

## 4 Electrolytic zinc coated 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

electrolytic zinc coated cold rolled steel products, DIN EN 10152 (ZE) / DIN EN 10271 (ZN)

Designation to		Mechanical properties					Chemical composition				
EN 10152	EN 10027-2 Material No.	R <sub>e</sub> [N/mm <sup>2</sup> ] max.	R <sub>m</sub> [N/mm <sup>2</sup> ]	A <sub>80</sub> [%] min.	r <sub>q</sub> min.	n <sub>q</sub> [%] min.	C [%] max.	Mn [%] max.	P [%] max.	S [%] max.	Ti [%] max.
DC01+ZE	1.0330	140 – 280	270 to 410	28	–	–	0.12	0.60	0.045	0.045	–
DC03+ZE	1.0347	140 – 240	270 to 370	34	1.3	–	0.10	0.45	0.035	0.035	–
DC04+ZE	1.0338	140 – 220	270 to 350	37	1.6	0.160	0.08	0.40	0.030	0.030	–
DC05+ZE	1.0312	140 – 190	270 to 330	39	1.9	0.190	0.06	0.35	0.025	0.025	–
DC06+ZE	1.0873	120 – 190	270 to 350	37	1.8	0.200	0.02	0.25	0.020	0.020	0.3

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DC01+ZN	1.0330	140 – 280	270 to 410	28	–	–	0.12	0.60	0.045	0.045	–
DC03+ZN	1.0347	140 – 240	270 to 370	34	1.2	–	0.10	0.45	0.035	0.035	–
DC04+ZN	1.0338	140 – 220	270 to 350	37	1.4	0.160	0.08	0.40	0.030	0.030	–
DC05+ZN	1.0312	140 – 190	270 to 330	38	1.6	0.180	0.06	0.35	0.025	0.025	–
DC06+ZN	1.0873	120 – 190	270 to 350	37	1.6	0.190	0.02	0.25	0.020	0.020	0.3

The mechanical properties of ZN treated flat stock differ from the values shown here, sometimes considerably.

#### Micro-alloyed grades

cold rolled high yield strength flat products in micro-alloyed steel for cold forming, DIN EN 10268;  
with an additional plating designation this standard also applies for electrolytic zinc coated flat products  
e.g. HC260LA + ZE 75/75

Designation to		Mechanical properties							Chemical composition							
EN 10268	EN 10027-2 Material No.	R <sub>e</sub> [N/mm <sup>2</sup> ]	BH <sub>2</sub> [N/mm <sup>2</sup> ]	R <sub>m</sub> [N/mm <sup>2</sup> ]	A <sub>80</sub> [%] min.	r max.	r min.	n min.	C [%] max.	Si [%] max.	Mn [%] max.	P [%] max.	S [%] max.	Al [%] min.	Ti [%] max.	Nb [%] max.
HC180Y	1.0922	180 to 230	–	340 to 400	36	–	1.7	0.19	0.01	0.30	0.70	0.06	0.025	0.010	0.12	–
HC180P	1.0342	180 to 230	–	280 to 360	34	–	1.6	0.17	0.05	0.40	0.60	0.08	0.025	0.015	–	–
HC180B	1.0395	180 to 230	35	300 to 360	34	–	1.6	0.17	0.05	0.50	0.70	0.06	0.025	0.015	–	–
HC220Y	1.0925	220 to 270	–	350 to 420	34	–	1.6	0.18	0.01	0.30	0.90	0.08	0.025	0.010	0.12	–
HC220I	1.0346	220 to 270	–	300 to 380	34	1.4	–	0.18	0.07	0.50	0.50	0.05	0.025	0.015	0.05	–
HC220P	1.0397	220 to 270	–	320 to 400	32	–	1.3	0.16	0.07	0.50	0.70	0.08	0.025	0.015	–	–
HC220B	1.0396	220 to 270	35	320 to 400	32	–	1.5	0.16	0.06	0.50	0.70	0.08	0.025	0.015	–	–
HC260Y	1.0928	260 to 320	–	380 to 440	32	–	1.4	0.17	0.01	0.30	1.60	0.10	0.025	0.010	0.12	–
HC260I	1.0349	260 to 310	–	320 to 400	32	1.4	–	0.17	0.07	0.50	0.50	0.05	0.025	0.015	0.05	–
HC260P	1.0417	260 to 320	–	360 to 440	29	–	–	–	0.08	0.50	0.70	0.10	0.025	0.015	–	–
HC260B	1.0400	260 to 320	35	360 to 440	29	–	–	–	0.08	0.50	0.70	0.10	0.025	0.015	–	–
HC260LA	1.0480	260 to 330	–	350 to 430	26	–	–	–	0.10	0.50	0.60	0.025	0.025	0.015	0.15	–

Designation to		Mechanical properties							Chemical composition							
EN 10268	EN 10027-2 Material No.	R <sub>e</sub> [N/mm <sup>2</sup> ]	BH <sub>2</sub> [N/mm <sup>2</sup> ]	R <sub>m</sub> [N/mm <sup>2</sup> ]	A <sub>80</sub> [%]	r	r	n	C [%]	Si [%]	Mn [%]	P [%]	S [%]	Al [%]	Ti [%]	Nb [%]
					min.	max.	min.	min.	max.	max.	max.	max.	max.	min.	max.	max.
HC300I	1.0447	300 to 350	–	340 to 440	30	1.4	–	0.16	0.08	0.50	0.70	0.08	0.025	0.015	0.05	–
HC300P	1.0448	300 to 360	–	400 to 480	26	–	–	–	0.10	0.50	0.70	0.12	0.025	0.015	–	–
HC300B	1.0444	300 to 360	35	400 to 480	26	–	–	–	0.10	0.50	0.70	0.12	0.025	0.015	–	–
HC300LA	1.0489	300 to 380	–	380 to 480	23	–	–	–	0.10	0.50	1.00	0.025	0.025	0.015	0.15	0.09
HC340LA	1.0548	340 to 420	–	410 to 510	21	–	–	–	0.10	0.50	1.10	0.025	0.025	0.015	0.15	0.09
HC380LA	1.0550	380 to 480	–	440 to 560	19	–	–	–	0.10	0.50	1.60	0.025	0.025	0.015	0.15	0.09
HC420LA	1.0556	420 to 520	–	470 to 590	17	–	–	–	0.10	0.50	1.60	0.025	0.025	0.015	0.15	0.09

**B** bake hardening    **P** phosphorous alloyed    **Y** interstitial-free (IF Steel)    **LA** low alloy (microalloyed)    **I** isotropic

## Multi-phase steel

electrolytic zinc coated steel for cold forming, DIN EN 10336

Designation to			Mechanical properties						Chemical composition										
EN 10336	EN 10027-2 Material No.	Symbol for the type of hot-dip coating	R <sub>e</sub> [N/mm <sup>2</sup> ] across	BH <sub>2</sub> [N/mm <sup>2</sup> ] across min.	R <sub>m</sub> [N/mm <sup>2</sup> ] across min.	A <sub>80</sub> [N/mm <sup>2</sup> ] 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.	
<b>FB-Steel</b>																			
HDT450F	1.0961	+ZE, +ZN	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	+ZE, +ZN	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	
<b>DP-Steel</b>																			
HCT450X	1.0937	+ZE, +ZN	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	+ZE, +ZN	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	+ZE, +ZN	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	+ZE, +ZN	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	+ZE, +ZN	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	+ZE, +ZN	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	
<b>TRIP-Steel</b>																			
HCT690T	1.0947	+ZE, +ZN	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	+ZE, +ZN	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	
<b>CP-Steel</b>																			
HCT600C	1.0953	+ZE, +ZN	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	+ZE, +ZN	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	+ZE, +ZN	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	+ZE, +ZN	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	+ZE, +ZN	720 to 920	30	950	9	–	0.230	0.800	2.200	0.080	0.015	–	2.00	1.20	0.15	0.20	0.005	
HCT980C	1.0955	+ZE, +ZN	700 to 900	30	980	7	–	0.230	0.800	2.200	0.080	0.015	–	2.00	1.20	0.15	0.22	0.005	
<b>MS-Steel</b>																			
HDT1200M	1.0665	+ZE, +ZN	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 coating

ZE: electrolytically applied pure zinc layer to DIN EN 10152

ZN: electrolytically applied zinc - nickel layer with a nickel content of 10 – 13% to DIN EN 10271 (Neuralyt)

### Variants

- zinc coated on one side
- zinc coated both sides
- differentially zinc coated

### After treatment (Surface protection)

P	phosphated
PC	phosphated and chemically passivated
C	chemically passivated
PCO	phosphated, chemically passivated and oiled
CO	chemically passivated and oiled
PO	phosphated and oiled
O	oiled
S	sealed
U	untreated surface

A standard surface finish for non-visible (core) parts

B best surface finish for coated visible parts