Leading the Energy Transition with advanced Electrical Steels

ArcelorMittal

As Europe and the world race toward e-mobility and sustainable power

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Last updated: 26 March 2026

iCARe® Save

Last updated: 23 June 2025

Description

Properties

The iCARe® Save product family comes with guaranteed losses at 400Hz and indicative maximum values at 700Hz. These values are representative of the steel's behaviour at high frequencies.

Advantages

Save grades enable you to reduce the iron losses from the stators of synchronous machines. They are particularly useful for reducing iron losses in high-speed hybrid and electric traction machines, and generators which extend the range of electric vehicles.

The iCARe® grades offer better losses than those of the materials described in the standards (see the brand correspondence table below).

Applications

Save grades are most effective at reducing iron losses from machine parts which are subject to high base frequencies and additional harmonics. Save thus helps to improve machine efficiency, which leads to an increase in power density. Power density can be tuned to create a lighter, smaller machine, or a more powerful machine for a given weight. Driving range is extended as Save reduces machine weight and costs and saves battery energy.

Designation and standard

ArcelorMittal name	EN 10303: 2015	IEC/CEI 60404-8-8: 2017
Save 20-12	NO 20-13*	NO 20-13*
Save 25-13	NO 25-14*	NO 25-14*
Save 27-14	NO 27-15*	NO 27-15*
Save 30-15	NO 30-16*	NO 30-16*
Save 35-18	NO 35-19*	NO 35-19*

* Closest equivalent. The iCARe® grades offer better losses than those of the materials described in the standards.

This brand correspondence above is based on loss level at 1T/400 Hz. Regarding magnetic polarisation, Save grades are at the same level as, or better than, the standard requirements.

Magnetic properties

ArcelorMittal name	Conventional density (kg/dm^3)	Max. loss (W/kg) at 400 Hz at 1T [Guaranteed]	[Guaranteed]	[Guaranteed]	[Guaranteed]	Min. polarisation (T) at 2,500 A/m [Guaranteed]	Min. polarisation (T) at 5,000 A/m [Guaranteed]	Min. polarisation (T) at 10,000 A/m [Indicative]
Save 20-12*	7.6	12	44	2.3	31	1.51	1.60	1.72
Save 25-13	7.6	13	52	2.3	32	1.51	1.61	1.73
Save 27-14	7.6	14	57	2.3	34	1.51	1.61	1.73
Save 30-15	7.6	15	63	2.5	37	1.51	1.61	1.73
Save 35-18	7.6	18	78	2.5	43	1.51	1.61	1.73

* On request

Remark on all grades: better guaranteed magnetic properties are available on request.

Mechanical properties

ArcelorMittal name	Min. yield strength Rp0.2 (MPa) at 20°C [Guaranteed]	Min. tensile strength Rm (MPa) at 20°C [Guaranteed]	Min. elongation at break (%) at 20°C [Guaranteed]
Save 20-12*	400	510	10
Save 25-13	400	510	12
Save 27-14	400	510	12
Save 30-15	400	510	12
Save 35-18	400	510	12

* On request

Recommendations

Save grades can be used immediately after lamination punching. The punching effect can be eliminated by performing a stress relief annealing. This optimises their performance in applications with fine teeth, and enables a substantial part of the lower frequency area to be exploited. A C5-type coating is recommended.

Save stacks can be produced using existing assembly techniques such as interlocking or welding.

iCARe® 420 Save

Last updated: 19 November 2025

Description

Properties

The iCARe® 420 Save products are low loss electrical steel grades with a guaranteed yield strength of 420 MPa. Compared to the standard iCARe® Save grades, these iCARe® 420 Save grades have a higher yield strength. The iCARe® 420 Save product family combines improved mechanical properties with low core losses, which are specified as guaranteed losses at 400 Hz and indicative maximum values at 700 Hz, both at 1 T. These values are representative of the steel's core loss behaviour at high frequencies.

Advantages

The improved and guaranteed yield strength (420 MPa) of the iCARe® 420 Save products allows for rotor design improvements of for instance interior permanent magnet synchronous machines. Combined with the low core losses which are particularly useful in the stator, such mechanical rotor design improvements increase the overall performance of the electrical machine.

Applications

iCARe® 420 Save grades have an improved combination of mechanical properties, core losses and magnetic polarisation, and are most effective at reducing iron losses from machine parts which are subject tohigh base frequencies, additional space and time harmonics. The valorisation of the improved mechanical properties of the iCARe® 420 Save grades can be found in those electrical machine topologies where its higher yield strength can be exploited by optimising the mechanical design and/or increasing the machine's rotating speed, thus enhancing the power density.

In general, Save grades help to improve machine efficiency, especially in the high speed region of the operational torque-versus-speed map. Save grades are particularly useful for reducing iron losses in high-speed hybrid and electric traction machines:the driving range is extended as Save grades save battery energy. Also, having lower core losses implies leaner cooling strategies and thermal management of the electrical machines.

Magnetic properties

ArcelorMittal name	Conventional density (kg/dm^3)	Max. loss (W/kg) at 400 Hz at 1T [Guaranteed]	[Guaranteed]	[Guaranteed]	[Guaranteed]	Min. polarisation (T) at 2,500 A/m [Guaranteed]	Min. polarisation (T) at 5,000 A/m [Guaranteed]	Min. polarisation (T) at 10,000 A/m [Indicative]
420 Save 20-12.5*	7.6	12.5	45	2.5	31	1.51	1.60	1.72
420 Save 25-13	7.6	13	52	2.5	32	1.51	1.61	1.73
420 Save 27-14	7.6	14	57	2.5	34	1.51	1.61	1.73
420 Save 30-15	7.6	15	62	2.7	37	1.51	1.61	1.73

* On request

Remark on all grades: better guaranteed magnetic properties are available on request.

Mechanical properties

ArcelorMittal name	Min. yield strength Rp0.2 (MPa) at 20°C [Guaranteed]	Min. tensile strength Rm (MPa) at 20°C [Guaranteed]	Min. elongation at break (%) at 20°C [Guaranteed]
420 Save 20-12.5*	420	520	10
420 Save 25-13	420	520	12
420 Save 27-14	420	520	12
420 Save 30-15	420	520	12

* On request

Recommendations

Save grades can be used immediately after lamination punching. The punching effect can be eliminated by performing a stress-relief annealing. This optimises their performance inapplications with fine teeth, and enables a substantial part of the lower frequency area to beexploited. A C5-type coating is recommended.
Save stacks can be produced using existing assembly techniques such as interlocking or welding.

iCARe® Torque

Last updated: 23 June 2025

Description

Properties

The iCARe® Torque product family comes with guaranteed losses at 400Hz and indicative maximum values at 700Hz. These values are representative of the steel's behaviour at high frequencies.

Advantages

Torque grades assist flux generation, allowing the motor to develop more mechanical output. If mechanical output is not an issue, permanent magnet or copper winding can be reduced to save on costs.

Applications

Torque grades are suitable for machines which need high torque at low speeds. They provide the fast acceleration required by hybrid and electric vehicles.

Magnetic properties

ArcelorMittal name	Conventional density (kg/dm^3)	Max. loss (W/kg) at 400 Hz at 1T [Guaranteed]	[Guaranteed]	[Guaranteed]	[Guaranteed]	Min. polarisation (T) at 2,500 A/m [Guaranteed]	Min. polarisation (T) at 5,000 A/m [Guaranteed]	Min. polarisation (T) at 10,000 A/m [Indicative]
Torque 25-13	7.6	13	52	2.3	32	1.52	1.62	1.74
Torque 30-16*	7.65	16	70	2.5	41	1.54	1.64	1.76
Torque 35-19	7.6	19	78	2.7	45	1.53	1.63	1.75

* On request

Remark on all grades: better guaranteed magnetic properties are available on request.

Mechanical properties

ArcelorMittal name	Min. yield strength Rp0.2 (MPa) at 20°C [Guaranteed]	Min. tensile strength Rm (MPa) at 20°C [Guaranteed]	Min. elongation at break (%) at 20°C [Guaranteed]
Torque 25-13	400	510	12
Torque 30-16*	330	450	12
Torque 35-19	380	490	12

* On request

Recommendations

Torque grades can be used immediately after lamination punching. The effect of punching can be eliminated if a stress relief annealing is applied. This optimises the performance of the Torque grades in applications with fine teeth. It can also provide substantial performance improvements in the lower frequency range. To achieve these effects, a C5 type coating is advised.

Torque stacks can be produced using existing assembly techniques such as interlocking or welding.

iCARe® Speed

Last updated: 24 June 2025

Description

Properties

The iCARe® Speed product family comes with guaranted losses at 400Hz and indicative maximum values at 700Hz. These values are representative of the steel's behaviour at high frequencies.

Advantages

The Speed grades provide an excellent compromise between mechanical properties and losses.

Applications

Speed has been developed for very high speed rotors. This enables manufacturers to make more compact machines for a given mechanical output.

Magnetic properties

ArcelorMittal name	Conventional density (kg/dm^3)	Max. loss (W/kg) at 400 Hz at 1T [Guaranteed]	[Guaranteed]	[Guaranteed]	[Guaranteed]	Min. polarisation (T) at 2,500 A/m [Guaranteed]	Min. polarisation (T) at 5,000 A/m [Guaranteed]	Min. polarisation (T) at 10,000 A/m [Indicative]
Speed 35-500*	7.6	28	100	5	63	1.52	1.62	1.73

* On request

Remark: better guaranteed magnetic properties are available on request.

Mechanical properties

ArcelorMittal name	Min. yield strength Rp0.2 (MPa) at 20°C [Guaranteed]	Min. tensile strength Rm (MPa) at 20°C [Guaranteed]	Min. elongation at break (%) at 20°C [Guaranteed]
Speed 35-500*	500	600	12

* On request

Recommendations

Speed grades can be used immediately after lamination punching. The effect of punching can be eliminated if a stress relief annealing is applied. This optimises the performance of the Speed grades in applications with fine teeth. It can also provide substantial performance improvements in the lower frequency range. To achieve these effects, a C5 type coating is advised.

Speed stacks can be produced using any existing assembly technique such as interlocking or welding.

Coatings for iCARe®

Last updated: 12 March 2026

Description

Electrical steel varnishes for non-oriented grades are designed to enhance the behaviour of fully processed electrical steels. Their main purpose is to provide inter-laminar insulation and to improve the punchability of these steels. Each type has its own specific properties, such as insulation level, punchability effect, corrosion protection, temperature resistance, weldability and compatibility with dot gluing; hence it is material use that determines the optimum choice of varnish. All varnishes have been selected and developed to be environmentally friendly: they are hydro-soluble and chromium-free.

The C5-type varnish is is the preferred varnish for automotive applications: it is a pigmented varnish, made with thermo-stable resins, mineral products and pigments.

Applications

These coatings are used for fully processed grades for hybrid and electric traction machines and compressors. For alternators, uncoated solutions can be used.

Coating properties

	ArcelorMittal C5-A	ArcelorMittal C5-D	ArcelorMittal C5-T
	C5 insulating coating, thinnest C5 in our offer, for improved stacking factor	C5 insulating coating, with good punchability, good weldability and excellent dot glue compatibility	C5 insulating coating, with good punchability, good weldability and good dot glue compatibility
Coating thickness [µm]	≤1 (max. guarantee)	≤1.5 (max. guarantee)	≤1.5 (max. guarantee)
Insulation resistance	≥2 Ωcm^2/side (min. guarantee)	≥2 Ωcm^2/side (min. guarantee)	≥3 Ωcm^2/side (min. guarantee)
Temperature resistance	210°C continuous	210°C continuous	210°C continuous
Oil/chemical resistance	to be tested on specific oil in question	to be tested on specific oil in question	to be tested on specific oil in question

Insulation resistance measurement: Franklin test according to the standard EN 60404-11.

Continuous temperature resistance according to the standard IEC 60404-12.

Recommendations

The raw materials used in these coatings have a chemical composition – both in the liquid and cured varnish state – which does not require specific protective measures during the processing of the coated steels or during use in a given application.

D20 - Fully processed standard grades

Last updated: 2026-03-26

Properties

Non-oriented fully processed electrical steels have guaranteed magnetic properties, in accordance with (or exceeding the levels required by) EN 10106:2015. As well as the maximum loss and minimum polarisation levels cited, full magnetic characterisation curves regarding losses, polarisation, permeability and apparent power at different frequencies are available on request.

Advantages

A full range of these standard grades is available so that a steel grade can be selected according to the specific requirements of each application, from low alloy grades offering the advantage of excellent magnetic permeability, thermal conductivity and punchability to alloyed grades offering the advantage of very low losses, even at higher frequencies. A wide range of coatings is available, allowing further enhancement of punchability, reduction of interlaminar losses and improvement of corrosion protection.

Applications

Fully processed steels are designed for the manufacture of magnetic circuits for motors, transformers and other electrical equipment. The principal applications are in the electrical engineering, domestic appliance, automotive and building industries. Low loss fully processed steels are also suitable for shielding applications at low frequencies (e.g. housings around electrical systems).

Recommendations for use

The above properties are obtained without heat treatment after stamping. The material as supplied possesses all the required magnetic properties.

Brand correspondence

Thickness 0.35 mm

	EN 10106:2015	Former standard AISI	ASTM A677:2012	JIS C 2552:2014	IEC/CEI 60404-8-4:2013
M 210-35 A	M210-35A			35A210	M210-35A 5
M 230-35 A AM FCE				*35A230*	
M 235-35 A	M235-35A				M235-35A 5
M 250-35 A	M250-35A	M15	36F145	35A250	M250-35A 5
M 270-35 A	M270-35A	M19	36F155	35A270	M270-35A 5
M 300-35 A	M300-35A	M22	36F165	35A300	M300-35A 5
M 330-35 A	M330-35A	M36	36F185		M330-35A 5
Grades in italics: not included in the standard					

Thickness 0.50 mm

	EN 10106:2015	Former standard AISI	ASTM A677:2012	JIS C 2552:2014	IEC/CEI 60404-8-4:2013
M 230-50 A	M230-50A			50A230	M230-50A 5
M 250-50 A	M250-50A			50A250	M250-50A 5
M 270-50 A	M270-50A			50A270	M270-50A 5
M 290-50 A	M290-50A	M19	47F165	50A290	M290-50A 5
M 310-50 A	M310-50A	M22	47F180	50A310	M310-50A 5
M 330-50 A	M330-50A	M27	47F190		M330-50A 5
M 350-50 A	M350-50A	M36	47F200	50A350	M350-50A 5
M 400-50 A	M400-50A	M43	47F210	50A400	M400-50A 5
M 470-50 A	M470-50A	M45	47F240	50A470	M470-50A 5
M 530-50 A	M530-50A	M47	47F280		M530-50A 5
M 600-50 A	M600-50A			50A600	M600-50A 5
M 700-50 A	M700-50A		47F400	50A700	M700-50A 5
M 800-50 A	M800-50A		47F450	50A800	M800-50A 5
M 940-50 A	M940-50A				M940-50A 5

Thickness 0.65 mm

	EN 10106:2015	Former standard AISI	ASTM A677:2012	JIS C 2552:2014	IEC/CEI 60404-8-4:2013
M 290-65 A AM FCE					
M 310-65 A	M310-65A				M310-65A 5
M 330-65 A	M330-65A	M19	64F200		M330-65A 5
M 350-65 A	M350-65A	M22	64F210		M350-65A 5
M 400-65 A	M400-65A	M36	64F235		M400-65A 5
M 470-65 A	M470-65A	M43	64F250		M470-65A 5
M 530-65 A	M530-65A	M45	64F275		M530-65A 5
M 600-65 A	M600-65A	M47	64F320		M600-65A 5
M 700-65 A	M700-65A				M700-65A 5
M 800-65 A	M800-65A			65A800	M800-65A 5
M 1000-65 A	M1000-65A			65A1000	M1000-65A 5
Grades in italics: not included in the standard					

Thickness 1.00 mm

	EN 10106:2015	Former standard AISI	ASTM A677:2012	JIS C 2552:2014	IEC/CEI 60404-8-4:2013
M 600-100 A	M600-100A				M600-100A 5
M 700-100 A	M700-100A				M700-100A 5
M 800-100 A	M800-100A				M800-100A 5
M 900-100 A AM FCE					
M 1000-100 A	M1000-100A				M1000-100A 5
M 1300-100 A *	M1300-100A				M1300-100A 5
Grades in italics: not included in the standard					
* After prior agreement					

Dimensions

Thickness 0.35 mm

	Notes	Before side trimming		Side trimmed		Slit coils		Sheet length 400 to 2500 mm	
		Min width	Max width	Min width	Max width	Min width	Max width	Min width	Max width
M 210-35 A	1 & 3	-	-	600	1000	20	600	400	1100
M 230-35 A AM FCE	1 & 3				1200				
M 235-35 A	1 & 3								
M 250-35 A	1 & 3	1030	1230		1220				
M 270-35 A	1 & 3								
M 300-35 A	1 & 3								
M 330-35 A	1 & 3								
1 & 3. After prior agreement regarding sheet lengths between 2000 and 2500 mm; Slit coils: after prior agreement regarding widths between 20 and 44 mm									
Grades in italics: not included in the standard									

Thickness 0.50 mm

	Notes	Before side trimming		Side trimmed		Slit coils		Sheet length 400 to 2500 mm	
		Min width	Max width	Min width	Max width	Min width	Max width	Min width	Max width
M 230-50 A	3	-	-	600	1000	20	600	400	1100
M 250-50 A	3				1200				
M 270-50 A	2 & 3	1030	1250		1220				
M 290-50 A	2 & 3								
M 310-50 A	2 & 3								
M 330-50 A	2 & 3								
M 350-50 A	2 & 3								
M 400-50 A	2 & 3								
M 470-50 A	2 & 3								
M 530-50 A	2 & 3								
M 600-50 A	2 & 3								
M 700-50 A	2 & 3								
M 800-50 A	2 & 3								
M 940-50 A	2 & 3								
2 & 3. Side trimmed: max width 1250 after prior agreement; Slit coils: after prior agreement regarding widths between 20 and 44 mm 3. Slit coils: after prior agreement regarding widths between 20 and 44 mm									

Thickness 0.65 mm

	Notes	Before side trimming		Side trimmed		Slit coils		Sheet length 400 to 2500 mm	
		Min width	Max width	Min width	Max width	Min width	Max width	Min width	Max width
M 290-65 A AM FCE	3	-	-	600	1000	20	600	400	1100
M 310-65 A	3				1200				
M 330-65 A	3	1030	1250		1220				
M 350-65 A	2 & 3								
M 400-65 A	2 & 3								
M 470-65 A	2 & 3								
M 530-65 A	2 & 3								
M 600-65 A	2 & 3								
M 700-65 A	2 & 3								
M 800-65 A	2 & 3								
M 1000-65 A	2 & 3								
2 & 3. Side trimmed: max width 1250 after prior agreement; Slit coils: after prior agreement regarding widths between 20 and 44 mm 3. Slit coils: after prior agreement regarding widths between 20 and 44 mm									
Grades in italics: not included in the standard									

Thickness 1.00 mm

	Notes	Before side trimming		Side trimmed		Slit coils		Sheet length 400 to 2500 mm	
		Min width	Max width	Min width	Max width	Min width	Max width	Min width	Max width
M 600-100 A	1, 2 & 3	1030	1250	600	1220	20	600	400	1100
M 700-100 A	1, 2 & 3								
M 800-100 A	1, 2 & 3								
M 900-100 A AM FCE	1, 2 & 3								
M 1000-100 A	1, 2 & 3								
M 1300-100 A	2 & 3							-	-
1, 2 & 3. After prior agreement regarding sheet length; Side trimmed: max width 1250 after prior agreement; Slit coils: after prior agreement regarding widths between 20 and 44 mm 2 & 3. Side trimmed: max width 1250 after prior agreement; Slit coils: after prior agreement regarding widths between 20 and 44 mm									
Grades in italics: not included in the standard									

Magnetic properties

Thickness 0.35 mm

	Conventional density (kg/dm^3)	Max loss (W/kg) at 50 Hz at 1 T	Max loss (W/kg) at 50 Hz at 1.5 T	Max loss (W/kg) at 60 Hz at 1.5 T	Min polarisation (T) at 2500 A/m
		Indicative	Guaranteed	Indicative	Guaranteed
M 210-35 A	7.60	0.90	2.10	2.65	1.49
M 230-35 A AM FCE		0.95	2.30	2.90	
M 235-35 A			2.35	2.97	
M 250-35 A		1.00	2.50	3.14	
M 270-35 A	7.65	1.10	2.70	3.36	
M 300-35 A		1.20	3.00	3.74	
M 330-35 A		1.30	3.30	4.12	
Grades in italics: not included in the standard					
Multiply the values in W/kg by 0.4536 to obtain the values in W/lb.					

	Min polarisation (T) at 5000 A/m	Min polarisation (T) at 10,000 A/m	Max anisotropy of loss (+/-%)	Min number of bends	Min stacking factor (mm)
	Guaranteed	Guaranteed	Guaranteed	Guaranteed	Guaranteed
M 210-35 A	1.60	1.70	17	2	0.95
M 230-35 A AM FCE					
M 235-35 A					
M 250-35 A					
M 270-35 A					
M 300-35 A				3	
M 330-35 A					
Grades in italics: not included in the standard					
Multiply the values in W/kg by 0.4536 to obtain the values in W/lb.					

Thickness 0.50 mm

	Conventional density (kg/dm^3)	Max loss (W/kg) at 50 Hz at 1 T	Max loss (W/kg) at 50 Hz at 1.5 T	Max loss (W/kg) at 60 Hz at 1.5 T	Min polarisation (T) at 2500 A/m
		Indicative	Guaranteed	Indicative	Guaranteed
M 230-50 A	7.60	1.00	2.30	2.95	1.49
M 250-50 A		1.05	2.50	3.21	
M 270-50 A		1.10	2.70	3.47	
M 290-50 A		1.15	2.90	3.71	
M 310-50 A	7.65	1.25	3.10	3.95	
M 330-50 A		1.35	3.30	4.20	
M 350-50 A		1.50	3.50	4.45	1.50
M 400-50 A	7.70	1.70	4.00	5.10	1.53
M 470-50 A		2.00	4.70	5.90	1.54
M 530-50 A		2.30	5.30	6.66	1.56
M 600-50 A	7.75	2.60	6.00	7.53	1.57
M 700-50 A	7.80	3.00	7.00	8.79	1.60
M 800-50 A		3.60	8.00	10.06	
M 940-50 A	7.85	4.20	9.40	11.84	1.62
Multiply the values in W/kg by 0.4536 to obtain the values in W/lb.					

	Min polarisation (T) at 5000 A/m	Min polarisation (T) at 10,000 A/m	Max anisotropy of loss (+/-%)	Min number of bends	Min stacking factor (mm)
	Guaranteed	Guaranteed	Guaranteed	Guaranteed	Guaranteed
M 230-50 A	1.60	1.70	17	2	0.96
M 250-50 A					
M 270-50 A					
M 290-50 A					
M 310-50 A			14	3	
M 330-50 A					
M 350-50 A			12	5	
M 400-50 A	1.63	1.73			
M 470-50 A	1.64	1.74	10	10	
M 530-50 A	1.65	1.75			
M 600-50 A	1.66	1.76			
M 700-50 A	1.69	1.77			
M 800-50 A	1.70	1.78			
M 940-50 A	1.72	1.81	8		
Multiply the values in W/kg by 0.4536 to obtain the values in W/lb.					

Thickness 0.65 mm

	Conventional density (kg/dm^3)	Max loss (W/kg) at 50 Hz at 1 T	Max loss (W/kg) at 50 Hz at 1.5 T	Max loss (W/kg) at 60 Hz at 1.5 T	Min polarisation (T) at 2500 A/m
		Indicative	Guaranteed	Indicative	Guaranteed
M 290-65 A AM FCE	7.60	1.25	2.90	3.85	1.49
M 310-65 A			3.10	4.08	
M 330-65 A		1.35	3.30	4.30	
M 350-65 A		1.50	3.50	4.57	
M 400-65 A	7.65	1.70	4.00	5.20	1.52
M 470-65 A		2.00	4.70	6.13	1.53
M 530-65 A	7.70	2.30	5.30	6.84	1.54
M 600-65 A	7.75	2.60	6.00	7.71	1.56
M 700-65 A		3.00	7.00	8.98	1.57
M 800-65 A	7.80	3.60	8.00	10.26	1.60
M 1000-65 A		4.40	10.00	12.77	1.61
Grades in italics: not included in the standard					
Multiply the values in W/kg by 0.4536 to obtain the values in W/lb.					

	Min polarisation (T) at 5000 A/m	Min polarisation (T) at 10,000 A/m	Max anisotropy of loss (+/-%)	Min number of bends	Min stacking factor (mm)
	Guaranteed	Guaranteed	Guaranteed	Guaranteed	Guaranteed
M 290-65 A AM FCE	1.60	1.70	15	2	0.97
M 310-65 A					
M 330-65 A					
M 350-65 A			14		
M 400-65 A	1.62	1.72			
M 470-65 A	1.63	1.73	12	5	
M 530-65 A	1.64	1.74			
M 600-65 A	1.66	1.76	10	10	
M 700-65 A	1.67				
M 800-65 A	1.70	1.78			
M 1000-65 A	1.71	1.80			
Grades in italics: not included in the standard					
Multiply the values in W/kg by 0.4536 to obtain the values in W/lb.					

Thickness 1.00 mm

	Conventional density (kg/dm^3)	Max loss (W/kg) at 50 Hz at 1 T	Max loss (W/kg) at 50 Hz at 1.5 T	Max loss (W/kg) at 60 Hz at 1.5 T	Min polarisation (T) at 2500 A/m
		Indicative	Guaranteed	Indicative	Guaranteed
M 600-100 A	7.60	2.60	6.00	8.14	1.53
M 700-100 A	7.65	3.00	7.00	9.38	1.54
M 800-100 A	7.70	3.60	8.00	10.70	1.56
M 900-100 A AM FCE		4.00	9.00	12.05	
M 1000-100 A	7.80	4.40	10.00	13.39	1.58
M 1300-100 A		5.80	13.00	17.34	1.60
Grades in italics: not included in the standard					
Multiply the values in W/kg by 0.4536 to obtain the values in W/lb.					

	Min polarisation (T) at 5000 A/m	Min polarisation (T) at 10,000 A/m	Max anisotropy of loss (+/-%)	Min number of bends	Min stacking factor (mm)
	Guaranteed	Guaranteed	Guaranteed	Guaranteed	Guaranteed
M 600-100 A	1.63	1.72	10	2	0.98
M 700-100 A	1.64	1.73	8	3	
M 800-100 A	1.66	1.75	6	5	
M 900-100 A AM FCE					
M 1000-100 A	1.68	1.76		10	
M 1300-100 A	1.70	1.78			
Grades in italics: not included in the standard					
Multiply the values in W/kg by 0.4536 to obtain the values in W/lb.					

Mechanical properties

The mechanical properties are for information purposes only.

Thickness 0.35 mm

	Direction	R_e (MPa)	R_m (MPa)	A_{80} (%)	HV	R_e/R_m
M 210-35 A	T	410 - 460	530 - 580	12 - 22	210 - 240	0.76 - 0.81
M 230-35 A AM FCE	T	410 - 460	530 - 580	12 - 22	210 - 240	0.76 - 0.81
M 235-35 A	T	410 - 460	530 - 580	12 - 22	210 - 240	0.76 - 0.81
M 250-35 A	T	410 - 460	530 - 580	12 - 22	210 - 240	0.76 - 0.81
M 270-35 A	T	400 - 450	520 - 570	15 - 25	195 - 225	0.76 - 0.81
M 300-35 A	T	400 - 450	520 - 570	15 - 25	195 - 225	0.76 - 0.81
M 330-35 A	T	370 - 420	510 - 550	20 - 30	165 - 195	0.72 - 0.77
Grades in italics: not included in the standard						

Thickness 0.50 mm

	Direction	R_e (MPa)	R_m (MPa)	A_{80} (%)	HV	R_e/R_m
M 230-50 A	T	425 - 475	550 - 600	12 - 22	210 - 240	0.75 - 0.80
M 250-50 A	T	425 - 475	550 - 600	12 - 22	210 - 240	0.75 - 0.80
M 270-50 A	T	420 - 470	540 - 590	15 - 25	200 - 230	0.75 - 0.80
M 290-50 A	T	420 - 470	540 - 590	15 - 25	200 - 230	0.73 - 0.78
M 310-50 A	T	400 - 450	530 - 580	20 - 30	200 - 230	0.73 - 0.78
M 330-50 A	T	365 - 415	510 - 560	20 - 30	180 - 210	0.72 - 0.77
M 350-50 A	T	365 - 415	500 - 560	20 - 30	180 - 210	0.72 - 0.77
M 400-50 A	T	340 - 390	480 - 530	25 - 35	170 - 200	0.69 - 0.74
M 470-50 A	T	270 - 320	410 - 460	28 - 38	140 - 170	0.62 - 0.67
M 530-50 A	T	270 - 320	410 - 460	28 - 38	140 - 170	0.62 - 0.67
M 600-50 A	T	260 - 310	390 - 440	30 - 40	120 - 150	0.64 - 0.69
M 700-50 A	T	260 - 310	390 - 440	30 - 40	120 - 150	0.64 - 0.69
M 800-50 A	T	290 - 350	420 - 460	27 - 37	120 - 150	0.69 - 0.74
M 940-50 A	T	290 - 350	420 - 460	27 - 37	120 - 150	0.69 - 0.74

Thickness 0.65 mm

	Direction	R_e (MPa)	R_m (MPa)	A_{80} (%)	HV	R_e/R_m
M 290-65 A AM FCE	T	430 - 480	550 - 600	12 - 22	210 - 240	0.78 - 0.82
M 310-65 A	T	430 - 480	550 - 600	15 - 25	210 - 240	0.78 - 0.82
M 330-65 A	T	430 - 480	550 - 620	15 - 25	210 - 240	0.78 - 0.82
M 350-65 A	T	420 - 470	550 - 600	15 - 25	200 - 230	0.75 - 0.80
M 400-65 A	T	370 - 420	520 - 570	20 - 30	200 - 230	0.71 - 0.76
M 470-65 A	T	370 - 420	520 - 570	20 - 30	160 - 190	0.71 - 0.76
M 530-65 A	T	270 - 320	420 - 470	30 - 40	140 - 170	0.65 - 0.70
M 600-65 A	T	270 - 320	420 - 470	30 - 40	140 - 170	0.65 - 0.70
M 700-65 A	T	280 - 330	420 - 470	30 - 40	130 - 160	0.67 - 0.72
M 800-65 A	T	300 - 350	430 - 480	27 - 37	130 - 160	0.70 - 0.75
M 1000-65 A	T	300 - 350	430 - 480	27 - 37	120 - 150	0.70 - 0.75
Grades in italics: not included in the standard						

Thickness 1.00 mm

	Direction	R_e (MPa)	R_m (MPa)	A_{80} (%)	HV	R_e/R_m
M 600-100 A	T	370 - 420	520 - 570	20 - 30	170 - 200	0.71 - 0.76
M 700-100 A	T	290 - 340	450 - 490	30 - 40	140 - 170	0.66 - 0.71
M 800-100 A	T	290 - 340	450 - 490	30 - 40	140 - 170	0.66 - 0.71
M 900-100 A AM FCE	T	290 - 340	450 - 490	30 - 40	140 - 170	0.66 - 0.71
M 1000-100 A	T	260 - 300	390 - 430	30 - 40	120 - 150	0.66 - 0.71
M 1300-100 A	T	260 - 300	390 - 430	30 - 40	120 - 150	0.66 - 0.71
Grades in italics: not included in the standard						

D22 - Fully processed high permeability and high thermal conductivity grades

Last updated: 2026-03-26

Properties

Non-oriented fully processed high permeability electrical steels have guaranteed magnetic properties significantly superior to the requirements of EN 10106:2015, particularly regarding the polarisation levels obtained. Full magnetic characterisation curves are available on request, as well as thermal conductivity data. The thermal conductivity of these steels is also higher than the conductivity of the fully processed standard grades.

Advantages

The high permeability levels of these grades allow a reduction of the magnetising current required for a given air gap flux. This increases the efficiency of the machine and also makes it possible to increase its specific power rating, thereby reducing the machine's dimensions.
High thermal conductivity levels are important, since they facilitate heat evacuation from the machine.

Applications

High permeability is particularly useful for applications such as ballasts and motors, because it makes it possible to build machines that meet the most stringent environmental regulations. High thermal conductivity is a significant advantage for large machines.

Recommendations for use

The above properties are obtained without heat treatment after stamping. The material as supplied possesses all the required magnetic properties.

Brand correspondence

Thickness 0.35 mm

M 330P-35 A AM FCE

Thickness 0.50 mm

M 330P-50 A AM FCE
M 350P-50 A AM FCE
M 400P-50 A AM FCE
M 400XP-50 A AM FCE
M 470P-50 A AM FCE

Thickness 0.65 mm

M 470P-65 A AM FCE

Dimensions

Thickness 0.35 mm

	Notes	Before side trimming		Side trimmed		Slit coils		Sheet length 400 to 2500 mm	
		Min width	Max width	Min width	Max width	Min width	Max width	Min width	Max width
M 330P-35 A AM FCE	1 & 3	1030	1230	600	1200	20	600	400	1100
1 & 3. After prior agreement regarding sheet lengths between 2000 and 2500 mm; Slit coils: after prior agreement regarding widths between 20 and 44 mm									

Thickness 0.50 mm

	Notes	Before side trimming		Side trimmed		Slit coils		Sheet length 400 to 2500 mm	
		Min width	Max width	Min width	Max width	Min width	Max width	Min width	Max width
M 330P-50 A AM FCE	2 & 3	1030	1230	600	1200	20	600	400	1100
M 350P-50 A AM FCE	2 & 3								
M 400P-50 A AM FCE	2 & 3								
M 400XP-50 A AM FCE	2 & 3								
M 470P-50 A AM FCE	2 & 3								
2 & 3. Side trimmed: max width 1250 after prior agreement; Slit coils: after prior agreement regarding widths between 20 and 44 mm									

Thickness 0.65 mm

	Notes	Before side trimming		Side trimmed		Slit coils		Sheet length 400 to 2500 mm	
		Min width	Max width	Min width	Max width	Min width	Max width	Min width	Max width
M 470P-65 A AM FCE	2 & 3	1030	1230	600	1200	20	600	400	1100
2 & 3. Side trimmed: max width 1250 after prior agreement; Slit coils: after prior agreement regarding widths between 20 and 44 mm									

Magnetic properties

Thickness 0.35 mm

	Conventional density (kg/dm^3)	Max loss (W/kg) at 50 Hz at 1 T	Max loss (W/kg) at 50 Hz at 1.5 T	Max loss (W/kg) at 60 Hz at 1.5 T	Min polarisation (T) at 2500 A/m	Min polarisation (T) at 5000 A/m	Min polarisation (T) at 10,000 A/m	Max anisotropy of loss (+/- %)	Min number of bends	Min stacking factor (mm)
		Indicative	Guaranteed	Indicative	Guaranteed	Guaranteed	Guaranteed	Guaranteed	Guaranteed	Guaranteed
M 330P-35 A AM FCE	7.75	1.35	3.30	4.12	1.61	1.70	1.82	17	3	0.95
Multiply the values in W/kg by 0.4536 to obtain the values in W/lb.										

Thickness 0.50 mm

	Conventional density (kg/dm^3)	Max loss (W/kg) at 50 Hz at 1 T	Max loss (W/kg) at 50 Hz at 1.5 T	Max loss (W/kg) at 60 Hz at 1.5 T	Min polarisation (T) at 2500 A/m	Min polarisation (T) at 5000 A/m	Min polarisation (T) at 10,000 A/m	Max anisotropy of loss (+/- %)	Min number of bends	Min stacking factor (mm)
		Indicative	Guaranteed	Indicative	Guaranteed	Guaranteed	Guaranteed	Guaranteed	Guaranteed	Guaranteed
M 330P-50 A AM FCE	7.75	1.45	3.30	4.20	1.62	1.72	1.83	14	3	0.96
M 350P-50 A AM FCE		1.60	3.50	4.45				12	5	
M 400P-50 A AM FCE		1.80	4.00	5.10						
M 400XP-50 A AM FCE					1.65	1.74	1.85			
M 470P-50 A AM FCE		2.00	4.70	5.90	1.62	1.72	1.83	10	10	
Multiply the values in W/kg by 0.4536 to obtain the values in W/lb.										

Thickness 0.65 mm

	Conventional density (kg/dm^3)	Max loss (W/kg) at 50 Hz at 1 T	Max loss (W/kg) at 50 Hz at 1.5 T	Max loss (W/kg) at 60 Hz at 1.5 T	Min polarisation (T) at 2500 A/m	Min polarisation (T) at 5000 A/m	Min polarisation (T) at 10,000 A/m	Max anisotropy of loss (+/- %)	Min number of bends	Min stacking factor (mm)
		Indicative	Guaranteed	Indicative	Guaranteed	Guaranteed	Guaranteed	Guaranteed	Guaranteed	Guaranteed
M 470P-65 A AM FCE	7.75	2.10	4.70	6.13	1.62	1.72	1.83	12	5	0.97
Multiply the values in W/kg by 0.4536 to obtain the values in W/lb.										

Mechanical properties

The mechanical properties are for information purposes only.

Thickness 0.35 mm

	Direction	R_e (MPa)	R_m (MPa)	A_{80} (%)	HV	R_e/R_m
M 330P-35 A AM FCE	T	250 - 300	415 - 455	25 - 35	130 - 160	0.61 - 0.66

Thickness 0.50 mm

	Direction	R_e (MPa)	R_m (MPa)	A_{80} (%)	HV	R_e/R_m
M 330P-50 A AM FCE	T	250 - 300	400 - 450	27 - 37	135 - 165	0.61 - 0.66
M 350P-50 A AM FCE	T	250 - 300	400 - 450	27 - 37	135 - 165	0.61 - 0.66
M 400P-50 A AM FCE	T	260 - 310	420 - 470	27 - 37	135 - 165	0.62 - 0.67
M 400XP-50 A AM FCE	T	260 - 310	420 - 470	27 - 37	135 - 165	0.62 - 0.67
M 470P-50 A AM FCE	T	270 - 320	430 - 480	27 - 37	140 - 170	0.63 - 0.68

Thickness 0.65 mm

	Direction	R_e (MPa)	R_m (MPa)	A_{80} (%)	HV	R_e/R_m
M 470P-65 A AM FCE	T	270 - 320	430 - 480	30 - 40	140 - 170	0.62 - 0.67

D24 - Fully processed high frequency grade

Last updated: 2026-03-26

Properties

This non-oriented fully processed high frequency grade has guaranteed magnetic properties in accordance with EN 10303:2015, which specifically concerns thin electrical steels for use at frequencies above 100 Hz. Full magnetic characterisation curves at various frequencies are available on request.

Advantages

High frequency electrical steels have very low loss levels, especially at high frequencies. These properties are a result of the thin gauge of this material (0.20 mm), its particular chemical composition and specific thermomechanical processing.

Applications

This grade is designed for high speed rotating machines (100 to 5000 Hz). It allows minimisation of losses due to higher harmonics and clearly increases machine efficiency in the case of non-sinusoidal power supply. This thin, fully processed grade is also used when weight and volume reduction are of major importance, such as in medical or aviation applications.

Recommendations for use

The above properties are obtained without heat treatment after stamping. The material as supplied possesses all the required magnetic properties.

Brand correspondence

	EN 10303:2015	ASTM A1086:2013	IEC/CEI 60404-8-8:2017
NO 20	NO 20-15	20T680 [15,0]	NO 20-15

Dimensions

	Notes	Before side trimming		Side trimmed		Slit coils	
		Min width	Max width	Min width	Max width	Min width	Max width
NO 20	3	1030	1030	600	1000	20	600
3. Slit coils: after prior agreement regarding widths between 20 and 44 mm							

Magnetic properties

	Conventional density (kg/dm^3)	Max loss (W/kg) at 400 Hz at 1 T	Max loss (W/kg) at 400 Hz at 1.5 T	Max loss (W/kg) at 700 Hz at 1 T	Min polarisation (T) at 2500 A/m	Min polarisation (T) at 5000 A/m	Min polarisation (T) at 10,000 A/m	Min number of bends	Min stacking factor (mm)
		Guaranteed	Indicative	Indicative	Guaranteed	Guaranteed	Guaranteed	Guaranteed	Guaranteed
NO 20	7.60	15.00	38.00	32.00	1.48	1.59	1.69	2	0.93
Multiply the values in W/kg by 0.4536 to obtain the values in W/lb.									

Mechanical properties

The mechanical properties are for information purposes only.

	Direction	R_e (MPa)	R_m (MPa)	A_{80} (%)	R_e/R_m	HV
NO 20	L	395 - 435	505 - 545	12 - 22	0.78 - 0.83	205 - 235

D26 – Fully processed high strength grades

Last updated: 2026-03-26

Properties

Non-oriented fully processed high strength grades have not only guaranteed magnetic properties but also guaranteed mechanical properties. Typical for these grades are higher strength values compared with the standard grades, both at room temperature and at higher temperature operating conditions. Full magnetic characterisation curves at different frequencies are available on request.

Advantages

These high strength grades withstand stronger mechanical forces than the standard grades. They are therefore an excellent compromise when a combination of high mechanical strength and low magnetic losses is required.

Applications

High strength values, combined with low losses and good permeability, make these grades particularly suitable for high-speed rotating machines.

Recommendations for use

The above properties are obtained without heat treatment after stamping. The material as supplied possesses all the required magnetic properties.

Brand correspondence

	Old brand names
M 470YS-50 A AM FCE	HLE50
M 530YS-65 A AM FCE	HLE65

Dimensions

	Before side trimming		Side trimmed		Slit coils		Sheet length 400 to 2500 mm	
	Min width	Max width	Min width	Max width	Min width	Max width	Min width	Max width
M 470YS-50 A AM FCE	1030	1230	600	1200	250	600	400	1100
M 530YS-65 A AM FCE								

Magnetic properties

	Conventional density (kg/dm^3)	Max loss (W/kg) at 50 Hz at 1.5 T	Min polarisation (T) at 5000 A/m
		Guaranteed	Guaranteed
M 470YS-50 A AM FCE	7.60	4.7	1.60
M 530YS-65 A AM FCE		5.3	1.62
Multiply the values in W/kg by 0.4536 to obtain the values in W/lb.			

Mechanical properties

Guaranteed mechanical properties:

	Direction	R_e (MPa)	R_m (MPa)	A_{80} (%)
M 470YS-50 A AM FCE	T	> 470	> 580	> 15
M 530YS-65 A AM FCE		> 480	> 590	

The following table specifies the typical mechanical properties:

	Direction	R_e (MPa)	R_m (MPa)	A_{80} (%)	R_e/R_m	HV
M 470YS-50 A AM FCE	T	485 - 525	605 - 645	20 - 30	0.78 - 0.83	205 - 235
M 530YS-65 A AM FCE	T	495 - 545	610 - 660	20 - 30	0.80 - 0.85	205 - 235

D28 - Varnish for non-oriented grades

Last updated: 2026-03-26

Properties

Electrical steel varnishes for non-oriented grades are designed to enhance the behaviour of fully processed electrical steels. Their main purpose is to provide interlaminar insulation and to improve the punchability of these steels. Each type has its own specific properties, such as insulation level, punchability effect, corrosion protection, temperature resistance and weldability; hence it is material use that determines the optimum choice of varnish. All varnishes have been selected and developed to be environmentally friendly: they are hydrosoluble and chromium-free.

Advantages

The C3-type varnish is based on synthetic resins, resulting in a product with excellent lubricating properties for the punching process: the coated sheet can be punched without the need for additional lubricant. The resins' chemical composition yields special advantages such as high elasticity and very strong adhesion. It is particularly recommended for automatic stacking processes. Typical gauges range from 1 to 4 µm per side. A coating thickness of less than 1 µm offers the additional advantage of excellent weldability, whereas 3 µm ensures good interlaminar insulation.

The C5-type varnish is a pigmented varnish, made with thermostable resins, mineral products and pigments.

For the EC-5-N varnish, the type of mineral products and the amount used have been selected to obtain a coating with excellent temperature resistance during prolonged thermal treatments, which is of particular interest where stress-relief annealing is required after punching. The composition of this varnish was designed to maintain its dielectrical properties during the repair of damaged copper windings. Additionally, the mineral part of the coating provides high thermal conductivity. The combination of resins and mineral products achieves a good compromise between corrosion protection and weldability. Typical gauges range from 1 to 4 µm per side.

The EC-5-P has an increased amount of organic components compared to the EC-5-N, in order to achieve a better punchability, whilst maintaining a good weldability. Typical gauges range from 1 to 2 µm per side.

The C6-type varnish is also a pigmented varnish, but is especially suitable for high-power rotating machines, thanks to its high electrical insulation level. The mineral elements have been selected to reduce punching tool wear and favour punching oil retention. They also enhance the rigidity of the varnish, which minimises dimensional changes under high pressure/temperature. This varnish is particularly recommended for use with contactors, to permit a higher flutter frequency whilst reducing noise. Typical gauges range from 4 to 10 µm per side. This varnish can also be provided in a formaldehyde-free version.

Applications

These coatings are used for fully processed grades, as well as for pole sheets in the cold rolled version, in a wide range of electrical applications such as rotating machines, transformers and contactors.

Recommendations for use

The raw materials used have a chemical composition - both in liquid and cured varnish state - which does not require specific protective measures during the processing of the coated steels or during use in a given application.

Brand correspondence

	EN 10342:2005	ASTM A976:2008	IEC/CEI 60404-1-1:2004	ArcelorMittal-Code
C3	EC-3	C-3	EC-3	S
C5	EC-5-P	C-5	EC-5-P	T
C5	EC-5-N	C-5	EC-5-N	G
C6	EC-6	C-6	EC-6	M
C6 formaldehyde-free	EC-6	C-6	EC-6	F

D30 - Semi-processed standard grades

Last updated: 2026-03-26

Properties

Semi-processed standard grades have guaranteed magnetic properties in accordance with EN 10341:2006 (which superseded EN 10126:1995 for non-alloyed grades and EN 10165:1995 for alloyed grades). The magnetic properties are developed during the final annealing cycle, which is performed by the client after punching the laminations. This annealing treatment reduces losses and improves permeability and polarisation, as a result of recrystallisation, grain growth and also - for certain grades - decarburisation.

Advantages

The punchability of the semi-processed grades has been optimised by the application of an optimised final skin-pass reduction, after the cold rolling and annealing process. Skin-passing produces a controlled surface roughness, ensuring good material behaviour in the punching presses. This roughness also prevents the strips from sticking during the client's final annealing treatment. Regarding magnetic performance, skin-passing also plays an important role by stimulating grain growth during the annealing cycle, which results in further reduction of losses and increased permeability of the steel.

Applications

Non-alloyed semi-processed electrical steels are designed for small industrial motors, fans and domestic appliances such as washing machine motors, microwave oven transformers and refrigerator compressors.

Alloyed semi-processed electrical steels are designed for similar higher efficiency versions of these applications, as they have lower losses whilst the permeability remains at a good level.

Recommendations for use

The punching process needs to be carried out with an appropriate lubricant, which must be selected carefully, especially in the case of the alloyed semi-processed grades.

Brand correspondence

Thickness 0.50 mm

	EN 10341:2006	EN 10126:1995	EN 10165:1995	IEC/CEI 60404-8-3:2005
M 340-50 K	M 340-50 K		M 340-50 E	M 340-50 K5
M 390-50 K	M 390-50 K		M 390-50 E	M 390-50 K5
M 450-50 K	M 450-50 K		M 450-50 E	M 450-50 K5
M 560-50 K	M 560-50 K		M 560-50 E	M 560-50 K5
M 660-50 K	M 660-50 K	M 660-50 D		M 660-50 K5
M 890-50 K	M 890-50 K	M 890-50 D		M 890-50 K5
M 1050-50 K	M 1050-50 K	M 1050-50 D		M 1050-50 K5

Thickness 0.65 mm

	EN 10341:2006	EN 10126:1995	EN 10165:1995	IEC/CEI 60404-8-3:2005
M 390-65 K	M 390-65 K		M 390-65 E	M 390-65 K5
M 450-65 K	M 450-65 K		M 450-65 E	M 450-65 K5
M 520-65 K	M 520-65 K		M 520-65 E	M 520-65 K5
M 630-65 K	M 630-65 K		M 630-50 E	M 630-65 K5
M 800-65 K	M 800-65 K	M 800-65 D		M 800-65 K5
M 1000-65 K	M 1000-65 K	M 1000-65 D		M 1000-65 K5
M 1200-65 K	M 1200-65 K	M 1200-65 D		M 1200-65 K5

Thickness 0.70 mm

	EN 10341:2006	EN 10126:1995	EN 10165:1995	IEC/CEI 60404-8-3:2005
M 1000-70 K AM FCE				
Grades in italics: not included in the standard				

Thickness 0.80 mm

	EN 10341:2006	EN 10126:1995	EN 10165:1995	IEC/CEI 60404-8-3:2005
M 1200-80 K AM FCE				
Grades in italics: not included in the standard				

Thickness 1.00 mm

	EN 10341:2006	EN 10126:1995	EN 10165:1995	IEC/CEI 60404-8-3:2005
M 1300-100 K AM FCE				
M 1800-100 K AM FCE				
Grades in italics: not included in the standard				

Dimensions

Please contact us for thicknesses < 0.50 mm.

Thickness 0.50 mm

	Notes	Side trimmed		Slit coils	
		Min width	Max width	Min width	Max width
M 340-50 K	1	600	1300	40	600
M 390-50 K					
M 450-50 K			1350		
M 560-50 K					
M 660-50 K			1400		
M 890-50 K					
M 1050-50 K					
1. After prior agreement					

Thickness 0.65 mm

	Notes	Side trimmed		Slit coils	
		Min width	Max width	Min width	Max width
M 390-65 K	1	600	1300	40	600
M 450-65 K					
M 520-65 K			1350		
M 630-65 K					
M 800-65 K			1400		
M 1000-65 K					
M 1200-65 K					
1. After prior agreement					

Thickness 0.70 mm

	Notes	Side trimmed		Slit coils	
		Min width	Max width	Min width	Max width
M 1000-70 K AM FCE		600	1400	40	600
Grades in italics: not included in the standard					

Thickness 0.80 mm

	Notes	Side trimmed		Slit coils	
		Min width	Max width	Min width	Max width
M 1200-80 K AM FCE		600	1400	40	600
Grades in italics: not included in the standard					

Thickness 1.00 mm

	Notes	Side trimmed		Slit coils	
		Min width	Max width	Min width	Max width
M 1300-100 K AM FCE		600	1400	40	600
M 1800-100 K AM FCE					
Grades in italics: not included in the standard					

Magnetic properties

Thickness 0.50 mm

	Conventional density (kg/dm^3)	Max loss (W/kg) at 50 Hz at 1 T	Max loss (W/kg) at 50 Hz at 1.5 T	Min polarisation (T) at 2500 A/m	Min polarisation (T) at 5000 A/m	Min polarisation (T) at 10,000 A/m
		Indicative	Guaranteed	Guaranteed	Guaranteed	Guaranteed
M 340-50 K	7.65	1.42	3.40	1.54	1.62	1.72
M 390-50 K	7.70	1.62	3.90	1.56	1.64	1.74
M 450-50 K	7.75	1.92	4.50	1.57	1.65	1.75
M 560-50 K	7.80	2.42	5.60	1.58	1.66	1.76
M 660-50 K	7.85	2.80	6.60	1.62	1.70	1.79
M 890-50 K		3.70	8.90	1.60	1.68	1.78
M 1050-50 K		4.30	10.50	1.57	1.65	1.77
Multiply the values in W/kg by 0.4536 to obtain the values in W/lb.						

Thickness 0.65 mm

	Conventional density (kg/dm^3)	Max loss (W/kg) at 50 Hz at 1 T	Max loss (W/kg) at 50 Hz at 1.5 T	Min polarisation (T) at 2500 A/m	Min polarisation (T) at 5000 A/m	Min polarisation (T) at 10,000 A/m
		Indicative	Guaranteed	Guaranteed	Guaranteed	Guaranteed
M 390-65 K	7.65	1.62	3.90	1.54	1.62	1.72
M 450-65 K	7.70	1.92	4.50	1.56	1.64	1.74
M 520-65 K	7.75	2.22	5.20	1.57	1.65	1.75
M 630-65 K	7.80	2.72	6.30	1.58	1.66	1.76
M 800-65 K	7.85	3.30	8.00	1.62	1.70	1.79
M 1000-65 K		4.20	10.00	1.60	1.68	1.78
M 1200-65 K		5.00	12.00	1.57	1.65	1.77
Multiply the values in W/kg by 0.4536 to obtain the values in W/lb.						

Thickness 0.70 mm

	Conventional density (kg/dm^3)	Max loss (W/kg) at 50 Hz at 1 T	Max loss (W/kg) at 50 Hz at 1.5 T	Min polarisation (T) at 2500 A/m	Min polarisation (T) at 5000 A/m	Min polarisation (T) at 10,000 A/m
		Indicative	Guaranteed	Guaranteed	Guaranteed	Guaranteed
M 1000-70 K AM FCE	7.85	4.20	10.00	1.60	1.70	1.80
Grades in italics: not included in the standard						
Multiply the values in W/kg by 0.4536 to obtain the values in W/lb.						

Thickness 0.80 mm

	Conventional density (kg/dm^3)	Max loss (W/kg) at 50 Hz at 1 T	Max loss (W/kg) at 50 Hz at 1.5 T	Min polarisation (T) at 2500 A/m	Min polarisation (T) at 5000 A/m	Min polarisation (T) at 10,000 A/m
		Indicative	Guaranteed	Guaranteed	Guaranteed	Guaranteed
M 1200-80 K AM FCE	7.85	5.00	12.00	1.60	1.70	1.80
Grades in italics: not included in the standard						
Multiply the values in W/kg by 0.4536 to obtain the values in W/lb.						

Thickness 1.00 mm

	Conventional density (kg/dm^3)	Max loss (W/kg) at 50 Hz at 1 T	Max loss (W/kg) at 50 Hz at 1.5 T	Min polarisation (T) at 2500 A/m	Min polarisation (T) at 5000 A/m	Min polarisation (T) at 10,000 A/m
		Indicative	Guaranteed	Guaranteed	Guaranteed	Guaranteed
M 1300-100 K AM FCE	7.85	5.40	13.00	1.60	1.70	1.80
M 1800-100 K AM FCE		6.00	18.00	1.58	1.68	1.77
Grades in italics: not included in the standard						
Multiply the values in W/kg by 0.4536 to obtain the values in W/lb.						

Mechanical properties

The mechanical properties are for information purposes only.

Thickness 0.50 mm

	Direction	R_e (MPa)	R_m (MPa)	A_{80} (%)	HV
M 340-50 K	T	400 - 450	450 - 550	7 - 23	150 - 210
M 390-50 K	T	390 - 485	445 - 515	7 - 26	150 - 210
M 450-50 K	T	355 - 435	405 - 475	10 - 29	135 - 190
M 560-50 K	T	380 - 440	435 - 495	10 - 29	130 - 185
M 660-50 K	T	350 - 450	380 - 470	13 - 30	125 - 170
M 890-50 K	T	285 - 450	350 - 470	16 - 35	120 - 170
M 1050-50 K	T	240 - 450	295 - 470	21 - 39	105 - 170

Thickness 0.65 mm

	Direction	R_e (MPa)	R_m (MPa)	A_{80} (%)	HV
M 390-65 K	T	505 - 565	560 - 610	10 - 21	185 - 235
M 450-65 K	T	435 - 465	470 - 510	18 - 24	180 - 210
M 520-65 K	T	370 - 440	420 - 480	12 - 26	150 - 190
M 630-65 K	T	370 - 440	420 - 480	12 - 31	150 - 190
M 800-65 K	T	360 - 450	380 - 470	12 - 31	130 - 175
M 1000-65 K	T	280 - 450	350 - 470	17 - 37	120 - 170
M 1200-65 K	T	270 - 450	320 - 470	19 - 39	100 - 170

Thickness 0.70 mm

	Direction	R_e (MPa)	R_m (MPa)	A_{80} (%)	HV
M 1000-70 K AM FCE	T	300 - 340	360 - 400	28 - 35	120 - 140
Grades in italics: not included in the standard					

Thickness 0.80 mm

	Direction	R_e (MPa)	R_m (MPa)	A_{80} (%)	HV
M 1200-80 K AM FCE	T	320 - 375	360 - 400	20 - 30	125 - 155
Grades in italics: not included in the standard					

Thickness 1.00 mm

	Direction	R_e (MPa)	R_m (MPa)	A_{80} (%)	HV
M 1300-100 K AM FCE	T	370 - 400	390 - 430	21 - 27	140 - 170
M 1800-100 K AM FCE	T	255 - 305	290 - 335	29 - 43	105 - 140
Grades in italics: not included in the standard					

D32 - Semi-processed high permeability grades

Last updated: 2026-03-26

Properties

Semi-processed high permeability grades have guaranteed superior magnetic properties compared with the standard semi-processed grades (see data sheet D30). We offer two categories:

- Higher permeability isotropic products (indicated by the letter P)
- Very high permeability grades (indicated by the letters XP). In addition to their overall excellent permeability at higher saturations, these grades have extra high permeability at 45° (diagonal) to the rolling direction.

As for the standard semi-processed grades, the high permeability grades need a final annealing treatment, carried out by the client after punching the laminations.

Advantages

The semi-processed high permeability grades allow core weight reduction and increased efficiency of motors and transformers. The improved efficiency achieved reduces machine operating costs and at the same time makes them more environmentally friendly.

Applications

Semi-processed high permeability grades are designed for motors, generators, transformers, converters and ballasts where higher efficiency is required.

Recommendations for use

M450P-50K AM FCE and M600P-65K AM FCE need no particular machine production process adjustments. The very high polarisation levels of M560XP-50K AM FCE and M700XP-65K AM FCE diagonal to the rolling direction can be exploited advantageously for ballasts and small transformers by adjusting the punching operation, preferably in the 45° direction.

Brand correspondence

Thickness 0.50 mm

	Old brand names
M450P-50K AM FCE	
M560XP-50K AM FCE	Ekotex® 50

Thickness 0.65 mm

	Old brand names
M600P-65K AM FCE	
M700XP-65K AM FCE	Ekotex® 65

Dimensions

Please contact us for thicknesses < 0.50 mm.

Thickness 0.50 mm

	Side trimmed		Slit coils	
	Min width	Max width	Min width	Max width
M450P-50K AM FCE	600	1400	40	600
M560XP-50K AM FCE				

Thickness 0.65 mm

	Side trimmed		Slit coils	
	Min width	Max width	Min width	Max width
M600P-65K AM FCE	600	1400	40	600
M700XP-65K AM FCE				

Magnetic properties

The very high permeability grades (XP) offer excellent performance at 45°, with J2500 up to 1.79 T. Deviating from the standard Epstein test, we guarantee for these grades the average values measured in all directions of the sheet plane. These values are representative of the real material behaviour in a rotating machine.

The magnetic properties given for the high permeability grades (P) refer to the standard Epstein test (mixture of L and T direction).

Thickness 0.50 mm

	Conventional density (kg/dm^3)	Max loss (W/kg) at 50 Hz at 1 T	Max loss (W/kg) at 50 Hz at 1.5 T	Max loss (W/kg) at 60 Hz at 1.5 T	Min polarisation (T) at 2500 A/m	Min polarisation (T) at 5000 A/m	Min polarisation (T) at 10,000 A/m
		Indicative	Guaranteed	Indicative	Guaranteed	Guaranteed	Guaranteed
M450P-50K AM FCE	7.85	1.90	4.50	5.70	1.61	1.68	1.79
M560XP-50K AM FCE		2.20	5.60	7.00	1.68	1.76	1.86
Multiply the values in W/kg by 0.4536 to obtain the values in W/lb.							

Thickness 0.65 mm

	Conventional density (kg/dm^3)	Max loss (W/kg) at 50 Hz at 1 T	Max loss (W/kg) at 50 Hz at 1.5 T	Max loss (W/kg) at 60 Hz at 1.5 T	Min polarisation (T) at 2500 A/m	Min polarisation (T) at 5000 A/m	Min polarisation (T) at 10,000 A/m
		Indicative	Guaranteed	Indicative	Guaranteed	Guaranteed	Guaranteed
M600P-65K AM FCE	7.85	2.40	6.00	7.60	1.61	1.68	1.79
M700XP-65K AM FCE		2.50	7.00	8.90	1.68	1.76	1.86
Multiply the values in W/kg by 0.4536 to obtain the values in W/lb.							

Mechanical properties

The mechanical properties are for information purposes only.

Thickness 0.50 mm

	Direction	R_e (MPa)	R_m (MPa)	A_{80} (%)	HV
M450P-50K AM FCE	T	350 - 490	380 - 500	< 30	130 - 180
M560XP-50K AM FCE	T	380 - 450	430 - 470	< 28	130 - 165

Thickness 0.65 mm

	Direction	R_e (MPa)	R_m (MPa)	A_{80} (%)	HV
M600P-65K AM FCE	T	350 - 490	380 - 500	< 30	130 - 180
M700XP-65K AM FCE	T	380 - 450	430 - 470	< 28	130 - 165

D40 - Easy Punch steels with guaranteed punchability

Last updated: 2026-03-26

Properties

The Easy Punch grade has guaranteed mechanical properties and roughness. Magnetic properties are not guaranteed, as they are not optimised in this product. Should the application require enhanced magnetic performance, other electrical steel grades in our product range are recommended.

Advantages

This Easy Punch grade has excellent punchability and stackability, thanks to appropriate mechanical properties and roughness. It is therefore eminently suitable for automatic stacking and assembling techniques. The excellent punchability is achieved by means of a final skin-pass treatment, which produces high R_e/R_m values (over 0.9). Easy Punch also has excellent weldability.

Applications

The Easy Punch grade is designed for small machines for intermittent use:

- Automotive equipment such as alternators, windscreen wipers, window-opening motors
- Small domestic appliances such as coffee grinders, mixers
- Small hand tools such as drills

Recommendations for use

Usually, the client does not perform heat treatment after punching. Heat treatment is an option to increase the magnetic performance of Easy Punch.

Brand correspondence

	Old brand names
Easy Punch	Usidécoupe

Dimensions

The Easy Punch grade is available in thicknesses ranging from 0.5 to 1.2 mm. For thicknesses less than 0.7 mm, the width may not exceed 1400 mm.

	Side trimmed	
	Min width	Max width
Easy Punch	600	1500

Mechanical properties

Guaranteed mechanical properties:

	Direction	R_e (MPa)	R_m (MPa)	R_e/R_m
Easy Punch	T	270 - 370	310 - 380	> 0.85

The following table specifies the typical mechanical properties:

	Direction	R_e (MPa)	R_m (MPa)	A_{80} (%)	R_e/R_m	HV
Easy Punch	T	290 - 370	310 - 380	23 - 35	≥ 0.90	115 - 125

D50 - Cold rolled pole sheet grades

Last updated: 2026-03-26

Properties

Cold rolled pole sheet grades are classified according to their yield strength (EN 10265:1995). As well as guaranteed mechanical properties, they have guaranteed magnetic properties, but unlike other electrical steel grades, their magnetic properties are determined under direct current (DC) conditions. Full magnetic characterisation curves in DC and also at various frequencies are available on request.

This data sheet deals with the cold rolled grades that conform to the standard.

Advantages

High yield strength values allow these grades to withstand strong electromechanical forces. As well as excellent DC magnetic properties significantly superior to the requirements of the standard, these grades perform well on loss and induction levels at 50 Hz, thanks to a special chemical composition.

Applications

Cold rolled pole sheet grades are designed for large high-speed machines because of their excellent combination of mechanical strength and magnetic performance.

Recommendations for use

These properties are obtained without heat treatment after stamping. The material as supplied possesses all the required magnetic properties.

Brand correspondence

Thickness 0.65 mm

	EN 10265:1995	IEC/CEI 60404-8-5:1989
250-65-TF 183	250-65-TF 183	250-65-TF 183
300-65-TF 182	300-65-TF 182	300-65-TF 182
350-65-TF 181	350-65-TF 181	350-65-TF 181
400-65-TF 180	400-65-TF 180	400-65-TF 180

Thickness 1.00 mm

	EN 10265:1995	IEC/CEI 60404-8-5:1989
250-100-TF 183	250-100-TF 183	250-100-TF 183
300-100-TF 182	300-100-TF 182	300-100-TF 182
350-100-TF 181	350-100-TF 181	350-100-TF 181
400-100-TF 180	400-100-TF 180	400-100-TF 180
450-100-TF 180 AM FCE		
Grades in italics: not included in the standard		

Dimensions

Thickness 0.65 mm

	Notes	Before side trimming		Side trimmed		Slit coils		Sheet length 400 to 2500 mm	
		Min width	Max width	Min width	Max width	Min width	Max width	Min width	Max width
250-65-TF 183	2	1030	1230	600	1200	250	600	400	1130
300-65-TF 182	2								
350-65-TF 181	2								
400-65-TF 180	2								
2. Side trimmed: max width 1250 mm after prior agreement									

Thickness 1.00 mm

	Notes	Before side trimming		Side trimmed		Slit coils		Sheet length 400 to 2500 mm	
		Min width	Max width	Min width	Max width	Min width	Max width	Min width	Max width
250-100-TF 183	1 & 2	1030	1230	600	1200	250	600	400	1130
300-100-TF 182	1 & 2								
350-100-TF 181	1 & 2								
400-100-TF 180	1 & 2								
450-100-TF 180 AM FCE	1 & 2								
1 & 2. After prior agreement regarding sheet lengths between 2000 and 2500 mm; Side trimmed: max width 1250 mm after prior agreement									
Grades in italics: not included in the standard									

Magnetic properties

Thickness 0.65 mm

	Min polarisation (T) in DC at 5000 A/m		Min polarisation (T) in DC at 15,000 A/m	
	Guaranteed	Typical	Guaranteed	Typical
250-65-TF 183	1.60	1.72	1.83	1.91
300-65-TF 182	1.55	1.69	1.82	1.88
350-65-TF 181	1.52	1.67	1.81	1.86
400-65-TF 180	1.50	1.64	1.80	1.84

Thickness 1.00 mm

	Min polarisation (T) in DC at 5000 A/m		Min polarisation (T) in DC at 15,000 A/m	
	Guaranteed	Typical	Guaranteed	Typical
250-100-TF 183	1.60	1.71	1.83	1.90
300-100-TF 182	1.55	1.69	1.82	1.88
350-100-TF 181	1.52	1.67	1.81	1.86
400-100-TF 180	1.50		1.80	
450-100-TF 180 AM FCE				
Grades in italics: not included in the standard				

Mechanical properties

Guaranteed mechanical properties:

	Direction	R_e (MPa)	R_m (MPa)	A_{80} (%)
250-65-TF 183	T	> 250	> 325	> 16
300-65-TF 182		> 300	> 375	> 15
350-65-TF 181		> 350	> 425	> 13
400-65-TF 180		> 400	> 450	> 10
250-100-TF 183		> 250	> 325	> 16
300-100-TF 182		> 300	> 375	> 15
350-100-TF 181		> 350	> 425	> 13
400-100-TF 180		> 400	> 450	> 10
450-100-TF 180 AM FCE		> 450	> 500	

450-100-TF 180 AM FCE: not included in the standard

The following table specifies the typical mechanical properties:

	Direction	R_e (MPa)	R_m (MPa)	A_{80} (%)	R_e/R_m	HV
250-65-TF 183	T	270 - 320	400 - 440	30 - 40	0.68 - 0.73	120 - 150
300-65-TF 182		320 - 360	450 - 490		0.70 - 0.75	140 - 170
350-65-TF 181		400 - 440	530 - 570	25 - 35	0.74 - 0.79	180 - 210
400-65-TF 180		470 - 510	590 - 630		0.77 - 0.82	200 - 230
250-100-TF 183		290 - 340	420 - 470	30 - 40	0.68 - 0.73	130 - 160
300-100-TF 182		320 - 360	450 - 490	28 - 38	0.70 - 0.75	140 - 170
350-100-TF 181		400 - 440	530 - 570	25 - 35	0.74 - 0.79	180 - 210
400-100-TF 180		420 - 460	540 - 580		0.75 - 0.80	190 - 220
450-100-TF 180 AM FCE		480 - 520	580 - 620	20 - 30	0.78 - 0.82	200 - 230

450-100-TF 180 AM FCE: not included in the standard

D52 - Hot rolled pole sheet grades

Last updated: 2026-03-26

Properties

Hot rolled pole sheet grades are classified according to their yield strength (EN 10265:1995). As well as guaranteed mechanical properties, they have guaranteed magnetic properties, but unlike other electrical steel grades, their magnetic characterisation is determined under direct current (DC) conditions.

Advantages

High yield strength values allow these grades to withstand strong centrifugal and electromechanical forces, both in static and dynamic conditions. The DC magnetic properties are excellent and significantly superior to the requirements of the standard.
For the hot rolled pole sheets with yield strength guarantee up to 400 MPa the flatness guarantee is maintained after laser cutting of the laminations.
For the hot rolled pole sheets with yield strength guarantee beyond 400 MPa the flatness remains excellent, even after laser cutting of the laminations.

Applications

Hot rolled pole sheet grades can be supplied in the form of coils or sheets.
Hot rolled pole sheet grades are designed for large high-speed machines because of their excellent combination of mechanical strength and good magnetic performance. Good magnetic properties are of major importance for the performance of the poles, whereas excellent mechanical properties are needed for the rims.

Recommendations for use

The above properties are obtained without heat treatment, whatever be the mechanical or thermal cutting process used to obtain the desired lamination diameter. The material as supplied possesses all the required magnetic properties.

Brand correspondence

	EN 10265:1995	IEC/CEI 60404-8-5:1989	Old brand names
250-150-TG 180	250-150-TG 180	250-150-TG 180	Usinalter 250
250-200-TG 180	250-200-TG 180	250-200-TG 180	Usinalter 250
250-300-TG 180	250-300-TG 180	250-300-TG 180	Usinalter 250
250-400-TG 180	250-400-TG 180	250-400-TG 180	Usinalter 250
250-500-TG 180	250-500-TG 180	250-500-TG 180	Usinalter 250
300-150-TG 180	300-150-TG 180	300-150-TG 180	Usinalter 300
300-200-TG 180	300-200-TG 180	300-200-TG 180	Usinalter 300
300-300-TG 180	300-300-TG 180	300-300-TG 180	Usinalter 300
300-400-TG 180	300-400-TG 180	300-400-TG 180	Usinalter 300
300-500-TG 180	300-500-TG 180	300-500-TG 180	Usinalter 300
350-150-TG 179	350-150-TG 179	350-150-TG 179	Usinalter 350
350-200-TG 179	350-200-TG 179	350-200-TG 179	Usinalter 350
350-250-TG 179	350-250-TG 179	350-250-TG 179	Usinalter 350
350-300-TG 179	350-300-TG 179	350-300-TG 179	Usinalter 350
350-400-TG 179	350-400-TG 179	350-400-TG 179	Usinalter 350
350-500-TG 179	350-500-TG 179	350-500-TG 179	Usinalter 350
400-180-TG 179	400-180-TG 179	400-180-TG 179	Usinalter 400
400-200-TG 179	400-200-TG 179	400-200-TG 179	Usinalter 400
400-240-TG 179	400-240-TG 179	400-240-TG 179	Usinalter 400
400-300-TG 179	400-300-TG 179	400-300-TG 179	Usinalter 400
400-400-TG 179	400-400-TG 179	400-400-TG 179	Usinalter 400
400-500-TG 179	400-500-TG 179	400-500-TG 179	Usinalter 400
450-180-TG 179 *	450-180-TG 179	450-180-TG 179	Usinalter 450
450-200-TG 179 *	450-200-TG 179	450-200-TG 179	Usinalter 450
450-300-TG 179 *	450-300-TG 179	450-300-TG 179	Usinalter 450
450-400-TG 179 *	450-400-TG 179	450-400-TG 179	Usinalter 450
450-500-TG 179 *	450-500-TG 179	450-500-TG 179	Usinalter 450
500-200-TG 179 *	500-200-TG 179	500-200-TG 179	Usinalter 500
500-300-TG 179 *	500-300-TG 179	500-300-TG 179	Usinalter 500
500-400-TG 179 *	500-400-TG 179	500-400-TG 179	Usinalter 500
500-500-TG 179 *	500-500-TG 179	500-500-TG 179	Usinalter 500
550-200-TG 178 *	550-200-TG 178	550-200-TG 178	Usinalter 550
550-220-TG 178 *	550-220-TG 178	550-220-TG 178	Usinalter 550
550-250-TG 178 *	550-250-TG 178	550-250-TG 178	Usinalter 550
550-300-TG 178 *	550-300-TG 178	550-300-TG 178	Usinalter 550
550-400-TG 178 *	550-400-TG 178	550-400-TG 178	Usinalter 550

* Please contact us for the flatness.

	EN 10265:1995	IEC/CEI 60404-8-5:1989	Old brand names
550-500-TG 178 *	550-500-TG 178	550-500-TG 178	Usinalter 550
600-200-TG 178 *	600-200-TG 178	600-200-TG 178	Usinalter 600
600-250-TG 178 *	600-250-TG 178	600-250-TG 178	Usinalter 600
600-300-TG 178 *	600-300-TG 178	600-300-TG 178	Usinalter 600
600-400-TG 178 *	600-400-TG 178	600-400-TG 178	Usinalter 600
600-500-TG 178 *	600-500-TG 178	600-500-TG 178	Usinalter 600
650-200-TG 178 *	650-200-TG 178	650-200-TG 178	Usinalter 650
650-250-TG 178 *	650-250-TG 178	650-250-TG 178	Usinalter 650
650-300-TG 178 *	650-300-TG 178	650-300-TG 178	Usinalter 650
650-400-TG 178 *	650-400-TG 178	650-400-TG 178	Usinalter 650
650-500-TG 178 *	650-500-TG 178	650-500-TG 178	Usinalter 650
700-200-TG 178 *	700-200-TG 178	700-200-TG 178	Usinalter 700
700-250-TG 178 *	700-250-TG 178	700-250-TG 178	Usinalter 700
700-300-TG 178 *	700-300-TG 178	700-300-TG 178	Usinalter 700
700-400-TG 178 *	700-400-TG 178	700-400-TG 178	Usinalter 700
700-500-TG 178 *	700-500-TG 178	700-500-TG 178	Usinalter 700
* Please contact us for the flatness.			

Dimensions

	Mill finish		Side trimmed*	
	Min width	Max width	Min width	Max width
250-150-TG 180	675	1350	595	1270
250-200-TG 180		1550		1470
250-300-TG 180		2037		1957
250-400-TG 180		2137		2057
250-500-TG 180				
300-150-TG 180		1055		975
300-200-TG 180		1550		1470
300-300-TG 180		1610		1530
300-400-TG 180		1887		1807
300-500-TG 180		2137		2057
350-150-TG 179		1055		975
350-200-TG 179		1550		1470
350-250-TG 179		1400		1320
350-300-TG 179		1610		1530
350-400-TG 179		1887		1807
350-500-TG 179		2137		2057
400-180-TG 179		1055		975
400-200-TG 179		1255		1175
400-240-TG 179		1330		1250
400-300-TG 179		1550		1470
400-400-TG 179		1840		1760
400-500-TG 179		2137		2057
450-180-TG 179		1055		975
450-200-TG 179		1255		1175
450-300-TG 179		1550		1470
450-400-TG 179		1840		1760
450-500-TG 179		2137		2057
500-200-TG 179		1255		1175
500-300-TG 179		1550		1470
500-400-TG 179				
500-500-TG 179		1640		1560
550-200-TG 178		1105		1025
550-220-TG 178		1180		1100
550-250-TG 178		1255		1175
550-300-TG 178		1350		1270
550-400-TG 178		1550		1470

	Mill finish		Side trimmed*	
	Min width	Max width	Min width	Max width
550-500-TG 178	675	1640	595	1560
600-200-TG 178		1225		1145
600-250-TG 178				
600-300-TG 178		1520		1440
600-400-TG 178		1620		1540
600-500-TG 178		1720		1640
650-200-TG 178		1225		1145
650-250-TG 178				
650-300-TG 178		1520		1440
650-400-TG 178		1620		1540
650-500-TG 178		1720		1640
700-200-TG 178		1225		1145
700-250-TG 178				
700-300-TG 178		1520		1440
700-400-TG 178		1620		1540
700-500-TG 178		1720		1640

Please contact us for other dimensions.

** Smaller widths are available after slitting.*

Magnetic properties

	Min polarisation (T) in DC at 5000 A/m	Min polarisation (T) in DC at 15,000 A/m
	Guaranteed	Guaranteed
250-150-TG 180	1.60	1.80
250-200-TG 180		
250-300-TG 180		
250-400-TG 180		
250-500-TG 180		
300-150-TG 180		
300-200-TG 180		
300-300-TG 180		
300-400-TG 180		
300-500-TG 180		
350-150-TG 179	1.55	1.79
350-200-TG 179		
350-250-TG 179		
350-300-TG 179		
350-400-TG 179		
350-500-TG 179		
400-180-TG 179		
400-200-TG 179		
400-240-TG 179		
400-300-TG 179		
400-400-TG 179		
400-500-TG 179		
450-180-TG 179	1.54	
450-200-TG 179		
450-300-TG 179		
450-400-TG 179		
450-500-TG 179		
500-200-TG 179	1.53	
500-300-TG 179		
500-400-TG 179		
500-500-TG 179		
550-200-TG 178	1.52	1.78
550-220-TG 178		
550-250-TG 178		
550-300-TG 178		
550-400-TG 178		

	Min polarisation (T) in DC at 5000 A/m	Min polarisation (T) in DC at 15,000 A/m
	Guaranteed	Guaranteed
550-500-TG 178	1.52	1.78
600-200-TG 178	1.50	
600-250-TG 178		
600-300-TG 178		
600-400-TG 178		
600-500-TG 178		
650-200-TG 178	1.48	
650-250-TG 178		
650-300-TG 178		
650-400-TG 178		
650-500-TG 178		
700-200-TG 178	1.46	
700-250-TG 178		
700-300-TG 178		
700-400-TG 178		
700-500-TG 178		

Mechanical properties

Guaranteed mechanical properties:

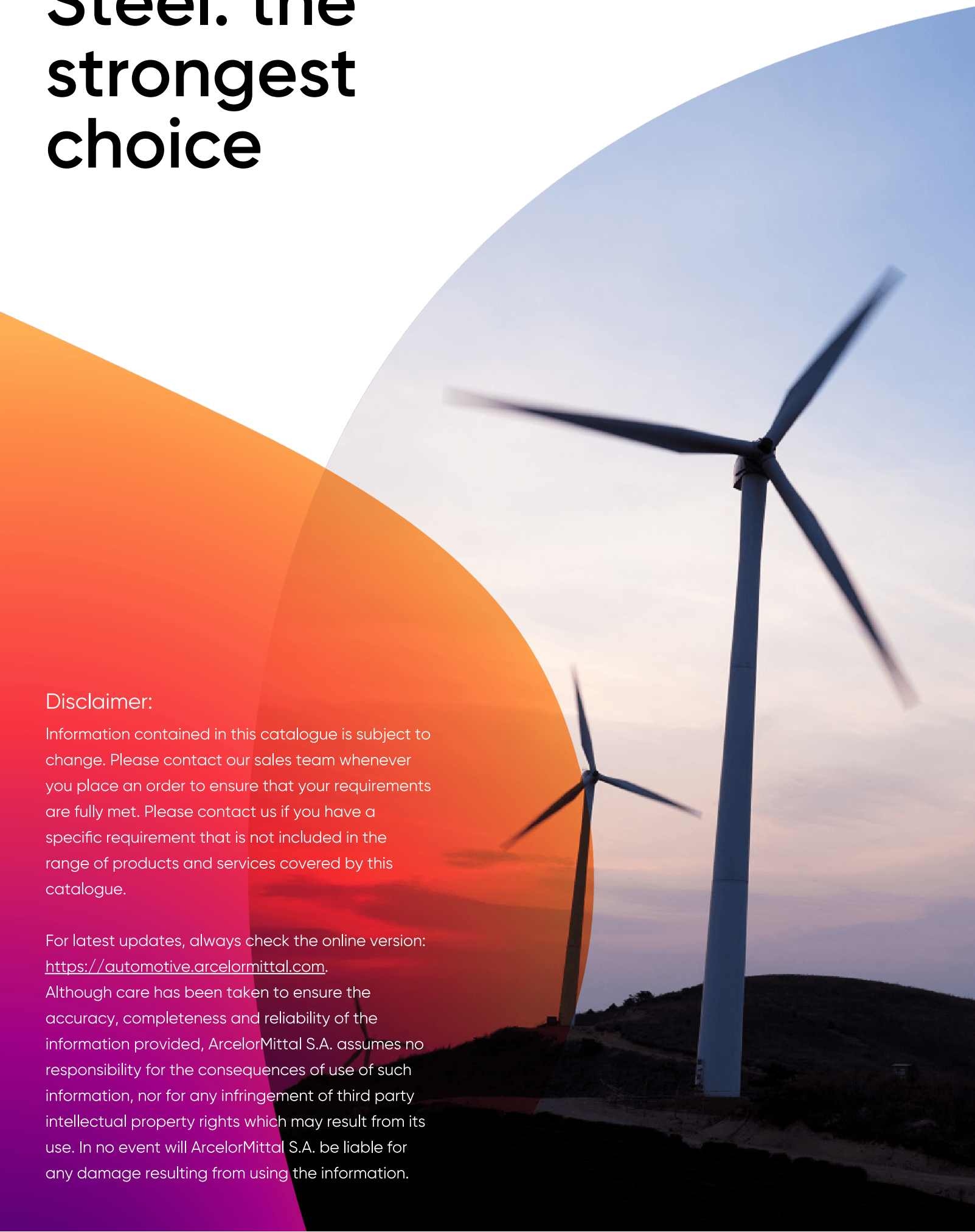
	Notes	Direction	Thickness (mm)	R_e (MPa)	R_m (MPa)	A 5.65√S_o (%)	A_{80} (%)
250-150-TG 180		T	1.5 - 1.5	≥ 250	350 - 480	-	≥ 20
250-200-TG 180		T	2 - 2	≥ 250	350 - 480	-	≥ 20
250-300-TG 180		T	3 - 3	≥ 250	350 - 480	≥ 26	-
250-400-TG 180		T	4 - 4	≥ 250	350 - 480	≥ 26	-
250-500-TG 180		T	5 - 5	≥ 250	350 - 480	≥ 26	-
300-150-TG 180		T	1.5 - 1.5	≥ 300	400 - 520	-	≥ 20
300-200-TG 180		T	2 - 2	≥ 300	400 - 520	-	≥ 20
300-300-TG 180		T	3 - 3	≥ 300	400 - 520	≥ 24	-
300-400-TG 180		T	4 - 4	≥ 300	400 - 520	≥ 24	-
300-500-TG 180		T	5 - 5	≥ 300	400 - 520	≥ 24	-
350-150-TG 179		L	1.5 - 1.5	≥ 350	450 - 600	-	≥ 18
		T	1.5 - 1.5	≥ 350	450 - 600	-	≥ 18
350-200-TG 179		L	2 - 2	≥ 350	450 - 600	-	≥ 18
		T	2 - 2	≥ 350	450 - 600	-	≥ 18
350-250-TG 179		L	2.5 - 2.5	≥ 350	450 - 600	-	≥ 18
		T	2.5 - 2.5	≥ 350	450 - 600	-	≥ 18
350-300-TG 179		L	3 - 3	≥ 350	450 - 600	≥ 22	-
		T	3 - 3	≥ 350	450 - 600	≥ 22	-
350-400-TG 179		L	4 - 4	≥ 350	450 - 600	≥ 22	-
		T	4 - 4	≥ 350	450 - 600	≥ 22	-
350-500-TG 179		L	5 - 5	≥ 350	450 - 600	≥ 22	-
		T	5 - 5	≥ 350	450 - 600	≥ 22	-
400-180-TG 179		L	1.8 - 1.8	≥ 400	500 - 680	-	≥ 16
		T	1.8 - 1.8	≥ 400	500 - 680	-	≥ 16
400-200-TG 179		L	2 - 2	≥ 400	500 - 680	-	≥ 16
		T	2 - 2	≥ 400	500 - 680	-	≥ 16
400-240-TG 179		L	2.4 - 2.4	≥ 400	500 - 680	-	≥ 16
		T	2.4 - 2.4	≥ 400	500 - 680	-	≥ 16
400-300-TG 179		L	3 - 3	≥ 400	500 - 680	≥ 19	-
		T	3 - 3	≥ 400	500 - 680	≥ 19	-
400-400-TG 179		L	4 - 4	≥ 400	500 - 680	≥ 19	-
		T	4 - 4	≥ 400	500 - 680	≥ 19	-
400-500-TG 179		L	5 - 5	≥ 400	500 - 680	≥ 19	-
		T	5 - 5	≥ 400	500 - 680	≥ 19	-
450-180-TG 179		L	1.8 - 1.8	≥ 450	550 - 750	-	≥ 16
		T	1.8 - 1.8	≥ 450	550 - 750	-	≥ 16

	Notes	Direction	Thickness (mm)	R_e (MPa)	R_m (MPa)	A 5.65√S_o (%)	A_{80} (%)
450-200-TG 179		L	2 - 2	≥ 450	550 - 750	-	≥ 16
		T	2 - 2	≥ 450	550 - 750	-	≥ 16
450-300-TG 179		L	3 - 3	≥ 450	550 - 750	≥ 17	-
		T	3 - 3	≥ 450	550 - 750	≥ 17	-
450-400-TG 179		L	4 - 4	≥ 450	550 - 750	≥ 17	-
		T	4 - 4	≥ 450	550 - 750	≥ 17	-
450-500-TG 179		L	5 - 5	≥ 450	550 - 750	≥ 17	-
		T	5 - 5	≥ 450	550 - 750	≥ 17	-
500-200-TG 179		L	2 - 2	≥ 500	600 - 800	-	≥ 14
		T	2 - 2	≥ 500	600 - 800	-	≥ 14
500-300-TG 179		L	3 - 3	≥ 500	600 - 800	≥ 14	-
		T	3 - 3	≥ 500	600 - 800	≥ 14	-
500-400-TG 179		L	4 - 4	≥ 500	600 - 800	≥ 14	-
		T	4 - 4	≥ 500	600 - 800	≥ 14	-
500-500-TG 179		L	5 - 5	≥ 500	600 - 800	≥ 14	-
		T	5 - 5	≥ 500	600 - 800	≥ 14	-
550-200-TG 178		L	2 - 2	≥ 550	650 - 850	-	≥ 12
		T	2 - 2	≥ 550	650 - 850	-	≥ 12
550-220-TG 178		L	2.2 - 2.2	≥ 550	650 - 850	-	≥ 12
		T	2.2 - 2.2	≥ 550	650 - 850	-	≥ 12
550-250-TG 178		L	2.5 - 2.5	≥ 550	650 - 850	-	≥ 12
		T	2.5 - 2.5	≥ 550	650 - 850	-	≥ 12
550-300-TG 178		L	3 - 3	≥ 550	650 - 850	≥ 14	-
		T	3 - 3	≥ 550	650 - 850	≥ 14	-
550-400-TG 178		L	4 - 4	≥ 550	650 - 850	≥ 14	-
		T	4 - 4	≥ 550	650 - 850	≥ 14	-
550-500-TG 178		L	5 - 5	≥ 550	650 - 850	≥ 14	-
		T	5 - 5	≥ 550	650 - 850	≥ 14	-
600-200-TG 178		L	2 - 2	≥ 600	700 - 900	-	≥ 10
		T	2 - 2	≥ 600	700 - 900	-	≥ 10
600-250-TG 178		L	2.5 - 2.5	≥ 600	700 - 900	-	≥ 10
		T	2.5 - 2.5	≥ 600	700 - 900	-	≥ 10
600-300-TG 178		L	3 - 3	≥ 600	700 - 900	≥ 12	-
		T	3 - 3	≥ 600	700 - 900	≥ 12	-
600-400-TG 178		L	4 - 4	≥ 600	700 - 900	≥ 12	-
		T	4 - 4	≥ 600	700 - 900	≥ 12	-
600-500-TG 178		L	5 - 5	≥ 600	700 - 900	≥ 12	-
		T	5 - 5	≥ 600	700 - 900	≥ 12	-

	Notes	Direction	Thickness (mm)	R_e (MPa)	R_m (MPa)	A 5.65√S_o (%)	A_{80} (%)
650-200-TG 178		L	2 - 2	≥ 650	750 - 900	-	≥ 10
		T	2 - 2	≥ 650	750 - 900	-	≥ 10
650-250-TG 178		L	2.5 - 2.5	≥ 650	750 - 900	-	≥ 10
		T	2.5 - 2.5	≥ 650	750 - 900	-	≥ 10
650-300-TG 178		L	3 - 3	≥ 650	750 - 900	≥ 12	-
		T	3 - 3	≥ 650	750 - 900	≥ 12	-
650-400-TG 178		L	4 - 4	≥ 650	750 - 900	≥ 12	-
		T	4 - 4	≥ 650	750 - 900	≥ 12	-
650-500-TG 178		L	5 - 5	≥ 650	750 - 900	≥ 12	-
		T	5 - 5	≥ 650	750 - 900	≥ 12	-
700-200-TG 178	1	L	2 - 2	≥ 700	750 - 900	-	≥ 10
		T	2 - 2	≥ 700	750 - 900	-	≥ 10
700-250-TG 178	1	L	2.5 - 2.5	≥ 700	750 - 900	-	≥ 10
		T	2.5 - 2.5	≥ 700	750 - 900	-	≥ 10
700-300-TG 178	1	L	3 - 3	≥ 700	750 - 900	≥ 12	-
		T	3 - 3	≥ 700	750 - 900	≥ 12	-
700-400-TG 178	1	L	4 - 4	≥ 700	750 - 900	≥ 12	-
		T	4 - 4	≥ 700	750 - 900	≥ 12	-
700-500-TG 178	1	L	5 - 5	≥ 700	750 - 900	≥ 12	-
		T	5 - 5	≥ 700	750 - 900	≥ 12	-

1. Guaranteed tensile strength R_m ≥ 750 MPa

Steel: the strongest choice



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