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and the Government of Montenegro

INSTITUT ZA GRAĐEVINARSTVO

REPORT FROM THE FINITE ELEMENT MODELING AND EXPERIMENTAL INVESIGATION

Project: Design and development of prototypes of aluminum poles for the power system CFCU/MNE/272

INPUT PARAMETERS FOR DESIGN OF ALUMINUM TRUSS POLES FOR LOW-VOLTAGE LINES

The goal of the proposed project is to create a prototype of aluminum alloy poles for the transmission and distribution of electricity.

The key challenges arise from the need to optimize the poles in accordance with the configuration of the terrain and climatic conditions, as well as their parameters at the micro and macro level. The planned prototype of pillars made of aluminum alloys corresponds to the goals of sustainable development and energy efficiency in Montenegro. The project also fits into the strategies of sustainable development and green energy at the level of Montenegro and the European Union, supporting innovation, resource conservation and environmental protection.

Preliminary research in the field of aluminum application for transmission line pole constructions with a focus on design optimization, efficiency, profitability and structural integrity, the following conclusions were made:

- Advantages of high-strength aluminum alloys: Preference is given to the use of high-strength aluminum alloys compared to other aluminum alloys, with special emphasis on the use of alloys from the 6000 series;
- Optimization of aluminum profiles: Research on the use of aluminum sections obtained by applying the extrusion process as a substitute for traditional sections that are characteristic of steel structures of existing transmission lines, focusing on structural integrity, economy and optimization of the weight of said structures;
- Experimental tests of aluminum profiles: Conducting experimental studies of the behavior of extruded aluminum profiles under pressure, with the aim of contributing to the development of new design rules and optimization of the use of aluminum in constructions;
- Structural modeling and analysis: Focusing on the calculation and analysis of transmission line poles under wind load, emphasizing the consideration of dynamic load for more precise design and ensuring a higher degree of safety;
- Case Studies on Aluminum Transmission Poles: Examining case studies where aluminum has been used to construct transmission lines, demonstrating its economic advantages and reliability compared to steel.

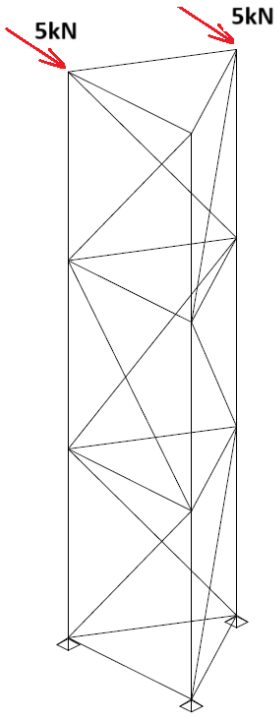
The project task defined the production of an aluminum column with a height of 12 m, which must be loaded with a resultant concentrated force of 10 kN at the top of the support in the elastic zone. The experimental test is performed for the last segment of the lattice girder.

FINITE ELEMENT MODEL

Modeling of the poles was carried out in the Tower 7 software package from Radimpex. Truss members are modeled as linear elements that can be axially loaded in compression or tension. The actual geometric characteristics of the cross-sections are defined. Material characteristics for the corresponding aluminum alloys as well as for the heat-affected zone are also incorporated in the model. Due to the software limited capabilities, as it is made for design of steel structures, there had to be made two models for each design solution:

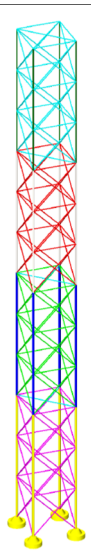
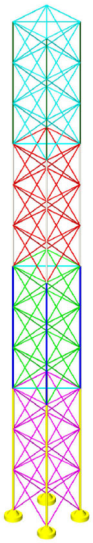
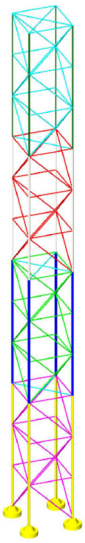
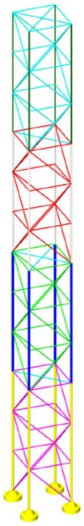
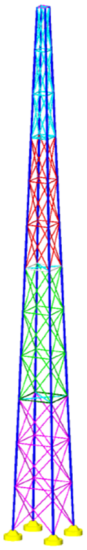
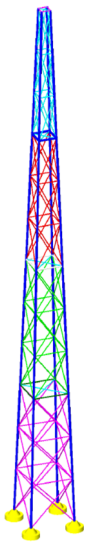
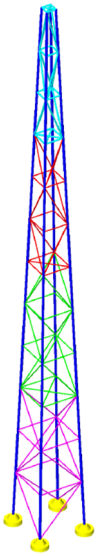
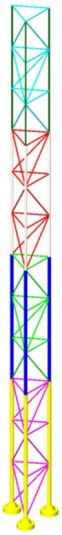
1. Model with the material characteristic of HAZ to check the load-bearing capacity of members in vicinity to the weld;
2. Model with material characteristics of the base material to check the stability of elements due to high slenderness and possibility of buckling.

Load was applied as static in the nodes at top of the truss in two nodes as concentrated forces perpendicular to the pole. The truss is supported with the simple supports with prevented displacement in any orthogonal direction but with free rotations around all axes.



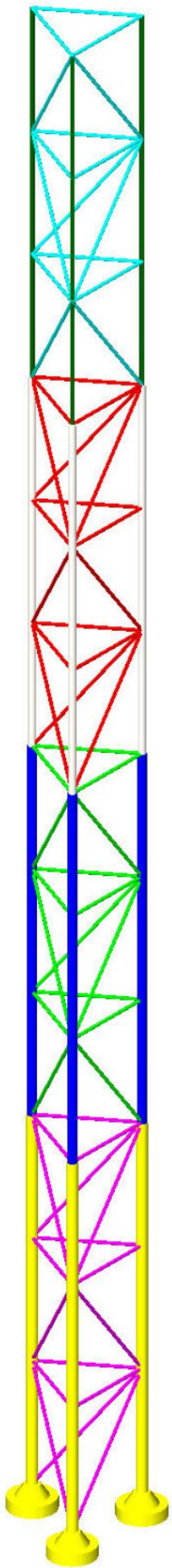
CONCEPTUAL DESIGN

As a result of finite element modeling, the following eight FEM models fulfilled the project task.

			
ST1 6061 T6	**ST1 6082 T6**	**ST2 6061 T6**	**ST2 6082 T6**
			
ST3 6061 T6	**ST3 6082 T6**	**ST4 6061 T6**	**ST5 6082 T6**

As all design solutions have the same performance, the most optimal solution was selected based on the amount of material required and the hours of manual labor spent on the prototype. Therefore, design solution with the code name ST5 6082 T6 emerged as the most optimal one based on previously mentioned criteria. Design solution ST5 6082 T6 is a truss with a triangular base of an equilateral triangle. It is designed using the alloy EN AW-6082-T6, which represents the alloy with the highest load capacity in the 6000 series of aluminum alloys.

RESULTS FROM FEM



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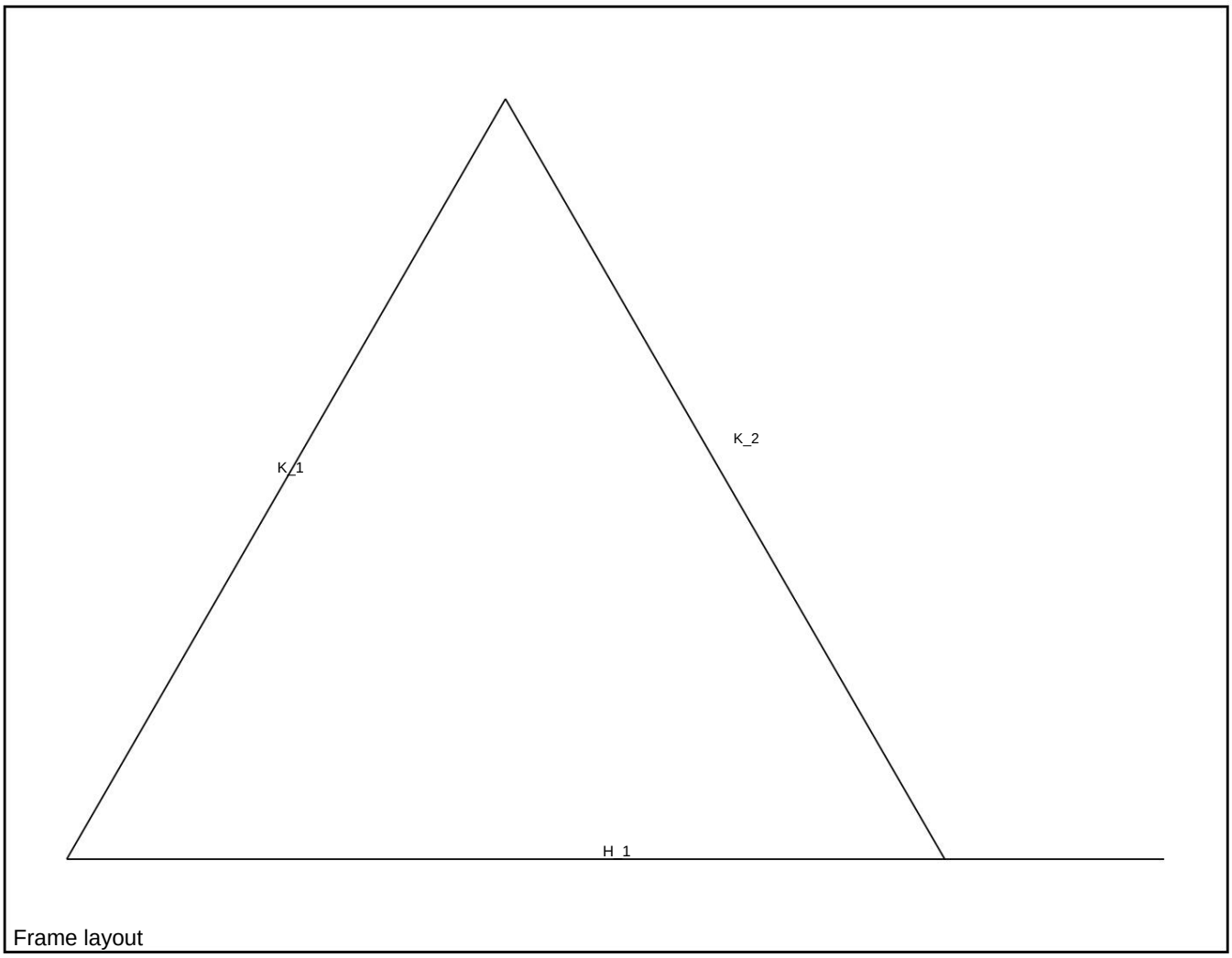
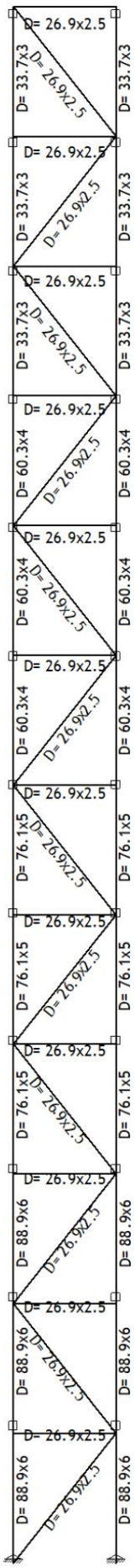


Frame layout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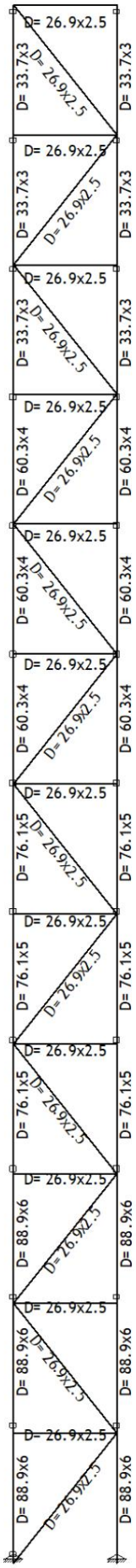
D= 88.9x6

Ram: K_1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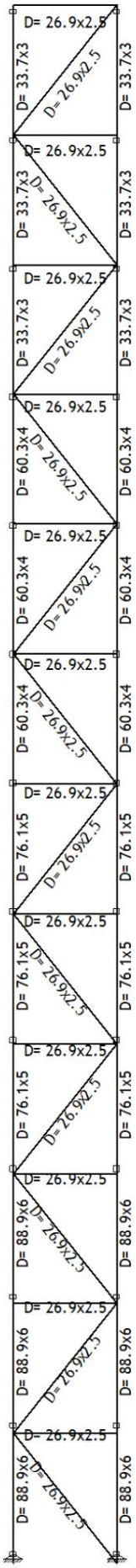
D= 88.9x6

Ram: K_2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D= 88.9x6
D= 26.9x2.5
D= 88.9x6
D= 26.9x2.5
D= 88.9x6
D= 26.9x2.5
D= 88.9x6

Ram: H_1

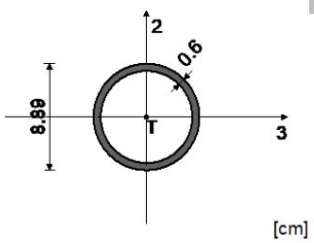
Table of materials

No	Material name	E[kN/m2]	ν	γ[kN/m3]	γt[1/C]	Em[kN/m2]	νm	
1	Aluminum	7.000e+7	0.30	27.00	2.300e-5	7.000e+7	0.30	

Beam sets

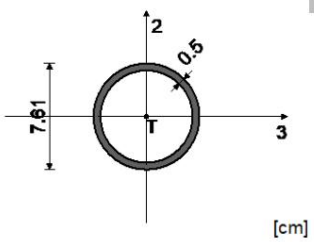
Set: 1 Section: D= 88.9x6, Prost stick, Fictitious eccentricity

	Matte.		A2	A3			I3
	1 - Aluminum	A1 1.663e-3	7.809e-4	7.809e-4	I1 2.697e-6	I2 1.349e-6	1.349e-6



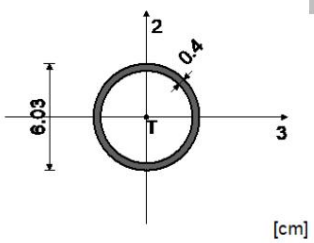
Set: 2 Section: D= 76.1x5, Prost stick, Fictitious eccentricity

	Matte.		A2	A3			I3
	1 - Aluminum	A1 1.117e-3	5.581e-4	5.581e-4	I1 1.418e-6	I2 7.092e-7	7.092e-7



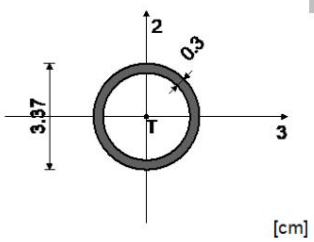
Set: 3 Section: D= 60.3x4, Simple rod, Fictitious eccentricity

	Matte.		A2	A3			I3
	1 - Aluminum	A1 7.070e-4	3.536e-4	3.536e-4	I1 5.632e-7	I2 2.817e-7	2.817e-7



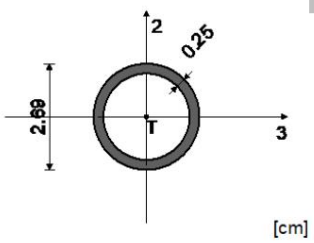
Set: 4 Section: D= 33.7x3, Prost stick, Fictitious eccentricity

	Matte.		A2	A3			I3
	1 - Aluminum	A1 2.890e-4	1.446e-4	1.446e-4	I1 6.879e-8	I2 3.440e-8	3.440e-8



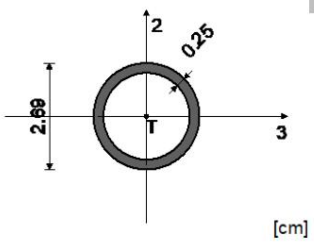
Set: 5 Section: D= 26.9x2.5, Simple rod, Fictitious eccentricity

	Matte.		A2	A3			I3
	1 - Aluminum	A1 1.920e-4	9.577e-5	9.577e-5	I1 2.881e-8	I2 1.440e-8	1.440e-8



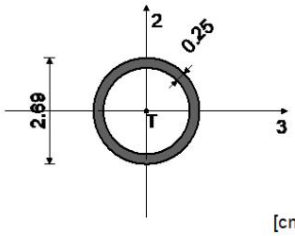
Set: 6 Section: D= 26.9x2.5, Simple rod, Fictitious eccentricity

	Matte.		A2	A3			I3
	1 - Aluminum	A1 1.920e-4	9.577e-5	9.577e-5	I1 2.881e-8	I2 1.440e-8	1.440e-8



Set: 7 Section: D= 26.9x2.5, Simple rod, Fictitious eccentricity

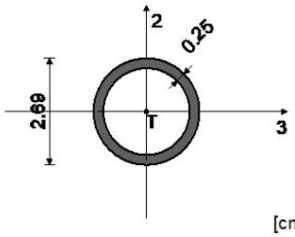
	Matte.	A1	A2	A3		I2	I3
	1 - Aluminum	1.920e-4	9.577e-5	9.577e-5	I1 2.881e-8	1.440e-8	1.440e-8



[cm]

Set: 8 Section: D= 26.9x2.5, Simple rod, Fictitious eccentricity

	Matte.	A1	A2	A3		I2	I3
	1 - Aluminum	1.920e-4	9.577e-5	9.577e-5	I1 2.881e-8	1.440e-8	1.440e-8



[cm]

Beam contours Set 1. D= 88.9x6

No	Node I	Node J	Releasing influence Node I M1	M2	M3	P1	P2	P3	Node J M1	M2	M3	P1	P2	P3	M	Position mark
	12															
1 2	33	1 6														
3	38	12														
4	45	15														
5	63	33														
6	72	38														
7	75	45														
8	93	63														
9	105	75														

Beam contours Set 2. D= 76.1x5

No	Node I	Node J	Releasing influence Node I Node J M1	M2	M3	P1	P2	P3	M1	M2	M3	P1	P2	P3	M	Position mark
1	98	72														
2	123	93														
3	132	98														
4	135	105														
5	153	123														
6	158	132														
7	165	135														
8	183	153														
9	195	165														

Beam contours Set 3. D= 60.3x4

No	Node I	Node J	Releasing influence Node I M1	M2	M3	P1	P2	P3	Node J M1	M2	M3	P1	P2	P3	M	Position mark
	192	158														
1 2	213	183														
3	218	192														
4	225	195														
5	243	213														
6	252	218														
7	255	225														
8	273	243														
9	285	255														

Beam contours Set 4. D= 33.7x3

No	Node I	Node J	Releasing influence Node I Node J M1	M2	M3	P1	P2	P3	M1	M2	M3	P1	P2	P3	M	Position mark
1	278	252														
2	303	273														
3	312	278														
4	315	285														
5	333	303														
6	338	312														
7	345	315														
8	359	333														
9	363	345														

Beam contours Set 5. D= 26.9x2.5

No	Node I	Node J	Releasing influence Node I M1	M2	M3	P1	P2	P3	Node J M1	M2	M3	P1	P2	P3	M	Position mark
		45														
1 2	1	12														
3	6	45														
4	6	33														
5	12 12	45														
6	12	63														
7	33	45														
8	38	63														
9	38	75														
10	38	105														
11	45	38														
12	45	63														
13	63	72														
14	63	75														
15	63	105														

16	72	93														
17	72	105														
18	93	105														

Beam contours Set 6. D= 26.9x2.5

No	Node I	Node J	Releasing influence												M	Position mark
			Node I						Node J							
			M1	M2	M3	P1	P2	P3	M1	M2	M3	P1	P2	P3		
	72	123														
1 2	98	123														
3	98	135														
4	98	165														
5	105	98														
6	105	123														
7	123	132														
8	123	135														
9	123	165														
10	132	153														
11	132	165														
12	132	183														
13	153	165														
14	158	183														
15	158	195														
16	165	158														
17	165	183														
18	183	195														

Beam contours Set 7. D= 26.9x2.5

No	Node I	Node J	Releasing influence												M	Position mark
			Node I						Node J							
			M1	M2	M3	P1	P2	P3	M1	M2	M3	P1	P2	P3		
	158	225														
1	183	192														
2 3	183	225														
4	192	213														
5	192	225														
6	192	243														
7	213	225														
8	218	243														
9	218	255														
10	218	285														
11	225	218														
12	225	243														
13	243	252														
14	243	255														
15	243	285														
16	252	273														
17	252	285														
18	273	285														

Beam contours Set 8. D= 26.9x2.5

No	Node I	Node J	Releasing influence												M	Position mark
			Node I Node J													
			M1	M2	M3	P1	P2	P3	M1	M2	M3	P1	P2	P3		
1	252	303														
2	278	303														
3	278	315														
4	278	345														
5	285	278														
6	285	303														
7	303	312														
8	303	315														
9	303	345														
10	312	333														
11	312	345														
12	312	359														
13	333	345														
14	338	359														
15	338	363														
16	345	338														
17	345	359														
18	359	363														

Contours of point supports

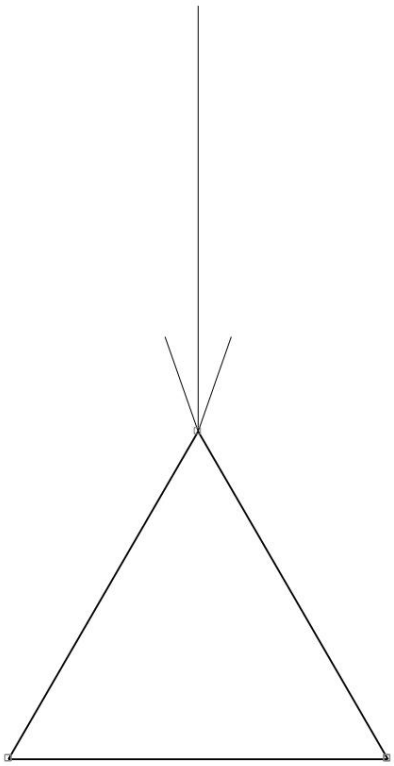
Nodes	Set
1, 6, 15	1

Input data - Load

List of load cases

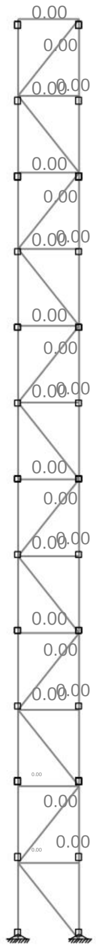
LC	Name	pX [kN]	pY [kN]	pZ [kN]
	constantly (g)	-0.00	-10.00	-1.31
1 2	Comb.: 1.35xl	-0.00	-13.50	-1.76
3	Comb.: I	-0.00	-10.00	-1.31

Charge 1: constant (g)

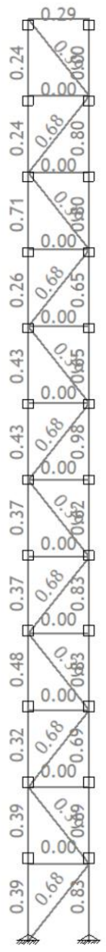


Level: [12.00 m]

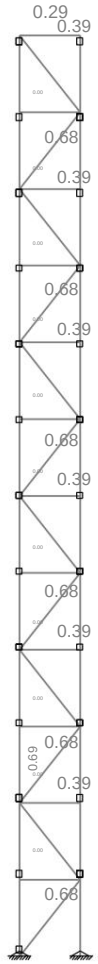
Dimensioning (steel)



Frame: H_1
Stability control



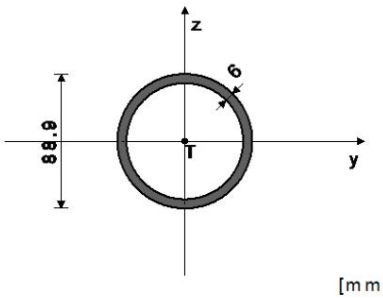
Ram: K_1
Kontrola stabilnosti



Frame: K_2
Stability control

STICK 38-72
CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 1]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	16.630 cm2
Ay =	7.809 cm2
Az =	7.809 cm2
Ix =	269.75 cm4
Iy =	134.94 cm4
From =	134.94 cm4
Wy =	30.358 cm3
Wz =	30.358 cm3
Wy,pl =	41.306 cm3
Wz,pl =	41.306 cm3
ÿM0 =	1.000
ÿM1 =	1.000
ÿM2 =	1.000
Anet/A =	0.900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS
3. ÿ=0.32

A ROD EXPOSED TO CENTRAL PRESSURE
(load case 3, end of rod)

Calculation normal force	NO =	-65.272 kN
System rod length	L =	100.00 cm

5.5 CLASSIFICATION OF CROSS SECTIONS
Section class 1

6.2 LOAD CAPACITY OF CROSS-SECTIONS
6.2.4 Pressure

Calculation resistance to pressure Condition 6.9: NEd <= Nc,Rd (65.27 <= 207.88)	Nc,Rd =	207.88 kN

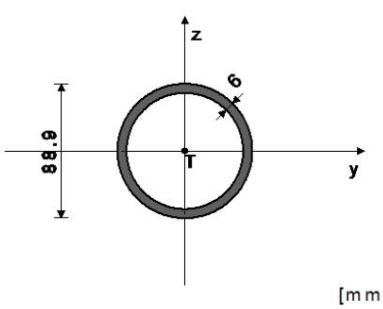
6.3 BENDING CAPACITY OF ELEMENTS 6.3.1.1 Buckling

capacity **Buckling length** yy		
Relative slenderness yy	l,y =	100.00 cm
Buckling curve for axis	ÿ_y = ÿ	0.273
yy: A **Elastic critical force**	=	0.210
Reduction coefficient	Ncr,y =	2796.8 kN
Calculated buckling	**ÿ,y =**	0.984
resistance Condition 6.46: NEd <= Nb,Rd,y (65.27 <= 204.51)	Nb,Rd,y =	204.51 kN

Buckling length zz	l,z =	100.00 cm
Relative slenderness of the zz	**ÿ_z =**	0.273
Buckling curve for axis zz: A	ÿ =	0.210
Reduction coefficient	**ÿ,z =**	0.984
Calculation resistance to buckling	Nb,Rd,z =	204.51 kN
Condition 6.46: NEd <= Nb,Rd,z (65.27 <= 204.51)		

ROD 12-38
CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 1]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	16.630 cm2
Ay =	7.809 cm2
Az =	7.809 cm2
Ix =	269.75 cm4
Iy =	134.94 cm4
From =	134.94 cm4
Wy =	30.358 cm3
Wz =	30.358 cm3
Wy,pl =	41.306 cm3
Wz,pl =	41.306 cm3
ÿM0 =	1.000
ÿM1 =	1.000
ÿM2 =	1.000
Anet/A =	0.900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS
3. ÿ=0.39

A ROD EXPOSED TO CENTRAL PRESSURE
(load case 3, end of rod)

Calculation normal force	NO =	-79.762 kN
System rod length	L =	100.00 cm

5.5 CLASSIFICATION OF CROSS SECTIONS
Section class 1

6.2 LOAD CAPACITY OF CROSS-SECTIONS
6.2.4 **Pressure**

Calculation resistance to pressure Condition 6.9: NEd <= Nc,Rd (79.76 <= 207.88)	Nc,Rd =	207.88 kN

6.3 ELEMENTS BUCKLING CAPACITY 6.3.1.1 Buckling

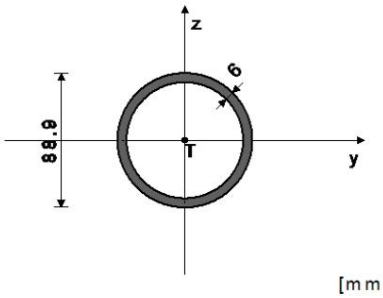
capacity **Buckling length** yy		
Relative slenderness yy	l,y =	100.00 cm
Buckling curve for axis	**ÿ_y =**	0.273
yy: A **Elastic critical force**	ÿ =	0.210
Reduction coefficient	Ncr,y =	2796.8 kN
Calculated buckling	**ÿ,y =**	0.984
resistance	Nb,Rd,y =	204.51 kN

Condition 6.46: NEd <= Nb,Rd,y (79.76 <= 204.51)

Buckling length zz	l,z =	100.00 cm
Relative slenderness of the zz	**ÿ_z =**	0.273
Buckling curve for axis zz: A	ÿ =	0.210
Reduction coefficient	**ÿ,z =**	0.984
Calculation resistance to buckling	Nb.Rd,z =	204.51 kN
Condition 6.46: NEd <= Nb,Rd,z (79.76 <= 204.51)		

ROD 1-12
CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 1]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	16.630 cm2
Ay =	7.809 cm2
Az =	7.809 cm2
Ix =	269.75 cm4
Iy =	134.94 cm4
From =	134.94 cm4
Wy =	30.358 cm3
Wz =	30.358 cm3
Wy,pl =	41.306 cm3
Wz,pl =	41.306 cm3
ÿM0 =	1.000
ÿM1 =	1.000
ÿM2 =	1.000
Anet/A =	0.900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

3. ÿ=0.39

A ROD EXPOSED TO CENTRAL PRESSURE
(load case 3, end of rod)

Calculation normal force	NO =	-79.818 kN
System rod length	L =	100.00 cm

5.5 CLASSIFICATION OF CROSS SECTIONS

Section class 1

6.2 LOAD CAPACITY OF CROSS-SECTIONS

6.2.4 **Pressure**

Calculation resistance to pressure	Nc,Rd =	207.88 kN
Condition 6.9: NEd <= Nc,Rd (79.82 <= 207.88)		

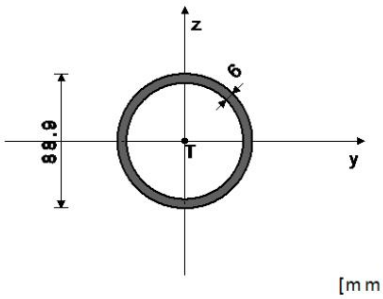
6.3 BENDING CAPACITY OF ELEMENTS 6.3.1.1 Buckling

capacity **Buckling length** yy		
Relative slenderness yy	l,y =	100.00 cm
Buckling curve for axis	**ÿ_y =**	0.273
yy: A **Elastic critical force**	ÿ =	0.210
Reduction coefficient	Ncr,y =	2796.8 kN
Calculated resistance to	**ÿ,y =**	0.984
buckling Condition 6.46: NEd <= Nb,Rd,y (79.82 <= 204.51)	Nb,Rd,y =	204.51 kN

Buckling length zz	l,z =	100.00 cm
Relative slenderness zz	**ÿ_z =**	0.273
Buckling curve for axis zz: A	ÿ =	0.210
Reduction coefficient	**ÿ,z =**	0.984
Calculated resistance to buckling	Nb.Rd,z =	204.51 kN
Condition 6.46: NEd <= Nb,Rd,z (79.82 <= 204.51)		

ROD 33-63
CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 1]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	16.630 cm2
Ay =	7.809 cm2
Az =	7.809 cm2
Ix =	269.75 cm4
Iy =	134.94 cm4
From =	134.94 cm4
Wy =	30.358 cm3
Wz =	30.358 cm3
Wy,pl =	41.306 cm3
Wz,pl =	41.306 cm3
ÿM0 =	1.000
ÿM1 =	1.000
ÿM2 =	1.000
Anet/A =	0.900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

3. ÿ=0.39

A ROD EXPOSED TO CENTRAL PRESSURE
(load case 3, end of rod)

Calculation normal force	NO =	-79.765 kN
System rod length	L =	100.00 cm

5.5 CLASSIFICATION OF CROSS SECTIONS

Section class 1

6.2 LOAD CAPACITY OF CROSS-SECTIONS

6.2.4 Pressure

Calculation resistance to pressure	Nc,Rd =	207.88 kN
Condition 6.9: NEd <= Nc,Rd (79.77 <= 207.88)		

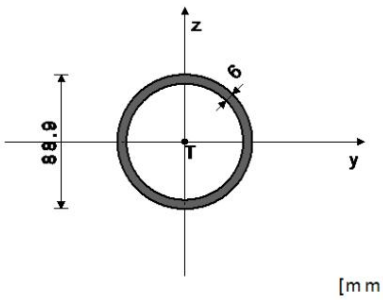
6.3 BENDING CAPACITY OF ELEMENTS 6.3.1.1 Buckling

capacity **Buckling length** yy		
Relative slenderness yy	l,y =	100.00 cm
Buckling curve for axis	ÿ_y = ÿ	0.273
yy: A **Elastic critical force**	=	0.210
Reduction coefficient	Ncr,y =	2796.8 kN
Calculated resistance to	**ÿ,y =**	0.984
buckling Condition 6.46: NEd <= Nb,Rd,y (79.77 <= 204.51)	Nb,Rd,y =	204.51 kN

Buckling length zz	l,z =	100.00 cm
Relative slenderness zz	**ÿ_z =**	0.273
Buckling curve for axis zz: A	ÿ =	0.210
Reduction coefficient	**ÿ,z =**	0.984
Calculated buckling resistance	Nb.Rd,z =	204.51 kN
Condition 6.46: NEd <= Nb,Rd,z (79.77 <= 204.51)		

ROD 6-33
CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 1]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	16.630 cm2
Ay =	7.809 cm2
Az =	7.809 cm2
Ix =	269.75 cm4
Iy =	134.94 cm4
From =	134.94 cm4
Wy =	30.358 cm3
Wz =	30.358 cm3
Wy,pl =	41.306 cm3
Wz,pl =	41.306 cm3
ÿM0 =	1.000
ÿM1 =	1.000
ÿM2 =	1.000
Anet/A =	0.900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

3. ÿ=0.39

A ROD EXPOSED TO CENTRAL PRESSURE
(load case 3, end of rod)

Calculation normal force	NO =	-79.814 kN
System rod length	L =	100.00 cm

5.5 CLASSIFICATION OF CROSS SECTIONS

Section class 1

6.2 LOAD CAPACITY OF CROSS-SECTIONS

6.2.4 **Pressure**

Calculation resistance to pressure	Nc,Rd =	207.88 kN
Condition 6.9: NEd <= Nc,Rd (79.81 <= 207.88)		

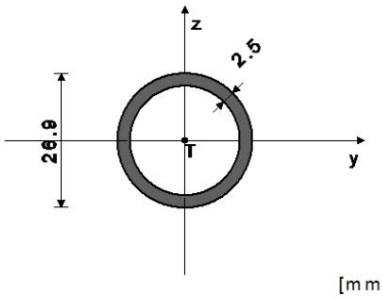
6.3 LOAD CAPACITY OF ELEMENTS AGAINST BULLION

6.3.1.1 Buckling capacity **Buckling**		
length yy Relative	l,y =	100.00 cm
slenderness yy Buckling	ÿ_y = ÿ	0.273
curve for axis yy: A **Elastic critical**	=	0.210
force	Ncr,y =	2796.8 kN
Reduction coefficient	**ÿ,y =**	0.984
Calculation resistance to buckling	Nb,Rd,y =	204.51 kN
Condition 6.46: NEd <= Nb,Rd,y (79.81 <= 204.51)		

Buckling length zz	l,z =	100.00 cm
Relative slenderness zz	ÿ_z = ÿ	0.273
Buckling curve for axis zz: A	= ÿ,z	0.210
Reduction coefficient	=	0.984
Calculated buckling resistance	Nb.Rd,z =	204.51 kN
Condition 6.46: NEd <= Nb,Rd,z (79.81 <= 204.51)		

STICK 338-345
CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 8]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

3. ÿ=0.39

ROD EXPOSED TO CENTRIC TENSION

(load case 3, end of rod)

Calculation normal force	NO =	9.245 kN
System rod length	L =	128.06 cm

6.2 LOAD CAPACITY OF CROSS-SECTIONS

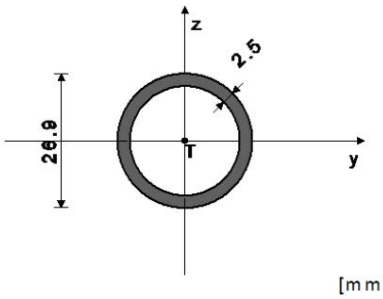
6.2.3 Tension

Plastic calculated resistance of gross	Npl,Rd =	24,000 kN
section Limit calculated	Nu,Rd =	28,771 kN
resistance		
of net section Calculated **resp. for**	Nt,Rd =	24,000 kN
tensioning Condition 6.5: NEd <= Nt,Rd (9.24 <= 24.00)		

STICK 345-278

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 8]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

3. ÿ=0.68

A ROD EXPOSED TO CENTRAL PRESSURE

(load case 3, beginning of the rod)

Calculation normal force	NO =	-9.245 kN
System rod length	L =	128.06 cm

5.5 CLASSIFICATION OF CROSS SECTIONS Section class 1

6.2 LOAD CAPACITY OF CROSS-SECTIONS

6.2.4 **Pressure**

Calculation resistance to pressure	Nc,Rd =	24,000 kN
Condition 6.9: NEd <= Nc,Rd (9.24 <= 24.00)		

6.3 BENDING CAPACITY OF ELEMENTS 6.3.1.1 Buckling capacity Buckling length yy Relative

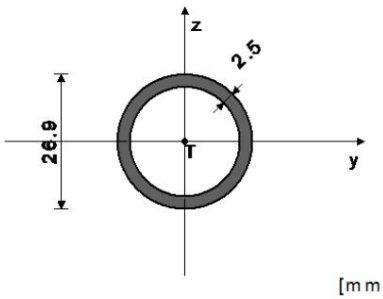
slenderness yy Buckling	l,y =	128.06 cm
curve for axis yy: A	ÿ_y = ÿ	1.148
Elastic critical force Reduction	=	0.210
coefficient **Calculated**	Ncr,y =	18.199 kN
resistance to buckling	**ÿ,y =**	0.563
Condition 6.46: NEd <= Nb,Rd,y (9.24 <= 13.52)	Nb,Rd,y =	13.522 kN

Buckling length zz	l,z =	128.06 cm
Relative slenderness zz	**ÿ_z =**	1.148
Buckling curve for axis zz: A	ÿ =	0.210
Reduction coefficient	**ÿ,z =**	0.563
Calculated buckling resistance	Nb.Rd,z =	13.522 kN
Condition 6.46: NEd <= Nb,Rd,z (9.24 <= 13.52)		

STICK 278-285

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 8]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

3. ÿ=0.39

ROD EXPOSED TO CENTRIC TENSION

(load case 3, end of rod)

Calculation normal force	NO =	9.245 kN
System rod length	L =	128.06 cm

6.2 LOAD CAPACITY OF CROSS-SECTIONS

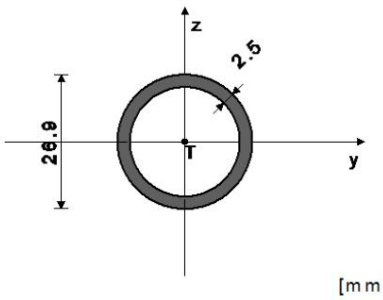
6.2.3 Tension

Plastic calculated resistance of gross	Npl,Rd =	24,000 kN
section Limit calculated	Nu,Rd =	28,771 kN
resistance		
of net section Calculated **resp. for**	Nt,Rd =	24,000 kN
tensioning Condition 6.5: NEd <= Nt,Rd (9.24 <= 24.00)		

STICK 285-218

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 7]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

3. ÿ=0.68

A ROD EXPOSED TO CENTRAL PRESSURE

(load case 3, beginning of the rod)

Calculation normal force	NO =	-9.245 kN
System rod length	L =	128.06 cm

5.5 CLASSIFICATION OF CROSS SECTIONS

Section class 1

6.2 LOAD CAPACITY OF CROSS-SECTIONS

6.2.4 **Pressure**

Calculation resistance to pressure	Nc,Rd =	24,000 kN
Condition 6.9: NEd <= Nc,Rd (9.24 <= 24.00)		

6.3 BENDING CAPACITY OF ELEMENTS 6.3.1.1 Buckling capacity **Buckling length** yy

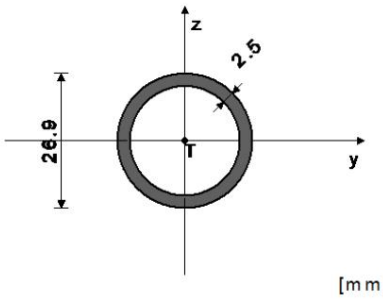
Relative slenderness yy	l,y =	128.06 cm
Buckling curve for axis	**ÿ_y =**	1.148
yy: A **Elastic critical force**	ÿ =	0.210
Reduction coefficient	Ncr,y =	18.199 kN
Calculated resistance to	**ÿ,y =**	0.563
buckling Condition 6.46: NEd <= Nb,Rd,y (9.24 <= 13.52)	Nb,Rd,y =	13.522 kN

Buckling length zz	l,z =	128.06 cm
Relative slenderness zz	**ÿ_z =**	1.148
Buckling curve for axis zz: A	ÿ =	0.210
Reduction coefficient	**ÿ,z =**	0.563
Calculated buckling resistance	Nb.Rd,z =	13.522 kN
Condition 6.46: NEd <= Nb,Rd,z (9.24 <= 13.52)		

ROD 218-225

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 7]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS
3. ÿ=0.39

ROD EXPOSED TO CENTRIC TENSION
(load case 3, end of rod)

Calculation normal force	NO =	9.245 kN
System rod length	L =	128.06 cm

6.2 LOAD CAPACITY OF CROSS-SECTIONS

6.2.3 Tensile

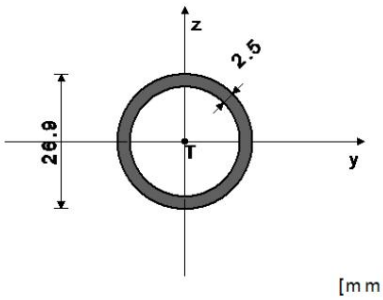
Plastic resistance of the gross cross-	Npl,Rd =	24,000 kN
section Limit resistance of the	Nu,Rd =	28,771 kN
net **cross-**		
section Comput. for tensioning	Nt,Rd =	24,000 kN

Condition 6.5: NEd <= Nt,Rd (9.24 <= 24.00)

STICK 225-158

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 7]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS 3. ÿ=0.68

A ROD EXPOSED TO CENTRAL PRESSURE
(load case 3, beginning of the rod)

Calculation normal force	NO =	-9.245 kN
System rod length	L =	128.06 cm

5.5 CLASSIFICATION OF CROSS SECTIONS

Section class 1

6.2 LOAD CAPACITY OF CROSS-SECTIONS

6.2.4 Pressure

Calculation resistance to pressure	Nc,Rd =	24,000 kN

Condition 6.9: NEd <= Nc,Rd (9.24 <= 24.00)

6.3 BENDING CAPACITY OF ELEMENTS 6.3.1.1 Buckling

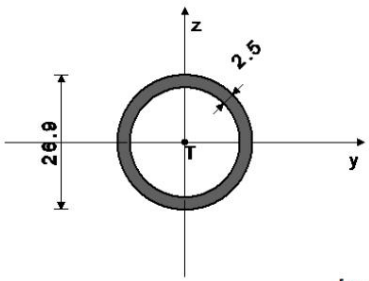
capacity **Buckling length** yy		
Relative slenderness yy	l,y =	128.06 cm
Buckling curve for axis	ÿ_y = ÿ	1.148
yy: A **Elastic critical force**	=	0.210
Reduction coefficient	Ncr,y =	18.199 kN
Calculated resistance to	**ÿ,y =**	0.563
buckling Condition 6.46: NEd <=	Nb,Rd,y =	13.522 kN
Nb,Rd,y (9.24 <= 13.52)		
Buckling length zz	l,z =	128.06 cm
Relative slenderness of the zz	**ÿ_z =**	1.148
Buckling curve for axis zz: A	ÿ =	0.210
Reduction coefficient	**ÿ,z =**	0.563
Calculation resistance to buckling	Nb.Rd,z =	13.522 kN

Condition 6.46: NEd <= Nb,Rd,z (9.24 <= 13.52)

STICK 158-165

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 6]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS
3. ÿ=0.39

ROD EXPOSED TO CENTRIC TENSION
(load case 3, end of rod)

Calculation normal force	NO =	9.245 kN
System rod length	L =	128.06 cm

6.2 LOAD CAPACITY OF CROSS-SECTIONS

6.2.3 Tension

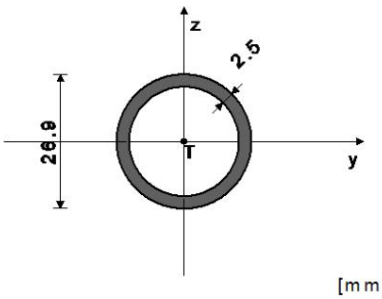
Plastic calculated resistance of	Npl,Rd =	24,000 kN
gross section Limit calculated	Nu,Rd =	28,771 kN
resistance of net section	Nt,Rd =	24,000 kN

Calculated **resp. for tensioning Condition 6.5: NEd <= Nt,Rd (9.24 <= 24.00)**

STICK 165-98

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 6]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS 3. ÿ=0.68

A ROD EXPOSED TO CENTRAL PRESSURE
(load case 3, beginning of the rod)

Calculation normal force	NO =	-9.245 kN
System rod length	L =	128.06 cm

5.5 CLASSIFICATION OF CROSS SECTIONS
Section class 1

6.2 LOAD CAPACITY OF CROSS-SECTIONS
6.2.4 **Pressure**

Calculation resistance to pressure	Nc,Rd =	24,000 kN
Condition 6.9: NEd <= Nc,Rd (9.24 <= 24.00)		

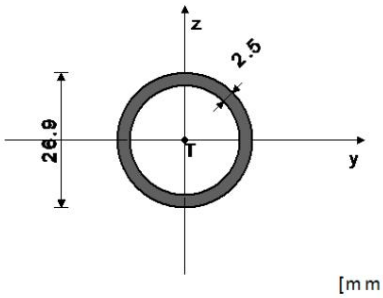
6.3 LOAD CAPACITY OF ELEMENTS AGAINST BULLION
6.3.1.1 Buckling resistance

Bending length yy	l,y =	128.06 cm
Relative slenderness yy	**ÿ_y =**	1.148
Buckling curve for the yy axis: A	ÿ =	0.210
Elastic critical force	Ncr,y =	18.199 kN
Reduction coefficient	**ÿ,y =**	0.563
Calculation resistance to buckling	Nb,Rd,y =	13.522 kN
Condition 6.46: NEd <= Nb,Rd,y (9.24 <= 13.52)		

Buckling length zz	l,z =	128.06 cm
Relative slenderness of the zz	**ÿ_z =**	1.148
Buckling curve for axis zz: A	ÿ =	0.210
Reduction coefficient	**ÿ,z =**	0.563
Calculation resistance to buckling	Nb.Rd,z =	13.522 kN
Condition 6.46: NEd <= Nb,Rd,z (9.24 <= 13.52)		

STICK 98-105
CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 6]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS
3. ÿ=0.39

ROD EXPOSED TO CENTRIC TENSION
(load case 3, end of rod)

Calculation normal force	NO =	9.245 kN
System rod length	L =	128.06 cm

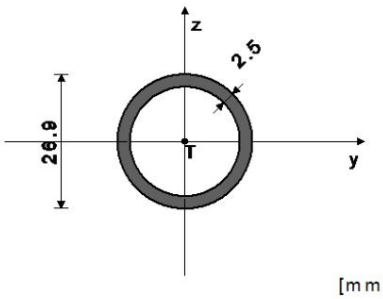
6.2 LOAD CAPACITY OF CROSS-SECTIONS
6.2.3 Tension

Plastic calculated resistance of	Npl,Rd =	24,000 kN
gross section Limit calculated	Nu,Rd =	28,771 kN
resistance of net section	Nt,Rd =	24,000 kN

Calculated **resp. for tensioning Condition 6.5: NEd <= Nt,Rd (9.24 <= 24.00)**

ROD 105-38
CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 5]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS
3. ÿ=0.68

A ROD EXPOSED TO CENTRAL PRESSURE
(load case 3, beginning of the rod)

Calculation normal force	NO =	-9.245 kN
System rod length	L =	128.06 cm

5.5 CLASSIFICATION OF CROSS SECTIONS
Section class 1

6.2 LOAD CAPACITY OF CROSS-SECTIONS
6.2.4 **Pressure**

Calculation resistance to pressure	Nc,Rd =	24,000 kN
Condition 6.9: NEd <= Nc,Rd (9.24 <= 24.00)		

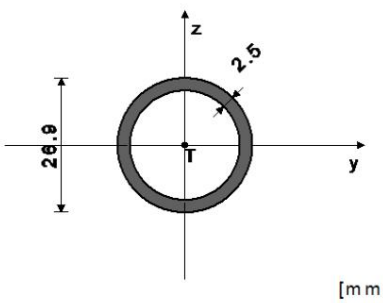
6.3 LOAD CAPACITY OF ELEMENTS AGAINST BULLION
6.3.1.1 Buckling capacity **Buckling length** yy Relative slenderness yy Buckling curve for axis yy: A **Elastic critical force** Reduction coefficient

Calculation resistance to buckling	l,y =	128.06 cm
Condition 6.46: NEd <= Nb,Rd,y (9.24 <= 13.52)	**ÿ_y =**	1.148
	ÿ =	0.210
	Ncr,y =	18.199 kN
	ÿ,y =	0.563
	Nb,Rd,y =	13.522 kN

Buckling length zz	l,z =	128.06 cm
Relative slenderness zz	**ÿ_z =**	1.148
Buckling curve for axis zz: A	ÿ =	0.210
Reduction coefficient	**ÿ,z =**	0.563
Calculated buckling resistance	Nb.Rd,z =	13.522 kN
Condition 6.46: NEd <= Nb,Rd,z (9.24 <= 13.52)		

STICK 38-45
CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 5]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS
3. ÿ=0.39

ROD EXPOSED TO CENTRIC TENSION
(load case 3, end of rod)

Calculation normal force	NO =	9.245 kN
System rod length	L =	128.06 cm

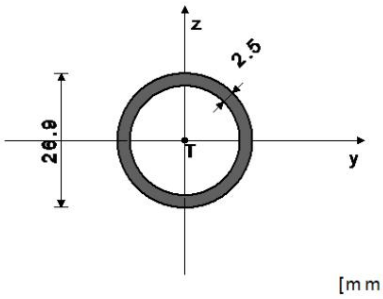
6.2 LOAD CAPACITY OF CROSS-SECTIONS
6.2.3 Tension

Plastic calculated resistance of	Npl,Rd =	24,000 kN
gross section Limit calculated	Nu,Rd =	28,771 kN
resistance of net section	Nt,Rd =	24,000 kN

Calculated **resp. for tensioning Condition 6.5: NEd <= Nt,Rd (9.24 <= 24.00)**

STICK 45-1
CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 5]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

3. ÿ=0.68

A ROD EXPOSED TO CENTRAL PRESSURE

(load case 3, beginning of the rod)

Calculation normal force	NO =	-9.245 kN
System rod length	L =	128.06 cm

5.5 CLASSIFICATION OF CROSS SECTIONS

Section class 1

6.2 LOAD CAPACITY OF CROSS-SECTIONS

6.2.4 **Pressure**

Calculation resistance to pressure	Nc,Rd =	24,000 kN
Condition 6.9: NEd <= Nc,Rd (9.24 <= 24.00)		

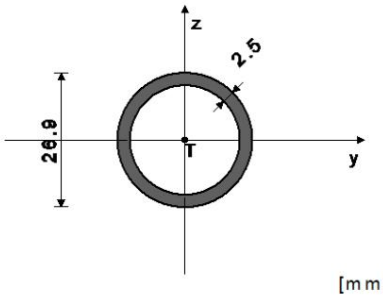
6.3 BENDING CAPACITY OF ELEMENTS 6.3.1.1 Buckling

capacity **Buckling length** yy		
Relative slenderness yy	l,y =	128.06 cm
Buckling curve for axis	**ÿ_y =**	1.148
yy: A **Elastic critical force**	ÿ =	0.210
Reduction coefficient	Ncr,y =	18.199 kN
Calculated resistance to	**ÿ,y =**	0.563
buckling Condition 6.46: NEd <=	Nb,Rd,y =	13.522 kN
Nb,Rd,y (9.24 <= 13.52)		
Buckling length zz	l,z =	128.06 cm
Relative slenderness zz	**ÿ_z =**	1.148
Buckling curve for axis zz: A	ÿ =	0.210
Reduction coefficient	**ÿ,z =**	0.563
Calculated buckling resistance	Nb.Rd,z =	13.522 kN
Condition 6.46: NEd <= Nb,Rd,z (9.24 <= 13.52)		

STICK 359-312

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 8]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

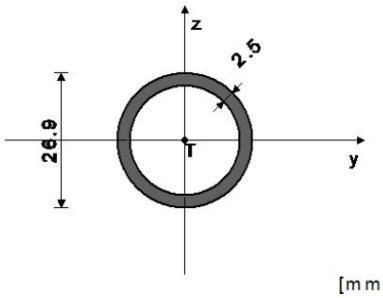
3. ÿ=0.00

No influence

STICK 312-303

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 8]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

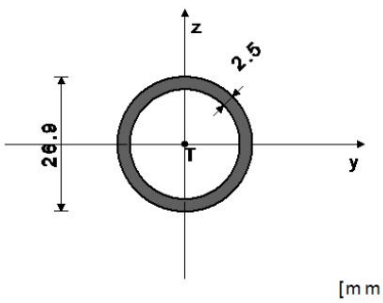
3. ÿ=0.00

No influence

STICK 303-252

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 8]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

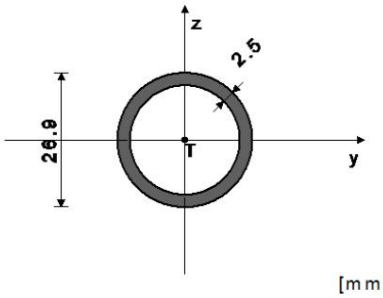
3. ÿ=0.00

No influence

STICK 252-243

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 7]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

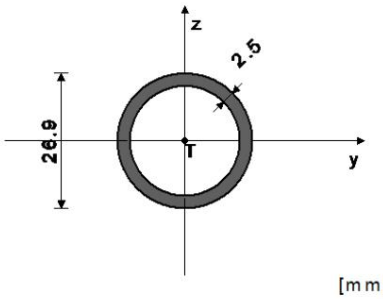
3. ÿ=0.00

No influence

STICK 243-192

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 7]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

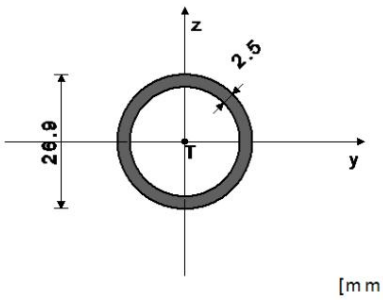
3. ÿ=0.00

No influence

STICK 192-183

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 7]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

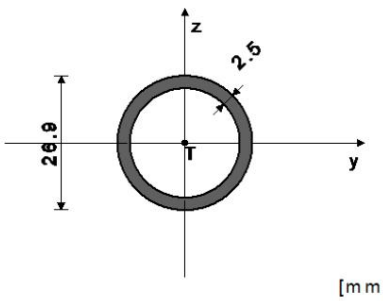
3. ÿ=0.00

No influence

STICK 183-132

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 6]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

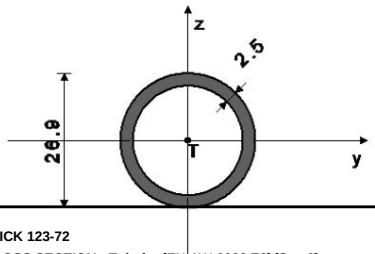
3. ÿ=0.00

No influence

STICK 132-123

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 6]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

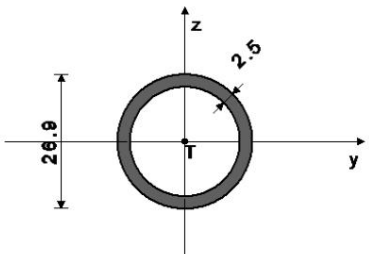
3. ÿ=0.00

No influence

STICK 123-72

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 6]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

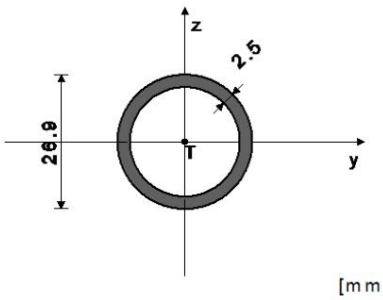
3. ÿ=0.00

No influence

STICK 72-63

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 5]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

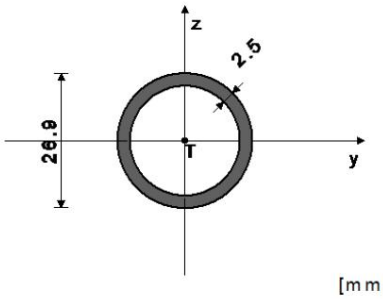
3. ÿ=0.00

No influence

STICK 63-12

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 5]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

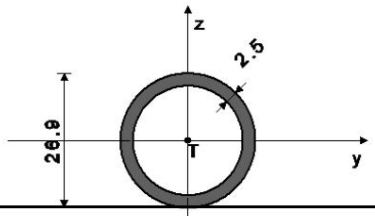
3. ÿ=0.00

No influence

STICK 12-6

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 5]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

3. ÿ=0.00

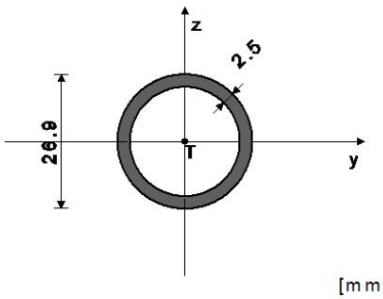
No influence

STICK 359-345

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 8]
EUROCODE 3 (EN 1993-1-1:2005)

[mm]

GEOMETRIC CHARACTERISTICS OF SECTIONS



Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

[mm]

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

3. ÿ=0.39

ROD EXPOSED TO CENTRIC TENSION
(load case 3, end of rod)

Calculation normal force	NO =	9.245 kN
System rod length	L =	128.06 cm

6.2 LOAD CAPACITY OF CROSS-SECTIONS

6.2.3 Tensile

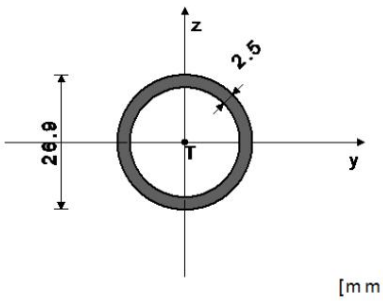
Plastic resistance of the gross cross-section Limit resistance of the net cross-section Comput. for tensioning	Npl,Rd =	24,000 kN
	Nu,Rd =	28,771 kN
	Nt,Rd =	24,000 kN

Condition 6.5: NEd <= Nt,Rd (9.24 <= 24.00)

STICK 345-303

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 8]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

[mm]

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

3. ÿ=0.68

A ROD EXPOSED TO CENTRAL PRESSURE
(load case 3, beginning of the rod)

Calculation normal force	NO =	-9.245 kN
System rod length	L =	128.06 cm

5.5 CLASSIFICATION OF CROSS SECTIONS

Section class 1

6.2 LOAD CAPACITY OF CROSS-SECTIONS

6.2.4 **Pressure**

Calculation resistance to pressure	Nc,Rd =	24,000 kN

Condition 6.9: NEd <= Nc,Rd (9.24 <= 24.00)

6.3 BENDING CAPACITY OF ELEMENTS 6.3.1.1 Buckling

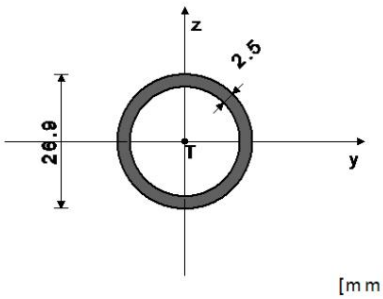
capacity **Buckling length** yy		
Relative slenderness yy	l,y =	128.06 cm
Buckling curve for axis	**ÿ_y =**	1.148
yy: A **Elastic critical force**	ÿ =	0.210
Reduction coefficient	Ncr,y =	18.199 kN
Calculated resistance to	**ÿ,y =**	0.563
buckling Condition 6.46: NEd <= Nb,Rd,y (9.24 <= 13.52)	Nb,Rd,y =	13.522 kN
Buckling length zz	l,z =	128.06 cm
Relative slenderness zz	ÿ_z = ÿ	1.148
Buckling curve for axis zz: A	= ÿ,z	0.210
Reduction coefficient	=	0.563
Calculated buckling resistance	Nb,Rd,z =	13.522 kN

Condition 6.46: NEd <= Nb,Rd,z (9.24 <= 13.52)

STICK 303-285

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 8]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

[mm]

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

3. ÿ=0.39

ROD EXPOSED TO CENTRIC TENSION
(load case 3, end of rod)

Calculation normal force	NO =	9.245 kN
System rod length	L =	128.06 cm

6.2 LOAD CAPACITY OF CROSS-SECTIONS

6.2.3 Tensile

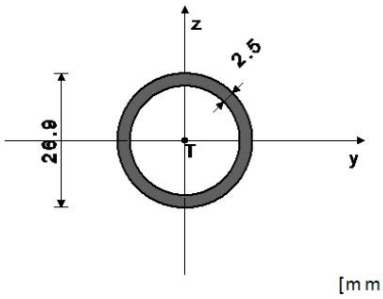
Plastic resistance of the gross cross-section Limit resistance of the net cross-section Comput. for tensioning	Npl,Rd =	24,000 kN
	Nu,Rd =	28,771 kN
	Nt,Rd =	24,000 kN

Condition 6.5: NEd <= Nt,Rd (9.24 <= 24.00)

STICK 285-243

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 7]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

3. ÿ=0.68

A ROD EXPOSED TO CENTRAL PRESSURE
(load case 3, beginning of the rod)

Calculation normal force	NO =	-9.245 kN
System rod length	L =	128.06 cm

5.5 CLASSIFICATION OF CROSS SECTIONS

Section class 1

6.2 LOAD CAPACITY OF CROSS-SECTIONS

6.2.4 **Pressure**

Calculation resistance to pressure	Nc,Rd =	24,000 kN
Condition 6.9: NEd <= Nc,Rd (9.24 <= 24.00)		

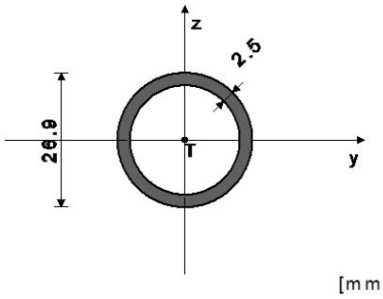
6.3 BENDING CAPACITY OF ELEMENTS 6.3.1.1 Buckling capacity **Buckling length** yy

Relative slenderness yy	l,y =	128.06 cm
Buckling curve for axis yy: A	**ÿ_y =**	1.148
Elastic critical force	ÿ =	0.210
Reduction coefficient	Ncr,y =	18.199 kN
Calculated resistance to buckling Condition 6.46: NEd <= Nb,Rd,y (9.24 <= 13.52)	**ÿ,y =**	0.563
	Nb,Rd,y =	13.522 kN

Buckling length zz	l,z =	128.06 cm
Relative slenderness zz	**ÿ_z =**	1.148
Buckling curve for axis zz: A	ÿ =	0.210
Reduction coefficient	**ÿ,z =**	0.563
Calculated buckling resistance	Nb.Rd,z =	13.522 kN
Condition 6.46: NEd <= Nb,Rd,z (9.24 <= 13.52)		

STICK 243-225
CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 7]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

3. ÿ=0.39

ROD EXPOSED TO CENTRIC TENSION
(load case 3, end of rod)

Calculation normal force	NO =	9.245 kN
System rod length	L =	128.06 cm

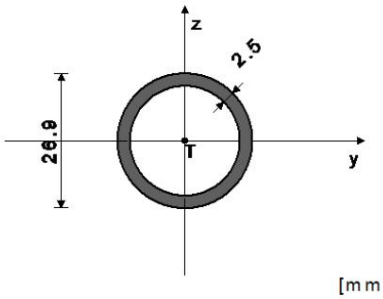
6.2 LOAD CAPACITY OF CROSS-SECTIONS

6.2.3 Tensile

Plastic resistance of the gross cross-section Limit resistance of the net cross-section Comput. for tensioning	Npl,Rd =	24,000 kN
	Nu,Rd =	28,771 kN
	Nt,Rd =	24,000 kN
Condition 6.5: NEd <= Nt,Rd (9.24 <= 24.00)		

STICK 225-183
CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 7]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

3. ÿ=0.68

A ROD EXPOSED TO CENTRAL PRESSURE
(load case 3, beginning of the rod)

Calculation normal force	NO =	-9.245 kN
System rod length	L =	128.06 cm

5.5 CLASSIFICATION OF CROSS SECTIONS

Section class 1

6.2 LOAD CAPACITY OF CROSS-SECTIONS

6.2.4 Pressure

Calculation resistance to pressure	Nc,Rd =	24,000 kN
Condition 6.9: NEd <= Nc,Rd (9.24 <= 24.00)		

6.3 BUCKLING CAPACITY OF ELEMENTS 6.3.1.1

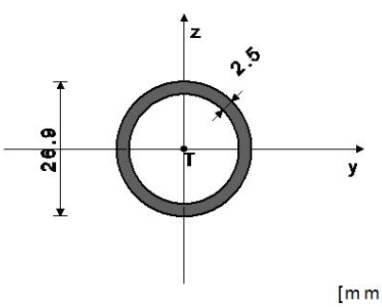
Buckling capacity **Buckling length**

yy Relative slenderness	l,y =	128.06 cm
yy Buckling curve for axis	**ÿ_y =**	1.148
yy: A **Elastic critical force**	ÿ =	0.210
	Ncr,y =	18.199 kN
Reduction coefficient	**ÿ,y =**	0.563
Calculation resistance to buckling	Nb,Rd,y =	13.522 kN
Condition 6.46: NEd <= Nb,Rd,y (9.24 <= 13.52)		

Buckling length zz	l,z =	128.06 cm
Relative slenderness of the zz	**ÿ_z =**	1.148
Buckling curve for axis zz: A	ÿ =	0.210
Reduction coefficient	**ÿ,z =**	0.563
Calculation resistance to buckling	Nb.Rd,z =	13.522 kN
Condition 6.46: NEd <= Nb,Rd,z (9.24 <= 13.52)		

STICK 183-165
CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 6]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

3. ÿ=0.39

ROD EXPOSED TO CENTRIC TENSION
(load case 3, end of rod)

Calculation normal force	NO =	9.245 kN
System rod length	L =	128.06 cm

6.2 LOAD CAPACITY OF CROSS-SECTIONS

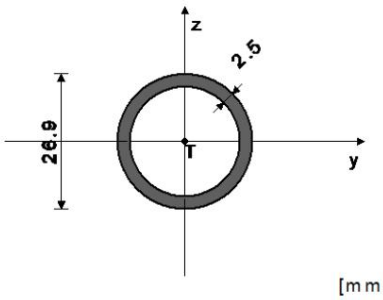
6.2.3 Tensile

Plastic resistance of the gross cross-section Limit resistance of the net cross-section Comput. for tensioning	Npl,Rd =	24,000 kN
	Nu,Rd =	28,771 kN
	Nt,Rd =	24,000 kN

Condition 6.5: NEd <= Nt,Rd (9.24 <= 24.00)

STICK 165-123
CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 6]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS
3. ÿ=0.68

A ROD EXPOSED TO CENTRAL PRESSURE
(load case 3, beginning of the rod)

Calculation normal force	NO =	-9.245 kN
System rod length	L =	128.06 cm

5.5 CLASSIFICATION OF CROSS SECTIONS
Section class 1

6.2 LOAD CAPACITY OF CROSS-SECTIONS
6.2.4 **Pressure**

Calculation resistance to pressure	Nc,Rd =	24,000 kN

Condition 6.9: NEd <= Nc,Rd (9.24 <= 24.00)

6.3 LOAD CAPACITY OF ELEMENTS AGAINST BULLION
6.3.1.1 Buckling capacity **Buckling length** yy Relative slenderness yy Buckling curve for axis yy: A **Elastic critical force**

	l,y =	128.06 cm
	ÿ_y = ÿ =	1.148
	=	0.210
	Ncr,y =	18.199 kN
Reduction coefficient	**ÿ,y =**	0.563
Calculated buckling resistance	Nb,Rd,y =	13.522 kN

Condition 6.46: NEd <= Nb,Rd,y (9.24 <= 13.52)

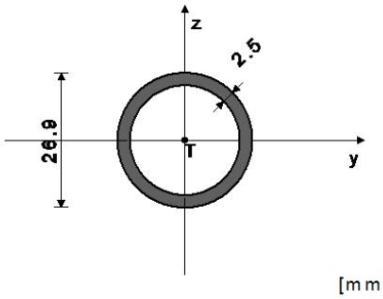
Buckling length zz Relative slenderness of the zz Buckling curve for axis zz: A Reduction coefficient **Calculation resistance to buckling**

	l,z =	128.06 cm
	ÿ_z =	1.148
	ÿ =	0.210
	ÿ,z =	0.563
	Nb.Rd,z =	13.522 kN

Condition 6.46: NEd <= Nb,Rd,z (9.24 <= 13.52)

STICK 123-105
CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 6]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS
3. ÿ=0.39

ROD EXPOSED TO CENTRIC TENSION
(load case 3, end of rod)

Calculation normal force	NO =	9.245 kN
System rod length	L =	128.06 cm

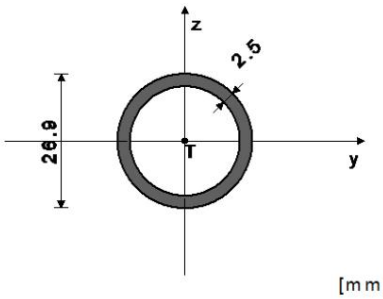
6.2 LOAD CAPACITY OF CROSS-SECTIONS
6.2.3 Tensile

Plastic resistance of the gross cross-section Limit resistance of the net cross-section Comput. for tensioning	Npl,Rd =	24,000 kN
	Nu,Rd =	28,771 kN
	Nt,Rd =	24,000 kN

Condition 6.5: NEd <= Nt,Rd (9.24 <= 24.00)

ROD 105-63
CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 5]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS
3. ÿ=0.68

A ROD EXPOSED TO CENTRAL PRESSURE
(load case 3, beginning of the rod)

Calculation normal force	NO =	-9.245 kN
System rod length	L =	128.06 cm

5.5 CLASSIFICATION OF CROSS SECTIONS
Section class 1

6.2 LOAD CAPACITY OF CROSS-SECTIONS
6.2.4 **Pressure**

Calculation resistance to pressure	Nc,Rd =	24,000 kN

Condition 6.9: NEd <= Nc,Rd (9.24 <= 24.00)

6.3 BENDING CAPACITY OF ELEMENTS 6.3.1.1 Buckling capacity **Buckling length** yy Relative slenderness yy Buckling curve for axis yy: A **Elastic critical force**

	l,y =	128.06 cm
	ÿ_y = ÿ =	1.148
	=	0.210
	Ncr,y =	18.199 kN
Reduction coefficient	**ÿ,y =**	0.563
Calculated resistance to buckling Condition 6.46: NEd <= Nb,Rd,y (9.24 <= 13.52)	Nb,Rd,y =	13.522 kN

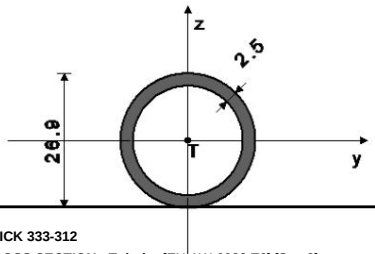
Buckling length zz Relative slenderness zz Buckling curve for axis zz: A Reduction coefficient **Calculated buckling resistance**

	l,z =	128.06 cm
	ÿ_z =	1.148
	ÿ =	0.210
	ÿ,z =	0.563
	Nb.Rd,z =	13.522 kN

Condition 6.46: NEd <= Nb,Rd,z (9.24 <= 13.52)

STICK 359-338
CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 8]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

3. ÿ=0.00

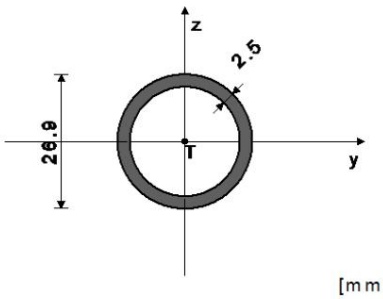
No influence

STICK 333-312

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 8]
EUROCODE 3 (EN 1993-1-1:2005)

[mm]

GEOMETRIC CHARACTERISTICS OF SECTIONS



Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

[mm]

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

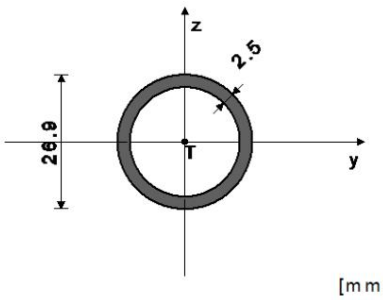
3. ÿ=0.00

No influence

STICK 303-278

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 8]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

[mm]

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

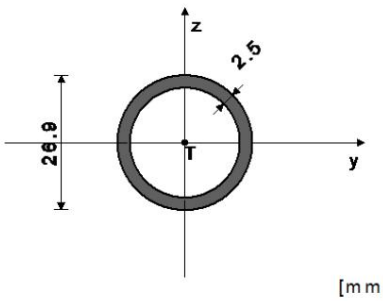
3. ÿ=0.00

No influence

STICK 273-252

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 7]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

[mm]

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

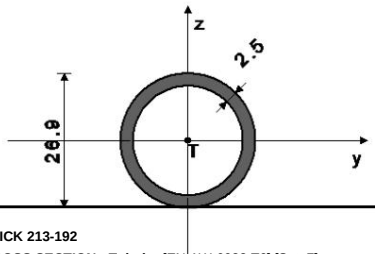
3. ÿ=0.00

No influence

STICK 243-218

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 7]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

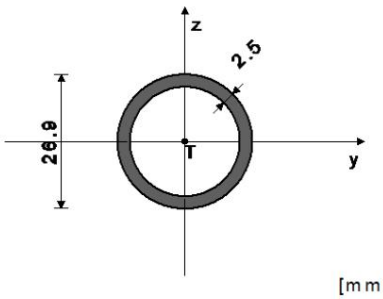
3. ÿ=0.00

No influence

STICK 213-192

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 7]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

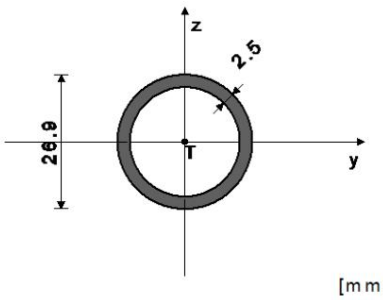
3. ÿ=0.00

No influence

STICK 183-158

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 6]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

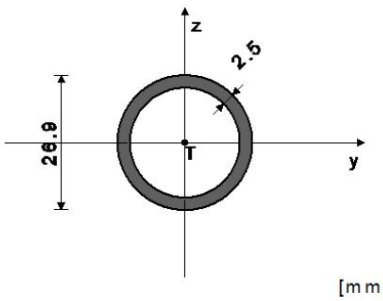
3. ÿ=0.00

No influence

STICK 153-132

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 6]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

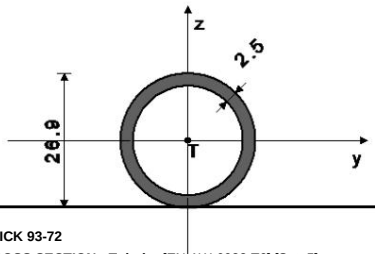
3. ÿ=0.00

No influence

STICK 123-98

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 6]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

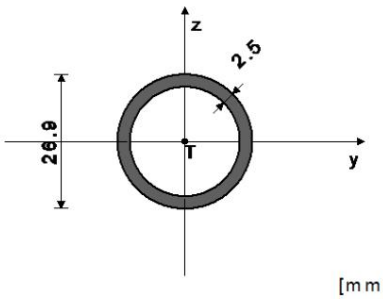
3. ÿ=0.00

No influence

STICK 93-72

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 5]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

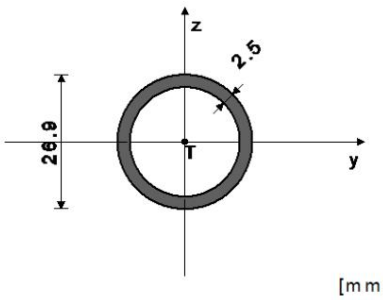
3. ÿ=0.00

No influence

STICK 63-38

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 5]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

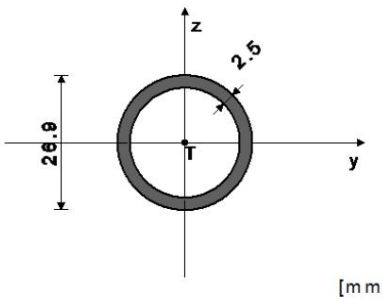
3. ÿ=0.00

No influence

STICK 33-12

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 5]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

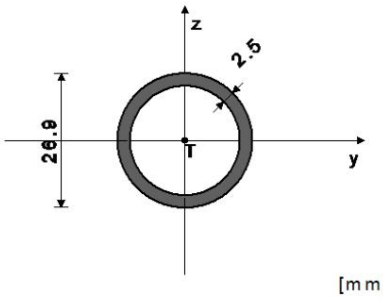
3. ÿ=0.00

No influence

STICK 363-359

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 8]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

3. ÿ=0.29

A ROD EXPOSED TO CENTRAL PRESSURE

(load case 3, beginning of the rod)

Calculation normal force	NO =	-5.774 kN

System rod length L = 80,000 cm

5.5 CLASSIFICATION OF CROSS SECTIONS

Section class 1

6.2 LOAD CAPACITY OF CROSS-SECTIONS

6.2.4 **Pressure**

Calculation resistance to pressure	Nc,Rd =	24,000 kN
Condition 6.9: NEd <= Nc,Rd (5.77 <= 24.00)		

6.3 BENDING CAPACITY OF ELEMENTS 6.3.1.1 Buckling

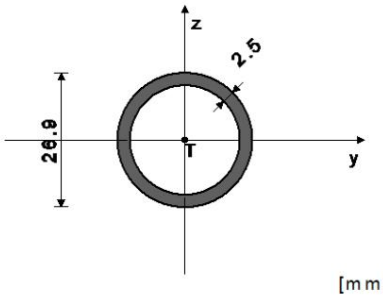
capacity **Buckling length** yy		
Relative slenderness yy	l,y =	80,000 cm
Buckling curve for axis	**ÿ_y =**	0.717
yy: A **Elastic critical force**	ÿ =	0.210
Reduction coefficient	Ncr,y =	46.634 kN
Calculated resistance to	**ÿ,y =**	0.839
buckling Condition 6.46: NEd <=	Nb,Rd,y =	20.146 kN
Nb,Rd,y (5.77 <= 20.15)		

Buckling length zz	l,z =	80,000 cm
Relative slenderness zz	**ÿ_z =**	0.717
Buckling curve for axis zz: A	ÿ =	0.210
Reduction coefficient	**ÿ,z =**	0.839
Calculated buckling resistance	Nb.Rd,z =	20.146 kN
Condition 6.46: NEd <= Nb,Rd,z (5.77 <= 20.15)		

STICK 345-333

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 8]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

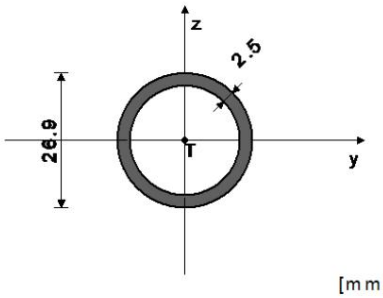
3. ÿ=0.00

No influence

ROD 315-303

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 8]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

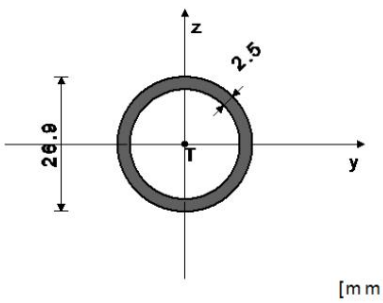
3. ÿ=0.00

No influence

STICK 285-273

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 7]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

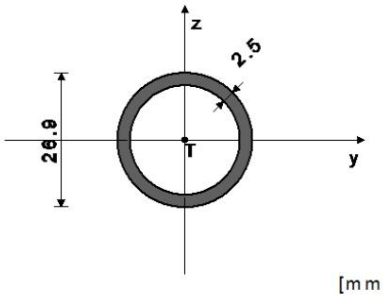
UTILIZATION FACTORS BY LOAD COMBINATIONS

3. ÿ=0.00

No influence

STICK 255-243
CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 7]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

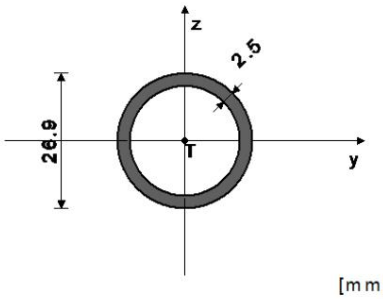
(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS
3. ÿ=0.00

No influence

ROD 225-213
CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 7]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

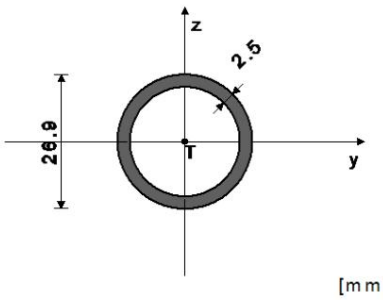
(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS
3. ÿ=0.00

No influence

STICK 195-183
CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 6]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

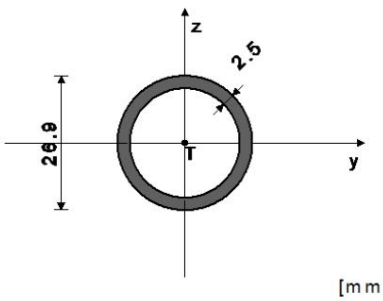
(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS
3. ÿ=0.00

No influence

STICK 165-153
CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 6]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

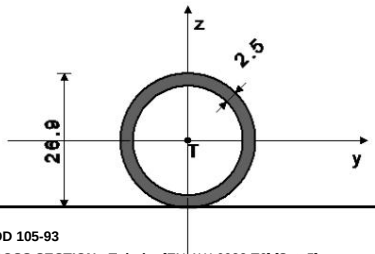
(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS
3. ÿ=0.00

No influence

STICK 135-123
CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 6]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

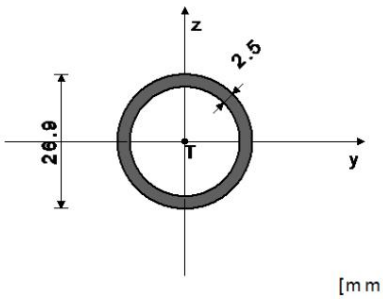
3. ÿ=0.00

No influence

ROD 105-93

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 5]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

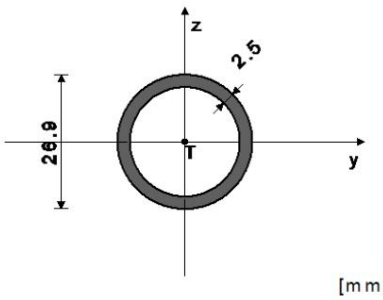
3. ÿ=0.00

No influence

ROD 75-63

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 5]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

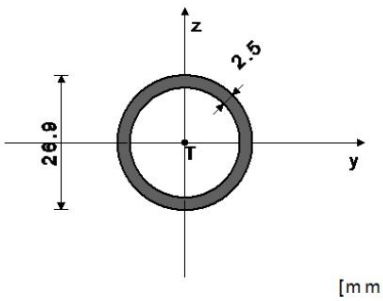
3. ÿ=0.00

No influence

STICK 45-33

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 5]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

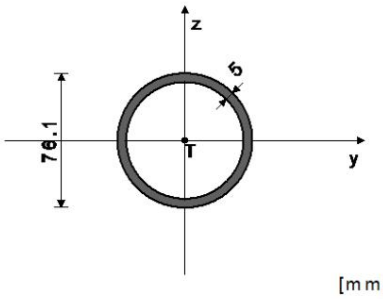
3. ÿ=0.00

No influence

STICK 93-123

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 2]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



Ax =	11.170 cm2
Ay =	5.581 cm2
Az =	5.581 cm2
Ix =	141.77 cm4
Iy =	70.920 cm4
From =	70.920 cm4
Wy =	18.639 cm3
Wz =	18.639 cm3
Wy,pl =	25.318 cm3
Wz,pl =	25.318 cm3
γM0 =	1.000
γM1 =	1.000
γM2 =	1.000
Anet/A =	0.900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

3. γ=0.48

A ROD EXPOSED TO CENTRAL PRESSURE

(load case 3, end of rod)

Calculation normal force	NO =	-65,220 kN
System rod length	L =	100,000 cm

5.5 CLASSIFICATION OF CROSS SECTIONS

Section class 1

6.2 LOAD CAPACITY OF CROSS-SECTIONS

6.2.4 **Pressure**

Calculation resistance to pressure	Nc,Rd =	139.63 kN
Condition 6.9: NEd <= Nc,Rd (65.22 <= 139.63)		

6.3 BENDING CAPACITY OF ELEMENTS 6.3.1.1 Buckling capacity **Buckling length** yy

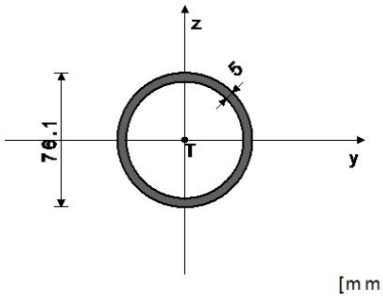
Relative slenderness yy	l,y =	100,000 cm
Buckling curve for axis yy: A **Elastic critical** force	**γ_y =** γ =	0.308 0.210 1469.9
Reduction coefficient	Ncr,y =	kN 0.976
Calculated buckling resistance Condition 6.46: NEd <= Nb,Rd,y (65.22 <= 136.21)	**γ,y =** Nb,Rd,y =	136.21 kN

Buckling length zz	l,z =	100,000 cm
Relative slenderness zz	**γ_z =**	0.308 0.210
Buckling curve for axis zz: A	γ =	0.976
Reduction coefficient	**γ,z =**	136.21
Calculated buckling resistance	Nb.Rd,z =	kN
Condition 6.46: NEd <= Nb,Rd,z (65.22 <= 136.21)		

STICK 123-153

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 2]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



Ax =	11.170 cm2
Ay =	5.581 cm2
Az =	5.581 cm2
Ix =	141.77 cm4
Iy =	70.920 cm4
From =	70.920 cm4
Wy =	18.639 cm3
Wz =	18.639 cm3
Wy,pl =	25.318 cm3
Wz,pl =	25.318 cm3
γM0 =	1.000
γM1 =	1.000
γM2 =	1.000
Anet/A =	0.900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

3. γ=0.37

A ROD EXPOSED TO CENTRAL PRESSURE

(load case 3, end of rod)

Calculation normal force	NO =	-50.739 kN
System rod length	L =	100.00 cm

5.5 CLASSIFICATION OF CROSS SECTIONS

Section class 1

6.2 LOAD CAPACITY OF CROSS-SECTIONS

6.2.4 **Pressure**

Calculation resistance to pressure	Nc,Rd =	139.63 kN
Condition 6.9: NEd <= Nc,Rd (50.74 <= 139.63)		

6.3 BENDING CAPACITY OF ELEMENTS 6.3.1.1 Buckling capacity **Buckling length** yy

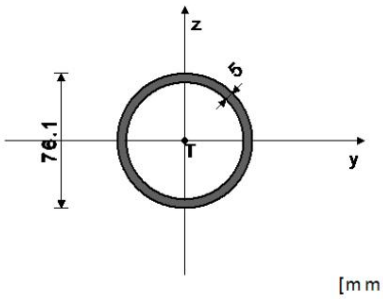
Relative slenderness yy	l,y =	100.00 cm
Buckling curve for axis yy: A **Elastic critical force**	**γ_y =** γ =	0.308 0.210
Reduction coefficient	Ncr,y =	1469.9 kN
Calculated resistance to buckling **Condition 6.46: NEd <= Nb,Rd,y (50.74 <= 136.21)**	**γ,y =** Nb,Rd,y =	0.976 136.21 kN

Buckling length zz	l,z =	100.00 cm
Relative slenderness zz	**γ_z =**	0.308
Buckling curve for axis zz: A	γ =	0.210
Reduction coefficient	**γ,z =**	0.976
Calculated buckling resistance	Nb.Rd,z =	136.21 kN
Condition 6.46: NEd <= Nb,Rd,z (50.74 <= 136.21)		

STICK 153-183

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 2]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



Ax =	11.170 cm2
Ay =	5.581 cm2
Az =	5.581 cm2
Ix =	141.77 cm4
Iy =	70.920 cm4
From =	70.920 cm4
Wy =	18.639 cm3
Wz =	18.639 cm3
Wy,pl =	25.318 cm3
Wz,pl =	25.318 cm3
γM0 =	1.000
γM1 =	1.000
γM2 =	1.000
Anet/A =	0.900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

3. γ=0.37

A ROD EXPOSED TO CENTRAL PRESSURE

(load case 3, end of rod)

Calculation normal force	NO =	-50.704 kN
System rod length	L =	100.00 cm

5.5 CLASSIFICATION OF CROSS SECTIONS

Section class 1

6.2 LOAD CAPACITY OF CROSS-SECTIONS

6.2.4 **Pressure**

Calculation resistance to pressure	Nc,Rd =	139.63 kN
Condition 6.9: NEd <= Nc,Rd (50.70 <= 139.63)		

6.3 BURNING CAPACITY OF ELEMENTS 6.3.1.1 Buckling capacity **Buckling length** yy Relative slenderness

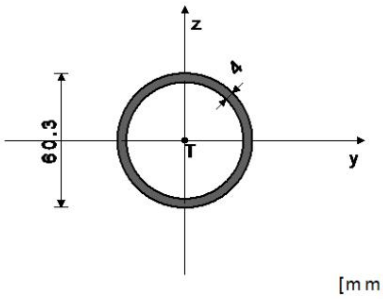
	l,y =	100.00 cm
yy Buckling curve for axis yy: A **Elastic critical force**	**γ_y = γ =**	0.308 0.210
Reduction coefficient	Ncr,y =	1469.9 kN
Calculated buckling resistance Condition 6.46: NEd <= Nb,Rd,y (50.70 <= 136.21)	**γ,y =** Nb,Rd,y =	0.976 136.21 kN

Buckling length zz	l,z =	100.00 cm
Relative slenderness zz	**γ_z =**	0.308
Buckling curve for axis zz: A	γ =	0.210
Reduction coefficient	**γ,z =**	0.976
Calculated buckling resistance	Nb.Rd,z =	136.21 kN
Condition 6.46: NEd <= Nb,Rd,z (50.70 <= 136.21)		

STICK 183-213

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 3]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



Ax =	7,070 cm2
Ay =	3,536 cm2
Az =	3,536 cm2
Ix =	56,317 cm4
Iy =	28,170 cm4
From =	28,170 cm4
Wy =	9,343 cm3
Wz =	9,343 cm3
Wy,pl =	12,700 cm3
Wz,pl =	12,700 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

3. ÿ=0.43

A ROD EXPOSED TO CENTRAL PRESSURE
(load case 3, end of rod)

Calculation normal force	NO =	-36.223 kN
System rod length	L =	100.00 cm

5.5 CLASSIFICATION OF CROSS SECTIONS

Section class 1

6.2 LOAD CAPACITY OF CROSS-SECTIONS

6.2.4 **Pressure**

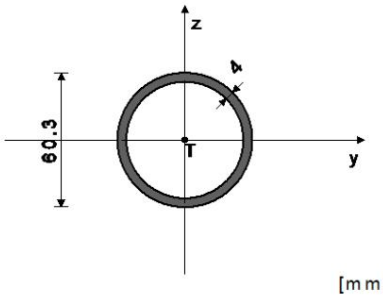
Calculation resistance to pressure	Nc,Rd =	88,375 kN
Condition 6.9: NEd <= Nc,Rd (36.22 <= 88.38)		

6.3 BENDING CAPACITY OF ELEMENTS 6.3.1.1 Buckling

capacity **Buckling length** yy		
Relative slenderness yy	l,y =	100.00 cm
Buckling curve for axis	**ÿ_y =**	0.389
yy: A **Elastic critical force**	ÿ =	0.210
Reduction coefficient	Ncr,y =	583.86 kN
Calculated resistance to	**ÿ,y =**	0.956
buckling Condition 6.46: NEd <=	Nb,Rd,y =	84.455 kN
Nb,Rd,y (36.22 <= 84.45)		
Buckling length zz	l,z =	100.00 cm
Relative slenderness zz	**ÿ_z =**	0.389
Buckling curve for axis zz: A	ÿ =	0.210
Reduction coefficient	**ÿ,z =**	0.956
Calculated buckling resistance	Nb.Rd,z =	84.455 kN
Condition 6.46: NEd <= Nb,Rd,z (36.22 <= 84.45)		

STICK 213-243
CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 3]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



Ax =	7,070 cm2
Ay =	3,536 cm2
Az =	3,536 cm2
Ix =	56,317 cm4
Iy =	28,170 cm4
From =	28,170 cm4
Wy =	9,343 cm3
Wz =	9,343 cm3
Wy,pl =	12,700 cm3
Wz,pl =	12,700 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

3. ÿ=0.43

A ROD EXPOSED TO CENTRAL PRESSURE
(load case 3, end of rod)

Calculation normal force	NO =	-36.200 kN
System rod length	L =	100.00 cm

5.5 CLASSIFICATION OF CROSS SECTIONS

Section class 1

6.2 LOAD CAPACITY OF CROSS-SECTIONS

6.2.4 Pressure

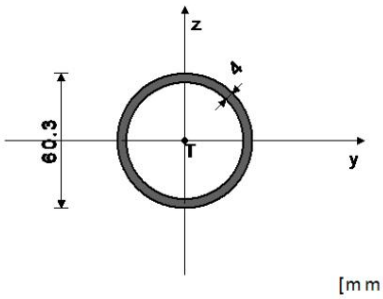
Calculated pressure resistance	Nc,Rd =	88,375 kN
Condition 6.9: NEd <= Nc,Rd (36.20 <= 88.38)		

6.3 BURNING CAPACITY OF ELEMENTS 6.3.1.1

Buckling capacity **Buckling length**		
yy Relative slenderness	l,y =	100.00 cm
yy Buckling curve for axis	**ÿ_y =**	0.389
yy: A **Elastic critical force**	ÿ =	0.210
Reduction coefficient	Ncr,y =	583.86 kN
Calculated buckling	**ÿ,y =**	0.956
resistance **Condition 6.46: NEd <=**	Nb,Rd,y =	84.455 kN
Nb,Rd,y (36.20 <= 84.45)		
Buckling length zz	l,z =	100.00 cm
Relative slenderness zz	**ÿ_z =**	0.389
Buckling curve for axis zz: A	ÿ =	0.210
Reduction coefficient	**ÿ,z =**	0.956
Calculated resistance to buckling	Nb.Rd,z =	84.455 kN
Condition 6.46: NEd <= Nb,Rd,z (36.20 <= 84.45)		

STICK 243-273
CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 3]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



Ax =	7,070 cm2
Ay =	3,536 cm2
Az =	3,536 cm2
Ix =	56,317 cm4
Iy =	28,170 cm4
From =	28,170 cm4
Wy =	9,343 cm3
Wz =	9,343 cm3
Wy,pl =	12,700 cm3
Wz,pl =	12,700 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

3. ÿ=0.26

A ROD EXPOSED TO CENTRAL PRESSURE
(load case 3, end of rod)

Calculation normal force	NO =	-21.730 kN
System rod length	L =	100.00 cm

5.5 CLASSIFICATION OF CROSS SECTIONS

Section class 1

6.2 LOAD CAPACITY OF CROSS-SECTIONS

6.2.4 Pressure

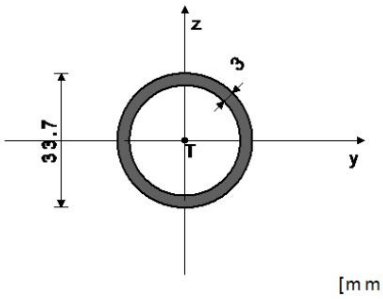
Calculated resistance to pressure	Nc,Rd =	88,375 kN
Condition 6.9: NEd <= Nc,Rd (21.73 <= 88.38)		

6.3 BURNING CAPACITY OF ELEMENTS 6.3.1.1

Buckling capacity **Buckling length**		
yy Relative slenderness	l,y =	100.00 cm
yy Buckling curve for axis	ÿ_y = ÿ	0.389
yy: A **Elastic critical force**	=	0.210
Reduction coefficient	Ncr,y =	583.86 kN
Calculation resistance to	**ÿ,y =**	0.956
buckling Condition 6.46: NEd <=	Nb,Rd,y =	84.455 kN
Nb,Rd,y (21.73 <= 84.45)		
Buckling length zz	l,z =	100.00 cm
Relative slenderness zz	**ÿ_z =**	0.389
Buckling curve for axis zz: A	ÿ =	0.210
Reduction coefficient	**ÿ,z =**	0.956
Calculated buckling resistance	Nb.Rd,z =	84.455 kN
Condition 6.46: NEd <= Nb,Rd,z (21.73 <= 84.45)		

STICK 273-303
CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 4]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



Ax =	2,890 cm2
Ay =	1,446 cm2
Az =	1,446 cm2
Ix =	6,879 cm4
Iy =	3,440 cm4
From =	3,440 cm4
Wy =	2,042 cm3
Wz =	2,042 cm3
Wy,pl =	2,836 cm3
Wz,pl =	2,836 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

3. ÿ=0.71

A ROD EXPOSED TO CENTRAL PRESSURE
(load case 3, end of rod)

Calculation normal force	NO =	-21,706 kN
System rod length	L =	100.00 cm

5.5 CLASSIFICATION OF CROSS SECTIONS
Section class 1

6.2 LOAD CAPACITY OF CROSS-SECTIONS
6.2.4 **Pressure**

Calculation resistance to pressure	Nc,Rd =	36,125 kN
Condition 6.9: NEd <= Nc,Rd (21.71 <= 36.13)		

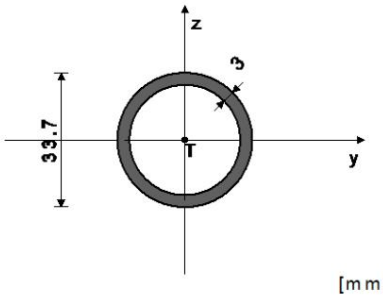
6.3 BENDING CAPACITY OF ELEMENTS 6.3.1.1 Buckling capacity **Buckling length** yy

Relative slenderness yy	l,y =	100.00 cm
Buckling curve for axis	**ÿ_y =**	0.712
yy: A **Elastic critical force**	ÿ =	0.210
Reduction coefficient	Ncr,y =	71.298 kN
Calculated resistance to	**ÿ,y =**	0.842
buckling Condition 6.46: NEd <=	Nb,Rd,y =	30.422 kN
Nb,Rd,y (21.71 <= 30.42)		

Buckling length zz	l,z =	100.00 cm
Relative slenderness zz	**ÿ_z =**	0.712
Buckling curve for axis zz: A	ÿ =	0.210
Reduction coefficient	**ÿ,z =**	0.842
Calculated buckling resistance	Nb.Rd,z =	30.422 kN
Condition 6.46: NEd <= Nb,Rd,z (21.71 <= 30.42)		

STICK 303-333
CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 4]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



Ax =	2,890 cm2
Ay =	1,446 cm2
Az =	1,446 cm2
Ix =	6,879 cm4
Iy =	3,440 cm4
From =	3,440 cm4
Wy =	2,042 cm3
Wz =	2,042 cm3
Wy,pl =	2,836 cm3
Wz,pl =	2,836 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

3. ÿ=0.24

A ROD EXPOSED TO CENTRAL PRESSURE
(load case 3, end of rod)

Calculation normal force	NO =	-7.247 kN
System rod length	L =	100.00 cm

5.5 CLASSIFICATION OF CROSS SECTIONS Section class 1

6.2 LOAD CAPACITY OF CROSS-SECTIONS
6.2.4 Pressure

Calculated resistance to pressure	Nc,Rd =	36,125 kN
Condition 6.9: NEd <= Nc,Rd (7.25 <= 36.13)		

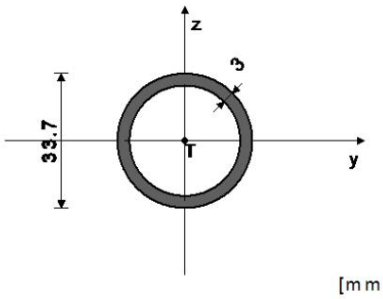
6.3 BENDING CAPACITY OF ELEMENTS 6.3.1.1 Buckling capacity Buckling length yy Relative slenderness yy Buckling curve for axis yy: A **Elastic critical force** Reduction coefficient **Calculated resistance to buckling Condition 6.46: NEd <= Nb,Rd,y (7.25 <= 30.42)**

	l,y =	100.00 cm
	ÿ_y =	0.712
	ÿ =	0.210
	Ncr,y =	71.298 kN
	ÿ,y =	0.842
	Nb,Rd,y =	30.422 kN

Buckling length zz	l,z =	100.00 cm
Relative slenderness zz	**ÿ_z =**	0.712
Buckling curve for axis zz: A	ÿ =	0.210
Reduction coefficient	**ÿ,z =**	0.842
Calculated buckling resistance	Nb.Rd,z =	30.422 kN
Condition 6.46: NEd <= Nb,Rd,z (7.25 <= 30.42)		

STICK 333-359
CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 4]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



Ax =	2,890 cm2
Ay =	1,446 cm2
Az =	1,446 cm2
Ix =	6,879 cm4
Iy =	3,440 cm4
From =	3,440 cm4
Wy =	2,042 cm3
Wz =	2,042 cm3
Wy,pl =	2,836 cm3
Wz,pl =	2,836 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

3. ÿ=0.24

A ROD EXPOSED TO CENTRAL PRESSURE
(load case 3, end of rod)

Calculation normal force	NO =	-7.235 kN
System rod length	L =	100.00 cm

5.5 CLASSIFICATION OF CROSS SECTIONS
Section class 1

6.2 LOAD CAPACITY OF CROSS-SECTIONS
6.2.4 Pressure

Calculated resistance to pressure	Nc,Rd =	36,125 kN
Condition 6.9: NEd <= Nc,Rd (7.24 <= 36.13)		

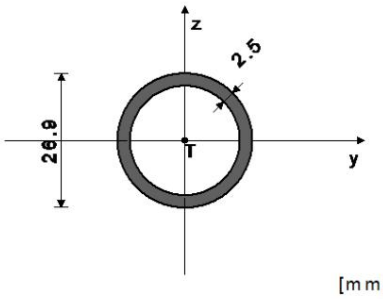
6.3 BENDING CAPACITY OF ELEMENTS 6.3.1.1 Buckling capacity **Buckling length** yy

Relative slenderness yy	l,y =	100.00 cm
Buckling curve for axis	ÿ_y = ÿ	0.712
yy: A **Elastic critical force**	=	0.210
Reduction coefficient	Ncr,y =	71.298 kN
Calculated resistance to	**ÿ,y =**	0.842
buckling Condition 6.46: NEd <=	Nb,Rd,y =	30.422 kN
Nb,Rd,y (7.24 <= 30.42)		

Buckling length zz	l,z =	100.00 cm
Relative slenderness zz	**ÿ_z =**	0.712
Buckling curve for axis zz: A	ÿ =	0.210
Reduction coefficient	**ÿ,z =**	0.842
Calculated buckling resistance	Nb.Rd,z =	30.422 kN
Condition 6.46: NEd <= Nb,Rd,z (7.24 <= 30.42)		

STICK 363-338
CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 8]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

3. ÿ=0.29

A ROD EXPOSED TO CENTRAL PRESSURE

(load case 3, beginning of the rod)

Calculation normal force	NO =	-5.774 kN

System rod length	L =	80,000 cm

5.5 CLASSIFICATION OF CROSS SECTIONS

Section class 1

6.2 LOAD CAPACITY OF CROSS-SECTIONS

6.2.4 **Pressure**

Calculation resistance to pressure	Nc,Rd =	24,000 kN
Condition 6.9: NEd <= Nc,Rd (5.77 <= 24.00)		

6.3 BENDING CAPACITY OF ELEMENTS 6.3.1.1 Buckling

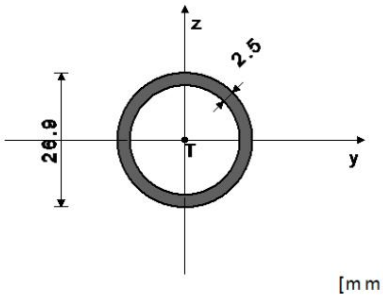
capacity **Buckling length** yy		
Relative slenderness yy	l,y =	80,000 cm
Buckling curve for axis	**ÿ_y =**	0.717
yy: A **Elastic critical force**	ÿ =	0.210
Reduction coefficient	Ncr,y =	46.634 kN
Calculated resistance to	**ÿ,y =**	0.839
buckling Condition 6.46: NEd <=	Nb,Rd,y =	20.146 kN
Nb,Rd,y (5.77 <= 20.15)		

Buckling length zz	l,z =	80,000 cm
Relative slenderness zz	**ÿ_z =**	0.717
Buckling curve for axis zz: A	ÿ =	0.210
Reduction coefficient	**ÿ,z =**	0.839
Calculated buckling resistance	Nb.Rd,z =	20.146 kN
Condition 6.46: NEd <= Nb,Rd,z (5.77 <= 20.15)		

STICK 345-312

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 8]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

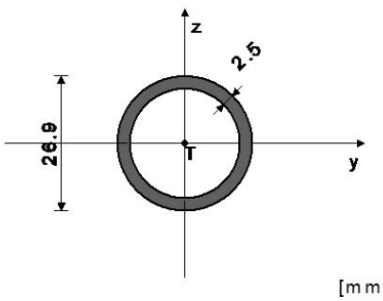
3. ÿ=0.00

No influence

STICK 315-278

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 8]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

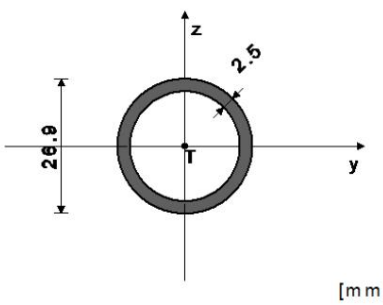
3. ÿ=0.00

No influence

STICK 285-252

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 7]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

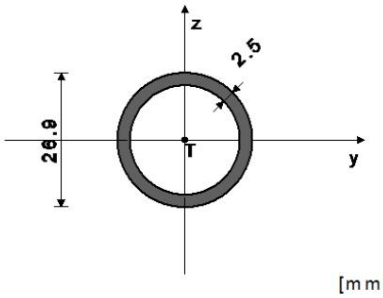
3. ÿ=0.00

No influence

STICK 255-218

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 7]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

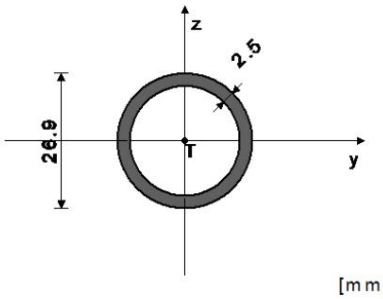
3. ÿ=0.00

No influence

STICK 225-192

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 7]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

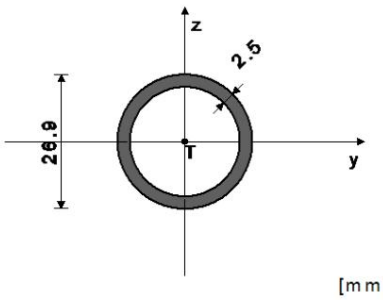
3. ÿ=0.00

No influence

STICK 195-158

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 6]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

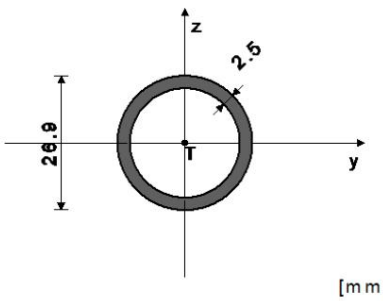
3. ÿ=0.00

No influence

ROD 105-72

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 5]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

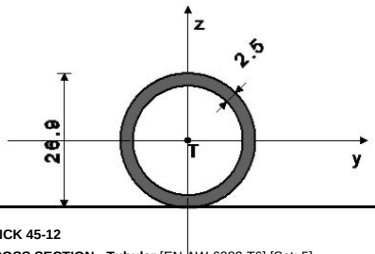
3. ÿ=0.00

No influence

STICK 75-38

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 5]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

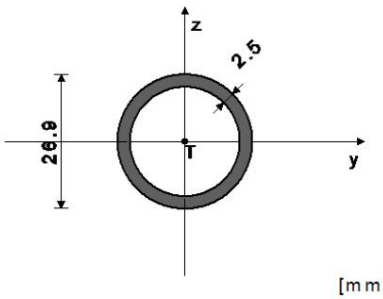
3. ÿ=0.00

No influence

STICK 45-12

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 5]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

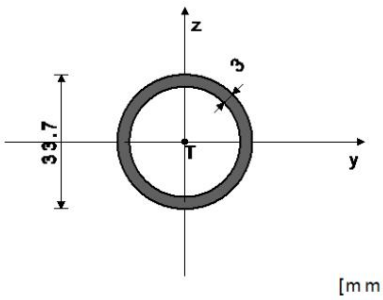
3. ÿ=0.00

No influence

STICK 345-363

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 4]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	2,890 cm2
Ay =	1,446 cm2
Az =	1,446 cm2
Ix =	6,879 cm4
Iy =	3,440 cm4
From =	3,440 cm4
Wy =	2,042 cm3
Wz =	2,042 cm3
Wy,pl =	2,836 cm3
Wz,pl =	2,836 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

3. ÿ=0.00

A ROD EXPOSED TO CENTRAL PRESSURE
(load case 3, end of rod)

Calculation normal force	NO =	-0.012 kN
System rod length	L =	100.00 cm

5.5 CLASSIFICATION OF CROSS SECTIONS

Section class 1

6.2 LOAD CAPACITY OF CROSS-SECTIONS

6.2.4 Pressure

Calculated resistance to pressure	Nc,Rd =	36,125 kN
Condition 6.9: NEd <= Nc,Rd (0.01 <= 36.13)		

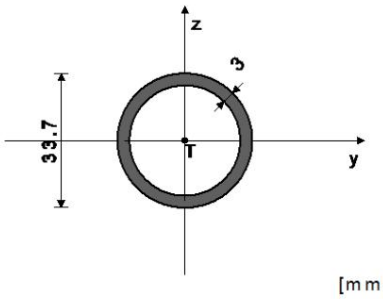
6.3 BENDING CAPACITY OF ELEMENTS 6.3.1.1 Buckling

capacity **Buckling length** yy		
Relative slenderness yy	l,y =	100.00 cm
Buckling curve for axis	**ÿ_y =**	0.712
yy: A **Elastic critical force**	ÿ =	0.210
Reduction coefficient	Ncr,y =	71.298 kN
Calculated buckling	**ÿ,y =**	0.842
resistance Condition 6.46: NEd <=	Nb,Rd,y =	30.422 kN
Nb,Rd,y (0.01 <= 30.42)		
Buckling length zz	l,z =	100.00 cm
Relative slenderness zz	ÿ_z = ÿ	0.712
Buckling curve for axis zz: A	= ÿ,z	0.210
Reduction coefficient	=	0.842
Calculated buckling resistance	Nb,Rd,z =	30.422 kN
Condition 6.46: NEd <= Nb,Rd,z (0.01 <= 30.42)		

ROD 315-345

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 4]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	2,890 cm2
Ay =	1,446 cm2
Az =	1,446 cm2
Ix =	6,879 cm4
Iy =	3,440 cm4
From =	3,440 cm4
Wy =	2,042 cm3
Wz =	2,042 cm3
Wy,pl =	2,836 cm3
Wz,pl =	2,836 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

3. ÿ=0.80

ROD EXPOSED TO CENTRIC TENSION
(load case 3, beginning of the rod)

Calculation normal force	NO =	28.838 kN
System rod length	L =	100.00 cm

6.2 BEARING CAPACITY OF CROSS SECTIONS 6.2.3

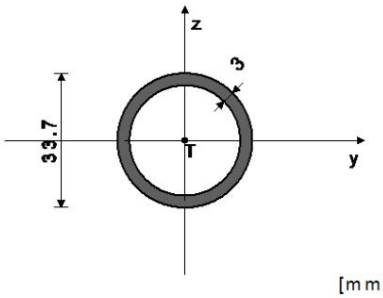
Tension **Plastic resistance of gross**	Npl,Rd =	36,125 kN
section Limit calculation	Nu,Rd =	43,307 kN
resistance of net section	Nt,Rd =	36,125 kN

Calculation **resp. for tensioning Condition 6.5: NEd <= Nt,Rd (28.84 <= 36.13)**

STICK 285-315

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 4]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	2,890 cm2
Ay =	1,446 cm2
Az =	1,446 cm2
Ix =	6,879 cm4
Iy =	3,440 cm4
From =	3,440 cm4
Wy =	2,042 cm3
Wz =	2,042 cm3
Wy,pl =	2,836 cm3
Wz,pl =	2,836 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

3. ÿ=0.80

ROD EXPOSED TO CENTRIC TENSION

(load case 3, beginning of the rod)

Calculation normal force	NO =	28.826 kN
System rod length	L =	100.00 cm

6.2 LOAD CAPACITY OF CROSS-SECTIONS

6.2.3 Tensile

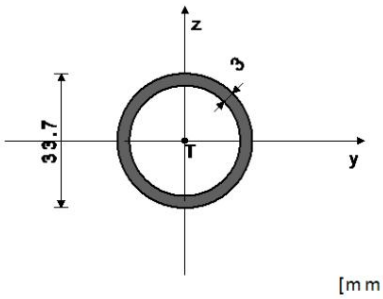
Plastic resistance of the gross cross-	Npl,Rd =	36,125 kN
section Limit resistance of the	Nu,Rd =	43,307 kN
net **cross-**		
section Comput. for tensioning	Nt,Rd =	36,125 kN

Condition 6.5: NEd <= Nt,Rd (28.83 <= 36.13)

STICK 312-338

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 4]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	2,890 cm2
Ay =	1,446 cm2
Az =	1,446 cm2
Ix =	6,879 cm4
Iy =	3,440 cm4
From =	3,440 cm4
Wy =	2,042 cm3
Wz =	2,042 cm3
Wy,pl =	2,836 cm3
Wz,pl =	2,836 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

3. ÿ=0.24

A ROD EXPOSED TO CENTRAL PRESSURE

(load case 3, end of rod)

Calculation normal force	NO =	-7.232 kN
System rod length	L =	100.00 cm

5.5 CLASSIFICATION OF CROSS SECTIONS

Section class 1

6.2 LOAD CAPACITY OF CROSS-SECTIONS

6.2.4 Pressure

Calculated pressure resistance	Nc,Rd =	36,125 kN

Condition 6.9: NEd <= Nc,Rd (7.23 <= 36.13)

6.3 BENDING CAPACITY OF ELEMENTS 6.3.1.1 Buckling

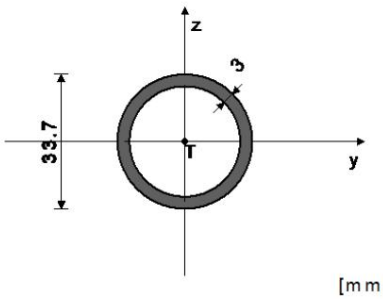
capacity **Buckling length** yy		
Relative slenderness yy	l,y =	100.00 cm
Buckling curve for axis	ÿ_y = ÿ	0.712
yy: A **Elastic critical force**	=	0.210
Reduction coefficient	Ncr,y =	71.298 kN
Calculated buckling	**ÿ,y =**	0.842
resistance Condition 6.46: NEd <=	Nb,Rd,y =	30.422 kN
Nb,Rd,y (7.23 <= 30.42)		
Buckling length zz	l,z =	100.00 cm
Relative slenderness zz	**ÿ_z =**	0.712
Buckling curve for axis zz: A	ÿ =	0.210
Reduction coefficient	**ÿ,z =**	0.842
Calculated buckling resistance	Nb.Rd,z =	30.422 kN

Condition 6.46: NEd <= Nb,Rd,z (7.23 <= 30.42)

STICK 278-312

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 4]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	2,890 cm2
Ay =	1,446 cm2
Az =	1,446 cm2
Ix =	6,879 cm4
Iy =	3,440 cm4
From =	3,440 cm4
Wy =	2,042 cm3
Wz =	2,042 cm3
Wy,pl =	2,836 cm3
Wz,pl =	2,836 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

3. ÿ=0.24

A ROD EXPOSED TO CENTRAL PRESSURE

(load case 3, end of rod)

Calculation normal force	NO =	-7.251 kN
System rod length	L =	100.00 cm

5.5 CLASSIFICATION OF CROSS SECTIONS

Section class 1

6.2 LOAD CAPACITY OF CROSS-SECTIONS

6.2.4 Pressure

Calculated resistance to pressure	Nc,Rd =	36,125 kN

Condition 6.9: NEd <= Nc,Rd (7.25 <= 36.13)

6.3 BENDING CAPACITY OF ELEMENTS 6.3.1.1 Buckling

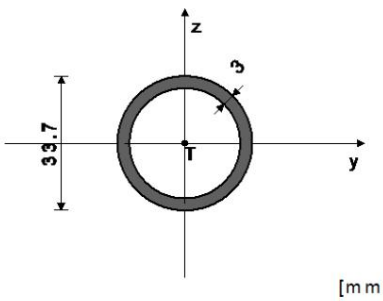
capacity **Buckling length** yy		
Relative slenderness yy	l,y =	100.00 cm
Buckling curve for axis	**ÿ_y =**	0.712
yy: A **Elastic critical force**	ÿ =	0.210
Reduction coefficient	Ncr,y =	71.298 kN
Calculated resistance to	**ÿ,y =**	0.842
buckling Condition 6.46: NEd <=	Nb,Rd,y =	30.422 kN
Nb,Rd,y (7.25 <= 30.42)		
Buckling length zz	l,z =	100.00 cm
Relative slenderness zz	ÿ_z = ÿ	0.712
Buckling curve for axis zz: A	= ÿ,z	0.210
Reduction coefficient	=	0.842
Calculated buckling resistance	Nb.Rd,z =	30.422 kN

Condition 6.46: NEd <= Nb,Rd,z (7.25 <= 30.42)

STICK 252-278

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 4]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	2,890 cm2
Ay =	1,446 cm2
Az =	1,446 cm2
Ix =	6,879 cm4
Iy =	3,440 cm4
From =	3,440 cm4
Wy =	2,042 cm3
Wz =	2,042 cm3
Wy,pl =	2,836 cm3
Wz,pl =	2,836 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

3. ÿ=0.71

A ROD EXPOSED TO CENTRAL PRESSURE

(load case 3, end of rod)

Calculation normal force	NO =	-21.703 kN
System rod length	L =	100.00 cm

5.5 CLASSIFICATION OF CROSS **SECTIONS**

Section class 1

6.2 LOAD CAPACITY OF CROSS-SECTIONS

6.2.4 **Pressure**

Calculation resistance to pressure	Nc,Rd =	36,125 kN

Condition 6.9: NEd <= Nc,Rd (21.70 <= 36.13)

6.3 BENDING CAPACITY OF ELEMENTS 6.3.1.1 Buckling

capacity Buckling length yy Relative		
slenderness yy Buckling	l,y =	100.00 cm
curve for axis yy: A	**ÿ_y =**	0.712
Elastic critical force Reduction	ÿ =	0.210
coefficient **Calculated**	Ncr,y =	71.298 kN
resistance to buckling	**ÿ,y =**	0.842
Condition 6.46: NEd <= Nb,Rd,y (21.70	Nb,Rd,y =	30.422 kN
<= 30.42)		

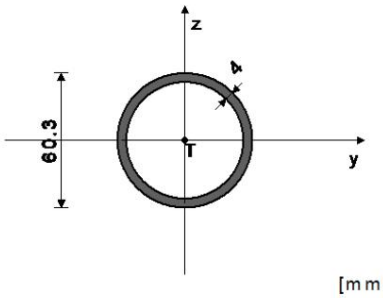
Buckling length zz	l,z =	100.00 cm
Relative slenderness of the zz	**ÿ_z =**	0.712
Buckling curve for axis zz: A	ÿ =	0.210
Reduction coefficient	**ÿ,z =**	0.842

Calculation resistance to buckling	Nb.Rd,z =	30,422 kN
Condition 6.46: NEd <= Nb,Rd,z (21.70 <= 30.42)		

ROD 255-285

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 3]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	7,070 cm2
Ay =	3,536 cm2
Az =	3,536 cm2
Ix =	56,317 cm4
Iy =	28,170 cm4
From =	28,170 cm4
Wy =	9,343 cm3
Wz =	9,343 cm3
Wy,pl =	12,700 cm3
Wz,pl =	12,700 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

3. ÿ=0.65

ROD EXPOSED TO CENTRIC TENSION
(load case 3, beginning of the rod)

Calculation normal force	NO =	57.668 kN
System rod length	L =	100.00 cm

6.2 LOAD CAPACITY OF CROSS-SECTIONS

6.2.3 Tensile

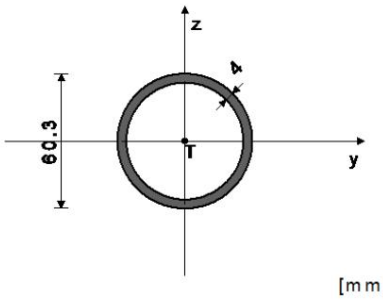
Plastic resistance of the gross cross-	Npl,Rd =	88.375 kN
section Limit resistance of the	Nu,Rd =	105.94 kN
net **cross-**		
section Comput. for tensioning	Nt,Rd =	88,375 kN

Condition 6.5: NEd <= Nt,Rd (57.67 <= 88.38)

ROD 225-255

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 3]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	7,070 cm2
Ay =	3,536 cm2
Az =	3,536 cm2
Ix =	56,317 cm4
Iy =	28,170 cm4
From =	28,170 cm4
Wy =	9,343 cm3
Wz =	9,343 cm3
Wy,pl =	12,700 cm3
Wz,pl =	12,700 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

3. ÿ=0.65

ROD EXPOSED TO CENTRIC TENSION
(load case 3, beginning of the rod)

Calculation normal force	NO =	57.645 kN
System rod length	L =	100.00 cm

6.2 BEARING CAPACITY OF CROSS SECTIONS 6.2.3

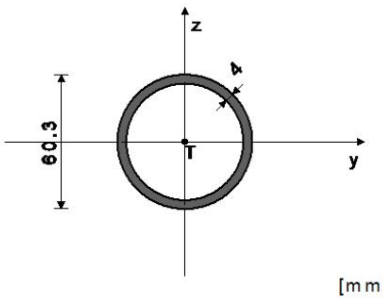
Tension **Plastic resistance of gross**	Npl,Rd =	88.375 kN
section Limit calculation	Nu,Rd =	105.94 kN
resistance of net section	Nt,Rd =	88,375 kN

Calculation **resp. for tensioning Condition 6.5: NEd <= Nt,Rd (57.65 <= 88.38)**

STICK 195-225

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 3]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	7,070 cm2
Ay =	3,536 cm2
Az =	3,536 cm2
Ix =	56,317 cm4
Iy =	28,170 cm4
From =	28,170 cm4
Wy =	9,343 cm3
Wz =	9,343 cm3
Wy,pl =	12,700 cm3
Wz,pl =	12,700 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

3. ÿ=0.98

ROD EXPOSED TO CENTRIC TENSION
(load case 3, beginning of the rod)

Calculation normal force	NO =	86.476 kN
System rod length	L =	100.00 cm

6.2 LOAD CAPACITY OF CROSS-SECTIONS

6.2.3 Tensile

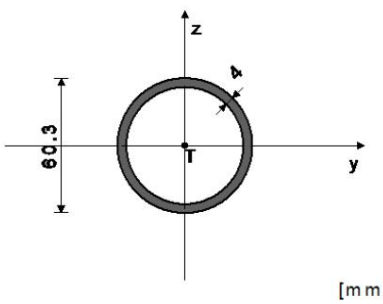
Plastic resistance of the gross cross-	Npl,Rd =	88.375 kN
section Limit resistance of the	Nu,Rd =	105.94 kN
net cross-		
section Comput. for tension	Nt,Rd =	88,375 kN

Condition 6.5: NEd <= Nt,Rd (86.48 <= 88.38)

ROD 218-252

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 3]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	7,070 cm2
Ay =	3,536 cm2
Az =	3,536 cm2
Ix =	56,317 cm4
Iy =	28,170 cm4
From =	28,170 cm4
Wy =	9,343 cm3
Wz =	9,343 cm3
Wy,pl =	12,700 cm3
Wz,pl =	12,700 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

3. ÿ=0.26

A ROD EXPOSED TO CENTRAL PRESSURE
(load case 3, end of rod)

Calculation normal force	NO =	-21.733 kN
System rod length	L =	100.00 cm

5.5 CLASSIFICATION OF CROSS SECTIONS

Section class 1

6.2 LOAD CAPACITY OF CROSS-SECTIONS

6.2.4 Pressure

Calculated resistance to pressure	Nc,Rd =	88,375 kN

Condition 6.9: NEd <= Nc,Rd (21.73 <= 88.38)

6.3 ELEMENTS BUCKLING CAPACITY 6.3.1.1 Buckling

capacity **Buckling length** yy		
Relative slenderness yy	l,y =	100.00 cm
Buckling curve for axis	**ÿ_y =**	0.389
yy: A **Elastic critical force**	ÿ =	0.210
Reduction coefficient	Ncr,y =	583.86 kN
Calculated buckling	**ÿ,y =**	0.956
resistance	Nb,Rd,y =	84.455 kN

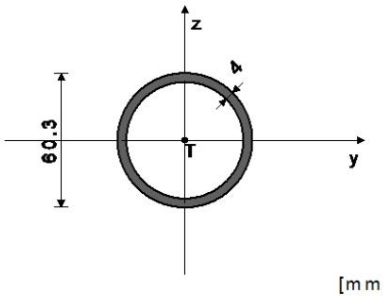
Condition 6.46: NEd <= Nb,Rd,y (21.73 <= 84.45)

Buckling length zz	l,z =	100.00 cm
Relative slenderness of the zz	**ÿ_z =**	0.389
Buckling curve for axis zz: A	ÿ =	0.210
Reduction coefficient	**ÿ,z =**	0.956
Calculated buckling resistance	Nb.Rd,z =	84.455 kN

Condition 6.46: NEd <= Nb,Rd,z (21.73 <= 84.45)

STICK 192-218
CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 3]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	7,070 cm2
Ay =	3,536 cm2
Az =	3,536 cm2
Ix =	56,317 cm4
Iy =	28,170 cm4
From =	28,170 cm4
Wy =	9,343 cm3
Wz =	9,343 cm3
Wy,pl =	12,700 cm3
Wz,pl =	12,700 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS
3. ÿ=0.43

A ROD EXPOSED TO CENTRAL PRESSURE
(load case 3, end of rod)

Calculation normal force	NO =	-36.197 kN
System rod length	L =	100.00 cm

5.5 CLASSIFICATION OF CROSS SECTIONS
Section class 1

6.2 LOAD CAPACITY OF CROSS-SECTIONS
6.2.4 Pressure

Calculated pressure resistance	Nc,Rd =	88,375 kN

Condition 6.9: NEd <= Nc,Rd (36.20 <= 88.38)

6.3 BURNING CAPACITY OF ELEMENTS 6.3.1.1

Buckling capacity **Buckling length** yy		
Relative slenderness	l,y =	100.00 cm
yy Buckling curve for axis	**ÿ_y =**	0.389
yy: A **Elastic critical force**	ÿ =	0.210
Reduction coefficient	Ncr,y =	583.86 kN
Calculated buckling	**ÿ,y =**	0.956
resistance Condition 6.46: NEd <=	Nb,Rd,y =	84.455 kN

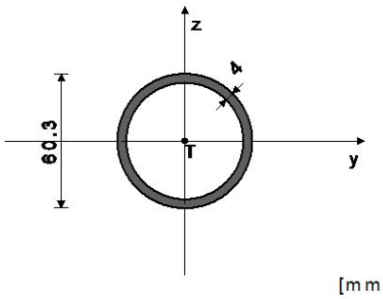
Nb,Rd,y (36.20 <= 84.45)

Buckling length zz	l,z =	100.00 cm
Relative slenderness zz	**ÿ_z =**	0.389
Buckling curve for axis zz: A	ÿ =	0.210
Reduction coefficient	**ÿ,z =**	0.956
Calculated resistance to buckling	Nb.Rd,z =	84.455 kN

Condition 6.46: NEd <= Nb,Rd,z (36.20 <= 84.45)

STICK 158-192
CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 3]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	7,070 cm2
Ay =	3,536 cm2
Az =	3,536 cm2
Ix =	56,317 cm4
Iy =	28,170 cm4
From =	28,170 cm4
Wy =	9,343 cm3
Wz =	9,343 cm3
Wy,pl =	12,700 cm3
Wz,pl =	12,700 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS
3. ÿ=0.43

A ROD EXPOSED TO CENTRAL PRESSURE
(load case 3, end of rod)

Calculation normal force	NO =	-36.226 kN
System rod length	L =	100.00 cm

5.5 CLASSIFICATION OF CROSS SECTIONS
Section class 1

6.2 LOAD CAPACITY OF CROSS-SECTIONS
6.2.4 Pressure

Calculation resistance to pressure	Nc,Rd =	88,375 kN

Condition 6.9: NEd <= Nc,Rd (36.23 <= 88.38)

6.3 BENDING CAPACITY OF ELEMENTS 6.3.1.1 Buckling

capacity **Buckling length** yy		
Relative slenderness yy	l,y =	100.00 cm
Buckling curve for axis	ÿ_y = ÿ	0.389
yy: A **Elastic critical force**	=	0.210
Reduction coefficient	Ncr,y =	583.86 kN
Calculated resistance to	**ÿ,y =**	0.956
buckling **Condition 6.46: NEd <=**	Nb,Rd,y =	84.455 kN

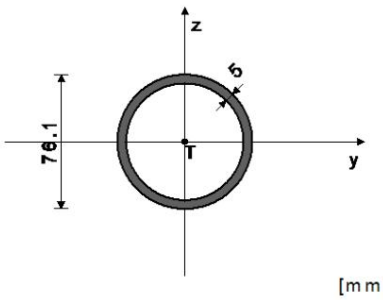
Nb,Rd,y (36.23 <= 84.45)

Buckling length zz	l,z =	100.00 cm
Relative slenderness zz	**ÿ_z =**	0.389
Buckling curve for axis zz: A	ÿ =	0.210
Reduction coefficient	**ÿ,z =**	0.956
Calculated buckling resistance	Nb.Rd,z =	84.455 kN

Condition 6.46: NEd <= Nb,Rd,z (36.23 <= 84.45)

STICK 165-195
CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 2]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	11.170 cm2
Ay =	5.581 cm2
Az =	5.581 cm2
Ix =	141.77 cm4
Iy =	70.920 cm4
From =	70.920 cm4
Wy =	18.639 cm3
Wz =	18.639 cm3
Wy,pl =	25.318 cm3
Wz,pl =	25.318 cm3
ÿM0 =	1.000
ÿM1 =	1.000
ÿM2 =	1.000
Anet/A =	0.900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS
3. ÿ=0.62

ROD EXPOSED TO CENTRIC TENSION
(load case 3, beginning of the rod)

Calculation normal force	NO =	86.453 kN
System rod length	L =	100.00 cm

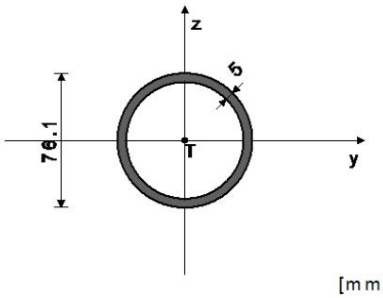
6.2 LOAD CAPACITY OF CROSS-SECTIONS
6.2.3 Tensile

Plastic resistance of the gross cross-	Npl,Rd =	139.63 kN
section Limit resistance of the	Nu,Rd =	167.38 kN
net **cross-**		
section Comput. for tensioning	Nt,Rd =	139.63 kN

Condition 6.5: NEd <= Nt,Rd (86.45 <= 139.63)

STICK 135-165
CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 2]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



Ax =	11.170 cm2
Ay =	5.581 cm2
Az =	5.581 cm2
Ix =	141.77 cm4
Iy =	70.920 cm4
From =	70.920 cm4
Wy =	18.639 cm3
Wz =	18.639 cm3
Wy,pl =	25.318 cm3
Wz,pl =	25.318 cm3
ÿM0 =	1.000
ÿM1 =	1.000
ÿM2 =	1.000
Anet/A =	0.900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

3. ÿ=0.82

ROD EXPOSED TO CENTRIC TENSION

(load case 3, beginning of the rod)

Calculation normal force	NO =	115.27 kN
System rod length	L =	100.00 cm

6.2 LOAD CAPACITY OF CROSS-SECTIONS

6.2.3 Tensile

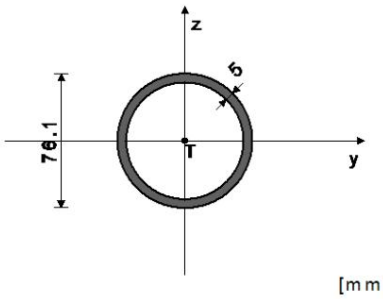
Plastic resistance of the gross	Npl,Rd =	139.63 kN
cross-section Limit resistance	Nu,Rd =	167.38 kN
of the		
net cross-section Comput. for	Nt,Rd =	139.63 kN

tension **Condition 6.5: NEd <= Nt,Rd (115.27 <= 139.63)**

ROD 105-135

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 2]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



Ax =	11.170 cm2
Ay =	5.581 cm2
Az =	5.581 cm2
Ix =	141.77 cm4
Iy =	70.920 cm4
From =	70.920 cm4
Wy =	18.639 cm3
Wz =	18.639 cm3
Wy,pl =	25.318 cm3
Wz,pl =	25.318 cm3
ÿM0 =	1.000
ÿM1 =	1.000
ÿM2 =	1.000
Anet/A =	0.900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

3. ÿ=0.82

ROD EXPOSED TO CENTRIC TENSION

(load case 3, beginning of the rod)

Calculation normal force	NO =	115.24 kN
System rod length	L =	100.00 cm

6.2 LOAD CAPACITY OF CROSS-SECTIONS

6.2.3 Tensile

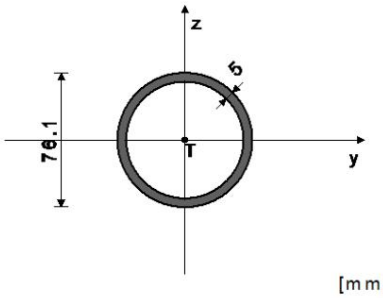
Plastic resistance of the gross	Npl,Rd =	139.63 kN
cross-section Limit resistance	Nu,Rd =	167.38 kN
of the		
net **cross-section Comput.**	Nt,Rd =	139.63 kN

for tension Condition 6.5: NEd <= Nt,Rd (115.24 <= 139.63)

STICK 132-158

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 2]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



Ax =	11.170 cm2
Ay =	5.581 cm2
Az =	5.581 cm2
Ix =	141.77 cm4
Iy =	70.920 cm4
From =	70.920 cm4
Wy =	18.639 cm3
Wz =	18.639 cm3
Wy,pl =	25.318 cm3
Wz,pl =	25.318 cm3
ÿM0 =	1.000
ÿM1 =	1.000
ÿM2 =	1.000
Anet/A =	0.900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

3. ÿ=0.37

A ROD EXPOSED TO CENTRAL PRESSURE

(load case 3, end of rod)

Calculation normal force	NO =	-50.701 kN
System rod length	L =	100.00 cm

5.5 CLASSIFICATION OF CROSS SECTIONS

Section class 1

6.2 LOAD CAPACITY OF CROSS-SECTIONS

6.2.4 **Pressure**

Calculation resistance to pressure	Nc,Rd =	139.63 kN

Condition 6.9: NEd <= Nc,Rd (50.70 <= 139.63)

6.3 BURNING CAPACITY OF ELEMENTS 6.3.1.1

Buckling capacity **Buckling length**		
yy Relative slenderness	l,y =	100.00 cm
yy Buckling curve for axis	**ÿ_y =**	0.308
yy: A **Elastic critical force**	ÿ =	0.210
Reduction coefficient	Ncr,y =	1469.9 kN
Calculated buckling	**ÿ,y =**	0.976
resistance **Condition 6.46: NEd <=**	Nb,Rd,y =	136.21 kN

Nb,Rd,y (50.70 <= 136.21)

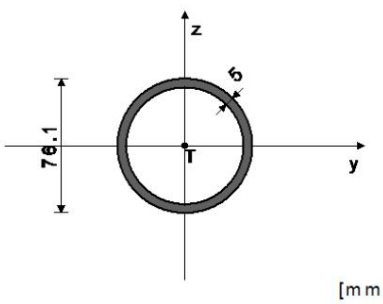
Buckling length zz	l,z =	100.00 cm
Relative slenderness zz	**ÿ_z =**	0.308
Buckling curve for axis zz: A	ÿ =	0.210
Reduction coefficient	**ÿ,z =**	0.976
Calculated buckling resistance	Nb.Rd,z =	136.21 kN

Condition 6.46: NEd <= Nb,Rd,z (50.70 <= 136.21)

STICK 98-132

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 2]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



Ax =	11.170 cm2
Ay =	5.581 cm2
Az =	5.581 cm2
Ix =	141.77 cm4
Iy =	70.920 cm4
From =	70.920 cm4
Wy =	18.639 cm3
Wz =	18.639 cm3
Wy,pl =	25.318 cm3
Wz,pl =	25.318 cm3
ÿM0 =	1.000
ÿM1 =	1.000
ÿM2 =	1.000
Anet/A =	0.900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

3. ÿ=0.37

A ROD EXPOSED TO CENTRAL PRESSURE

(load case 3, end of rod)

Calculation normal force	NO =	-50.742 kN
System rod length	L =	100.00 cm

5.5 CLASSIFICATION OF CROSS SECTIONS

Section class 1

6.2 LOAD CAPACITY OF CROSS-SECTIONS

6.2.4 **Pressure**

Calculation resistance to pressure	Nc,Rd =	139.63 kN

Condition 6.9: NEd <= Nc,Rd (50.74 <= 139.63)

6.3 BENDING CAPACITY OF ELEMENTS 6.3.1.1 Buckling

capacity **Buckling length** yy		
Relative slenderness yy	l,y =	100.00 cm
Buckling curve for axis	**ÿ_y =**	0.308
yy: A **Elastic critical force**	ÿ =	0.210
Reduction coefficient	Ncr,y =	1469.9 kN
Calculated resistance to	**ÿ,y =**	0.976
buckling Condition 6.46: NEd <=	Nb,Rd,y =	136.21 kN

Nb,Rd,y (50.74 <= 136.21)

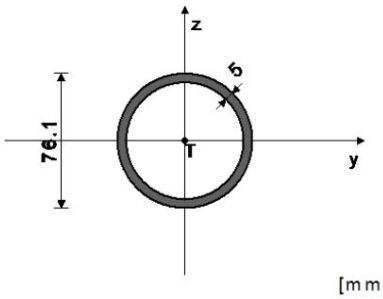
Buckling length zz	l,z =	100.00 cm
Relative slenderness zz	**ÿ_z =**	0.308
Buckling curve for axis zz: A	ÿ =	0.210
Reduction coefficient	**ÿ,z =**	0.976
Calculated buckling resistance	Nb.Rd,z =	136.21 kN

Condition 6.46: NEd <= Nb,Rd,z (50.74 <= 136.21)

STICK 72-98

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 2]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	11.170 cm2
Ay =	5.581 cm2
Az =	5.581 cm2
Ix =	141.77 cm4
Iy =	70.920 cm4
From =	70.920 cm4
Wy =	18.639 cm3
Wz =	18.639 cm3
Wy,pl =	25.318 cm3
Wz,pl =	25.318 cm3
ÿM0 =	1.000
ÿM1 =	1.000
ÿM2 =	1.000
Anet/A =	0.900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

3. ÿ=0.48

A ROD EXPOSED TO CENTRAL PRESSURE
(load case 3, end of rod)

Calculation normal force	NO =	-65.217 kN
System rod length	L =	100.00 cm

5.5 CLASSIFICATION OF CROSS SECTIONS

Section class 1

6.2 LOAD CAPACITY OF CROSS-SECTIONS

6.2.4 **Pressure**

Calculation resistance to pressure	Nc,Rd =	139.63 kN
Condition 6.9: NEd <= Nc,Rd (65.22 <= 139.63)		

6.3 BENDING CAPACITY OF ELEMENTS 6.3.1.1 Buckling capacity **Buckling length** yy

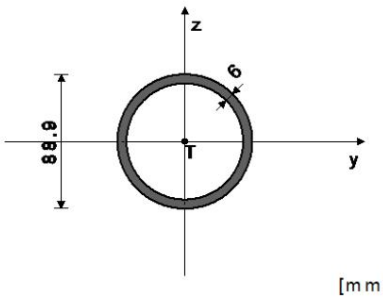
Relative slenderness yy	l,y =	100.00 cm
Buckling curve for axis yy: A	**ÿ_y =**	0.308
Elastic critical force	ÿ =	0.210
Reduction coefficient	Ncr,y =	1469.9 kN
Calculated buckling resistance Condition 6.46: NEd <= Nb,Rd,y (65.22 <= 136.21)	**ÿ,y =**	0.976
	Nb,Rd,y =	136.21 kN

Buckling length zz	l,z =	100.00 cm
Relative slenderness zz	ÿ_z = ÿ	0.308
Buckling curve for axis zz: A	= ÿ,z	0.210
Reduction coefficient	=	0.976
Calculated buckling resistance	Nb,Rd,z =	136.21 kN
Condition 6.46: NEd <= Nb,Rd,z (65.22 <= 136.21)		

STICK 75-105

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 1]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	16.630 cm2
Ay =	7.809 cm2
Az =	7.809 cm2
Ix =	269.75 cm4
Iy =	134.94 cm4
From =	134.94 cm4
Wy =	30.358 cm3
Wz =	30.358 cm3
Wy,pl =	41.306 cm3
Wz,pl =	41.306 cm3
ÿM0 =	1.000
ÿM1 =	1.000
ÿM2 =	1.000
Anet/A =	0.900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

3. ÿ=0.69

ROD EXPOSED TO CENTRIC TENSION
(load case 3, beginning of the rod)

Calculation normal force	NO =	144.06 kN
System rod length	L =	100,000 cm

6.2 LOAD CAPACITY OF CROSS-SECTIONS

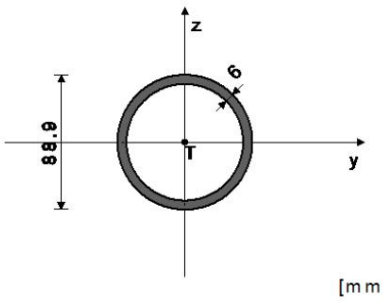
6.2.3 Tensile

Plastic resistance of the gross cross-	Npl,Rd =	207.88 kN
section Limit resistance of the	Nu,Rd =	249.20 kN
net **cross-**		
section Comput. for tensioning	Nt,Rd =	207.88 kN
Condition 6.5: NEd <= Nt,Rd (144.06 <= 207.88)		

ROD 45-75

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 1]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	16.630 cm2
Ay =	7.809 cm2
Az =	7.809 cm2
Ix =	269.75 cm4
Iy =	134.94 cm4
From =	134.94 cm4
Wy =	30.358 cm3
Wz =	30.358 cm3
Wy,pl =	41.306 cm3
Wz,pl =	41.306 cm3
ÿM0 =	1.000
ÿM1 =	1.000
ÿM2 =	1.000
Anet/A =	0.900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

3. ÿ=0.69

ROD EXPOSED TO CENTRIC TENSION
(load case 3, beginning of the rod)

Calculation normal force	NO =	144.01 kN
System rod length	L =	100.00 cm

6.2 LOAD CAPACITY OF CROSS-SECTIONS

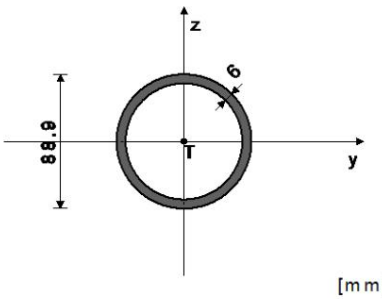
6.2.3 Tensile

Plastic resistance of the gross cross-	Npl,Rd =	207.88 kN
section Limit resistance of the	Nu,Rd =	249.20 kN
net **cross-**		
section Comput. for tensioning	Nt,Rd =	207.88 kN
Condition 6.5: NEd <= Nt,Rd (144.01 <= 207.88)		

ROD 15-45

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 1]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	16.630 cm2
Ay =	7.809 cm2
Az =	7.809 cm2
Ix =	269.75 cm4
Iy =	134.94 cm4
From =	134.94 cm4
Wy =	30.358 cm3
Wz =	30.358 cm3
Wy,pl =	41.306 cm3
Wz,pl =	41.306 cm3
ÿM0 =	1.000
ÿM1 =	1.000
ÿM2 =	1.000
Anet/A =	0.900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

3. ÿ=0.83

ROD EXPOSED TO CENTRIC TENSION
(load case 3, beginning of the rod)

Calculation normal force	NEd = 172.81 kN L =	
System rod length	100,000 cm	

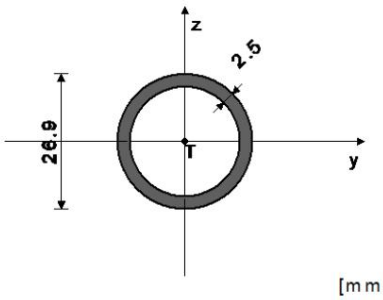
6.2 LOAD CAPACITY OF CROSS-SECTIONS
6.2.3 Tightening

Plastic calc. resistance of gross	Npl,Rd =	207.88 kN
cross-section Limit calc.	Nu,Rd =	249.20 kN
resistance of net cross **-section**	Nt,Rd =	207.88 kN

Calcul. for tension Condition 6.5: NEd <= Nt,Rd (172.81 <= 207.88)

STICK 63-45
CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 5]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS
3. ÿ=0.39

ROD EXPOSED TO CENTRIC TENSION
(load case 3, end of rod)

Calculation normal force	NO =	9.245 kN
System rod length	L =	128.06 cm

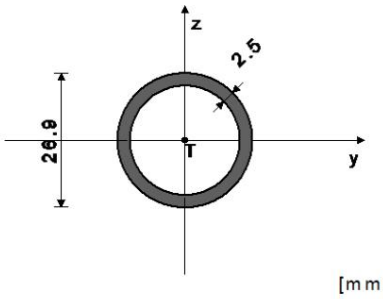
6.2 LOAD CAPACITY OF CROSS-SECTIONS
6.2.3 Tensile

Plastic resistance of the gross cross-	Npl,Rd =	24,000 kN
section Limit resistance of the	Nu,Rd =	28,771 kN
net **cross-**		
section Comput. for tensioning	Nt,Rd =	24,000 kN

Condition 6.5: NEd <= Nt,Rd (9.24 <= 24.00)

STICK 45-6
CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 5]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS
3. ÿ=0.68

A ROD EXPOSED TO CENTRAL PRESSURE
(load case 3, beginning of the rod)

Calculation normal force	NO =	-9.245 kN
System rod length	L =	128.06 cm

5.5 CLASSIFICATION OF CROSS SECTIONS
Section class 1

6.2 LOAD CAPACITY OF CROSS-SECTIONS
6.2.4 **Pressure**

Calculation resistance to pressure	Nc,Rd =	24,000 kN

Condition 6.9: NEd <= Nc,Rd (9.24 <= 24.00)

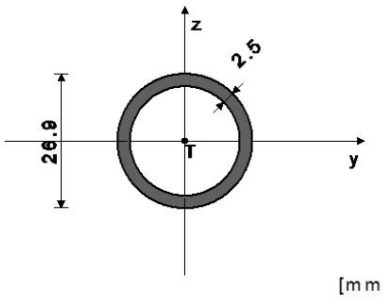
6.3 BENDING CAPACITY OF ELEMENTS 6.3.1.1 Buckling

capacity **Buckling length** yy		
Relative slenderness yy	l,y =	128.06 cm
Buckling curve for axis	**ÿ_y =**	1.148
yy: A **Elastic critical force**	ÿ =	0.210
Reduction coefficient	Ncr,y =	18.199 kN
Calculated resistance to	**ÿ,y =**	0.563
buckling Condition 6.46: NEd <=	Nb,Rd,y =	13.522 kN
Nb,Rd,y (9.24 <= 13.52)		
Buckling length zz	l,z =	128.06 cm
Relative slenderness zz	**ÿ_z =**	1.148
Buckling curve for axis zz: A	ÿ =	0.210
Reduction coefficient	**ÿ,z =**	0.563
Calculated buckling resistance	Nb.Rd,z =	13.522 kN

Condition 6.46: NEd <= Nb,Rd,z (9.24 <= 13.52)

STICK 165-132
CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 6]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



[mm]

Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

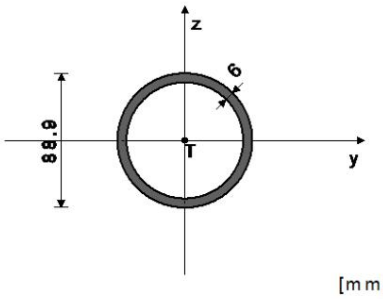
(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS
3. ÿ=0.00

No influence

STICK 63-93
CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 1]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



Ax =	16.630 cm2
Ay =	7.809 cm2
Az =	7.809 cm2
Ix =	269.75 cm4
Iy =	134.94 cm4
From =	134.94 cm4
Wy =	30.358 cm3
Wz =	30.358 cm3
Wy,pl =	41.306 cm3
Wz,pl =	41.306 cm3
ÿM0 =	1.000
ÿM1 =	1.000
ÿM2 =	1.000
Anet/A =	0.900

(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

UTILIZATION FACTORS BY LOAD COMBINATIONS

3. ÿ=0.32

A ROD EXPOSED TO CENTRAL PRESSURE

(load case 3, end of rod)

Calculation normal force	NO =	-65,269 kN

System rod length	L =	100.00 cm

5.5 CLASSIFICATION OF CROSS SECTIONS

Section class 1

6.2 LOAD CAPACITY OF CROSS-SECTIONS

6.2.4 **Pressure**

Calculation resistance to pressure	Nc,Rd =	207.88 kN
Condition 6.9: NEd <= Nc,Rd (65.27 <= 207.88)		

6.3 BENDING CAPACITY OF ELEMENTS 6.3.1.1 Buckling

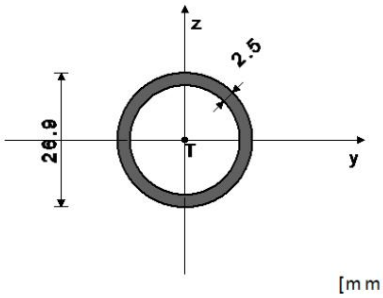
capacity **Buckling length** yy		
Relative slenderness yy	l,y =	100.00 cm
Buckling curve for axis	**ÿ_y =**	0.273
yy: A **Elastic critical force**	ÿ =	0.210
Reduction coefficient	Ncr,y =	2796.8 kN
Calculated buckling	**ÿ,y =**	0.984
resistance Condition 6.46: NEd <=	Nb,Rd,y =	204.51 kN
Nb,Rd,y (65.27 <= 204.51)		

Buckling length zz	l,z =	100.00 cm
Relative slenderness zz	**ÿ_z =**	0.273
Buckling curve for axis zz: A	ÿ =	0.210
Reduction coefficient	**ÿ,z =**	0.984
Calculated buckling resistance	Nb.Rd,z =	204.51 kN
Condition 6.46: NEd <= Nb,Rd,z (65.27 <= 204.51)		

STICK 135-98

CROSS SECTION : Tubular [EN-AW-6082-T6] [Set: 6]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIC CHARACTERISTICS OF SECTIONS



Ax =	1,920 cm2
Ay =	0,958 cm2
Az =	0,958 cm2
Ix =	2,881 cm4
Iy =	1,440 cm4
From =	1,440 cm4
Wy =	1,071 cm3
Wz =	1,071 cm3
Wy,pl =	1,494 cm3
Wz,pl =	1,494 cm3
ÿM0 =	1,000
ÿM1 =	1,000
ÿM2 =	1,000
Anet/A =	0,900

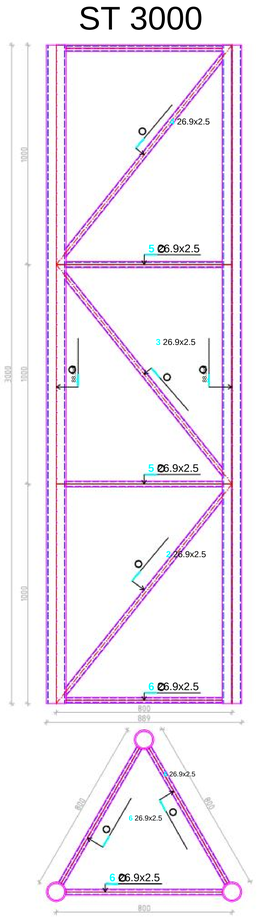
(fy = 12.5 kN/cm2, fu = 18.5 kN/cm2)

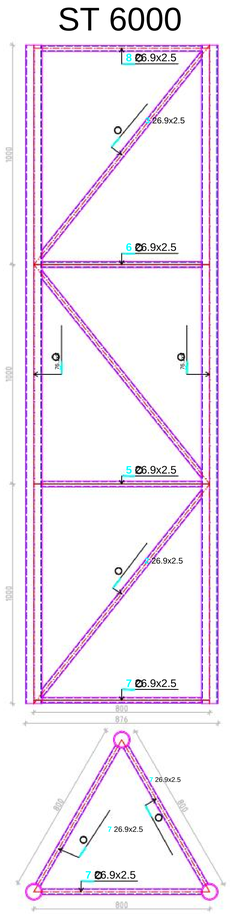
UTILIZATION FACTORS BY LOAD COMBINATIONS

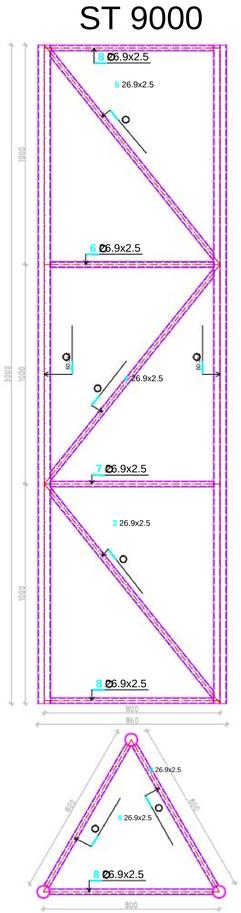
3. ÿ=0.00

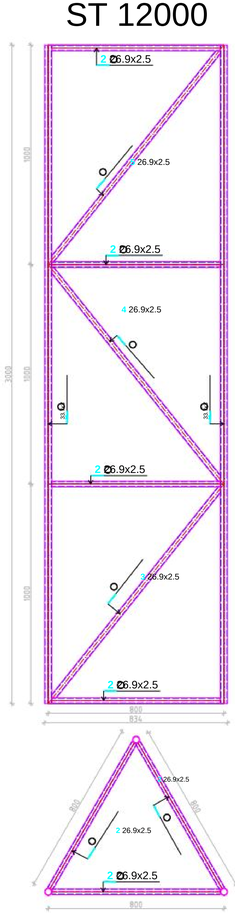
No influence

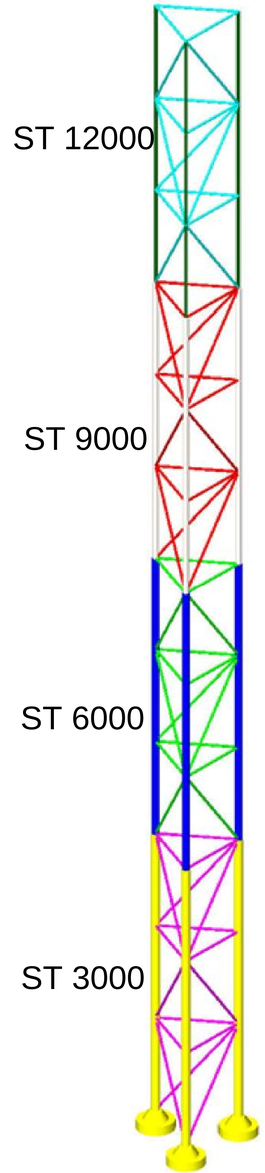
TEHNICAL DRAWINGS











Rods and sheets - specification

POS	Type	Material	n [piece]	Width [mm]	Thickness [mm]	Length [mm]	Unit weight [kg/m]	Weight per piece, [kg]	Total weight [kg]
			STT 3000 (1 pc)						
1	Ø88.9x6 EN AW-6082-T6 3					3000.00	4.22	12.66	37.97
2	Ø26.9x2.5 EN AW-6082-T6 3					1171.94	0.52	0.61	1.82
3	Ø26.9x2.5 EN AW-6082-T6 3					1171.94	0.52	0.61	1.82
4	Ø26.9x2.5 EN AW-6082-T6 3					1172.13	0.52	0.61	1.82
5	Ø26.9x2.5 EN AW-6082-T6 6					711.10	0.52	0.37	2.21
6	Ø26.9x2.5 EN AW-6082-T6 6					711.10	0.52	0.37	2.21
Total									47.84
			STT 6000 (1 pc)						
1	Ø76.1x5 EN AW-6082-T6 3					3000.00	3.02	9.05	27.14
2	Ø26.9x2.5 EN AW-6082-T6 3					1192.43	0.52	0.62	1.85
3	Ø26.9x2.5 EN AW-6082-T6 3					1192.43	0.52	0.62	1.85
4	Ø26.9x2.5 EN AW-6082-T6 3					1192.43	0.52	0.62	1.85
5	Ø26.9x2.5 EN AW-6082-T6 3					723.90	0.52	0.37	1.12
6	Ø26.9x2.5 EN AW-6082-T6 3					723.90	0.52	0.37	1.12
7	Ø26.9x2.5 EN AW-6082-T6 3					723.90	0.52	0.37	1.12
8	Ø26.9x2.5 EN AW-6082-T6 3					723.90	0.52	0.37	1.12
Total									37.19
			STT 9000 (1 pc)						
1	Ø60.3x4 EN AW-6082-T6 2					3000.00	1.91	5.73	11.46
2	Ø60.3x4 EN AW-6082-T6 1					3000.00	1.91	5.73	5.73
3	Ø26.9x2.5 EN AW-6082-T6 3					1217.72	0.52	0.63	1.89
4	Ø26.9x2.5 EN AW-6082-T6 3					1217.72	0.52	0.63	1.89
5	Ø26.9x2.5 EN AW-6082-T6 3					1217.72	0.52	0.63	1.89
6	Ø26.9x2.5 EN AW-6082-T6 3					739.70	0.52	0.38	1.15
7	Ø26.9x2.5 EN AW-6082-T6 3					739.70	0.52	0.38	1.15
8	Ø26.9x2.5 EN AW-6082-T6 6					739.70	0.52	0.38	2.30
Total									27.46
			STT 12000 (1 pc)						
1	Ø33.7x3 EN AW-6082-T6 3					3000.00	0.78	2.34	7.03
2	Ø26.9x2.5 EN AW-6082-T6 15					766.30	0.52	0.40	5.95
3	Ø26.9x2.5 EN AW-6082-T6 3					1228.06	0.52	0.64	1.91
4	Ø26.9x2.5 EN AW-6082-T6 3					1238.57	0.52	0.64	1.92
5	Ø26.9x2.5 EN AW-6082-T6 3					1228.06	0.52	0.64	1.91
Total									18.71

Profiles - recap

Profile type	Material	Unit weight [kg/m]	Total weight [kg]
Ø88.9x6	EN AW-6082-T6	4.22	37.97
Ø33.7x3	EN AW-6082-T6	0.78	7.03
Ø76.1x5	EN AW-6082-T6	3.02	27.14
Ø60.3x4	EN AW-6082-T6	1.91	17.19
Ø26.9x2.5	EN AW-6082-T6	0.52	41.87
Total			131.20

Summary recapitulation

Assembly	Unit weight [kg]	Total weight [kg]
ST 3000 (0 pcs)	0.00	0.00
ST 6000 (0 pcs)	0.00	0.00
ST 9000 (0 pcs)	0.00	0.00
ST 12000 (0 pcs)	0.00	0.00
STT 3000 (1 pc)	47.84	47.84
STT 6000 (1 pc)	37.19	37.19
STT 9000 (1 pc)	27.46	27.46
STT 12000 (1 pc)	18.71	18.71
Total		131.20
Total (+ for bonding agents 3%)		135.14

PROJEKTANT:		INVESTOR:	
Objekat:		Lokacija:	
Glavni inženjer:		Vrsta tehničke dokumentacije:	
Dio tehničke dokumentacije: KONSTRUKCIJA	RAZMJERA: R=1:10	Grafička dokumentacija	Br. priloga: 01
Crtež:			

PREPARATION AND PRODUCTION OF SAMPLES

During the preparation of the material, the following guidelines were followed:

- When welding aluminum before and after each layer of weld, it is necessary to perform cleaning in order to reduce the presence of Al2O3, cleaning must be done mechanically with a brush with stainless steel wires;

- After mechanical cleaning of the surface, it is necessary to perform welding as soon as possible in order to avoid the re-formation of aluminum oxide, within 4 hours at the latest;

- When welding aluminum before and after each layer of weld, it is necessary to perform cleaning in order to reduce the presence of Al2O3.

- You should brush until it loses its shine. It should not be shiny as this is usually an indication that there is still an outer layer on the metal.

- The use of points with a wire brush or anything similar is not recommended because aluminum is soft. It will not clean the oxide; it will only embed it further into the metal due to the high speed of the wheel heating the metal.

- If using a wire brush, be sure to rub in one direction only, as back and forth brushing can also push the oxide further into the aluminum.

- Before welding, thoroughly flame dry the area around the joint being welded;

- Flushing the hose for a short time using a torch trigger can help reduce the amount of porosity, which directly reduces the moisture in the hose. If this is done with a MIG welding torch (GAW, gas metal arc welding) do not forget to turn off the wire feed!

- If the first seam is of poor quality due to the above, do a test weld on a spare or sample material and then start welding on the target material.

Welding wire

- For welding AW 6082 T6 alloy, one of the two suggested wires should be used

• ER 4043 (AlSi5)

• ER 5356 (AlMg5)

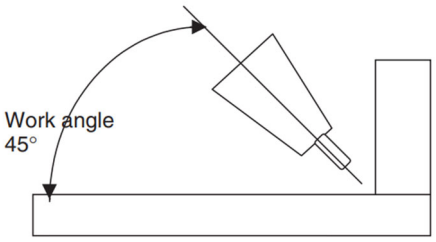
Protective gas

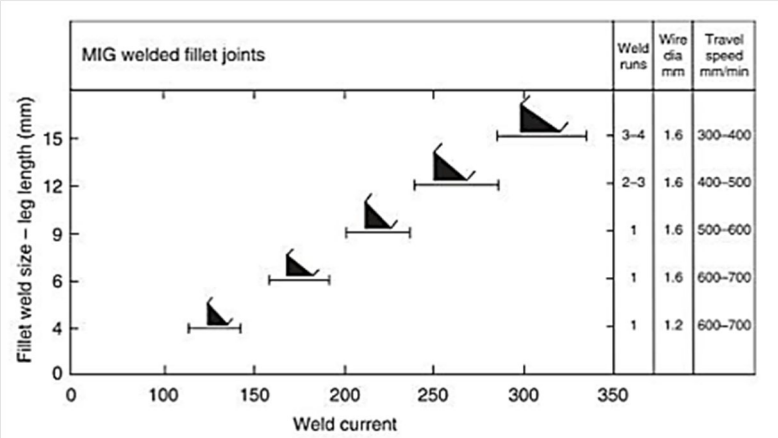
- Shielding gases in MIG welding - argon

Free wire end

- The free wire end is the length from the exit from the contact guide to the start of the electric arc, and should be 13 times the wire diameter, but not more than 20 mm.

Welding angle





7.17 Suggested parameters for fillet welding – argon shielding.





TELWIN
MAXIMA


VARMIG 600 D44
Sinergy
varstroj

EXPERIMENTAL INVESTIGATION

The experimental investigation was conducted at the Laboratory of the Faculty of Civil Engineering, University of Montenegro. To replicate the truss supports, the truss was installed horizontally and positioned perpendicular to a closed frame. One end of the truss was bolted to the frame, while at the opposite end, hydraulic presses applied load at the nodes, as illustrated in the figure.

Load measurements were taken using load cells placed beneath the hydraulic presses. Stresses in the chord and brace members were determined indirectly by measuring strains using strain gauges. These strain gauges were installed on compressed diagonal brace members at their mid-span. Each member had three strain gauges in the cross-section, positioned parallel to the member's span.

In addition to the brace members, strain gauges were also applied to the chord members using the same methodology. The chord members selected for strain gauge placement corresponded to those experiencing the highest stress utilization, as determined by the FEM model. The strain gauges used in this experiment were TML FLAB-6-23-5LJC-F.

Global displacement was measured using two displacement transducers to ensure that the load was applied evenly and simultaneously. The load step was set at **0.5 kN/min**, with a maximum load of **10.5 kN**.

EXPERIMENTAL VS FEM MODEL RESULTS

At the following table is given commparassion of the forces inside brace and chord members thru experiment (EXP) and thru the FEM modeling (FEM) and difference.

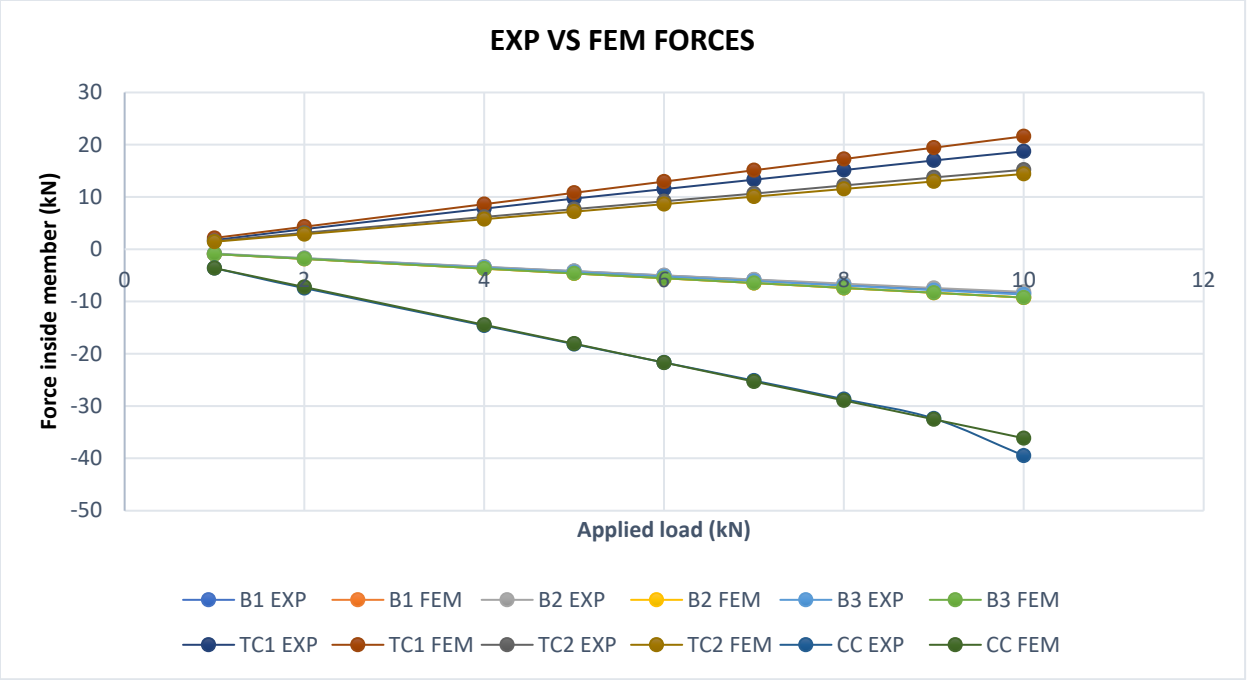
Member	Load step	1	2	4	5	6	7	8	9	10
B1	EXP	-0.91	-1.73	-3.38	-4.20	-5.01	-5.83	-6.70	-7.56	-8.42
	FEM	-0.92	-1.85	-3.70	-4.62	-5.54	-6.47	-7.39	-8.32	-9.24
	Diference	1.97	6.49	8.49	8.99	9.59	9.79	9.35	9.07	8.85
B2	EXP	-0.80	-1.69	-3.34	-4.17	-4.99	-5.77	-6.57	-7.39	-8.15
	FEM	-0.92	-1.85	-3.70	-4.62	-5.54	-6.47	-7.39	-8.32	-9.24
	Diference	13.71	8.70	9.72	9.77	10.06	10.72	11.15	11.08	11.80
B3	EXP	-0.88	-1.80	-3.52	-4.38	-5.21	-6.06	-6.95	-7.82	-8.67
	FEM	-0.92	-1.85	-3.70	-4.62	-5.54	-6.47	-7.39	-8.32	-9.24
	Diference	4.35	2.71	4.63	5.17	6.06	6.24	5.92	5.91	6.15
TC1	EXP	1.76	3.86	7.78	9.69	11.50	13.32	15.16	17.00	18.74
	FEM	2.16	4.32	8.64	10.80	12.96	15.12	17.28	19.44	21.60
	Diference	18.54	10.71	10.00	10.27	11.23	11.88	12.27	12.54	13.23
TC2	EXP	1.56	3.15	6.17	7.68	9.18	10.67	12.20	13.74	15.22
	FEM	1.44	2.88	5.76	7.21	8.65	10.09	11.53	12.97	14.41
	Diference	8.12	9.36	7.06	6.65	6.12	5.75	5.85	5.92	5.63
CC1	EXP	-3.61	-7.44	-14.59	-18.16	-21.66	-25.13	-28.67	-32.38	-39.49
	FEM	-3.61	-7.23	-14.46	-18.07	-21.68	-25.30	-28.91	-32.53	-36.14
	Diference	0.01	3.00	0.91	0.51	0.13	0.67	0.85	0.45	9.26

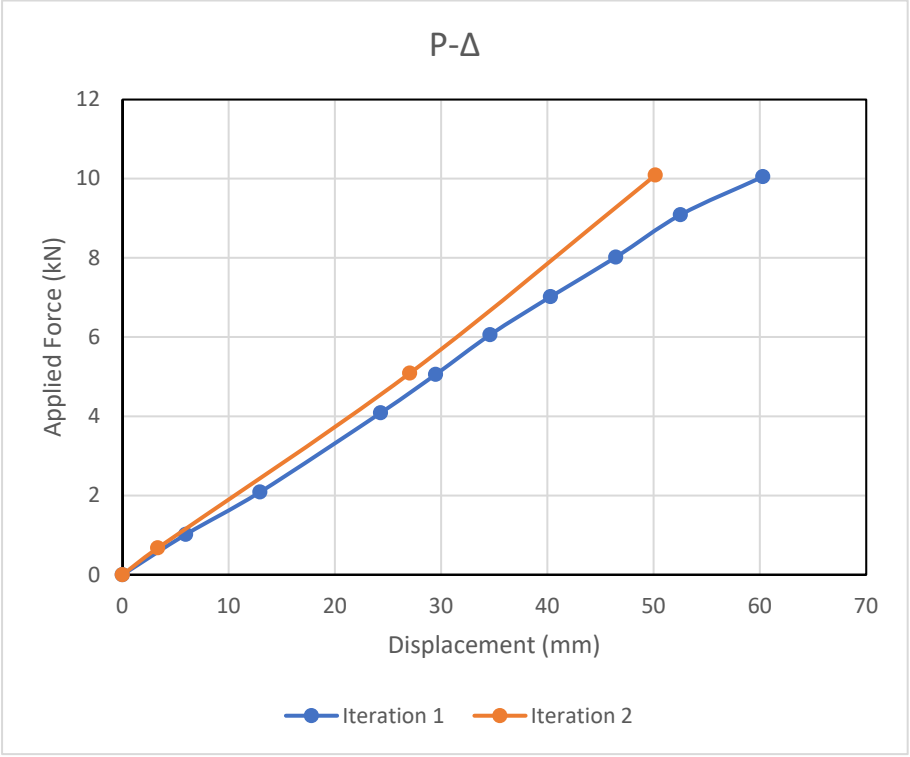
*DIFFERENCE= (FEM-EXP)/FEM*100

B1, B2, B3- compressed diagonal brace members

TC1, TC2- tensioned chord members

CC1- compressed chord member





MEASURED FORCES INSIDE MEMBERS COMPARED TO THE FEM FORCES FROM THE MODEL

CERTIFICATES FOR EN AW-6082-T6

SEYKOÇ ALÜMİNYUM "TÜRKİYE'NİN LİDER ALÜMİNYUM TEDARİKÇİSİ"	UYGUNLUK SERTİFİKASI *(Certificate of Conformity)*	Document No : FR.061 Publishing Date : 01.10.2016 Revision Date : 15.03.2018 Revision No : 2 Page No : 1/1

Sertifika No *(Certificate Number)*	249	**Tarih** *(Date)*	06.03.2024

Genel Bilgi *(General Information)*

Formu *(Form)*	BORU	Lot No *(Lot/Batch No)*	140305
Ölçüleri *(Dimensions)*	25X3	Miktar (Kg) *(Quantity)*	-
Alaşım *(Alloy)*	6082	Adet *(Pieces)*	-
Temper *(Temper)*	T6	Standartlar *(Standards)*	EN 573-3 EN 755-2

Kimyasal Analiz *(Chemical Analysis)*

DEĞERLER *(VALUES)*	**ELEMENTLER (%)** *(Elements)*										
STANDART	Fe	Si	Mn	Cr	Ti	Cu	Mg	Zn	Each	Total	Al
Min.		0,70	0,40				0,60				
Max.	0,50	1,30	1,00	0,25	0,10	0,10	1,20	0,20	0,050	0,15	
TEST SONUÇLARI (%) *(Test Results)*											
	0,23	0,93	0,50	0,01	0,01	0,02	0,72	0,02			

Mekanik Özellikler *(Mechanical Properties)*

1 Mpa = 1 N/mm² = 0.145 ksi =0.102 kgf/mm²

STANDART	Çekme Dayanımı (Mpa) *(Tensile Strength)*	Akma Dayanımı (Mpa) *(Yield Strength)*	Uzama (%) *(Elongation)*	Sertlik (HB) *(Hardness)*
Min.	310	260	10	95
Max.				
TEST SONUÇLARI (%) *(Test Results)*				
	325	271	10	95

Ultrasonik Muayene *(Ultrasonic Inspection)*

Uygulandı *(Done)*		Uygulandı İse, Standardı *(If Done, Standarts)*		Uygulanmadı *(Not Done)*	**X**

Onay *(Approval)*

Seykoç Alüminyum bu uygunluk sertifikası ile, müşteriye teslim edilen ve yukarıda özellikleri tanımlanan ürünlerin; müşteri sipariş şartlarını sağladığını, rapor üzerinde belirtilen teknik değerlerin doğruluğunu ve uluslararası standart şartlarına uygunluğunu beyan ve taahhüt eder.
Seykoç Alüminyum with this conformity certificate, the products delivered to the customer and defined above features; customer order conditions, the accuracy of the technical values stated on the report and compliance with international standard requirements.
Bu Uygunluk Sertifikası, TS EN 10204 standardının 3.1 formatına uygun olarak hazırlanmıştır.
This Conformity Of Certificate was prepared in format 3.1 in accordance with TS EN 10204 standart
Bu Uygunluk Sertifikası, üretici firmanın orijinal sertifika bilgilerini içermektedir.
This Conformity of Certificate contains the information of the manufacturer's original certificate.

Kalite Kontrol Departmanı
(Quality Control Department)

Şahin ARSLAN

QUALITY CONTROL DEPT. SEYKOÇ ALUMINYUM

Seykoç Alüminyum Pazarlama Ve Sanayi Ticaret Ltd. Şti.
Akse Mahallesi Nazım Hikmet Caddesi 536. Sokak No:7 Çayırova KOCAELİ TÜRKİYE
Tel: +90 262 743 88 88 Pbx **Faks:** +90 262 743 11 11 **Web**: seykoc.com.tr **E-Mail:** seykoc@seykoc.com.tr

SEYKOÇ ALÜMİNYUM "TÜRKİYE'NİN LİDER ALÜMİNYUM TEDARİKÇİSİ"	UYGUNLUK SERTİFİKASI *(Certificate of Conformity)*	Document No : FR.061 Publishing Date : 01.10.2016 Revision Date : 15.03.2018 Revision No : 2 Page No : 1/1

Sertifika No *(Certificate Number)*	3885	**Tarih** *(Date)*	27.03.2024

Genel Bilgi *(General Information)*

Formu *(Form)*	BORU	Lot No *(Lot/Batch No)*	10895
Ölçüleri *(Dimensions)*	32X3,5	Miktar (Kg) *(Quantity)*	534
Alaşım *(Alloy)*	6082	Adet *(Pieces)*	-
Temper *(Temper)*	T6	Standartlar *(Standards)*	EN 573-3 EN 755-2

Kimyasal Analiz *(Chemical Analysis)*

DEĞERLER *(VALUES)*	**ELEMENTLER (%)** *(Elements)*										
STANDART	Fe	Si	Mn	Cr	Ti	Cu	Mg	Zn	Each	Total	Al
Min.		0,70	0,40				0,60				
Max.	0,50	1,30	1,00	0,25	0,10	0,10	1,20	0,20	0,050	0,15	
TEST SONUÇLARI (%) *(Test Results)*											
	0,22	0,83	0,45	0,01	0,02	0,07	0,66	0,02			

Mekanik Özellikler *(Mechanical Properties)*

1 Mpa = 1 N/mm² = 0.145 ksi =0.102 kgf/mm²

STANDART	Çekme Dayanımı (Mpa) *(Tensile Strength)*	Akma Dayanımı (Mpa) *(Yield Strength)*	Uzama (%) *(Elongation)*	Sertlik (HB) *(Hardness)*
Min.	290	250	8	95
Max.				
TEST SONUÇLARI (%) *(Test Results)*				
	319	268	11	95

Ultrasonik Muayene *(Ultrasonic Inspection)*

Uygulandı *(Done)*		Uygulandı İse, Standardı *(If Done, Standarts)*		Uygulanmadı *(Not Done)*	**X**

Onay *(Approval)*

Seykoç Alüminyum bu uygunluk sertifikası ile, müşteriye teslim edilen ve yukarıda özellikleri tanımlanan ürünlerin; müşteri sipariş şartlarını sağladığını, rapor üzerinde belirtilen teknik değerlerin doğruluğunu ve uluslararası standart şartlarına uygunluğunu beyan ve taahhüt eder.
Seykoç Alüminyum with this conformity certificate, the products delivered to the customer and defined above features; customer order conditions, the accuracy of the technical values stated on the report and compliance with international standard requirements.
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