SALZGITTER FLACHSTAHL
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HCT780XD (HC450XD*)

Dual-phase steel for cold forming

Material no.	1.0943
IMDS	9621190
	51310627*
SZFG-Material data sheet 11-111 (Jul 09)	
according to	DIN EN 10346 (Jul 09)/
	DIN EN 10143 (Sept 06)

* steel type designation specific to yield strength

Surface finish

Thickness ranges

MB	**0,70 – 2,50**

General Information

Dual-phase steel features a (soft) ferrite microstructure, with a matrix containing islands of martensite (increasing yield to tensile strength) in the secondary phase (with propotional volume fraction increase in analogue to tensile strength).

Dual-phase steel features a low yield to tensile strength ratio, high tensile strength and work hardening rate.

The steel melt is produced in an oxygen top blowing process in the converter, and undergoes an alloy treatment in the secondary metallurgy phase. The product is alluminium-killed steel, with high tensile strength achieved by the composition with manganese, chromium and silicone.

The increase in the yield to strength ratio in the martensitic phase is produced by quenching the hot cold rolled strip before it enters the zinc pot of the hot-dip galvanization unit.

Chemical composition [1)]

(melt analysis in percent by weight)

	min.	max.
C		0,170%
Si		0,300%
Mn		2,000%
P		0,050%
S		**0,010%**
Al_{total}	0,015%	0,080%
Cr + Mo		1,000%
Nb + Ti		0,050%

1) The maximum value for V ≤ 0,20%, and B ≤ 0,005%.

Mechanical properties [1)] (transverse)

Yield strength R_e [2) 3)]
450 – 560 MPa
Tensile strength R_m [4)]
780 – 900 MPa
Total elongation A_{80} [5)]
≥14 %
Bake hardening BH_2
≥30 MPa

The samples for the tensile test are taken at right angles to rolling direction unless the product width is opposed to this.

1) Vaild to three months after supply.
2) $R_{eL}/R_{p0,2}$
3) longitudinal samples on request
4) longitudinal samples on request
5) For a thickness of 0,70 mm, A_{80} reduces for 2 units.

Available dimensions

Thickness in mm	Width in mm
0,70 – 0,84	900 – 1.500
0,85 – 1,20	900 – 1.550
1,21 – 1,92	900 – 1.730
1,93 – 2,00	900 – 1.800
2,01 – 2,50	900 – 1.600

Form of delivery

These steel sheet products with increased yield strength are supplied in the form of hot-dip galvanised steel sheet (cold rolled steel sheet carrier material) with a thickness of ≥ 0,70 mm ≤ 2,50 mm, and surface finish MB with Pretex®Texturing in accordance with DIN EN 10346. Delivery is based on conditions to DIN EN 10021, in combination with relevant valid dimensioning standards (DIN EN 10143) or special terms of delivery. The test unit comprises 20 tons, or 20 tons of each new batch of products of the same steel grade and nominal thickness. Strip material is tested in coil form.

The maximum strip width is 1800 mm, as determined by the steel sheet thickness.

Application examples

Galvanised dual-phase steel products were developed for the automotive industry. There is a constantly rising demand in other fields of application.

A special feature of these steel products is their high performance in terms of deflection limiting volume despite their high tensile strength, making the products particularly suitable for the production of components with complex structure.

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Such properties contribute towards the mechanical strength of components, under the aspect of reduced weight.

Value added potentials in terms of weight optimization by means of a reduction of steel sheet thickness were proven in extensive examinations, including an FEM (Finite Element Method) simulation.

Companies processing such steel products must verify compliance of their calculation, construction and processing methods with material requirements. The forming technology deployed must be fit fpr the purpose, compliant with state-of-the-art, and should be adapted as required.

Our dual-phase steel products can be finished with anti-corrosive / forming aid (prelube oil, hotmelt), including forming aids such as µphos® to suit application requirements.

Dual-phase steel products support all known processes, such as stamping, jointing and varnishing techniques.

Dual-phase steel products feature an excellent cold forming capability and high yield strength after forming.

The dual-phase steel products described in this document can be welded manually or automatically in any known welding technique. Only the welding wires and elctrodes approved as auxiliary welding materials for this group of high-tensile products should be used.

An anti-corrosive primer can be applied to dual-phase steel products.

Usage

Dual-phase steel features a natural aging and tends to heat-aging properties (= bake hardening effect). It is therefore in the interests of the user to process the material in time.

The validity of the mechanical properties are limited to the maximum of 3 months after supply.

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