

4.8 ALUMINIUM

4.8.1 MAIN STRUCTURAL ALLOYS

Typical uses: Curtain walling
Rainscreen cladding
Glazing arms/rails

	Alloy	Condition	Product	Range of thickness (mm)	Durability *	Limiting stress (N/mm ²)		
						P ₀	P _a	P _v
Heat-treatable	6063 (H9)	T4	Extruded	0 - 150	B	65 [65]	85 [85]	40 [40]
		T6	Extruded	0 - 150		160 [80]	175 [87]	95 [47]
	6082 (H30)	T4	Extruded	0 - 150	B	115 [115]	145 [145]	70 [70]
		T6	Extruded	20 - 150		270 [135]	290 [145]	160 [80]
Non-heat-treatable	5083 (N8)	O	Sheet, plate	0.2 - 80	A	105 [105]	150 [150]	65 [65]
		H22	Sheet, plate	0.2 - 6		235 [105]	270 [121]	140 [63]

where: p₀ is the limiting unfactored stress for bending and overall yielding
p_a is the limiting unfactored stress for local capacity of the section in tension or compression
p_v is the limiting unfactored stress in shear

Note : A material factor up to 1.3 must be used with these numbers

Figures in square brackets [] apply to all material within 25mm of a weld zone.

* For durability see corrosion protection table below.

4.8.2 DURABILITY (General corrosion protection of aluminium structures)

P = Protection is required (see BS 8118 : Part 2)

Alloy durability rating	Material thickness (mm)	Protection needed according to environment							
		Atmospheric						Immersed	
		Rural	Industrial/urban		Marine			Fresh water	Sea water
			Moderate	Severe	Non-industrial	Moderate	Severe		
A	All	None	None	P	None	None	P	None	None
B	< 3	None	P	P	P	P	P	P	P
	≥ 3	None	None	P	None	None	P	P	P

4.8.3 TYPICAL PHYSICAL PROPERTIES

Density 2710 kg/m³
Young's modulus 70 kN/mm²
Thermal coefficient 23 x 10⁻⁶ °C

4.8.4 DESIGN

Design in accordance with **BS 8118 : 1991**
BS 8118 : 1991 uses the limit state for design.

Aluminium comes in the following forms:

- extrusion
- cast
- plate
- sheet

Usually buckling in compression is critical.