Comparison of standards

Technical Terms of Delivery

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Designation systems for steels

Excerpt from EN 10027-1

Snnn			**Steels for general steel construction**
Pnnn			Steels for pressure vessel construction
Lnnn			Steels for pipeline construction
Ennn			Engineering steels
Bnnn			Reinforcing steels
Yzzz			Prestressing steel
Rzzz			Steels for rails or in the form of rails
			Cold-rolled flat products in higher-strength drawing grades
Hnnn..	**..=**	**P**	**Phosphorus-alloyed steels**
		B	**Bake-hardening steels**
		LA	**Micro-alloyed steels**
		Y	**High-strength IF steels**
		I	**Isotropic steels**
HTzzz..	**..=**	**X**	**Dual-phase steels**
		T	**TRIP steels**
		C	**Complex-phase steels**
			Flat products made of mild steels for cold forming
D..from	**..=**	**C**	**For cold-rolled flat products**
		D	**Or flat hot-rolled products designated for direct cold forming**
		X	**For flat products with no indicated method of rolling**
T(H or nnn)			Ultra-thin and tin sheet and strip as well as specially chromed sheet and strip
			Electrical steel strip
Mmmm-dd	**..=**	**A**	**For non-grain oriented**
		D	**For unalloyed, non-final annealed**
		E	**For alloyed, non-final annealed**
		N	For grain-oriented
		S	For grain-oriented with unlimited core losses
		P	For grain-oriented with low core losses

Legend

nnn	Minimum yield strength
zzz	Minimum tensile strength (with code letter T)
from	Figures
H	Hardness data
mmm	Hundred-fold maximum permitted loss of magnetization
dd	Hundred-fold nominal thickness

Bolded steel grades relevant to these Technical Terms of Delivery

Comparison of European material standardizations

Surface

Uncoated/electrolytically treated steel strip		Hot-dip-galvanized steel strip	
		Coating: Z (Zinc)	ZF (Galvannealed)
		NA, MA	RA
03	A	MB	RB
05	B	MC	RC
DIN 1623 DIN 17163	EN 10130 EN 10152 EN 10271 EN 10268	EN 10346	

Comparison of European material standardizations for cold-rolled flat products

Mild steels for cold forming

Uncoated								Electrolytically treated		
UNI 5866 1977 Edition	DIN 1623/ Part 1 1983 Edition	NF A 36 401 1983 Edition	BS 1449-1.1 1991 Edition	EN 10130 1991 Edition	EN 10130 2007 Edition	Material number	Terms of Delivery voestalpine Stahl 2011	EN 10152 2001 Edition	EN 10152 2009 Edition	Terms of Delivery voestalpine Stahl 2011
Designation of steel grades										
Fe P01	St 12	C	CR 4	Fe P01	**DC01**	**1.0330**	**DC01**	DC01+ZE	**DC01+ZE**	**DC01+ZE**
-	Ust 13	-	CR 3	-	**-**	**1.0333**	**-**	**-**	-	**-**
Fe P02	RRSt 13	E	CR 2	Fe P03	**DC03**	**1.0347**	**DC03**	DC03+ZE	**DC03+ZE**	**DC03+ZE**
Fe P04	ST 14	ES	CR 1	Fe P04	**DC04**	**1.0338**	**DC04**	DC04+ZE	**DC04+ZE**	**DC04+ZE**
-	-	-	-	Fe P05	**DC05**	**1.0312**	**DC05**	DC05+ZE	**DC05+ZE**	**DC05+ZE**
-	- [1)]	-	-	Fe P06	**DC06**	**1.0873**	**DC06**	DC06+ZE	**DC06+ZE**	**DC06+ZE**
-	-	-	-	-	**DC07**	**1.0898**	**DC07**	DC07+ZE	**DC07+ZE**	**DC07+ZE**
Designation of surface types										
MA	O3	X	GP	A	**A**	**A**	**A**	A	**A**	**A**
MB	O5	Z	FF	B	**B**	**B**	**B**	B	**B**	**B**

The comparison of standards provides helpful information on reference grades. Differences in defined values are possible.

[1)] St 15 was in common use.

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Comparison of European material standardizations for hot-dip-galvanized flat products

Mild steels for cold forming

DIN 17162 Part 1 1977 Edition	UNI 5753 1984 Edition	NF A 36 321 Z 1985 Edition	EN 10142 1990 Edition	BS 2989 1992 Edition	EN 10142 2000 Edition	EN 10346 2009 Edition	Material number	Terms of Delivery voestalpine Stahl 2011
Designation of steel grades								
St 01 Z	Fe P01 G	-	-	Z 1	-	**-**	**1.0022**	**-**
St 02 Z	Fe P02 G	GC	FeP 02 G Z (ZF)	Z 2	DX51D+Z (ZF, ZA, AZ, AS)	**DX51D+Z (ZF, ZA, AZ, AS)**	**1.0226**	**DX51D+Z (ZF)**
St 03 Z	Fe P03 G	GE	FeP 03 G Z (ZF)	Z 3	DX52D+Z (ZF, ZA, AZ, AS)	**DX52D+Z (ZF, ZA, AZ, AS)**	**1.0350**	**DX52D+Z (ZF)**
St 04 Z	Fe P04 G	-	-	Z 4	-	**-**	**-**	**-**
St 05 Z	Fe P05 G	GES	FeP 05 G Z (ZF)	Z 5	DX53D+Z (ZF, ZA, AZ, AS)	**DX53D+Z (ZF, ZA, AZ, AS)**	**1.0355**	**DX53D+Z (ZF)**
-	-	-	FeP 06 G Z (ZF)	-	DX54D+Z (ZF, ZA, AZ, AS)	**DX54D+Z (ZF, ZA, AZ, AS)**	**1.0306**	**DX54D+Z (ZF)**
-	-	-	-	-	DX56D+Z (ZF, ZA, AS)	**DX56D+Z (ZF, ZA, AS)**	**1.0322**	**DX56D+Z (ZF)**
-	-	-	-	-	DX57D+Z (ZF, ZA, AS)	**DX57D+Z (ZF, ZA, AS)**	**1.0853**	**DX57D+Z (ZF)**
Designation of surface types								
NA, MA	NA, MA, RA	NA, MA, RA	NA, MA, RA	N, M, R	NA, MA, RA	**NA, MA, RA, A**	**NA, MA, RA, A**	**NA, MA, RA**
SB	SB, RB	MB, RB	MB, RB	S	MB, RB	**MB, RB, B**	**MB, RB, B**	**MB, RB**
SC	SC, RC	MC, RC	MC, RC	XS	MC, RC	**MC, RC, C**	**MC, RC, C**	**MC, RC**

The comparison of standards provides helpful information on reference grades. Differences in defined values are possible.

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Mild steels in comparison with European material standardizations

Mild steels in comparison with European material standardizations

Cold-rolled, uncoated or electrolytically treated	Hot-dip-galvanized
Designation of steel grades	
-	DX51 (+Z, ZF)
DC01 (+ZE)	DX52 (+Z, ZF)
DC03 (+ZE)	DX53 (+Z, ZF)
DC04 (+ZE)	DX54 (+Z, ZF)
DC05 (+ZE)	DX56 (+Z, ZF)
DC06 (+ZE)	DX56 (+Z, ZF)
DC07 (+ZE)	DX57 (+Z, ZF)
Designation of surface types	
-	NA, MA, RA
A	MB, RB
B	MC, RC

This comparison of standards provides a standard value for the selection of reference grades.

Other mechanical values are defined on the basis of differing manufacturing processes.

Comparison of European material standardizations for hot-dip-galvanized flat products

Structural steels

DIN 17162 Part 2 1980 Edition	BS 2989 1982 Edition	NF A 36 322 Z 1982 Edition	UNI 5753 1984 Edition	EN 10147 1991 Edition	EN 10326 2004 Edition	EN 10346 2009 Edition	Material number	Terms of Delivery voestalpine Stahl 2011
Designation of steel grades								
-	Z 22	C 230	FeE 220 G	FeE 220 G Z (ZF)	S220GD+Z (ZF, ZA, AZ, AS)	**S220GD+Z (ZF, ZA, AZ)**	**1.0241**	**S220GD+Z (ZF)**
StE 250-2Z	Z 25	C 250	FeE 250 G	FeE 250 G Z (ZF)	S250GD+Z (ZF, ZA, AZ, AS)	**S250GD+Z (ZF, ZA, AZ, AS)**	**1.0242**	**S250GD+Z (ZF)**
StE 280-2Z(3Z)	Z 28	C 280	FeE 280 G	FeE 280 G Z (ZF)	S280GD+Z (ZF, ZA, AZ, AS)	**S280GD+Z (ZF, ZA, AZ, AS)**	**1.0244**	**S280GD+Z (ZF)**
StE 320-3Z	-	C 320	FeE 320 G	FeE 320 G Z (ZF)	S320GD+Z (ZF, ZA, AZ, AS)	**S320GD+Z (ZF, ZA, AZ, AS)**	**1.0250**	**S320GD+Z (ZF)**
StE 350-3Z	Z 35	C 350	FeE 350 G	FeE 350 G Z (ZF)	S350GD+Z (ZF, ZA, AZ, AS)	**S350GD+Z (ZF, ZA, AZ, AS)**	**1.0529**	**S350GD+Z (ZF)**
-	Z 55	C 550	FeE 550 G	FeE 550 G Z (ZF)	S550GD+Z (ZF, ZA, AZ, AS)	**S550GD+Z (ZF, ZA, AZ)**	**1.0531**	**-**
Designation of surface types								
NA, MA	N, M, R	NA, MA, RA	NA, MA, RA	NA, MA, RA	NA, MA, RA, A	**NA, MA, RA, A**	**NA, MA, RA, A**	**NA, MA, RA**
SB	S	MB, RB	SB, RB	MB, RB	MB, RB, B	**MB, RB, B**	**MB, RB, B**	**MB, RB**
SC	XS	MC, RC	SC, RC	MC, RC	MC, RC, C	**MC, RC, C**	**MC, RC, C**	**MC, RC**

The comparison of standards provides helpful information on reference grades. Differences in defined values are possible.

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Comparison of European material standardizations for steels with high yield stress for cold forming

Micro-alloyed steels

Cold-rolled, uncoated or electrolytically treated					Hot-dip-galvanized			
SEW 093 1987 Edition	NFA 36-232 1992 Edition	EN 10268 2006 Edition	Material number	Terms of Delivery voestalpine Stahl 2011	EN 10292 2007 Edition	EN 10346 2009 Edition	Material number	Terms of Delivery voestalpine Stahl 2011
Designation of steel grades								
ZStE 260	E240C, E260C	**HC260LA**	**1.0480**	**HC260LA**	HX260LAD	**HX260LAD+Z (ZF, ZA, AZ, AS)**	**1.0929**	**HX260LAD**
ZStE 300	E280C, E315C	**HC300LA**	**1.0489**	**HC300LA**	HX300LAD	**HX300LAD+Z (ZF, ZA, AZ, AS)**	**1.0932**	**HX300LAD**
ZStE 340	E555C	**HC340LA**	**1.0548**	**HC340LA**	HX340LAD	**HX340LAD+Z (ZF, ZA, AZ, AS)**	**1.0933**	**HX340LAD**
ZStE 380	-	**HC380LA**	**1.0550**	**HC380LA**	HX380LAD	**HX380LAD+Z (ZF, ZA, AZ, AS)**	**1.0934**	**HX380LAD**
ZStE 420	-	**HC420LA**	**1.0556**	**HC420LA**	HX420LAD	**HX420LAD+Z (ZF, ZA, AZ, AS)**	**1.0935**	**HX420LAD**
-	-	**-**	**-**	**HC460LA**	-	**HX460LAD+Z (ZF, ZA, AZ, AS)**	**1.0990**	**HX460LAD**
-	-	**-**	**-**	**HC500LA**	-	**HX500LAD+Z (ZF, ZA, AZ, AS)**	**1.0991**	**HX500LAD**
Designation of surface types								
-	-	**-**	**-**	**-**	-	**NA, MA, RA**	**-**	**NA, MA, RA**
O3	A	**A**	**-**	**A**	MB, RB, B	**MB, RB, B**	**MB, RB, B**	**MB, RB**
O5	-	-	**-**	-	MC, RC, C	**MC, RC, C**	**MC, RC, C**	**-**

The comparison of standards provides helpful information on reference grades. Differences in defined values are possible.

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Comparison of European material standardizations for steels with high yield stress for cold forming

Bake-hardening steels

Cold-rolled, uncoated or electrolytically treated				Hot-dip-galvanized			
SEW 094 1987 Edition	EN 10268 2006 Edition	Material number	Terms of Delivery voestalpine Stahl 2011	EN 10292 2007 Edition	EN 10346 2009 Edition	Material number	Terms of Delivery voestalpine Stahl 2011
Designation of steel grades							
ZStE 180 BH	**HC180B**	**1.0395**	**HC180B**	HX180BD	**HX180BD+Z (ZF, ZA, AZ, AS)**	**1.0914**	**HX180BD**
ZStE 220 BH	**HC220B**	**1.0396**	**HC220B**	HX220BD	**HX220BD+Z (ZF, ZA, AZ, AS)**	**1.0919**	**HX220BD**
ZStE 260 BH	**HC260B**	**1.0400**	**HC260B**	HX260BD	**HX260BD+Z (ZF, ZA, AZ, AS)**	**1.0924**	**HX260BD**
ZStE 300 BH	**HC300B**	**1.0444**	**HC300B**	HX300BD	**HX300BD+Z (ZF, ZA, AZ, AS)**	**1.0930**	**HX300BD**
Designation of surface types							
-	-	-	-	NA, MA, RA, A	**NA, MA, RA, A**	**NA, MA, RA, A**	**NA, MA, RA**
O3	**A**	-	**A**	MB, RB, B	**MB, RB, B**	**MB, RB, B**	**MB, RB**
O5	**B**	-	**B**	MC, RC, C	**MC, RC, C**	**MC, RC, C**	**MC, RC**

The comparison of standards provides helpful information on reference grades. Differences in defined values are possible.

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Comparison of European material standardizations for steels with high yield stress for cold forming

High-strength IF steels

Cold-rolled, uncoated or electrolytically treated			Hot-dip-galvanized			
EN 10268 2006 Edition	Material number	Terms of Delivery voestalpine Stahl 2011	EN 10292 2007 Edition	EN 10346 2009 Edition	Material number	Terms of Delivery voestalpine Stahl 2011
Designation of steel grades						
HC180Y	1.0922	HC180Y	HX180YD	HX180YD+Z (ZF, ZA, AZ, AS)	1.0921	HX180YD
HC220Y	1.0925	HC220Y	HX220YD	HX220YD+Z (ZF, ZA, AZ, AS)	1.0923	HX220YD
HC260Y	1.0928	HC260Y	HX260YD	HX260YD+Z (ZF, ZA, AZ, AS)	1.0926	HX260YD
-	-	-	HX300YD	HX300YD+Z (ZF, ZA, AZ, AS)	1.0927	HX300YD
Designation of surface types						
-	-	-	NA, MA, RA, A	NA, MA, RA, A	NA, MA, RA, A	NA, MA, RA
A	-	A	MB, RB, B	MB, RB, B	MB, RB, B	MB, RB
B	-	B	MC, RC, C	MC, RC, C	MC, RC, C	MC, RC

The comparison of standards provides helpful information on reference grades. Differences in defined values are possible.

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Comparison of standards final-annealed electrical steel strip

The indicated standards cannot be directly compared in every case. In such cases the overview refers to similar grades.

Comparison of standards final-annealed electrical steel strip by voestalpine

Grade	DIN EN 10106 2008	IEC 60404-8-4 1998	JIC c 2552 2000	ASTM A 677 2007	Previous AISI designation
M 250-35 A	M 250-35 A	250-35 A5	35-A-250	36F320M	M-19
isovac 250-35 A					
M 270-35 A	M 270-35 A	270-35 A5	35-A-270	36F348M	M-22
isovac 270-35 A					
isovac 270-35 A high-perm					
M 300-35 A	M 300-35 A	300-35 A5	35-A-300	36F397M	M-27
isovac 300-35 A					
M 330-35 A	M 330-35 A	330-35 A5	35-A-330	36F419M	M-36
isovac 330-35 A					
isovac 400-35 A					
M 270-50 A	M 270-50 A	270-50 A5	50-A-270	47F370M	M-19
isovac 270-50 A					
M 290-50 A	M 290-50 A	290-50 A5	50-A-290	47F384M	M-22
isovac 290-50 A					
M 310-50 A	M 310-50 A	310-50 A5	50-A-310	47F408M	M-27
isovac 310-50 A					
M 330-50 A	M 330-50 A	330-50 A5	50-A-330	47F419M	M-36
isovac 330-50 A					
M 350-50A	M 350-50 A	350-50-A5	50-A-350	47F452M	M-43
M 400-50 A	M 400-50 A	400-50-A5	50-A-400	47F507M	
isovac 400-50 A					
isovac 400-50 A high-perm					
M 470-50 A	M 470-50 A	470-50-A5	50-A-470	47F617M	M-45
isovac 470-50 A					
M 530-50 A	M 530-50 A	530-50 A5	50-A-530		
isovac 530-50 A					
M 600-50 A	M 600-50 A	600-50-A5	50-A-600	47F672M	M-47
isovac 600-50 A					
isovac 600-50 A blue					
M 700-50 A	M 700-50 A	700-50-A5	50-A-700	47F882M	
isovac 700-50 A					
M 800-50 A	M 800-50 A	800-50-A5	50-A-800	47F992M	
isovac 800-50 A					
isovac 800-50 A blue					
M 940-50 A	M 940-50 A		50-A-1000		

Comparison of standards final-annealed electrical steel strip by voestalpine (cont.)

Grade	DIN EN 10106 2008	IEC 60404-8-4 1998	JIC c 2552 2000	ASTM A 677 2007	Previous AISI designation
M 350-65 A	M 350-65 A	350-65 A5	65-A-350	64F459M	M-22
isovac 350-65 A					
M 400-65 A	M 400-65 A	400-65 A5	65-A-400	64F496M	M-36
isovac 400-65 A					
M 470-65 A	M 470-65 A	470-65-A5	65-A-470	64F595M	M-43
isovac 470-65 A					
isovac 470-65 A high-perm					
M 530-65 A	M 530-65 A	530-65 A5	65-A-530	64F705M	
isovac 530-65 A					
M 600-65 A	M 600-65 A	600-65 A5	65-A-600		M-45
isovac 600-65 A					
M 700-65 A	M 700-65 A	700-65 A5	65-A-700	64F882M	
isovac 700-65 A blue					
M 800-65 A	M 800-65 A	800-65 A5	65-A-800	64F1102M	M-47
isovac 800-65 A blue					
isovac 850-65 A					
M 1000-65 A	M 1000-65 A		65-A-1000		
isovac 1000-65 A					
isovac 600-80 A					
M 700-100 A	M 700-100 A	700-100 A5			
M 800-100 A	M 800-100 A	800-100 A5			
isovac 940-100 A					
M 1300-100 A	M 1300-100 A	1300-100 A5			
isovac 1400-100 A high-perm					

Comparison of standards
non-final-annealed electrical steel strip

The indicated standards cannot be directly compared in every case. In such cases the overview refers to similar grades.

Comparison of standards non-final-annealed electrical steel strip by voestalpine

Grade	DIN EN 10341 1996	IEC 60404-8-2&3 1998	ASTM A 683M 1999
isovac 310-50 K high-perm			
M 340-50 K	M 340-50 K	340-50-K5	47S155M
isovac 340-50 K high-perm			
M 390-50 K	M 390-50 K	390-50-K5	47S165M
isovac 420-50 K high-perm			
M 450-50 K	M 450-50 K	450-50-K5	47S175M
isovac 450-50 K high-perm			
M 660-50 K	M 660-50 K	660-50-K5	
M 890-50 K	M 890-50 K	890-50-K5	
M 390-65 K	M 390-65 K	390-65-K5	64S200M
isovac 390-65 K high-perm			
M 450-65 K	M 450-65 K	450-65-K5	64S210M
isovac 470-65 K high-perm			
M 520-65 K	M 520-65 K	520-65-K5	64S220M
isovac 520-65 K high-perm			
isovac 570-65 K high-perm			
M 800-65 K	M 800-65 K	800-65-K5	
M 1000-65 K	M 1000-65 K	1000-65-K5	

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High-quality materials are the basis for our products. We strive to be the best partner for our customers and want to provide them with the best-possible solution. We focus our expertise on two aspects:
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The technical aspect, with high-quality methods, products and services.

The companies in the voestalpine Steel Division and their employees understand partnership to be the following:

- Understanding for their customers' business
- Expertise and reliability
- Responsibility for satisfactory project completion
- Partnerships based on trust

Many years of successful partnerships with our customers prove our point.

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