

Test Study – HyGloss Aluminium Composite Material for Solar Mirrors

High strength, yet high gloss at the same time: the key features of HyGloss, a high-gloss finish rolled aluminium made from clad aluminium strip. This aluminium composite material is characterised by a high-purity aluminium mirror-finish coating, which consists of 99.99% pure aluminium and is applied to a high-strength core material (in this case EN AW 3005). This combination of properties – the reflectivity of the outer cladding together with the high strength of the inner core – can be encapsulated in a high-strength, high-gloss aluminium mirror through appropriate further processing of the surface.



Hydro has been cladding aluminium as a standard process for many years. Clad strip combines the best features of two different aluminium alloys and, for example, finds widespread application in the manufacture of heat exchangers for example. Now, Hydro has rolled pre-clad strip in its test rolling mill to produce surfaces with a high-gloss finish.

The main aim of this test study was to manufacture an all-aluminium composite material which facilitates the production of robust aluminium mirror solutions. Following smooth rolling, the reflectivity effect of the high-purity cladding is limited to a maximum total reflectance of 89% in the solar spectrum.

Another aim of this test study was to roll a high-strength, high-gloss material to a thickness of 1.3 mm to ease the manufac-

ture of a resistant self-supporting mirror surface. In contrast to other solutions on the market, high reflectance combined with high strength can be achieved through the careful selection of the core material. This material is thus suitable for use as the substrate for commonly used high-gloss finishing processes.



This mirror-finish material displays the following advantages:

- High overall reflectivity values of aluminium
- High strength achievable through careful substrate selection
- Opportunity to use more cost-effective core materials
- Wide range of thicknesses possible (0.15 mm to 1.3 mm)
- Suitable as the substrate for high-gloss finishing processes
- Provides a cost-effective, all-aluminium mirror solution when a suitable protective coating is applied

HyGloss Aluminium Composite Material for Solar Mirrors – Product Range (intended)

Cold-rolled Strip and Sheet

Thickness	0.15 mm to 1.3 mm
Width	Coiled strip - 40 mm to 1,540 mm Sheet - 600 mm to 1,540 mm
Length	Sheet - 500 mm to 6 m (depending on thickness)
Alloy	Cladding - Al 99.99 Core material - EN AW-3005 (others possible) Protective cladding EN AW-1050A
Temper	H19
Surface topography	High mirror-finish rolled
Surface treatment	Film protected for further processing
Spectral value	Overall reflectance of the solar spectrum - maximum 89% (ASTM E903)

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