



Issue: December 2021, version 0

## Areas of application

The non-oriented electrical steel grade powercore<sup>®</sup>traction 030-150Y420 from thyssenkrupp is ideal for use in highly efficient automotive drive systems. The steel grade is characterized by very good processing properties, providing advantages in final application regardless of whether it is used in hybrid or electric vehicles or other high-speed motors.

All powercore<sup>®</sup>traction grades for e-mobility meet requirements for high permeability, high magnetizability and low eddy current losses.

### Product advantages

- Application-optimized texture to minimize influence of processing on soft magnetic properties
- Guaranteed yield strengths of up to 420 MPa at room temperature
- Extended magnetic properties beyond standard DIN EN 10303

In addition to the grades for e-mobility and the fully finished standard grades, there are a large number of application-oriented grades for electric motors and generators, such as our high-permeability AP grades and our re-annealable PP grades.

### powercore<sup>®</sup> Explorer

In addition to the figures presented in the product information, the powercore<sup>®</sup> Explorer gives developers the following possibilities:

- Tabular and graphic presentations of magnetic properties
- Visual comparison of the magnetic properties of different powercore<sup>®</sup> electrical steel grades based on standard measurements at various frequencies
- Export of material data to common simulation programs for machine design and calculations

We would be pleased to provide you with powercore<sup>®</sup> Explorer on request.

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## Magnetic properties

Guaranteed values to DIN EN 10303

	Reference grade DIN EN 10303	Max. core loss		Min. polarization	
		[W/kg] at 400 Hz	1.0 T	[T] at 2,500	5,000
Steel grade				[A/m]	[A/m]
powercore®traction 030-150Y420	N030-16	15	1.49	1.60	1.70

## Mechanical properties

Guaranteed min. yield strength to DIN EN ISO 6892-1 is **420 MPa**.

Typical average values for grade

Test direction in rolling direction at room temperature	Yield strength*	Tensile strength	Elongation	Micro- hardness
	R <sub>p0.2</sub> [MPa]	R <sub>m</sub> [MPa]	A <sub>80</sub> [%]	HV5 [–]
Steel grade				
powercore®traction 030-150Y420	446	569	15	204

## Physical properties

Steel grade	Density
	ρ [kg/dm <sup>3</sup> ]
powercore®traction 030-150Y420	7.60

## Insulation types

IEC 60404-1-1/04 thyssenkrupp	
Steel grade	
powercore®traction 030-150Y420	– uncoated
	EC-3 stabolit® 10
	EC-5-P stabolit® 20
	EC-4 stabolit® 30
	EC-6 stabolit® 40
	EC-5 stabolit® 60
	– stabolit® 70

Please refer to the product information on stabolit® for more exact data on insulation coatings.

## Dimensions

	Form of supply	Thick-	Width	Inside	Outside
		ness		diameter	diameter
		[mm]	[mm]	[mm]	[mm]
Steel grade					
powercore®traction 030-150Y420	Narrow strip	0.30	20– 500	508	max. 1,360
	Wide strip	0.30	500– 1,250	508/610	max. 1,360

## Frequency-dependent properties

Typical values for information

50 Hz				
J [T]	H [A/m]	$\mu_a$	$P_s$ [W/kg]	$S_s$ [VA/kg]
		0°/90°	0°/90°	0°/90°
0.5	56	7134	0,30	0,58
0.6	62	7655	0,41	0,76
0.7	70	7972	0,52	0,98
0.8	79	8102	0,65	1,23
0.9	90	7961	0,78	1,53
1.0	105	7581	0,94	1,90
1.1	127	6893	1,11	2,39
1.2	164	5814	1,30	3,11
1.3	245	4231	1,54	4,45
1.4	494	2255	1,82	8,15
1.5	1407	850	2,16	23,14
1.6	3395	376	2,44	63,18
1.7	6601	206	2,68	138,80
1.8	11432	126	3,01	264,85

60 Hz				
J [T]	H [A/m]	$\mu_a$	$P_s$ [W/kg]	$S_s$ [VA/kg]
		0°/90°	0°/90°	0°/90°
0.5	56	7109	0,38	0,70
0.6	63	7634	0,51	0,92
0.7	70	7979	0,65	1,18
0.8	79	8092	0,80	1,48
0.9	90	7982	0,97	1,84
1.0	105	7604	1,16	2,29
1.1	127	6911	1,37	2,88
1.2	164	5825	1,62	3,75
1.3	243	4257	1,91	5,34
1.4	491	2269	2,26	9,74
1.5	1406	850	2,68	27,79
1.6	3401	375	3,04	76,05
1.7	6577	207	3,40	165,99
1.8	11432	126	3,75	318,15

200 Hz				
J [T]	H [A/m]	$\mu_a$	$P_s$ [W/kg]	$S_s$ [VA/kg]
		0°/90°	0°/90°	0°/90°
0.5	61	6486	1,67	2,63
0.6	68	7003	2,27	3,49
0.7	76	7377	2,93	4,47
0.8	83	7642	3,66	5,60
0.9	93	7675	4,47	6,91
1.0	107	7434	5,37	8,51
1.1	128	6864	6,31	10,49
1.2	163	5848	7,42	13,43
1.3	242	4273	8,78	18,76
1.4	492	2265	10,51	34,19
1.5	1410	848	12,61	99,73
1.6	3439	371	14,92	282,00

## Typical values for information

400 Hz				
J	H	$\mu_a$	$P_s$	$S_s$
[T]	[A/m]		[W/kg]	[VA/kg]
	0°/90°	0°/90°	0°/90°	0°/90°
0.2	42	3828	0,82	1,42
0.3	52	4583	1,73	2,69
0.4	61	5191	2,86	4,21
0.5	70	5704	4,21	5,98
0.6	78	6121	5,75	8,00
0.7	86	6456	7,49	10,29
0.8	95	6692	9,45	12,90
0.9	105	6836	11,64	15,90
1.0	116	6851	14,09	19,45
1.1	133	6598	16,84	23,88
1.2	165	5794	20,00	30,08
1.3	240	4314	23,73	40,81
1.4	486	2295	28,51	71,36
1.5	1363	877	34,61	200,99

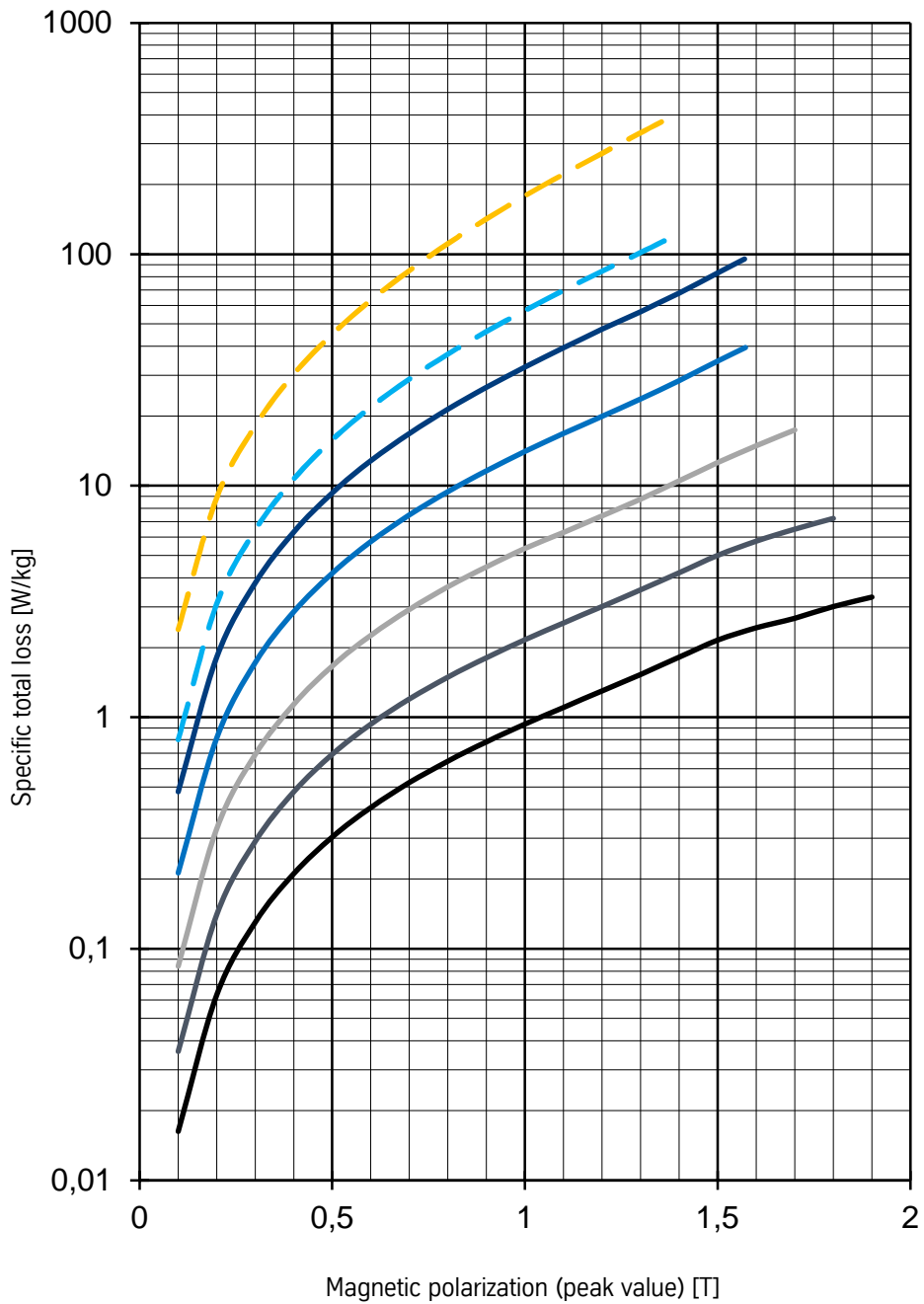
500 Hz				
J	H	$\mu_a$	$P_s$	$S_s$
[T]	[A/m]		[W/kg]	[VA/kg]
	0°/90°	0°/90°	0°/90°	0°/90°
0.2	43	3667	1,11	1,85
0.3	55	4352	2,36	3,53
0.4	65	4909	3,91	5,56
0.5	74	5376	5,76	7,92
0.6	83	5757	7,88	10,62
0.7	92	6046	10,32	13,69
0.8	102	6257	13,05	17,21
0.9	112	6390	16,10	21,25
1.0	124	6432	19,58	26,02
1.1	139	6313	23,54	31,92
1.2	168	5696	28,06	39,98
1.3	243	4255	33,39	53,72
1.4	490	2274	40,13	92,11
1.5	1372	871	48,93	255,21

1,000 Hz				
J	H	$\mu_a$	$P_s$	$S_s$
[T]	[A/m]		[W/kg]	[VA/kg]
	0°/90°	0°/90°	0°/90°	0°/90°
0.2	52	3042	3,10	4,44
0.3	68	3530	6,45	8,62
0.4	81	3936	10,72	13,75
0.5	94	4249	15,85	19,82
0.6	107	4482	21,91	26,92
0.7	120	4630	28,96	35,21
0.8	135	4709	37,11	44,86
0.9	151	4740	46,43	56,13
1.0	169	4718	57,28	69,39
1.1	188	4651	69,95	85,33
1.2	210	4539	84,69	105,61
1.3	255	4064	101,84	136,24

2,000 Hz				
J	H	$\mu_a$	$P_s$	$S_s$
[T]	[A/m]		[W/kg]	[VA/kg]
	0°/90°	0°/90°	0°/90°	0°/90°
0.2	68	1179	8,89	11,41
0.3	88	1812	18,22	22,38
0.4	107	2227	30,44	36,21
0.5	126	2518	45,28	53,07
0.6	148	2693	63,43	73,58
0.7	171	2785	85,21	98,33
0.8	199	2805	111,49	128,16
0.9	228	2791	142,42	163,91
1.0	262	2739	179,20	206,27
1.1	298	2669	222,11	256,13
1.2	339	2585	273,38	318,53
1.3	387	2467	335,45	401,09

## Specific core loss

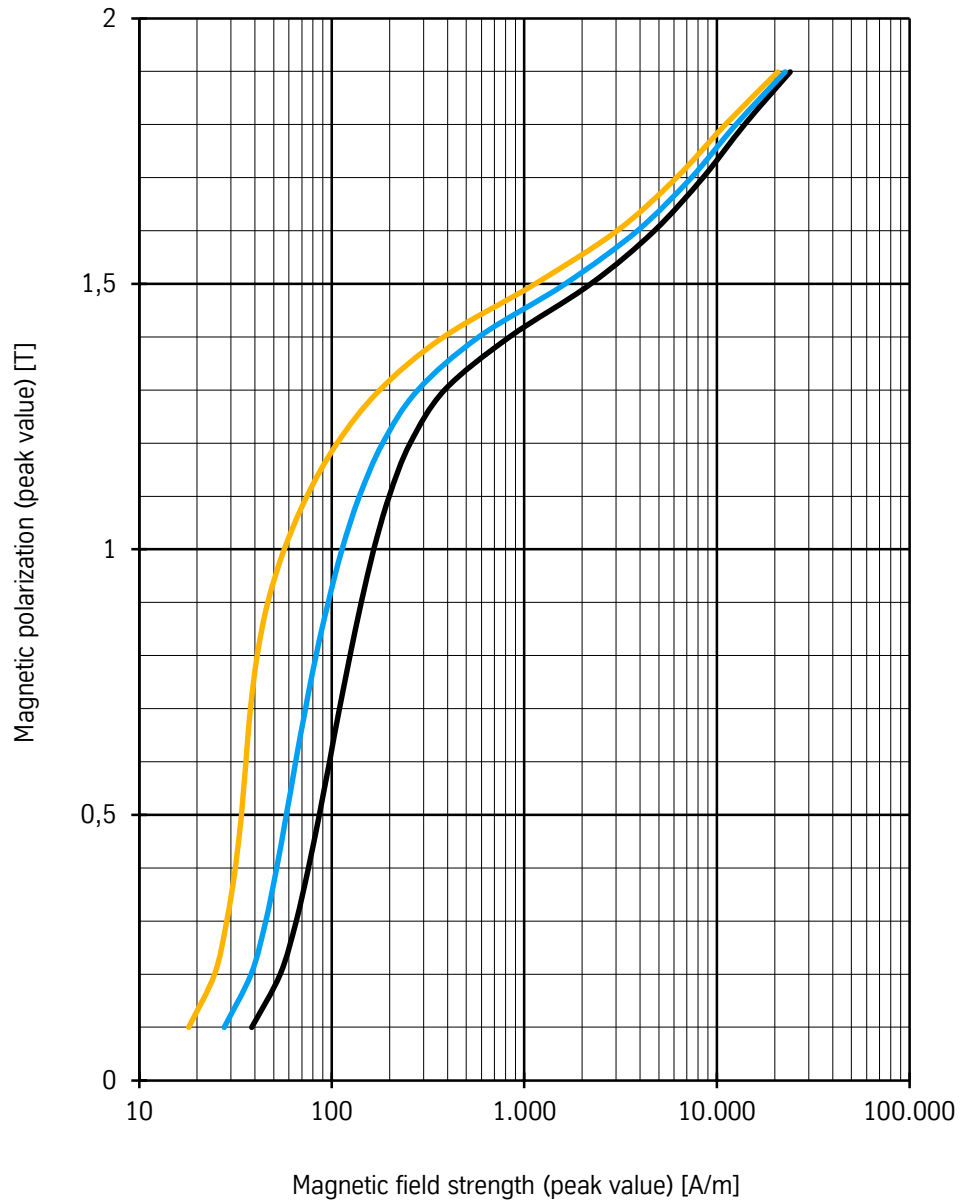
$P_s$  versus  $J$ , directional (L/Q/M)



- 030-150Y420/M/50
- 030-150Y420/M/100
- 030-150Y420/M/200
- 030-150Y420/M/400
- 030-150Y420/M/700
- 030-150Y420/M/1000
- - 030-150Y420/M/2000

## Magnetic polarization

J versus H, directional (L/Q/M), 50 Hz



Angle to rolling direction

- 0°
- 0°/90°
- 90°

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### General information

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