

3 Hot-dip galvanised sheet

1. Hot rolled sheet and strip
2. Cold rolled sheet
3. Hot-dip galvanised sheet
4. Electrolytic zinc coated sheet
5. Hot aluminised sheet

Grades and properties

Limitations, parameters for testing and exceptional arrangements are to be taken from the pertinent standard.

Mild steel grades

continuous hot-dip galvanised strip and sheet for cold forming, DIN EN 10346 (Z/ZF/ZA/AZ)

Designation to			Mechanical properties					Chemical composition					
EN 10346	EN 10027-2 Material No.	Symbol for the type of hot-dip coating	R _e [N/mm ²]	R _m [N/mm ²]	A ₈₀ [%] min.	r min.	n min.	C [%] max.	Si [%] max.	Mn [%] max.	P [%] max.	S [%] max.	Ti [%] max.
DX51D	1.0226	+Z, +ZA, +AZ	–	270 to 500	22	–	–	0.18	0.50	1.20	0.12	0.045	0.30
DX51D	1.0226	+ZF	–	270 to 500	22	–	–	0.18	0.50	1.20	0.12	0.045	0.30
DX52D	1.0350	+Z, +ZA, +AZ	140 to 300 *	270 to 420	26	–	–	0.12	0.50	0.60	0.10	0.045	0.30
DX52D	1.0350	+ZF	140 to 300 *	270 to 420	26	–	–	0.12	0.50	0.60	0.10	0.045	0.30
DX53D	1.0355	+Z, +ZA, +AZ	140 to 260	270 to 380	30	–	–	0.12	0.50	0.60	0.10	0.045	0.30
DX53D	1.0355	+ZF	140 to 260	270 to 380	30	–	–	0.12	0.50	0.60	0.10	0.045	0.30
DX54D	1.0306	+Z, +ZA	120 to 220	260 to 350	36	1.6	0.18	0.12	0.50	0.60	0.10	0.045	0.30
DX54D	1.0306	+ZF	120 to 220	260 to 350	34	1.4	0.18	0.12	0.50	0.60	0.10	0.045	0.30
DX54D	1.0306	+AZ	120 to 220	260 to 350	36	–	–	0.12	0.50	0.60	0.10	0.045	0.30
DX56D	1.0322	+Z, +ZA	120 to 180	260 to 350	39	1.9	0.21	0.12	0.50	0.60	0.10	0.045	0.30
DX56D	1.0322	+ZF	120 to 180	260 to 350	37	1.7	0.20	0.12	0.50	0.60	0.10	0.045	0.30
DX57D	1.0853	+Z, +ZA	120 to 170	260 to 350	41	2.1	0.22	0.12	0.50	0.60	0.10	0.045	0.30
DX57D	1.0853	+ZF	120 to 170	260 to 350	39	1.9	0.21	0.12	0.50	0.60	0.10	0.045	0.30

* only valid for surface qualities B and C

Micro-alloyed grades

continuous hot-dip galvanised high yield strength steel strip and sheet for cold forming, DIN EN 10346

Designation to			Mechanical properties						Chemical composition							
EN 10346	EN 10027-2 Material No.	Symbol for the type of hot-dip coating	R _e [N/mm ²] across	BH ₂ [N/mm ²] across min.	R _m [N/mm ²] across	A ₈₀ [%] across min.	r across min.	n across min.	C [%] max.	Si [%] max.	Mn [%] max.	P [%] max.	S [%] max.	Al [%]	Ti [%] max.	Nb [%] max.
HX160YD	1.0910	+Z, +ZF, +ZA, +AZ	160 to 220	–	300 to 360	37	1,9	0.20	0.01	0.15	0.70	0.06	0.025	≤ 0.10	0.12	0.09
HX180YD	1.0921	+Z, +ZF, +ZA, +AZ	180 to 240	–	340 to 400	34	1.7	0.18	0.01	0.15	0.70	0.06	0.025	≤ 0.10	0.12	0.09
HX180BD	1.0914	+Z, +ZF, +ZA, +AZ	180 to 240	35	290 to 360	34	1.5	0.16	0.10	0.50	0.70	0.06	0.025	≤ 0.10	0.12	0.09
HX220YD	1.0923	+Z, +ZF, +ZA, +AZ	220 to 280	–	340 to 420	32	1.5	0.17	0.01	0.20	0.90	0.08	0.025	≤ 0.10	0.12	0.09
HX220PD*	1.0358	+Z, +ZF, +ZA, +AZ	220 to 280	–	340 to 400	32	1.3	0.15	0.06	0.50	0.70	0.08	0.025	≥ 0.02	–	–
HX220BD	1.0919	+Z, +ZF, +ZA, +AZ	220 to 280	35	320 to 400	32	1.2	0.15	0.10	0.50	0.70	0.08	0.025	≤ 0.10	0.12	0.09
HX260YD	1.0926	+Z, +ZF, +ZA, +AZ	260 to 320	–	380 to 440	30	1.4	0.16	0.01	0.25	1.60	0.10	0.025	≤ 0.10	0.12	0.09
HX260PD*	1.0431	+Z, +ZF, +ZA, +AZ	260 to 320	–	380 to 440	28	–	–	0.11	0.50	0.70	0.10	0.025	≥ 0.02	–	–
HX260BD	1.0924	+Z, +ZF, +ZA, +AZ	260 to 320	35	360 to 440	28	–	–	0.10	0.50	0.80	0.10	0.025	≤ 0.10	0.12	0.09
HX260LAD	1.0929	+Z, +ZF, +ZA, +AZ	260 to 330	–	350 to 430	26	–	–	0.12	0.50	0.60	0.030	0.025	≥ 0.015	0.12	0.09
HX300PD*	1.0443	+Z, +ZF, +ZA, +AZ	300 to 360	–	400 to 480	26	–	–	0.11	0.50	0.70	0.12	0.025	≥ 0.02	–	–
HX300YD	1.0927	+Z, +ZF, +ZA, +AZ	300 to 360	–	390 to 470	27	1.3	0.15	0.01	0.30	1.30	0.10	0.025	≤ 0.10	0.12	0.09
HX300BD	1.0930	+Z, +ZF, +ZA, +AZ	300 to 360	35	400 to 480	26	–	–	0.11	0.50	0.80	0.12	0.025	≤ 0.10	0.12	0.09
HX300LAD	1.0932	+Z, +ZF, +ZA, +AZ	300 to 380	–	380 to 480	23	–	–	0.11	0.50	1.00	0.030	0.025	≥ 0.015	0.15	0.09
HX340LAD	1.0933	+Z, +ZF, +ZA, +AZ	340 to 420	–	410 to 510	21	–	–	0.11	0.50	1.00	0.030	0.025	≥ 0.015	0.15	0.09
HX380LAD	1.0934	+Z, +ZF, +ZA, +AZ	380 to 480	–	440 to 560	19	–	–	0.11	0.50	1.40	0.030	0.025	≥ 0.015	0.15	0.09
HX420LAD	1.0935	+Z, +ZF, +ZA, +AZ	420 to 520	–	470 to 590	17	–	–	0.11	0.50	1.40	0.030	0.025	≥ 0.015	0.15	0.09
HX460LAD	1.0990	+Z, +ZF, +ZA, +AZ	460 to 560	–	500 to 640	15	–	–	0.15	0.50	1.70	0.030	0.025	≥ 0.015	0.15	0.09
HX500LAD	1.0991	+Z, +ZF, +ZA, +AZ	500 to 620	–	530 to 690	13	–	–	0.15	0.50	1.70	0.030	0.025	≥ 0.015	0.15	0.09

B bake hardening **P** phosphorous alloyed **Y** interstitial-free (IF Steel) **LA** low alloy (micro-alloyed) * Grade not included in the latest norm (formerly: DIN EN 10292:2000)

Structural steels

continuous hot-dip galvanised structural steel strip and sheet for cold forming, DIN EN 10346 (Z/ZF/ZA/AZ)

Designation to			Mechanical properties			Chemical composition				
EN 10346	EN 10027-2 Material No.	Symbol for the type of hot-dip coating	R _e [N/mm ²] min.	R _m [N/mm ²] min.	A ₈₀ [%] min.	C [%] max.	Si [%] max.	Mn [%] max.	P [%] max.	S [%] max.
S220GD	1.0241	+Z, +ZA	220	300	20	0.2	0.6	1.70	0.10	0.045
S220GD	1.0241	+ZF, +AZ	220	300	20	0.2	0.6	1.70	0.10	0.045
S250GD	1.0242	+Z, +ZA	250	330	19	0.2	0.6	1.70	0.10	0.045
S250GD	1.0242	+ZF, +AZ	250	330	19	0.2	0.6	1.70	0.10	0.045
S280GD	1.0244	+Z, +ZA	280	360	18	0.2	0.6	1.70	0.10	0.045
S280GD	1.0244	+ZF, +AZ	280	360	18	0.2	0.6	1.70	0.10	0.045
S320GD	1.0250	+Z, +ZA	320	390	17	0.2	0.6	1.70	0.10	0.045
S320GD	1.0250	+ZF, +AZ	320	390	17	0.2	0.6	1.70	0.10	0.045
S350GD	1.0529	+Z, +ZA	350	420	16	0.2	0.6	1.70	0.10	0.045
S350GD	1.0529	+ZF, +AZ	350	420	16	0.2	0.6	1.70	0.10	0.045
S550GD	1.0531	+Z, +ZA	550	560	–	0.2	0.6	1.70	0.10	0.045
S550GD	1.0531	+ZF, +AZ	550	560	–	0.2	0.6	1.70	0.10	0.045

Multi-phase steel

continuous hot-dip galvanised multi-phase steel for cold forming, DIN EN 10346

Designation to			Mechanical properties						Chemical composition										
EN 10346	EN 10027-2 Material No.	Symbol for the type of hot-dip coating	R _e [N/mm ²] across	BH ₂ [N/mm ²] across min.	R _m [N/mm ²] across min.	A ₈₀ [N/mm ²] across min.	n across min.	C [%] max.	Si [%] max.	Mn [%] max.	P [%] max.	S [%] max.	Al [%] min.	Al [%] max.	Cr+Mo [%] max.	Nb+Ti [%] max.	V [%] max.	B [%] max.	
FB-Steel																			
HDT450F	1.0961	+Z, +ZF	320 to 420	30	450	23	–	0.180	0.500	1.200	0.030	0.010	0.015	–	0.30	0.05	0.15	0.005	
HDT560F	1.0959	+Z, +ZF	460 to 570	30	560	16	–	0.180	0.500	1.800	0.025	0.010	0.015	–	0.30	0.15	0.15	0.005	
DP-Steel																			
HCT450X	1.0937	+Z, +ZF	260 to 340	30	450	27	0.16	0.140	0.800	2.000	0.080	0.015	–	2.00	1.00	0.15	0.20	0.005	
HCT500X	1.0939	+Z, +ZF	300 to 380	30	500	23	0.15	0.140	0.800	2.000	0.080	0.015	–	2.00	1.00	0.15	0.20	0.005	
HCT600X	1.0941	+Z, +ZF	340 to 420	30	600	20	0.14	0.170	0.800	2.200	0.080	0.015	–	2.00	1.00	0.15	0.20	0.005	
HDT580X	1.0936	+Z, +ZF	330 to 460	30	580	19	0.13	0.170	0.800	2.200	0.080	0.015	–	2.00	1.00	0.15	0.20	0.005	
HCT780X	1.0943	+Z, +ZF	450 to 560	30	780	14	–	0.180	0.800	2.500	0.080	0.015	–	2.00	1.00	0.15	0.20	0.005	
HCT980X	1.0944	+Z, +ZF	600 to 750	30	980	10	–	0.230	0.800	2.500	0.080	0.015	–	2.00	1.00	0.15	0.20	0.005	
TRIP-Steel																			
HCT690T	1.0947	+Z, +ZF	430 to 550	40	690	23	0.18	0.320	2.200	2.500	0.120	0.015	–	2.00	0.60	0.20	0.20	0.005	
HCT780T	1.0948	+Z, +ZF	470 to 600	40	780	21	0.16	0.320	2.200	2.500	0.120	0.015	–	2.00	0.60	0.20	0.20	0.005	
CP-Steel																			
HCT600C	1.0953	+Z, +ZF	350 to 500	30	600	16	–	0.180	0.800	2.200	0.080	0.015	–	2.00	1.00	0.15	0.20	0.005	
HDT750C	1.0956	+Z, +ZF	620 to 760	30	750	10	–	0.180	0.800	2.200	0.080	0.015	–	2.00	1.00	0.15	0.20	0.005	
HCT780C	1.0954	+Z, +ZF	500 to 700	30	780	10	–	0.180	0.800	2.200	0.080	0.015	–	2.00	1.00	0.15	0.20	0.005	
HDT780C	1.0957	+Z, +ZF	680 to 830	30	780	10	–	0.180	0.800	2.200	0.080	0.015	–	2.00	1.00	0.15	0.20	0.005	
HDT950C	1.0958	+Z, +ZF	720 to 920	30	950	9	–	0.250	0.800	2.200	0.080	0.015	–	2.00	1.20	0.15	0.20	0.005	
HCT980C	1.0955	+Z, +ZF	700 to 900	30	980	7	–	0.250	0.800	2.200	0.080	0.015	–	2.00	1.20	0.15	0.22	0.005	
MS-Steel																			
HDT1200M	1.0665	+Z, +ZF	900 to 1150	30	1200	5	–	0.250	0.800	2.000	0.060	0.015	–	2.00	1.20	0.15	0.22	0.005	

Grade availability has to be checked individually.

Type of hot-dip coating			Surface finish
Z	hot-dip zinc coated	zinc coat with 5% Al	NA: unaffected solidification with differing bloom size, normal surface
ZA	Galfan	zinc coat with 5% Al	MA: targeted effect on the solidification with reduced bloom size, normal surface
AZ	Galvalume	zinc coat with 55% Al to 1.6% Si, rest zinc	MB: targeted effect on the solidification, cold re-rolled, best surface
			MC: targeted effect on the solidification, cold re-rolled, best surface
ZF	galvannealed	homogenised coating of zinc-iron	RA: normal surface
			RB: improved surface
			RC: best surface

After treatment (Surface protection)

C	chemically passivated
O	oiled
CO	chemically passivated and oiled
S	sealed
U	untreated