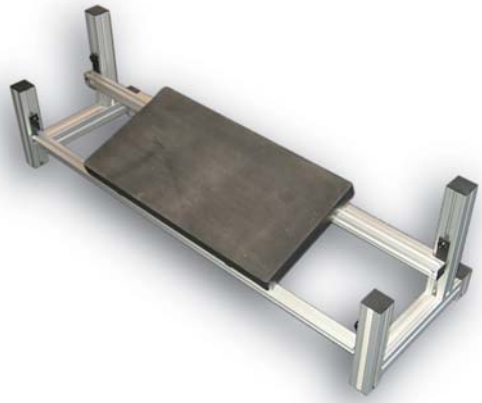
Cabinets:

Item Description:	Item Description:
Miscellaneous Storage Cabinet 1	Miscellaneous Storage Cabinet 2
	
Item Description:	**Item Description:**
Miscellaneous Storage Cabinet 3	Foot Rest 1
	

Section 2

Profiles

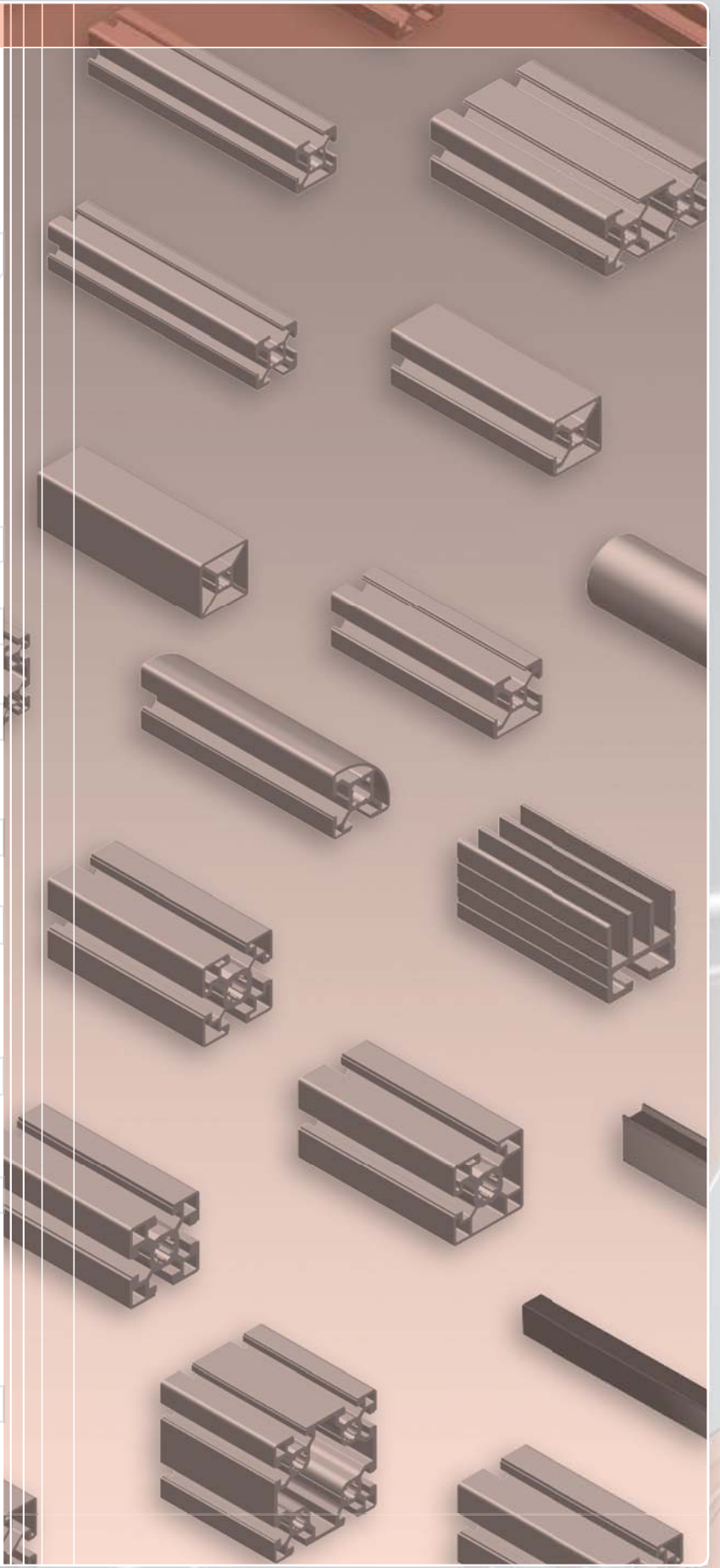
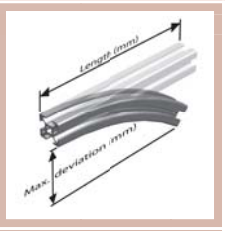
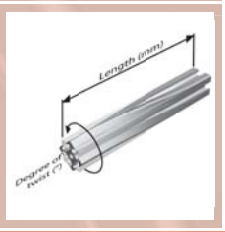


Table of Contents:

Table of Contents:

Technical Data on Aluminium Extrusions:

Note: Aluminium profiles are manufactured to the following specification unless otherwise specified:

Material:			
Alloy composition:		AlMg0.7 Si	AlMgSi 0.5 F25
International register designation number:		AA6063	AA6060
Temper:		T6	T5
Material Mechanical Properties:			
Minimum tensile strength:	(R_m)	245 Mpa	245 Mpa
Ductile Yield:	(A_5) (A_{10})	14 % 12 %	0 % 8%
Modulus of elasticity (Young's Modulus):	(E)	69.5 Gpa	70 GPa
Proof stress (at 0.2% strain in the direction of applied pressure):	$R_{p0.2}$	170 Mpa	195 Mpa
Brinell hardness:	75 HB	75 HB	
Longitudinal expansion coefficient:	$(a_{-50\ldots+20°C})$ $(a_{+20\ldots100°C})$	23.5×10^{-6} 1/K 21.9×10^{-6} 1/K	21.8×10^{-6} 1/K 23.4×10^{-6} 1/K
Transversal contraction:	(μ)	0.33	0.34
Anodising Process and Properties:			
Process:	-	EN AW	E6/EV1
Anodise layer thickness:	-	10 µm	12 µm
Vickers hardness:	-		300 HV
Profile Dimensional Tolerances:			
Longitudinal straightness tolerance of the profiles: 		mm / 1000 mm	± 1.5 mm / 2000 mm
Lateral straightness tolerance of profiles: 		0.1 mm / 25 mm	
Longitudinal torsional twist tolerance of the profiles: 		< 0.5° / 300mm	

General Information:

1. The material and anodising properties are averages of various forms, sizes and methods of manufacturing and may not exactly describe any one particular product. Typical tensile strength and elongation properties should not be used for design purposes.

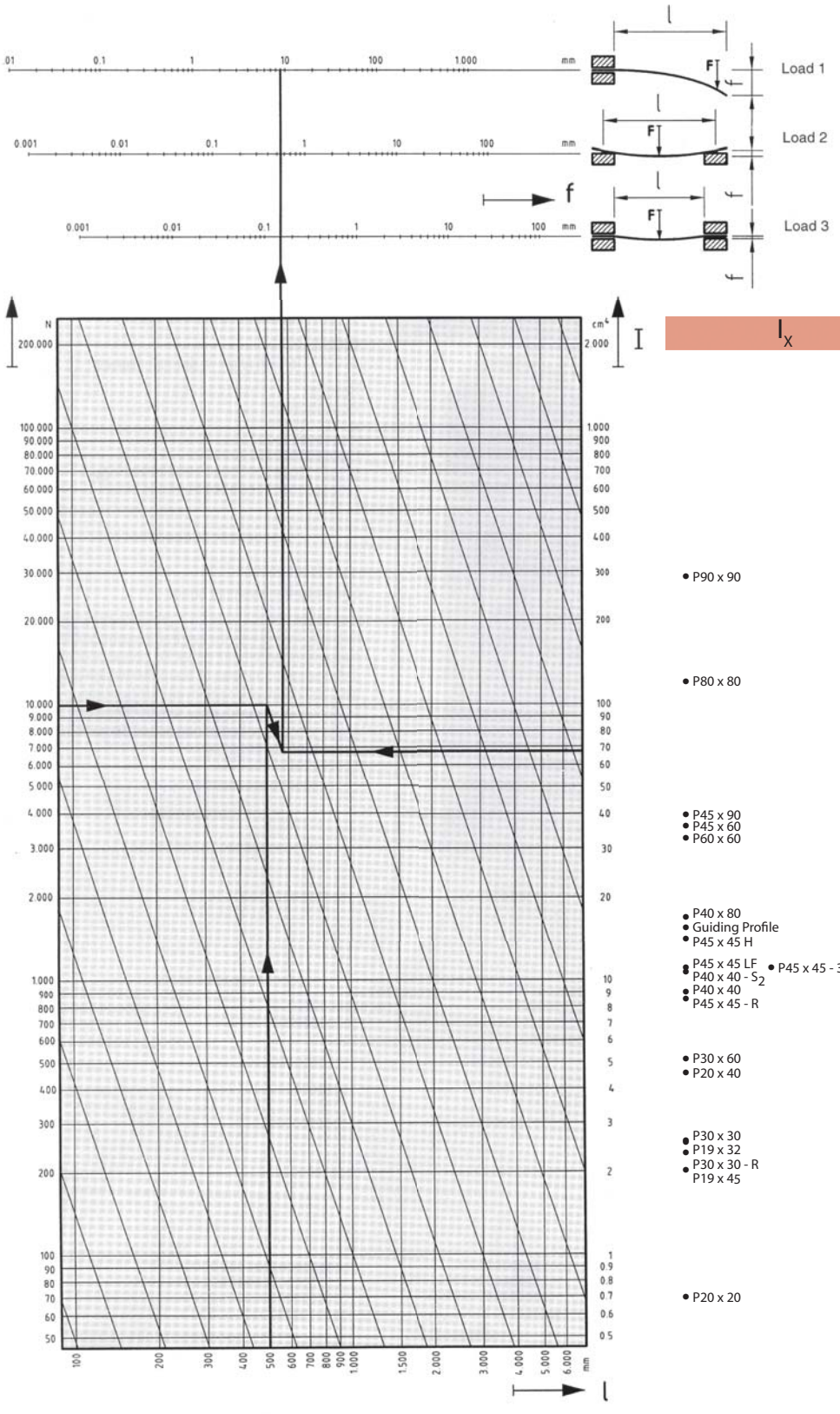
2. Average on tension and compression moduli. Compression modulus is about 2% greater then tension modulus.

3. Round test specimens were used to obtain the data

Technical Data on Aluminium Extrusions:

Note: Aluminium profiles are manufactured to the following specification unless otherwise specified:

Load Deflection Diagram:



I_X	I_Y
• P90 x 90	• P90 x 90
• P80 x 80	• P80 x 80 • P45 x 90
	• P40 x 80
• P45 x 90 • P45 x 60 • P60 x 60	• P60 x 60
• P40 x 80 • Guiding Profile • P45 x 45 H	• P45 x 60 • P30 x 60 • P45 x 45 H Guiding Profile
• P45 x 45 LF • P45 x 45 - 3S P40 x 40 - S_2 • P40 x 40 • P45 x 45 - R	• P45 x 45 LF • P45 x 45 - 3S P40 x 40 - S_2 • P40 x 40 • P45 x 45 - R
	• P19 x 45
• P30 x 60 • P20 x 40	
• P30 x 30 • P19 x 32 • P30 x 30 - R P19 x 45	• P30 x 30 • P30 x 30 - R
	• P19 x 32 • P20 x 40
• P20 x 20	• P20 x 20

Technical Data on Aluminium Extrusions:

Note: Aluminium profiles are manufactured to the following specification unless otherwise specified:

Calculating Deflection (f) Using the Nomogram:

Deflection can be approximated with the help of the nomogram on page 2.40. An example of how to determine deflection is shown on the diagram. It is worked through in the direction of the arrows.

Deflection (f) Formulae:

The following formulas apply for the calculation of deflection (f):

Load Scheme 1:

$$f = \frac{F \times L^3}{3 \times E \times I_x \times 10^4}$$

Load Scheme 2:

$$f = \frac{F \times L^3}{48 \times E \times I_x \times 10^4}$$

Load Scheme 3:

$$f = \frac{F \times L^3}{192 \times E \times I_x \times 10^4}$$

The following formulas apply for the calculation of deflection (f) caused by the dead weight:

Load Scheme 1:

$$f = \frac{F \times L^3}{8 \times E \times I_x \times 10^4}$$

Load Scheme 2:

$$f = \frac{F \times L^3}{384 \times E \times I_x \times 10^4}$$

Load Scheme 3:

$$f = \frac{F \times L^3}{384 \times E \times I_x \times 10^4}$$

Deflection (f) Calculation Example:

F = Load in (N)
L = Profile Length (mm)
I_x = Moment of inertia (cm^4)
E = Modulus of elasticity (N/mm^2)

Parameters:
Profile P45x60
F = 10 kN
L = 500 mm
I_x = 36.5 cm^4
E = 70 GPa

Find:
f = Deflection (mm)

Results:

Load Scheme 1:
f = 16.24 mm

Load Scheme 2:
f = 1.02 mm

Load Scheme 3:
f = 0.26 mm

To approximate deflection caused by dead weight, enter the dead weight as F in the nomogram on page 2.40. The resulting values should be halved.

Bending Stress Formulae:

$$\sigma = \frac{M_b}{W \times 10^3}$$

o = Bending stress (N/mm^2)
M_b = Max. bending moment (Nmm)
W = Resistance moment (cm^3)
σ

The calculated bending stress must always be compared to the *'permissible bending stress' (0_{perm})*.

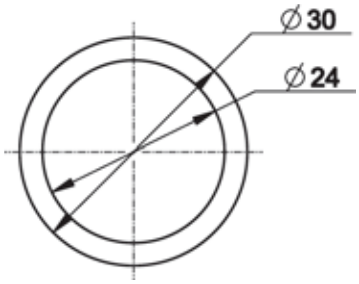
$$= \frac{Rp\ 0.2}{S}$$

σ

S = Safety factσ_{perm} be selected to suit desired application.

Aluminium Profiles (P)

Item Description:	Item Number:
P D30 Tube	1.07.0002.0

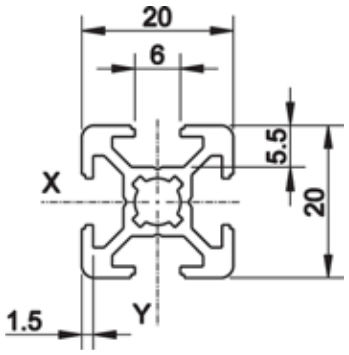


Technical Information:

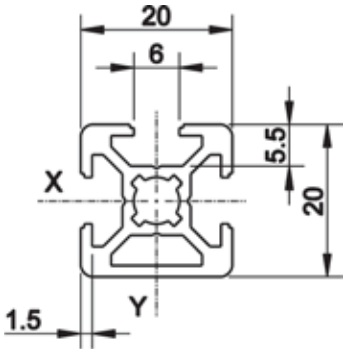
Item Description	Moment of Inertia (cm^4)		Moment of Resistance (cm^3)		Area (cm^2)	Standard Length (mm)	Weight (kg/m)	Material
	I_X	I_Y	Z_X	Z_Y				
P D30 Tube	-	-	-	-	2.50	6000	0.69	Al Mg Si 0.5 F22

Aluminium Profiles (P)

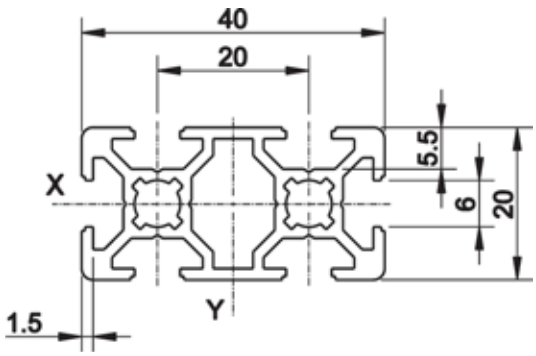
Item Description:	Item Number:
P20 x 20	1.06.2000.0



Item Description:	Item Number:
P20 x 20 - 3S	1.06.2003.0



Item Description:	Item Number:
P20 x 40	1.06.2005.0

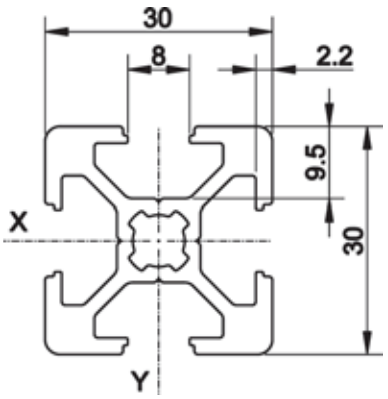


Technical Information:

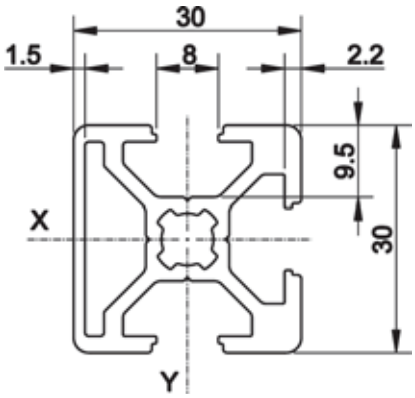
Item Description	Moment of Inertia (cm^4)		Moment of Resistance (cm^3)		Area (cm^2)	Standard Length (mm)	Weight (kg/m)	Material
	I_x	I_y	Z_x	Z_y				
P20 x 20	0.70	0.70	0.70	0.70	1.60	3000	0.43	AA6060 - T5
P20 x 20 - 3S					1.68		0.45	
P20 x 40	4.60	1.20	2.30	1.20	2.90		0.76	

Aluminium Profiles (P)

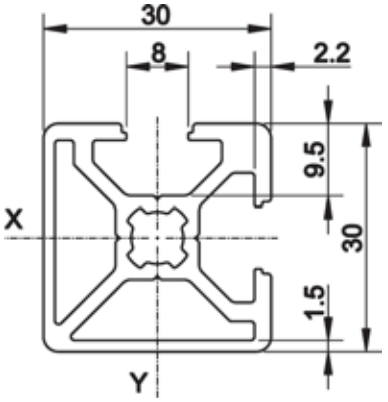
Item Description:	Item Number:
P30 x 30	1.08.3030.0



Item Description:	Item Number:
P30 x 30 - 3S	1.08.3003.0



Item Description:	Item Number:
P30 x 30 - 2S	1.08.3002.0



Technical Information:

Item Description	Moment of Inertia (cm^4)		Moment of Resistance (cm^3)		Area (cm^2)	Standard Length (mm)	Weight (kg/m)	Material
	I_x	I_y	Z_x	Z_y				
P30 x 30 - 4S	2.70	2.70	1.80	1.80	3.51	6000	0.95	AA6063 - T6
P30 x 30 - 3S					3.36		0.91	
P30 x 30 - 2S					3.32		0.90	