

# TRUGRID (PTY) LTD

## MECHANICAL PROPERTIES OF POLTRUSION

### Standard Structural Profiles

### Typical Engineering Properties (only an indication)

Section	Profile	Area (mm <sup>2</sup> )	WT (g/m)	E long (GPa)	L <sub>yy</sub> (mm <sup>4</sup> )	I <sub>xx</sub> (mm <sup>4</sup> )	y <sub>1</sub>	x <sub>1</sub>
Angle	50 x 50 x 6	564	1018	17	131 x 10 <sup>3</sup>	131 x 10 <sup>3</sup>	14.70	14.70
Channel	200 x 50 x 10	2777	5021	22	13.7 x 10 <sup>6</sup>	427 x 10 <sup>3</sup>	12.17	
Channel	102 x 45 x 5	910	1053	21	1.21 x 10 <sup>6</sup>	119 x 10 <sup>3</sup>	10.74	
Channel	75 x 4 x 35 x 5.5	640	1092	26	411 x 10 <sup>3</sup>	29.2 x 10 <sup>3</sup>	7.06	
I-Beam	150 x 150 x 10	4382	7335	17	5.61 x 10 <sup>6</sup>	16.8 x 10 <sup>6</sup>		
I-Beam	200 x 200 x 10	5882	9935	17	13.3 x 10 <sup>6</sup>	41.6 x 10 <sup>6</sup>		
Box	44 x 44 x 6	912	1704	28	225 x 10 <sup>3</sup>			
Box	51 x 51 x 3.2	602	1051	25	227 x 10 <sup>3</sup>			
Tube	38 x 38 diameter	298	508	19	47.0 x 10 <sup>3</sup>			
Rung	34 x 34 diameter	342	614	20	37.3 x 10 <sup>3</sup>			

### Typical Mechanical Properties

Properties	Units	Longitudinal	Transverse
Tensile Strength	MN/m <sup>2</sup>	300	55
Tensile Modulus	GN/m <sup>2</sup>	17	7
Compressive Strength	MN/m <sup>2</sup>	200	100
Compressive Modulus	GN/m <sup>2</sup>	17	7
Shear Strength	MN/m <sup>2</sup>	60	60
Shear Modulus	GN/m <sup>2</sup>	3	3
Flexural Strength	MN/m <sup>2</sup>	300	100
Flexural Modulus	GN/m <sup>2</sup>	12	5

## Comparative Properties

	Unit	Standard Profiles	Aluminium T651	Mild Steel	Stainless Steel 316	Rigid PVC
Density	g/cm <sup>3</sup>	1.7	2.7	7.8	7.9	1.38
Tensile Strength (L/T)	Mpa	300/55	310	414	552	43
Tensile Modulus (L/T)	Gpa	17/7	69	207	193	2.7
Flexural Strength (L/T)	Mpa	300/100	310	414	552	76
Flexural Modulus (L/T)	GPa	12/5	69	207	193	2.4
Coefficient of Thermal Expansion (L)	X10 <sup>-6</sup> /°C	9	24	13	17	67
Thermal Conductivity	W/m <sup>°C</sup>	0.6	170	35-60	15-25	0.2