

HCT780C+ZM (CR570Y780T-CP¹⁾)

**Multi-phase steel for cold forming
– cold rolled complex-phase steel**

Material no.	1.0954
according to	DIN EN 10346 (Jul. 09)/ DIN EN 10143 (Sept. 06)

1) VDA 239-100 (Aug. 11)

General information

Complex-phase steel (CP-steel) consists of a matrix based on ferrite and bainite, which may contain minor amounts of martensite, pearlite and retained austenite. In contrast to dual-phase steel, CP-steel has a higher yield to tensile strength ratio, reduced work hardening and a higher hole expansion.

In accordance with the basic oxygen steelmaking process, the steel is being melt in the converter, and subsequently undergoes an alloy treatment in the secondary metallurgy. The outcome is aluminum-killed steel, possessing high tensile strength owing to the addition of e.g. manganese, chromium or silicon. The adjustment of the steel's mechanical properties is ensured by precise temperature control preceding the immersion in a zinc bath.

General properties of StronSal[®]

StronSal[®], a newly developed hot-dipped coating for steel products, provides ultimate corrosion protection properties that add up to a high performance coating for all applications where zinc-plated steel is essential.

- StronSal[®] consists of zinc and small fractions of magnesium (1 to 2%) and aluminium (1 to 2%).
- StronSal[®] offers extraordinary corrosion protection with coating layers of constant properties and considerably reduced

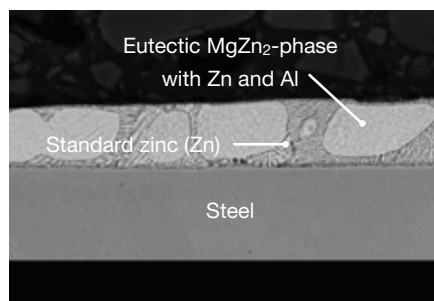
thickness by comparison with standard hot-dip galvanized layers (Z). Salt spray tests returned a corrosion resistance four to five times higher compared to standard zinc coating.

- StronSal[®] convinces with superior varnish adhesion.
- StronSal[®] offers improved cutting edge protection. Thanks to its special resistance against corrosion, the protective effect achieved with this anticorrosive plating is significantly higher than the effects produced by standard products, in many cases also after processing.
- StronSal[®] offers tremendous resource saving potential thanks to the zinc savings achieved. Our latest product developments make substantial, sustained contributions to environmental protection.

StronSal[®] layer - cross section

The cross-section polish of the StronSal[®] coating shows the difference: The Mg and Al-alloys are visible as a high-contrast phase within the zinc layer.

They effectively influence the anti-corrosion mechanism in a positive way.



Chemical composition²⁾

(melt analysis in percent by weight)

	min.	max.
C		0.17 %
Si		0.3 %
Mn		2.0 %
P		0.050%
S		0.010%
Al _{total}	0.015%	0.08 %
Cr + Mo		1.0 %
Nb + Ti		0.050%

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

Mechanical properties³⁾

(transversal/longitudinal)

Yield strength R_{p0,2}	500 – 700 MPa / 570 – 720 MPa
Tensile strength R_m	≥ 780 MPa / ≥ 780 MPa
Total elongation⁴⁾ A_{B0}	≥ 10 % / ≥ 10 %
Bake hardening⁵⁾ BH₂	≥ 30 MPa / ≥ 30 MPa

3) according to DIN EN 10346 (transversal) and VDA239-100 (longitudinal)

4) For a thickness of 0.70 mm, A_{B0} reduces to 8%.

5) Valid to three months after supply

Available dimensions

Thickness in mm	Width in mm
0.70 – 0.84	1,100 – 1,485
0.85 – 1.20	1,100 – 1,535
1.21 – 1.92	1,100 – 1,715
1.93 – 2.50	1,100 – 1,735

Form of delivery

This multi-phase steel product with high tensile strength is delivered as StronSal® coated sheet (cold rolled steel sheet substrate) within a thickness range of $\geq 0.70 \text{ mm} \leq 2.50 \text{ mm}$. It contains surface finish MB with PRETEX® texturing in accordance with DIN EN 10346 in combination with relevant valid dimensioning standards (DIN EN 10143), or special terms of delivery. The test unit is 20 t, or commencing 20 t of products of the same steel grade and nominal thickness. The test unit for strip steel is the coil. The steel width is determined by the nominal thickness, and can reach a maximum of 1,735 mm.

Application examples

CP-steel is predestined for the needs of car manufacturing, especially for safety-relevant components. The special quality of CP-steel can be seen in the well-balanced combination of forming capabilities and cracking resistance of the edges, which ensure its suitability for components with a complex shape (e.g. with protruding parts or rim holes).

As a consequence of the high yield strength, even slightly deformed components possess a high strength compared to dual-phase steel of the same strength class.

The CP-steel products can be processed by any common technique in the

fields of pressing, jointing and painting. Moreover, the products described in this document can be welded manually or automatically by any known welding technique.

HCT780Cxpand®⁶⁾

This steel grade can also be delivered as xpanse® version with a guaranteed hole expansion value of min. 40% (cf. HHE, High Hole Expansion).

High hole extension according to ISO 16630
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$\geq 40 \%$

⁶⁾ by agreement