Material Data Sheet: Feran®

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Clad material: **Feran®**
(One side or both sides aluminium cladded steel strip)

Description

Feran® is one side or both sides cold cladded steel strip, combining the forming and mechanical properties of low carbon, unalloyed deep drawing steel with the mechanical and aesthetic properties of aluminium.

Standard - Materials

Position	Material	Description	Grade	Standard
core	Unalloyed deep drawing steel	Similar to DD11[1)]	1.0332	DIN EN 10111
Layer foil	Aluminium	Similar to EN AW-AL 99,0 (EN AW – 1200)	3.0205	DIN EN 573-3

1) Regarding the steel aging characteristics

Available (standard) Dimensions

Thickness: 0.12 – 3.5 mm
Width: 10 – 800 mm
Length: 500 – 4,000 mm

Layer and Adhesion

Thickness of layer: Layer thickness of standard materials are 3/3, 5/5, 7/7 or 10/10% of strip thickness. Alternative layer thickness can be supplied on special request including different top & bottom layer thicknesses or one side cladded steel.

Adhesion: No mechanical separation of foil from core possible

Measuring of layer thickness: Magnetic force, metallographical or gravimetric method

Mechanical properties

The following table shows mechanical data of Feran with aluminium layer of max. 10/10% after skin pass operation and after the steel aging process is complete.

Surface condition	Mechanical strength	After skin Pass [1)] (less. 2 days)			Aging completed [2)] (>= 1 month)		
		$R_{p0,2}$ [3)] (N/mm^2)	R_m [4)] (N/mm^2)	A_{80} [5)] (%)	$R_{p0,2}$ [3)] (N/mm^2)	R_m [4)] (N/mm^2)	A_{80} [4)] (%)
Mill finish	LC	max. 250	270-370	min. 30	max. 300	290-390	min. 27
Bright	LC+	max. 280	270-370	min. 28	max. 330	290-390	min.22

1) Data as shown on certificate, 2) Typical Data measured in material flow
3) Yield point, 4) Tensile strength, 5) Elongation (Ultimate strain)

On request Feran can be rolled to mechanical properties between C290-C690 according to standard EN 10139.

Specific Performances of Feran®

The steel grade used for the cladding process ages, i.e. mechanical and technical values of the steel change during the aging period. Higher temperatures accelerate this process. It is characterized by a distinct yield strength during the tensile test and by appearance of flow lines as a result of low deformation. They disappear by increasing the amount of deformation.

Surface Conditions

Description	Characteristics	Roughness Ra
Bright	Bright, metallically clean surface. Pittings, grooves and scratches are permitted as long as the uniform smooth appearance is not essentially impaired when viewed with the naked eye.	< 0,10 µm
Mill Finish	Metallically clean surface. Pittings, minimal defects and scratches are acceptable in a scale not impairing the technical function of the outside layers of the composite material.	0,15 – 0,80 µm
Isotropic		1,0 – 2,0

Tolerances

Size limits of thickness - according to classes A,B,C of DIN EN 10140
Size limits of width - according to classes A,B of DIN EN 10140
Size limits of length - according to classes A,B of DIN EN 10140

Edge Finish

GK, NK according to DIN EN 10140

Delivering types

Strips, sheets

Ordering Example

Orders should be specified as below using the information stated in this material data sheet:

Product Features	Sample 1	Sample 2
Cladding Composite	Feran	Feran
Layer P(side1-side2) (%)	P(05-05)	P(10-00)
Strength Condition	LC+	LC
Surface Quality	Bright	Mill Finish
Edge Type	GK	GK
Delivery Form	Strip	Sheet
Thickness (Tolerance) x Width (Tolerance) x Length (Tolerance) (mm)	0,80 (+/- 0,025) x 100 (+/-0,13)mm	1,20 (+/-0,030) x 420 (+/- 0,30) x1.500 (-0/+6) mm

All information in this material data sheet refers to Feran® materials based on standard production parameters. Alternative product features are available on request.