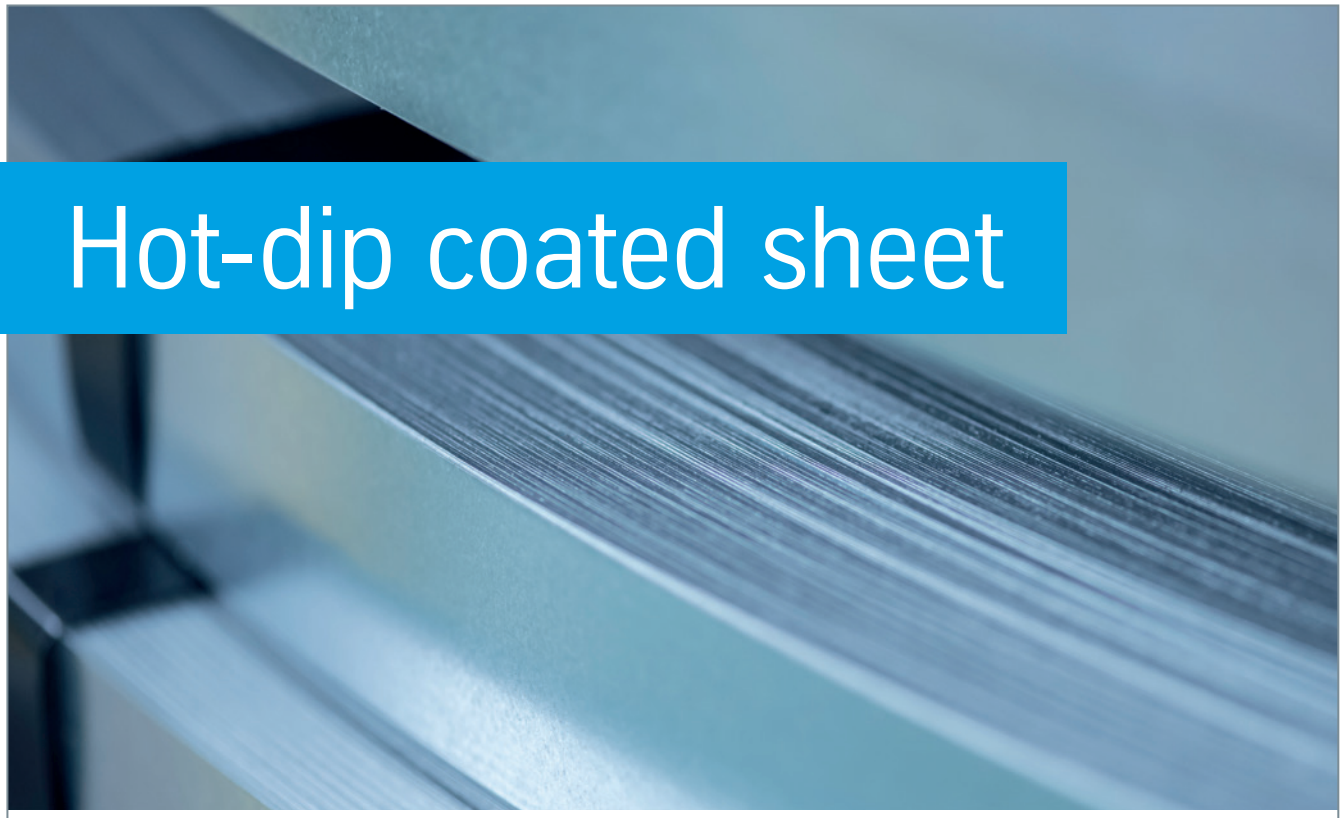
Hot-dip coated sheet



Depending on the application, different surface finishes are used for the hot-dip coating of sheet. The main priority for Z/GI, ZF, ZA, ZM, AZ coatings is the outstanding oxidation resistance based on zinc as well as the high-quality appearance combined with the strength of steel. The addition of aluminum to the coating (ZA, AZ, AS) increases its resistance to both corrosion and heat. A subsequent heat treatment causes a partial transformation of the zinc coating into a zinc-iron alloy layer, making it particularly suitable for welding and enamelling. ZM coatings belong to a new generation of economic coatings, which offer improved corrosion resistance.

Hot-dip coated sheet is used in the manufacture of a wide range of components including the automotive, machinery and plant construction, as well as the construction and household appliance industries.

Surface types to DIN EN 10 346

A	normal surface
B	improved surface
C	best surface
N	normal spangle (only with +Z)
M	minimized spangle (only with +Z)

Surface types to VDA 239-100

E	Exposed parts
U	Non exposed parts

Surface treatments

C	chemically passivated
O	oiled
CO	chemically passivated and oiled
P	phosphated
PO	phosphated and oiled
S	sealed
U	untreated

Coating variants

+Z/GI	zinc (99 % Zn)
+ZF	zinc-iron alloy (Galvannealed)
+ZM	zinc-magnesium (1–2 % Mg + 1-2 % Al + Zn)
+ZA	zinc-aluminum (galfan®, Zn + 5 % Al)
+AZ	aluminum-zinc (55 % Al + 1.6 % Si + Zn)
+AS	aluminum-silicon (11 % Si + Al)

Surface finishes

Hot-dip coated sheet

	Z/GI		ZF/GA		ZM		ZA	AZ	AS	AS
	DIN EN	VDA239-100*	DIN EN	VDA239-100*	DIN EN	VDA239-100*	DIN EN	DIN EN	DIN EN	VDA239-100*
Coating weight[1] in g/m²	–	–	–	–	70	30/30	–	–	–	–
	–	–	–	–	80	–	–	–	–	–
	100	40/40	100	40/40	100	40/40	95		–	–
	–	–	120	50/50	120	50/50	–	70	–	–
	–	–	–	–	130	–	–	–	50	–
	140	60/60	–	–	140	–	130	80	60	–
	–	–	–	–	150	–	–	–	–	–
	–	–	–	–	185	–	–	–	–	–
	200	85/85	–	–	200	–	185	100	80	30/30
	–	–	–	–	–	–	200	130	–	–
	225	–	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–	100	–
	275	–	–	–	275	–	255	150	120	45/45
	–	–	–	–	–	–	300	165	–	–
	–	–	–	–	300	–	–	–	–	–
	350	–	–	–	350[1]	–	–	185	150	–
	450[1]	–	–	–	–	–	–	–	200	–
	600[1]	–	–	–	–	–	–	–	250	–

1) DIN EN specifies the triple spot tests and VDA239-100 the single spot test.
In variance from the standards, a triple spot test or single spot test can be ordered according to DIN EN or VDA239-100.

Tolerances: Dimensional and shape tolerances to DIN EN 10 143 (closer tolerances by arrangement).

* Comparative grade, therefore minor deviations from DIN EN values possible

Low-carbon steel for cold forming · DIN EN 10 346

Steel type				Mechanical properties, transverse				
Short designation	VDA239-100*	Surface finish	Material number	Yield strength R_e[1] MPa max.	Tensile strength R_m MPa	Elongation at fracture A_{80}[2] % min.	Anisotropy r_{90} min.	Strain hardening exponent n_{90} min.
DX51D	–	+Z,+ZF,+ZA,+ZM,+AZ,+AS	1.0917	–	270–500	22	–	–
DX52D	CR1	+Z,+ZF,+ZA,+ZM,+AZ,+AS	1.0918	140–300[3]	270–420	26	–	–
DX53D	CR2	+Z,+ZF,+ZA,+ZM,+AZ,+AS	1.0951	140–260	270–380	30	–	–
DX54D	CR3	+Z,+ZA	1.0952	120–220	260–350	36	1.6[4]	0.18
DX54D	CR3	+ZF,+ZM	1.0952	120–220	260–350	34	1.4[4]	0.18
DX54D	–	+AZ	1.0952	120–220	260–350	36	–	–
DX54D	CR3	+AS	1.0952	120–220	260–350	34	1.4[4][5]	0.18[5]
DX55D	–	+AS	1.0962	140–240	270–370	30	–	–
DX56D	CR4	+Z,+ZA	1.0963	120–180	260–350	39	1.9[4]	0.21
DX56D	CR4	+ZF,+ZM	1.0963	120–180	260–350	37	1.7[4][5]	0.20[5]
DX56D	CR4	+AZ,+AS	1.0963	120–180	260–350	39	1.7[4][5]	0.20[5]
DX57D	CR5	+Z,+ZA	1.0853	120–170	260–350	41	2.1[4]	0.22
DX57D	CR5	+ZF,+ZM	1.0853	120–170	260–350	39	1.9[4][5]	0.21[5]
DX57D	CR5	+AS	1.0853	120–170	260–350	41	1.9[4][5]	0.21[5]

Steel type				Chemical composition, heat analysis					
Short designation	VDA239-100*		Material number	Percentage by weight % max.					
				C	Si	Mn	P	S	Ti
DX51D	–	+Z,+ZF,+ZA,+ZM,+AZ,+AS	1.0917	0.18	0.50	1.20	0.12	0.045	0.30
DX52D	CR1	+Z,+ZF,+ZA,+ZM,+AZ,+AS	1.0918	0.12	0.50	0.60	0.10	0.045	0.30
DX53D	CR2	+Z,+ZF,+ZA,+ZM,+AZ,+AS	1.0951	0.12	0.50	0.60	0.10	0.045	0.30
DX54D	CR3	+Z,+ZF,+ZA,+ZM,+AZ,+AS	1.0952	0.12	0.50	0.60	0.10	0.045	0.30
DX55D	–	+AS	1.0962	0.12	0.50	0.60	0.10	0.045	0.30
DX56D	CR4	+Z,+ZF,+ZA,+ZM,+AZ,+AS	1.0963	0.12	0.50	0.60	0.10	0.045	0.30
DX57D	CR5	+Z,+ZF,+ZA,+ZM,+AS	1.0853	0.12	0.50	0.60	0.10	0.045	0.30

1) Where no yield strength is defined, the respective values shall apply to the 0.2 % proof stress $R_{p0.2}$, otherwise for the lower yield strength (R_{eL}).
2) Reduced minimum values of elongation at fracture apply to product thicknesses 0.50 mm < t < 0.70 mm (minus 2 units), 0.35 mm < t < 0.50 mm (minus 4 units), and t < 0.35 mm (minus 7 units).
3) The maximum yield strength for surface class A is R_e = 360 MPa.
4) For product thicknesses of 1.5 mm < t < 2 mm, the minimum r_{90} value is reduced by 0.2, and for t ≥ 2 mm by 0.4.
5) Depending on the product thickness, the minimum r_{90} value is reduced as follows: 0.50 mm < t < 0.70 mm by 0.2; 0.35 mm < t < 0.50 mm by 0.4, and t < 0.35 mm by 0.6.
Also depending on the product thickness, the minimum n_{90} value is reduced as follows: 0.50 mm < t < 0.70 mm by 0.01; 0.35 mm < t < 0.50 mm by 0.03, and t < 0.35 mm by 0.04.

Structural steel · DIN EN 10 346

Steel type			Mechanical properties, longitudinal			Chemical composition, heat analysis				
Short designation	Surface finish	Material number	Proof stress $R_{p0,2}$[1] MPa min.	Tensile strength R_m[2] MPa min.	Elongation at fracture A_{80}[3] % min.	Percentage by weight % max.				
						C	Si	Mn	P	S
S220GD	+Z,+ZF,+ZA,+ZM,+AZ	1.0241	220	300	20	0.20	0.60	1.70	0.10	0.045
S250GD	+Z,+ZF,+ZA,+ZM,+AZ,+AS	1.0242	250	330	19	0.20	0.60	1.70	0.10	0.045
S280GD	+Z,+ZF,+ZA,+ZM,+AZ,+AS	1.0244	280	360	18	0.20	0.60	1.70	0.10	0.045
S320GD	+Z,+ZF,+ZA,+ZM,+AZ,+AS	1.0250	320	390	17	0.20	0.60	1.70	0.10	0.045
S350GD	+Z,+ZF,+ZA,+ZM,+AZ,+AS	1.0529	350	420	16	0.20	0.60	1.70	0.10	0.045
S390GD	+Z,+ZF,+ZA,+ZM,+AZ	1.0238	390	460	16	0.20	0.60	1.70	0.10	0.045
S420GD	+Z,+ZF,+ZA,+ZM,+AZ	1.0239	420	480	15	0.20	0.60	1.70	0.10	0.045
S450GD	+Z,+ZF,+ZA,+ZM,+AZ	1.0233	450	510	14	0.20	0.60	1.70	0.10	0.045
S550GD	+Z,+ZF,+ZA,+ZM,+AZ	1.0531	550	560	–	0.20	0.60	1.70	0.10	0.045

1) Where yield strength is defined, the values apply to the upper yield strength R_{eH}.
2) For all steel types, with the exception of S550GD, a span of 140 MPa can be expected for the tensile strength.
3) Depending on the product thickness, the minimum values of elongation at fracture are reduced as follows:
0.50 mm < t < 0.70 mm (minus 2 units), 0.35 mm < t < 0.50 mm (minus 4 units), and t < 0.35 mm (minus 7 units).

* Comparative grade, therefore minor deviations from DIN EN values possible

High and higher strength steel for cold forming · DIN EN 10 346

Steel type				Mechanical properties, transverse					
Short designation	VDA239-100*	Surface finish	Material number	Proof stress $R_{p0,2}$ [1] MPa	Tensile strength R_m MPa	Elongation at fracture A_{80} [2)3)] %	Anisotropy r_{90} [3)4)5)] min.	Strain hardening exponent n_{90} [5)] min.	Bake hardening index BH_2 min.
High-strength IF steel									
HX180YD	CR180IF	+Z,+ZF,+ZA,+ZM,+AZ,+AS	1.0921	180–240	330–390	34	1.7	0.18	–
HX220YD	CR210IF	+Z,+ZF,+ZA,+ZM,+AZ,+AS	1.0923	220–280	340–420	32	1.5	0.17	–
HX260YD	CR240IF	+Z,+ZF,+ZA,+ZM,+AZ,+AS	1.0926	260–320	380–440	30	1.4	0.16	–
HX300YD	–	+Z,+ZF,+ZA,+ZM,+AZ,+AS	1.0927	300–360	390–470	27	1.3	0.15	–
Bake hardening steel									
HX180BD	CR180BH	+Z,+ZF,+ZA,+ZM,+AZ,+AS	1.0914	180–240	290–360	34	1.5	0.16	30
HX220BD	CR210BH	+Z,+ZF,+ZA,+ZM,+AZ,+AS	1.0919	220–280	320–400	32	1.2	0.15	30
HX260BD	CR240BH	+Z,+ZF,+ZA,+ZM,+AZ,+AS	1.0924	260–320	360–440	28	–	–	30
HX300BD	–	+Z,+ZF,+ZA,+ZM,+AZ,+AS	1.0930	300–360	400–480	26	–	–	30
HX340BD	–	+Z,+ZF,+ZA,+ZM,+AZ,+AS	1.0945	340–400	440–520	24	–	–	30
Micro-alloyed steel									
HX260LAD	CR240LA	+Z,+ZF,+ZA,+ZM,+AZ,+AS	1.0929	260–330	350–430	26	–	–	–
HX300LAD	CR270LA	+Z,+ZF,+ZA,+ZM,+AZ,+AS	1.0932	300–380	380–480	23	–	–	–
HX340LAD	CR300LA	+Z,+ZF,+ZA,+ZM,+AZ,+AS	1.0933	340–420	410–510	21	–	–	–
HX380LAD	CR340LA	+Z,+ZF,+ZA,+ZM,+AZ,+AS	1.0934	380–480	440–560	19	–	–	–
HX420LAD	CR380LA	+Z,+ZF,+ZA,+ZM,+AZ,+AS	1.0935	420–520	470–590	17	–	–	–
HX460LAD	CR420LA	+Z,+ZF,+ZA,+ZM,+AZ,+AS	1.0990	460–560	500–640	15	–	–	–
HX500LAD	–	+Z,+ZF,+ZA,+ZM,+AZ,+AS	1.0991	500–620	530–690	13	–	–	–

Steel type				Chemical composition, heat analysis							
Short designation	VDA239-100*	Surface finish	Material number	Percentage by weight % max.							
				C	Si	Mn	P	S	Al min.	Nb	Ti
High-strength IF steel											
HX180YD	CR180IF	+Z,+ZF,+ZA,+ZM,+AZ,+AS	1.0921	0.01	0.30	0.70	0.060	0.025	0.010	0.09	0.12
HX220YD	CR210IF	+Z,+ZF,+ZA,+ZM,+AZ,+AS	1.0923	0.01	0.30	0.90	0.080	0.025	0.010	0.09	0.12
HX260YD	CR240IF	+Z,+ZF,+ZA,+ZM,+AZ,+AS	1.0926	0.01	0.30	1.60	0.10	0.025	0.010	0.09	0.12
HX300YD	–	+Z,+ZF,+ZA,+ZM,+AZ,+AS	1.0927	0.015	0.30	1.60	0.10	0.025	0.010	0.09	0.12
Bake hardening steel											
HX180BD	CR180BH	+Z,+ZF,+ZA,+ZM,+AZ,+AS	1.0914	0.06	0.50	0.70	0.060	0.025	0.015	0.09	0.12
HX220BD	CR210BH	+Z,+ZF,+ZA,+ZM,+AZ,+AS	1.0919	0.08	0.50	0.70	0.085	0.025	0.015	0.09	0.12
HX260BD	CR240BH	+Z,+ZF,+ZA,+ZM,+AZ,+AS	1.0924	0.10	0.50	1.00	0.10	0.030	0.010	0.09	0.12
HX300BD	–	+Z,+ZF,+ZA,+ZM,+AZ,+AS	1.0930	0.11	0.50	0.80	0.12	0.025	0.010	0.09	0.12
HX340BD	–	+Z,+ZF,+ZA,+ZM,+AZ,+AS	1.0945	0.11	0.50	0.80	0.12	0.025	0.010	0.09	0.12
Micro-alloyed steel											
HX260LAD	CR240LA	+Z,+ZF,+ZA,+ZM,+AZ,+AS	1.0929	0.11	0.50	1.0	0.030	0.025	0.015	0.09	0.15
HX300LAD	CR270LA	+Z,+ZF,+ZA,+ZM,+AZ,+AS	1.0932	0.12	0.50	1.4	0.030	0.025	0.015	0.09	0.15
HX340LAD	CR300LA	+Z,+ZF,+ZA,+ZM,+AZ,+AS	1.0933	0.12	0.50	1.4	0.030	0.025	0.015	0.10	0.15
HX380LAD	CR340LA	+Z,+ZF,+ZA,+ZM,+AZ,+AS	1.0934	0.12	0.50	1.5	0.030	0.025	0.015	0.10	0.15
HX420LAD	CR380LA	+Z,+ZF,+ZA,+ZM,+AZ,+AS	1.0935	0.12	0.50	1.6	0.030	0.025	0.015	0.10	0.15
HX460LAD	CR420LA	+Z,+ZF,+ZA,+ZM,+AZ,+AS	1.0990	0.15	0.50	1.7	0.030	0.025	0.015	0.10	0.15
HX500LAD	–	+Z,+ZF,+ZA,+ZM,+AZ,+AS	1.0991	0.15	0.50	1.7	0.030	0.025	0.015	0.10	0.15

1) Where the yield yield strength is defined, the respective values shall apply to the the lower yield strength (R_{eL}).
2) Depending on the product thickness, the minimum values of elongation at fracture are reduced as follows: 0.50 mm < t < 0.70 mm (minus 2 units), 0.35 mm < t < 0.50 mm (minus 4 units), and t < 0.35 mm (minus 7 units).
3) For AS, AZ, ZF and ZM coatings, the minimum A_{80} value is reduced by 2 units and the minimum r_{90} value by 0.2.
4) For product thicknesses of 1.5 mm < t < 2 mm, the minimum r_{90} value is reduced by 0.2, and for t ≥ 2 mm by 0.4.
5) Depending on the product thickness, the minimum r_{90} value is reduced as follows: 0.50 mm < t < 0.70 mm by 0.2; 0.35 mm < t < 0.50 mm by 0.4, and t < 0.35 mm by 0.6.
Also depending on the product thickness, the minimum n_{90} value is reduced as follows: 0.50 mm < t < 0.70 mm by 0.01; 0.35 mm < t < 0.50 mm by 0.03, and t < 0.35 mm by 0.04.

* Comparative grade, therefore minor deviations from DIN EN values possible

Multiphase steel · DIN EN 10 346

Steel type, cold rolled				Mechanical properties, longitudinal				
Short designation	VDA239-100*	Surface finish	Material number	Proof stress $R_{p0,2}$ MPa	Tensile strength R_m MPa min.	Elongation at fracture A_{80} [1)2)] % min.	Strain hardening exponent $n_{10\text{-}UE}$ min.	Bake hardening index BH_2 min.
Dual-phase steel								
HCT450X	–	+Z, +ZF, +ZA, +ZM	1.0937	260–340	450	27	0.16	30
HCT490X	CR290Y490T-DP	+Z, +ZF, +ZA, +ZM	1.0995	290–380	490	24	0.15	30
HCT590X	CR330Y590T-DP	+Z, +ZF, +ZA, +ZM	1.0996	330–430	590	20	0.14	30
HCT780X	CR440Y780T-DP	+Z, +ZF, +ZA, +ZM	1.0943	440–550	780	14	–	30
HCT980X	CR590Y980T-DP	+Z, +ZF, +ZA, +ZM	1.0944	590–740	980	10	–	30
HCT980XG	CR700Y980T-DP	+Z, +ZF, +ZA, +ZM	1.0997	700–850	980	8	–	30
Retained-austenite steel (TRIP steel)								
HCT690T	CR400Y690T-TR	+Z, +ZF, +ZA, +ZM	1.0947	400–520	690	23	0.19	40
HCT780T	CR450Y780T-TR	+Z, +ZF, +ZA, +ZM	1.0948	450–570	780	21	0.16	40
Complex-phase steel								
HCT600C	–	+Z, +ZF, +ZA, +ZM	1.0953	350–500	600	16	–	30
HCT780C	CR570Y780T-CP	+Z, +ZF, +ZA, +ZM	1.0954	570–720	780	10	–	30
HCT980C	CR780Y980T-CP	+Z, +ZF, +ZA, +ZM	1.0955	780–950	980	6	–	30

Steel type, hot rolled				Mechanical properties, longitudinal			
Short designation	VDA239-100	Surface finish	Material number	Proof stress $R_{p0,2}$ MPa	Tensile strength R_m MPa min.	Elongation at fracture A_{80} % min.	Strain hardening exponent $n_{10\text{-}UE}$ min.
Ferrite-bainite-phase steel							
HDT450F	HR300Y450T-FB	+Z, +ZF, +ZM	1.0961	300–420	450	24	–
HDT580F	HR440Y580T-FB	+Z, +ZF, +ZM	1.0994	460–620	580	15	–
Dual-phase steel							
HDT580X	HR330Y580T-DP	+Z, +ZF, +ZM	1.0936	330–450	580	19	0.13
Complex-phase steel							
HDT750C	–	+Z, +ZF, +ZM	1.0956	620–760	750	10	–
HDT760C	HR660Y760T-CP	+Z, +ZF, +ZM	1.0998	660–830	760	10	–
HDT950C	–	+Z, +ZF, +ZM	1.0958	720–950	950	9	–

1) Reduced minimum values of elongation at rupture apply to product thicknesses t < 0.60 mm (minus 2 units).
2) For ZF-coated products, the minimum values of elongation at fracture are reduced by 2 units.
For ZF-coated products in thicknesses t < 0.60 mm, the minimum elongation at rupture is reduced by 4 units.

Where particularly close thickness tolerances of up to ± 0.06 mm are required for hot-dip galvanized hot strip, we recommend our product scalur®+Z.

* Comparative grade, therefore minor deviations from DIN EN values possible

Multiphase steel · DIN EN 10 346

Steel type				Chemical composition, heat analysis									
Short designation	VDA239-100*	Surface finish	Material number	Percentage by weight % max.									
				C	Si	Mn	P	S	$Al_{total\ (span)}$	Cr + Mo	Nb + Ti	V	B
Ferrite-bainite-phase steel													
HDT450F	HR300Y450T-FB	+Z, +ZF, +ZM	1.0961	0.18	0.50	2.00	0.050	0.010	0.015–2.0	1.00	0.15	0.15	0.005
HDT580F	HR440Y580T-FB	+Z, +ZF, +ZM	1.0994	0.18	0.50	2.00	0.050	0.010	0.015–2.0	1.00	0.15	0.15	0.01
Dual-phase steel													
HCT450X	–	+Z, +ZF, +ZA, +ZM	1.0937	0.14	0.75	2.00	0.080	0.015	0.015–1.0	1.00	0.15	0.20	0.005
HCT490X	CR290Y490T-DP	+Z, +ZF, +ZA, +ZM	1.0995	0.14	0.75	2.00	0.080	0.015	0.015–1.0	1.00	0.15	0.20	0.005
HCT590X	CR330Y590T-DP	+Z, +ZF, +ZA, +ZM	1.0996	0.15	0.75	2.50	0.040	0.015	0.015–1.5	1.40	0.15	0.20	0.005
HCT780X	CR440Y780T-DP	+Z, +ZF, +ZA, +ZM	1.0943	0.18	0.80	2.50	0.080	0.015	0.015–2.0	1.40	0.15	0.20	0.005
HCT980X	CR590Y980T-DP	+Z, +ZF, +ZA, +ZM	1.0944	0.20	1.00	2.90	0.080	0.015	0.015–2.0	1.40	0.15	0.20	0.005
HCT980XG	CR700Y980T-DP	+Z, +ZF, +ZA, +ZM	1.0997	0.23	1.00	2.90	0.080	0.015	0.015–2.0	1.40	0.15	0.20	0.005
HDT580X	HR330Y580T-DP	+Z, +ZF, +ZM	1.0936	0.14	1.00	2.20	0.085	0.015	0.015–1.0	1.40	0.15	0.20	0.005
Retained-austenite steel (TRIP steel)													
HCT690T	CR400Y690T-TR	+Z, +ZF, +ZA, +ZM	1.0947	0.24	2.00	2.20	0.080	0.015	0.015–2.0	0.60	0.20	0.20	0.005
HCT780T	CR450Y780T-TR	+Z, +ZF, +ZA, +ZM	1.0948	0.25	2.20	2.50	0.080	0.015	0.015–2.0	0.60	0.20	0.20	0.005
Complex-phase steel													
HCT600C	–	+Z, +ZF, +ZA, +ZM	1.0953	0.18	0.80	2.20	0.080	0.015	0.015–2.0	1.00	0.15	0.20	0.005
HCT780C	CR570Y780T-CP	+Z, +ZF, +ZA, +ZM	1.0954	0.18	1.00	2.50	0.080	0.015	0.015–2.0	1.00	0.15	0.20	0.005
HCT980C	CR780Y980T-CP	+Z, +ZF, +ZA, +ZM	1.0955	0.23	1.00	2.70	0.080	0.015	0.015–2.0	1.00	0.15	0.22	0.005
HDT750C	–	+Z, +ZF, +ZM	1.0956	0.18	0.80	2.20	0.080	0.015	0.015–2.0	1.00	0.15	0.20	0.005
HDT760C	HR660Y760T-CP	+Z, +ZF, +ZM	1.0998	0.18	1.00	2.50	0.080	0.015	0.015–2.0	1.00	0.25	0.20	0.005
HDT950C	–	+Z, +ZF, +ZM	1.0958	0.25	0.80	2.70	0.080	0.015	0.015–2.0	1.20	0.25	0.30	0.005

Where particularly close thickness tolerances of up to ± 0.06 mm are required for hot-dip galvanized hot strip, we recommend our product scalur®+Z.

* Comparative grade, therefore minor deviations from DIN EN values possible

scalur®+Z

scalur®+Z from thyssenkrupp is a hot-dip galvanized flat product with extremely close thickness tolerances down to ± 0.06 mm over the entire strip length and width. The uniform properties of scalur®+Z ensure maximum yield in production, with excellent processing characteristics for consistently high product quality. Depending on the strength grade involved, scalur®+Z is available in thicknesses of 1.50 to 4.00 mm and widths of 900 to 1,550 mm. It is particularly suitable for stampings, sections and telescopic rails.

scalur®+Z – hot-dip galvanized flat products with extremely tight thickness tolerances

Low-carbon steel · DIN EN 10 346				Structural steel · DIN EN 10 346			Micro-alloyed steel · DIN EN 10 346			
Short designation	Standard designation	VDA 239-100*	Material number	Short designation	Standard designation	Material number	Short designation	Standard designation	VDA239-100*	Material number
scalur®+Z DX51D	DX51D	–	1.0917	scalur®+Z S220GD	S220GD	1.0241	scalur®+Z HX260LAD	HX260LAD	CR240LA	1.0929
scalur®+Z DX52D	DX52D	CR1	1.0918	scalur®+Z S250GD	S250GD	1.0242	scalur®+Z HX300LAD	HX300LAD	CR270LA	1.0932
				scalur®+Z S280GD	S280GD	1.0244	scalur®+Z HX340LAD	HX340LAD	CR300LA	1.0933
				scalur®+Z S320GD	S320GD	1.0250	scalur®+Z HX380LAD	HX380LAD	CR340LA	1.0934
				scalur®+Z S350GD	S350GD	1.0529	scalur®+Z HX420LAD	HX420LAD	CR380LA	1.0935
							scalur®+Z HX460LAD	HX460LAD	CR420LA	1.0990
							scalur®+Z HX500LAD	HX500LAD	–	1.0991

All the chemical and mechanical properties of the grades listed are identical to the properties described for hot-dip coated products.

* Comparative grade, therefore minor deviations from DIN EN values possible