



HCT780Xpand®+Z (CR440Y780T-DP-GI)

Dual-phase steel for cold forming

with guaranteed hole expansion – xpand®

Material No.	-
Materialinformationsblatt (MIB)	
VDA 239-100	CR440Y780T-DP-GI
DIN EN 10346	HCT780X+Z
DIN EN 10143	

xpand®

The forming properties of xpand® steels, optimised by increased hole expansion, enable the production of more complex component geometries. Due to the reduced edge crack sensitivity of xpand® steels, the risk of failure can be lowered despite reduced sheet thickness. This guarantees the safe adjustment of the production processes for the customer.

Hole expansion	HET ¹⁾
	≥ 30 %

1) Hole expansion test nach ISO 16630

Allgemeines

DP (dual-phase steel) is a steel with an ideally two-phase structure consisting of a ferritic (soft) basic structure in which a martensitic (strength-increasing) second phase is intercalated in the form of an island. Dual-phase steels show a very low yield strength ratio with simultaneously very high tensile strength and a strong strain hardening. They are characterised by good cold formability with forming forces similar to those of a micro-alloyed steel.

Chemical compositions

(in percent by weight)

	min. in %	max. in %
C		0.18
Si		0.75
Mn		2.50
P		0.040
S		0.010
Al _{total}	0.015	2.00 (1.00) ²⁾
V		0.20
B		0.005
Cu		0.20
Nb + Ti		0.15
Cr + Mo		1.40

1) Heat analysis

2) Values in parentheses for orders according to VDA 239-100

Mechanical properties

Yield strength R _{p0,2} in MPa	
longitudinal	330 – 430
transverse ²⁾	340 – 420
Tensile strength R _m in MPa	
longitudinal	590 – 700
transverse ²⁾	600 – 700
Total elongation A ₈₀ in %	
	≥ 20
Hardening exponent n	
	≥ 0.14
Bake-Hardening BH ₂ in MPa	
	≥ 30

3) valid for HCT600DXpand®+Z

4) Values in parentheses for ordering according to VDA 239-100

Available dimensions³⁾

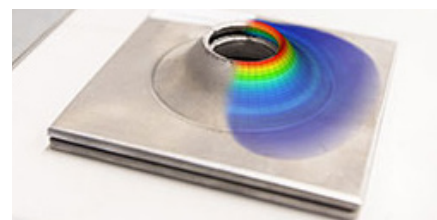
Thickness in mm	Width in mm
0.70 – 0.84	1,100 – 1,500
0.85 – 1.20	1,100 – 1,550
1.21 – 1.92	1,100 – 1,730
1.93 – 2.50	1,100 – 1,750

3) Further dimensions by agreement

Surface finish

Thickness ranges

MB	0.70 – 2.50
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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 ≤ 3.00 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 1,750 mm, as determined by the steel sheet thickness.





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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.

High strength in the component is achieved by a combination of the work-hardening effect and the bake-hardening effect, which represents a special advantage of dual-phase steels.

The work-hardening effect refers to the increase in strength after the shaping procedure (strain hardening). The bake-hardening effect refers to the increase in strength after the stove-enamel process. 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 for 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 (pre-lube oil, hotmelt), including forming aids such as ATP® to suit application requirements.

Dual-phase steel products support all known processes, such as stamping, joining 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 electrodes approved as auxiliary welding materials for this group of high-tensile products should be used. A primer for corrosion protection can be used.

Information for processing

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 6 months after supply.

Commitments regarding certain properties or a certain purpose of use require written agreements. Technical changes as well as typesetting and printing errors reserved



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