

### Aluminium Alloy Sheet

#### Typical Applications

- Higher strength sheet
- Metal work
- Packaging
- Boiler making
- Heat transfer devices
- Chemical industry
- Pharmaceutical
- Architectural panelling
- Welded structures
- Offshore applications
- Cabinets
- Appliances
- Pressure vessels
- Panelling

#### Product Description

An alloyed non-heat treatable rolled aluminium sheet designed for general sheet metal work where higher mechanical properties are required together with a degree of formability.

#### Technical Description

Internationally recognised grade EN AW 5251 H22 – AlMg2 hardened to the quarter-hard temper. The previous BS specification was known as NS4 H3. Smiths range of 5251 will meet all appropriate national / international standards.

Product Attributes	Customer Benefits
Good surface finish Very good anodising qualities Very good corrosion resistance	Excellent aesthetics
Very good marine corrosion resistance	Ideal for offshore applications
Good combination of strength and formability	Ideal for sheet metal work applications which require good all-round properties
Very good welding qualities	Ideal for welding fabrication
Close tolerance sheet	Components are easier to manufacture/assemble and have closer tolerances
Close tolerance cut to size service for both cut blanks and circles/rings Immediate or just-in-time delivery	Uneconomic cutting to size and stockholding costs are removed – your highly skilled operators and resources are used

#### Vinyl Coating

Smiths can supply aluminium sheet vinyl-coated for surface protection during machining, bending and fabrication. Our vinyl coating line can apply a variety of coatings and colours dependent on your exact requirements

#### Welding

5251 is easily welded by MIG or TIG processes, with a recommended filler metal of 5056A or 5154A for welding to 5251 structures. A good weld is likely to have strength of up to 160Mpa maximum, although this will be dependent on the type and quality of welding.

#### Cold Formability

5251 H22 has reasonable cold formability and is the ideal specification when moderate bending is required with good strength.

#### Cut to Size Guillotined Blanks

Edge deviation over cut length/width  $\pm 0.2\text{mm}$  per m (maximum thickness 6.35mm)

#### Cut to Size Sawn Blanks

Edge deviation over cut length/width  $+1.5,-0\text{mm}$  (minimum thickness 3mm)

#### Cut to Size Capability

Smiths Metal Centres carry a full range of 5251 in both imperial and metric sizes. Our close tolerance high capacity guillotines can cut accurately to exact customer requirements, whether that be 1 blank or 10,000 blanks. The cut blanks will be delivered immediately when cut or just in time to meet your schedules. We can also stamp or turn circles or rings to your specifications as part of our first stage engineering capability.

#### Machining

The higher strength and extra hardness of grade 5251 over pure aluminium give improved machinability properties. The machinability of the alloy for its intended application base is quite reasonable, if not as good as the heat-treated alloys, which are much harder combined with greatly reduced formability. We recommend aluminium geometry cutting tools running at a reasonable speed to avoid the edge build-up which can occur at lower cutting speeds. High speed steel tools may be more economical than carbide, particularly with the possibility of a large rake angle on machines which cannot reach carbide cutting speeds.

#### Surface Treatment

Grade 5251 has very good anodising properties, for both decorative and technical requirements.

#### Corrosion Resistance

5251 aluminium sheet has very good corrosion resistance and can be used in normal, industrial and marine environments without problems. It is particularly suited to offshore applications.

## Chemical Composition (weight %)

	Al	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Others	
Min	REM				0.10	1.70				Each	Total
Max		0.40	0.50	0.15	0.50	2.40	0.15	0.15	0.15	0.03	0.15

## Typical Mechanical Properties

Tensile strength	N/mm <sup>2</sup> (Rm)	200-240
Yield strength	N/mm <sup>2</sup> (Rp0.2)	Min 130 (approx. only)
Shear strength	N/mm <sup>2</sup>	125
Elongation	% (A50)	4-8
Brinell Hardness	HB	60
Thermal conductivity	W/m.K	149
Electrical conductivity	% IACS	39.4
Coefficient of thermal expansion	1/K	23.5x10 <sup>-6</sup>
Elastic modulus	MPa	70000

The mechanical properties of 5251 are the best combination of good strength and reasonable formability. If substantially higher mechanical properties are required with minimal forming we recommend the use of grade 6082 T6(51). Improved formability with reduced mechanical properties can be found with grades 3103 (NS3) and 1050A (S1B).

## Technical Assistance

Our knowledgeable staff backed up by our resident team of qualified metallurgists and engineers, will be pleased to assist further on any technical topic.

## UK Service Centres:

Smiths Belfast **02895 908 897**  
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 Smiths Birmingham **0121 728 4940**  
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## Quality &amp; Testing:



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