 0.0000000						
e62-----+-----+-----+-----+-----+-----+-----+						
62       0.0022829 0.0001113 0.0022864 0.0022202 0.0024621 0.0000000						
e72-----+-----+-----+-----+-----+-----+-----+						
72       0.0040282 0.0001306 0.0040309 0.0040332 0.0069780 0.0000000						
e73-----+-----+-----+-----+-----+-----+-----+						
73       0.0022940 0.0000965 0.0022966 0.0019406 0.0031189 0.0000000						

e74						
74	0.0036099	0.0001476	0.0036137	0.0036143	0.0064017	0.0000000
e77						
77	0.0008281	0.0000138	0.0008282	0.0008283	0.0011962	0.0000000
e150						
150	0.0054337	0.0004664	0.0054590	0.0053979	0.0054027	0.0000000
e151						
151	0.0158710	0.0015699	0.0159692	0.0123943	0.0194462	0.0000000
e152						
152	0.0351802	0.0009241	0.0351956	0.0315212	0.0357442	0.0000000
e153						
153	0.0223076	0.0013338	0.0223581	0.0198749	0.0253782	0.0000000
e154						
154	0.0317026	0.0009511	0.0317207	0.0295687	0.0334556	0.0000000
e155						
155	0.0162036	0.0020096	0.0163608	0.0138117	0.0212110	0.0000000
e156						
156	0.0166453	0.0025610	0.0168932	0.0156368	0.0263515	0.0000000
e157						
157	0.0041432	0.0005850	0.0041952	0.0041156	0.0041592	0.0000000
e158						
158	0.0463850	0.0046890	0.0466844	0.0318074	0.0540174	0.0000001
e159						
159	0.0470359	0.0012424	0.0470567	0.0224206	0.0274490	0.0000001
e160						
160	0.0357200	0.0025605	0.0358362	0.0366359	0.0958403	0.0000000
e161						
161	0.0373219	0.0024755	0.0374258	0.0393043	0.1090803	0.0000000
e162						
162	0.0386681	0.0029289	0.0388085	0.0398533	0.1028997	0.0000000
e163						
163	0.0391857	0.0011226	0.0392061	0.0168491	0.0248195	0.0000000
e164						
164	0.0473864	0.0051490	0.0477396	0.0327940	0.0546669	0.0000001
e165						
165	0.0489034	0.0053329	0.0492706	0.0399725	0.0671073	0.0000001
e168						
168	0.0028697	0.0002345	0.0028819	0.0028698	0.0029102	0.0000000
e169						
169	0.0276424	0.0008041	0.0276572	0.0270230	0.0281373	0.0000000
e170						
170	0.0083754	0.0007940	0.0084230	0.0082296	0.0115646	0.0000000
e171						
171	0.0064883	0.0011434	0.0066147	0.0064926	0.0104133	0.0000000
e172						
172	0.0022760	0.0000238	0.0022761	0.0022708	0.0024945	0.0000000
e173						
173	0.0034750	0.0003701	0.0034999	0.0033972	0.0037189	0.0000000
e174						
174	0.0137256	0.0002926	0.0137296	0.0137287	0.0153663	0.0000000
e175						
175	0.0077054	0.0004664	0.0077232	0.0077072	0.0098194	0.0000000
e176						
176	0.0055674	0.0006204	0.0056110	0.0055693	0.0075692	0.0000000
e177						
177	0.0014042	0.0000684	0.0014063	0.0014042	0.0014189	0.0000000
e178						
178	0.0027696	0.0000382	0.0027699	0.0027546	0.0029290	0.0000000
e179						
179	0.0032972	0.0002595	0.0033101	0.0032966	0.0036484	0.0000000
e180						
180	0.0087968	0.0004478	0.0088113	0.0087926	0.0103074	0.0000000
e181						
181	0.0075136	0.0005297	0.0075372	0.0075139	0.0091162	0.0000000
e182						
182	0.0059398	0.0003692	0.0059543	0.0059403	0.0073500	0.0000000
e183						
183	0.0009906	0.0000241	0.0009910	0.0009906	0.0010480	0.0000000
e184						
184	0.0030229	0.0000515	0.0030234	0.0030229	0.0032522	0.0000000
e185						
185	0.0032455	0.0001965	0.0032530	0.0032455	0.0035904	0.0000000



```

e186-----+-----+-----+-----+-----+-----+-----+
186      |0.0079644|0.0005275|0.0079865|0.0079649|0.0097454|0.0000000|
e187-----+-----+-----+-----+-----+-----+-----+
187      |0.0068775|0.0005129|0.0069017|0.0068780|0.0084152|0.0000000|
e188-----+-----+-----+-----+-----+-----+-----+
188      |0.0060904|0.0002433|0.0060965|0.0060910|0.0075263|0.0000000|
e189-----+-----+-----+-----+-----+-----+-----+
189      |0.0011152|0.0000442|0.0011163|0.0011152|0.0012242|0.0000000|
e250-----+-----+-----+-----+-----+-----+-----+
250      |0.1165974|0.0086182|0.1170004|0.1145498|0.1403819|0.0000004|
e251-----+-----+-----+-----+-----+-----+-----+
251      |0.0818697|0.0079414|0.0823564|0.0854601|0.1710172|0.0000002|
e252-----+-----+-----+-----+-----+-----+-----+
252      |0.1137084|0.0084547|0.1141061|0.1117833|0.1367825|0.0000004|
-----+-----+-----+-----+-----+-----+-----+

```

Plus grande valeur positive

```

Sc      0.1165974      Elément 250, Sc critère de contrainte axiale (CM66, CB71)
Tc      0.0086182      Elément 250, Tc contrainte de cisaillement/(0.65 S0), (CM66)
Mc      0.1170004      Elément 250, Mc critère de Mises (ou Tsai-Wu)
F_cm66 0.1145498      Elément 250, F_cm66 flambement simple (CM66 ou CB71)
D_cm66 0.1710172      Elément 251, D_cm66 flambement avec déversement (CM66)
V_cm66 0.0000004      Elément 250, V_cm66 voile CM66 pour profil en I (CM66)
-----+-----+-----+-----+-----+-----+-----+

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Propriété 6 UPN120  
Trémie Cuivre  
calcul 2 'calcul 0'

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-----+-----+-----+-----+-----+-----+-----+
CRITERES DE RUINE (CRITIQUES SI VALEUR > 1)
Sc critère de contrainte axiale (CM66, CB71)
Tc contrainte de cisaillement/(0.65 S0), (CM66)
Mc critère de Mises (ou Tsai-Wu)
F_cm66 flambement simple (CM66 ou CB71)
D_cm66 flambement avec déversement (CM66)
V_cm66 voile CM66 pour profil en I (CM66)
-----+-----+-----+-----+-----+-----+-----+

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```

Elément |      Sc |      Tc |      Mc |      F_cm66 |      D_cm66 |      V_cm66 |
-----+-----+-----+-----+-----+-----+-----+
e5-----+-----+-----+-----+-----+-----+-----+
5      |0.0045245|0.0001535|0.0045278|0.0045247|0.0049121|0.0000000|
e6-----+-----+-----+-----+-----+-----+-----+
6      |0.0042073|0.0002722|0.0042185|0.0042074|0.0046622|0.0000000|
e7-----+-----+-----+-----+-----+-----+-----+
7      |0.0046353|0.0001690|0.0046392|0.0046036|0.0049126|0.0000000|
e8-----+-----+-----+-----+-----+-----+-----+
8      |0.0060557|0.0003542|0.0060688|0.0060070|0.0070939|0.0000000|
e102-----+-----+-----+-----+-----+-----+-----+
102     |0.0017950|0.0000182|0.0017951|0.0017951|0.0020938|0.0000000|
e103-----+-----+-----+-----+-----+-----+-----+
103     |0.0039969|0.0000403|0.0039972|0.0039969|0.0043240|0.0000000|
e104-----+-----+-----+-----+-----+-----+-----+
104     |0.0040193|0.0000403|0.0040195|0.0040193|0.0043964|0.0000000|
e105-----+-----+-----+-----+-----+-----+-----+
105     |0.0041863|0.0001505|0.0041898|0.0041863|0.0045881|0.0000000|
e106-----+-----+-----+-----+-----+-----+-----+
106     |0.0076421|0.0006218|0.0076741|0.0074804|0.0101507|0.0000000|
e107-----+-----+-----+-----+-----+-----+-----+
107     |0.0071462|0.0005508|0.0071730|0.0069694|0.0094796|0.0000000|
e108-----+-----+-----+-----+-----+-----+-----+
108     |0.0056263|0.0002392|0.0056327|0.0055639|0.0064872|0.0000000|
e109-----+-----+-----+-----+-----+-----+-----+
109     |0.0054179|0.0003532|0.0054325|0.0052162|0.0063078|0.0000000|
e110-----+-----+-----+-----+-----+-----+-----+
110     |0.0063746|0.0003450|0.0063865|0.0061092|0.0075995|0.0000000|
e111-----+-----+-----+-----+-----+-----+-----+
111     |0.0097542|0.0003942|0.0097643|0.0097525|0.0103604|0.0000000|
-----+-----+-----+-----+-----+-----+-----+

```

Plus grande valeur positive

```
Sc    0.0097542    Elément 111, Sc critère de contrainte axiale (CM66, CB71)
Tc    0.0006218    Elément 106, Tc contrainte de cisaillement/(0.65 S0), (CM66)
Mc    0.0097643    Elément 111, Mc critère de Mises (ou Tsai-Wu)
F_cm66 0.0097525    Elément 111, F_cm66 flambement simple (CM66 ou CB71)
D_cm66 0.0103604    Elément 111, D_cm66 flambement avec déversement (CM66)
V_cm66 0.0000000    Elément 111, V_cm66 voile CM66 pour profil en I (CM66)
```

Propriété 7 RE120\_5X R120x120 5 - section rectangulaire creuse

Trémie Cuivre  
calcul 2 'calcul 0'

-----  
CRITERES DE RUINE (CRITIQUES SI VALEUR > 1)

```
Sc critère de contrainte axiale (CM66, CB71)
Tc contrainte de cisaillement/(0.65 S0), (CM66)
Mc critère de Mises (ou Tsai-Wu)
F_cm66 flambement simple (CM66 ou CB71)
D_cm66 flambement avec déversement (CM66)
V_cm66 voile CM66 pour profil en I (CM66)
```

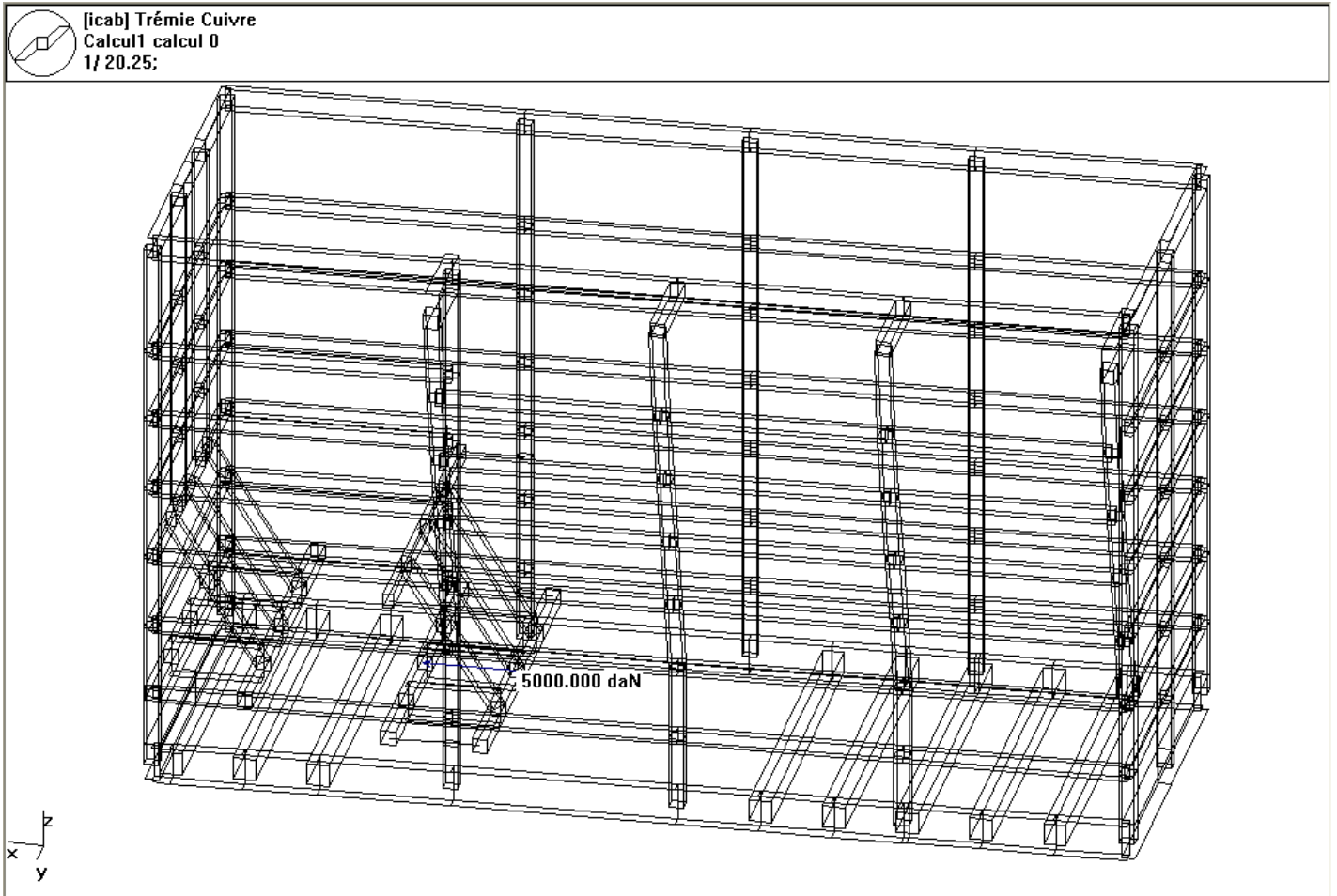
Elément	Sc	Tc	Mc	F_cm66	D_cm66	V_cm66
e13-----						
13	0.0001105	0.0000161	0.0001119	0.0001105	0.0001105	0.0000000
e14-----						
14	0.0001709	0.0000516	0.0001805	0.0001563	0.0001563	0.0000000
e15-----						
15	0.0009123	0.0001344	0.0009247	0.0009123	0.0009156	0.0000000
e16-----						
16	0.0002851	0.0000861	0.0003011	0.0002766	0.0002766	0.0000000
e17-----						
17	0.0006494	0.0001029	0.0006597	0.0006494	0.0006582	0.0000000
e18-----						
18	0.0026348	0.0001336	0.0026390	0.0017074	0.0017074	0.0000000
e19-----						
19	0.0005971	0.0000957	0.0006067	0.0005971	0.0006237	0.0000000
e20-----						
20	0.0000473	0.0000249	0.0000549	0.0000359	0.0000359	0.0000000

-----  
Plus grande valeur positive

```
Sc    0.0026348    Elément 18, Sc critère de contrainte axiale (CM66, CB71)
Tc    0.0001344    Elément 15, Tc contrainte de cisaillement/(0.65 S0), (CM66)
Mc    0.0026390    Elément 18, Mc critère de Mises (ou Tsai-Wu)
F_cm66 0.0017074    Elément 18, F_cm66 flambement simple (CM66 ou CB71)
D_cm66 0.0017074    Elément 18, D_cm66 flambement avec déversement (CM66)
V_cm66 0.0000000    Elément 18, V_cm66 voile CM66 pour profil en I (CM66)
```

## Modélisation de la structure et interprétation des résultats.

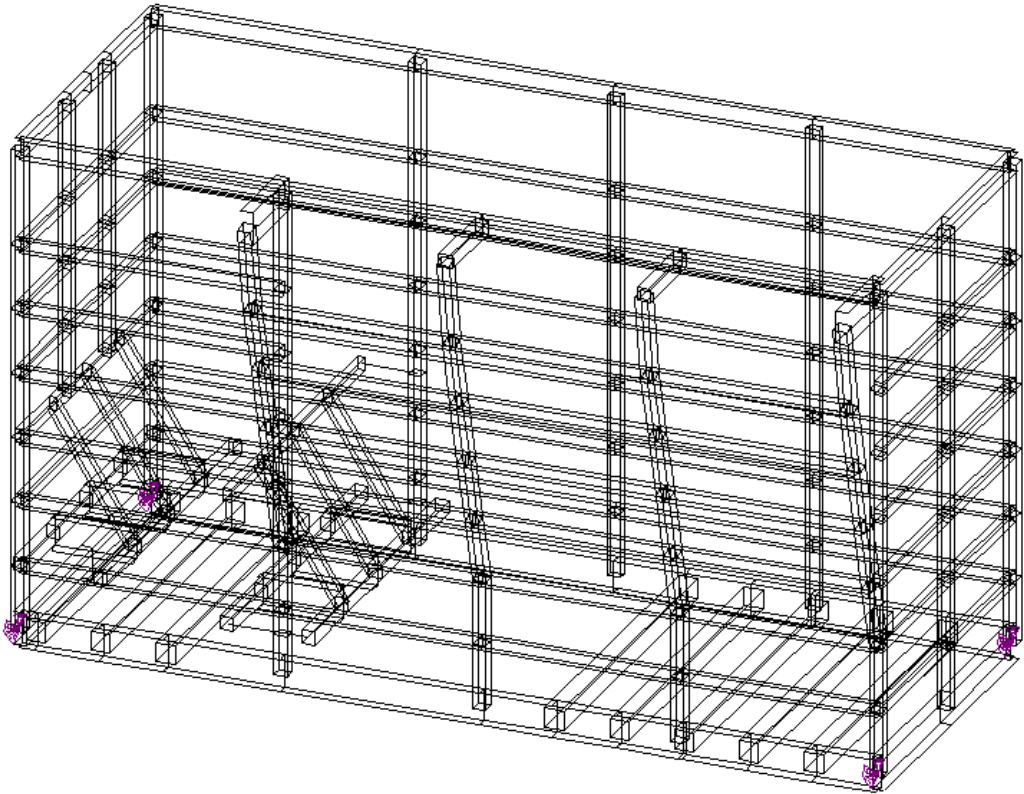
### 1. Charge.



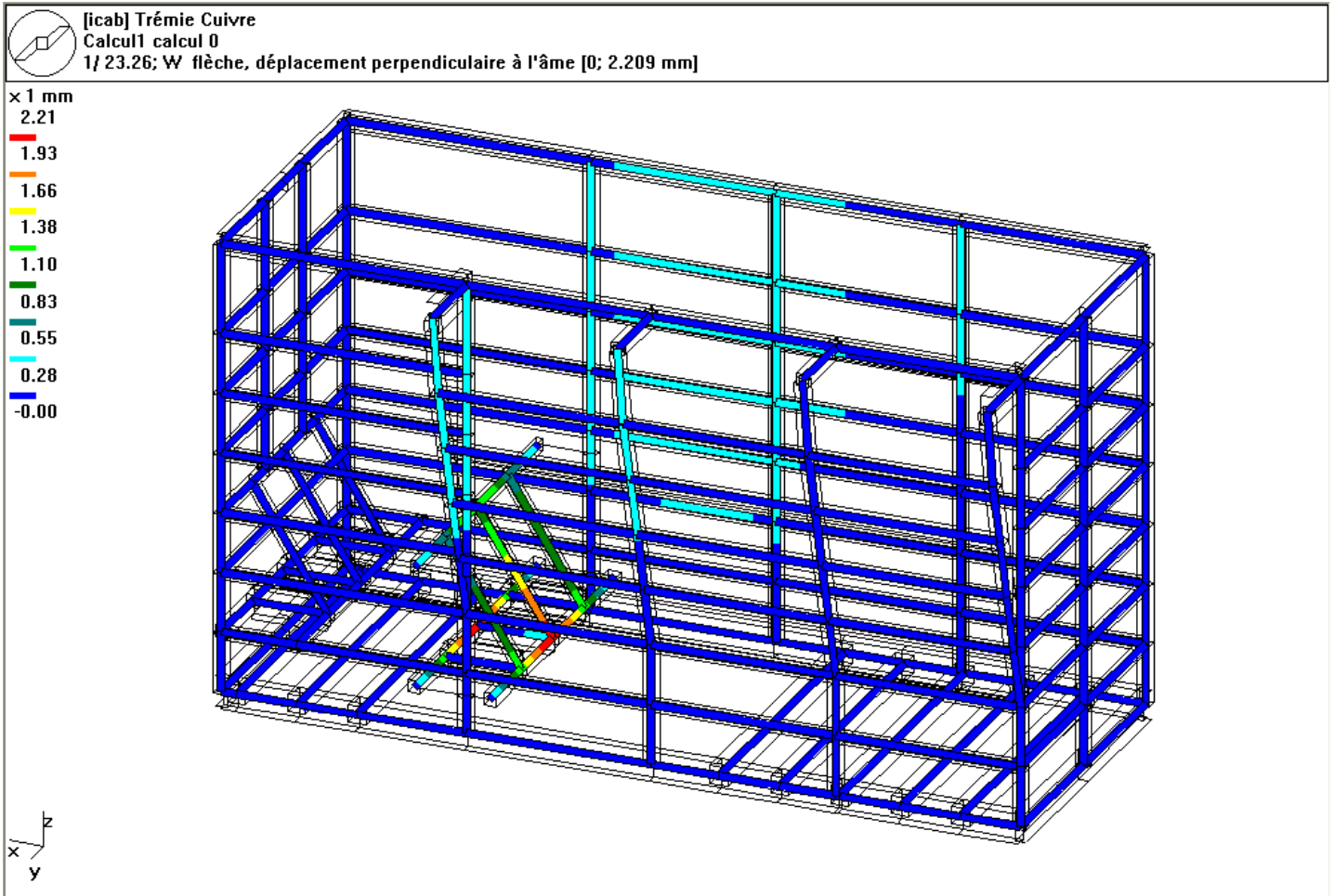
2. Blocages.



[icab] Trémie Cuivre  
Calcul1 calcul 0  
1/ 23.26;



3. Déplacement perpendiculaire à l'âme.



4. Flambement avec déversement. (CM66)

