

HC340I+ZE

Isotropic high-strength steel for cold forming

Material no.	1.0447
SZFG-Material data sheet 11-110	

Usage

Isotropic steels feature excellent forming characteristics and high yield strength and are ideal for the construction of diverse complex cold formed components, intended for demanding interior components as well as large outdoor panels. The isotropic behaviour ensures a uniform flow, regardless of the position in relation to the rolling direction.

Rotational-symmetric pressed parts do not show any earing due to the quasi-isotropic forming characteristics. Wall thickness fluctuation or local thinning will not develop. Isotropic steels are mainly used to produce:

1. Cold pressed parts
2. Large surface body parts
3. Cold profiles

Value added potentials in terms of weight optimization by means of a reduction of steel sheet thickness were proven in extensive examinations, including 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 for the purpose, compliant with state-of-the-art, and should be adapted as required.

Mechanical properties

in delivery state (lateral test)
(surface B)

Yield strength $R_{eL}/R_{p0,2}$	340–380 MPa
Tensile strength R_m	340 – 480 MPa
Total elongation $A_{80}^{1) 2)}$	29 %
Strain hardening exp. $n_{90}^{2)}$	≥ 0,15
Vertical anisotropy $r_{90}^{2)}$	≤ 1,40
Planar anisotropy $\Delta r^{3)}$	-0,15 – 0,15

¹⁾ With finish category A to EN 10130, the breaking elongation values will increase by one unit, the n value by 0.01 units.

²⁾ With additional organic thin-film coating, the elongation values will increase by two units and the strengthening exponential n_{90} is reduced by 0,01. The vertical anisotropic coefficient r_{90} will increase by 0,1.

³⁾ Calculated based on $\Delta r = 1/2(r_0 + r_{90} - 2r_{45})$

Production and processing

The steel is produced in an oxygen top blowing process in the converter and undergoes an alloying treatment in the secondary metallurgical centre.

The steel is aluminium-killed and achieves its high yield point as a result of the addition of titanium.

Chemical composition

(in weight percentage)

	min.	max.
C		0,070
Mn		0,650
P		0,080
S		0,025
Al	0,015	
Ti		0,050

Available dimensions

Thickness in mm	Width in mm
0,50 – 0,73	900 – 1.700
0,74 – 2,00	900 – 1.850

Form of delivery

These isotropic steel sheet types with higher tensile strength are available as electro-zinc coated sheet with a thickness of > 0,50 mm < 2,00 mm¹⁾ in surface category A and B.

This steel family is delivered to rerollers in the form of hot-rolled strip. Rerolling and annealing conditions must be agreed upon ordering.

The maximum strip width is 1860 mm, depending on the steel sheet thickness.

¹⁾ Thickness to 2,5 mm on request

Surface finish

Our isotropic steel products can be finished with anti-corrosive / forming aid (prelube oil, hotmelt), including forming aids (such as phosphating or μ phos) to suit application requirements.

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Processing

Isotropic steel products support all known processes, such as stamping, joining and varnishing techniques.

Cold forming ability

Isotropic steel products are ideal for cold forming.

They feature excellent deep drawing properties and are particularly suitable for the applications in the stretch forming field.

Welding

Isotropic steels are suitable for all manual or automatic electrical welding processes in accordance with general technical rules. Brittleness will not develop in the heated zones. Preheating is not required.

We recommend the use of soft wires and electrodes as welding auxiliaries. The specifications of the manufacturers of selected welding auxiliaries must be observed.

Finish category

These steel grades are delivered with finish category A or MB, and in category B or MC finish.

Surface coating

We supply our isotropic steels with electrolytic galvanization finish to DIN EN 10152. Certification to DIN EN 10268 is pending.

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

Test scope

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.

Certification

Proof of the steel grade to DIN EN 10204.

Delivery

Delivery is based on conditions to DIN EN 10021, in combination with relevant valid dimensioning standards (DIN EN 10131 or DIN EN 10143), or on special terms of delivery.