

## 5 Hot-dip aluminised 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 aluminised strip and sheet for cold forming, DIN EN 10346 (AS)

Designation to				Mechanical properties					Chemical composition					
EN 10346	EN 10027-2 Material No.	Symbol for the type of hot-dip coating	Thyssen Brochure June 96	$R_e$ [N/mm <sup>2</sup> ]	$R_m$ [N/mm <sup>2</sup> ]	$A_{80}$ [%] min.	r min.	n min.	C [%] max.	Si [%] max.	Mn [%] max.	P [%] max.	S [%] max.	Ti [%] max.
DX51D	1.0226	+AS	Quality A	–	270 – 500	22	–	–	0.18	0.50	1.20	0.12	0.045	0.30
DX52D	1.0350	+AS	Quality Bg	140 – 300	270 – 420	26	–	–	0.12	0.50	0.60	0.10	0.045	0.30
DX53D	1.0355	+AS	Quality C	140 – 260	270 – 380	30	–	–	0.12	0.50	0.60	0.10	0.045	0.30
DX54D	1.0306	+AS	Quality D	120 – 220	260 – 350	34	1.4	0.18	0.12	0.50	0.60	0.10	0.045	0.30
DX55D	1.0309	+AS	Quality T	140 – 240	270 – 370	30	–	–	0.12	0.50	0.60	0.10	0.045	0.30
DX56D	1.0322	+AS	–	120 – 180	260 – 350	39	1.7	0.20	0.12	0.50	0.60	0.10	0.045	0.30
DX57D	1.0853	+AS	–	120 – 170	260 – 350	41	1.9	0.21	0.12	0.50	0.60	0.10	0.045	0.30

#### Micro-alloyed grades

continuous hot-dip aluminised 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 <sup>2</sup> ] across	$BH_2$ [N/mm <sup>2</sup> ] across min.	$R_m$ [N/mm <sup>2</sup> ] across	$A_{80}$ [%] across min.	r across min.	n across min.	C [%] max.	Si [%] max.	Mn [%] max.	P [%] max.	S [%] max.	Al [%] min.	Ti [%] max.	Nb [%] max.
HX160YD	1.0910	+AS	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	+AS	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	+AS	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	+AS	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	+AS	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	+AS	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	+AS	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	+AS	260 to 320	–	380 to 440	28	–	–	0.11	0.50	0.70	0.10	0.025	≥ 0,02	–	–
HX260BD	1.0924	+AS	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	+AS	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	+AS	300 to 360	–	400 to 480	26	–	–	0.11	0.50	0.70	0.12	0.025	≥ 0,02	–	–
HX300YD	1.0927	+AS	300 to 360	–	390 to 470	27	1.3	0.15	0.01	0.30	1.30	0.10	0.025	≤ 0,10	0.09	
HX300BD	1.0930	+AS	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	+AS	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	+AS	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	+AS	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	+AS	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	+AS	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	+AS	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)

## continuous hot-dip aluminised structural steel strip and sheet for cold forming, DIN EN 10346 (AS)

Designation to				Mechanical properties			Chemical composition				
EN 10346	EN 10027-2 Material No.	Symbol for the type of hot-dip coating	Thyssen prospekt June 96	$R_b$ [N/mm <sup>2</sup> ] min.	$R_m$ [N/mm <sup>2</sup> ] min.	$A_{80}$ [%] min.	C [%] max.	Si [%] max.	Mn [%] max.	P [%] max.	S [%] max.
S250GD	1.0242	+ AS	L250 Al	250	330	19	0.20	0.60	1.70	0.10	0.045
S280GD	1.0244	+ AS	M280 Al	280	360	18	0.20	0.60	1.70	0.10	0.045
S320GD	1.0250	+ AS	N320 Al	320	390	17	0.20	0.60	1.70	0.10	0.045
S350GD	1.0529	+ AS	O320 Al	350	420	16	0.20	0.60	1.70	0.10	0.045

**Type of hot-dip coating**

AS Aluminium silicon alloy with a silicon content of 8-11%

**Surface finish**

- A imperfections and small surface flaws can be present
- B cold re-rolled, improved surface, small imperfections can be present
- C cold re-rolled, best surface

**After treatment (Surface protection)**

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