

AK Steel TRAN-COR® H-0 CARLITE® DR® Grain Oriented Electrical Steel

Category : Metal , Electronic/Magnetic Alloy , Ferrous Metal

Material Notes:

TRAN-COR H CARLITE® high permeability electrical steels offer an outstanding degree of grain orientation, This combination of higher permeability with low residual stress offers the potential for lower core losses and less noisy transformer core structures, particularly at higher operating inductions, when compared to conventional grain oriented electrical steels. The core loss characteristics are further enhanced in the TRAN-COR H CARLITE DR® (Domain Refined) products where laser scribing is employed. In this process, a precisely focused laser beam is rapidly scanned across the steel surface. The micro-strain imparted into the material forces the pre-existing magnetic domains to subdivide. The finer domain structure reduces the distance that the domain walls must move during AC magnetization, thereby reducing eddy current losses. The result is far lower core loss than possible with conventional grain oriented electrical steels of comparable thickness. TRAN-COR H CARLITE products are suitable for all types of transformers while TRAN-COR H DR products are suitable for those types of transformers where a stress relief annealing treatment of the magnetic core is not used. Stress relief annealing will result in the eradication of the effect provided by the laser treatment and will result in a significant increase in core loss. Information provided by AK Steel.

Order this product through the following link:

http://www.lookpolymers.com/polymer_AK-Steel-TRAN-COR-H-0-CARLITE-DR-Grain-Oriented-Electrical-Steel.php

Physical Properties	Metric	English	Comments
Density	7.65 g/cc	0.276 lb/in ³	
Thickness	200 - 240 microns	7.87 - 9.45 mil	
	230 microns	9.06 mil	Nominal

Mechanical Properties	Metric	English	Comments
Knoop Microhardness	173	173	
Hardness, Rockwell B	83	83	
Tensile Strength, Ultimate	359 MPa	52100 psi	In rolling direction
Tensile Strength, Yield	345 MPa	50000 psi	In rolling direction
Elongation at Break	11 %	11 %	In 2", rolling direction
Modulus of Elasticity	113.8 GPa	16510 ksi	In rolling direction
	138 GPa	20000 ksi	At 20° to rolling direction
	203 GPa	29400 ksi	At 90° to rolling direction
	241 GPa	35000 ksi	At 45° to rolling direction
	276 GPa	40000 ksi	At 55° to rolling direction

Electrical Properties	Metric	English	Comments
Exciting Power (RMS)	0.00165 RMS AT/cm	0.00260 RMS VA/lb	
	@Magnetic Field 0.100 T, Frequency 50.0 Hz	@Magnetic Field 0.100 T, Frequency 50.0 Hz	ASTM A804, 0.23 mm
	0.00209 RMS AT/cm	0.00330 RMS VA/lb	
	@Magnetic Field 0.100 T, Frequency 60.0 Hz	@Magnetic Field 0.100 T, Frequency 60.0 Hz	ASTM A804, 0.23 mm
	0.00576 RMS AT/cm	0.00910 RMS VA/lb	
	@Magnetic Field 0.200 T, Frequency 50.0 Hz	@Magnetic Field 0.200 T, Frequency 50.0 Hz	ASTM A804, 0.23 mm
	0.00721 RMS AT/cm	0.0114 RMS VA/lb	
	@Magnetic Field 0.200 T, Frequency 60.0 Hz	@Magnetic Field 0.200 T, Frequency 60.0 Hz	ASTM A804, 0.23 mm
	0.0120 RMS AT/cm	0.0190 RMS VA/lb	
	@Magnetic Field 0.300 T, Frequency 50.0 Hz	@Magnetic Field 0.300 T, Frequency 50.0 Hz	ASTM A804, 0.23 mm
	0.0151 RMS AT/cm	0.0238 RMS VA/lb	
	@Magnetic Field 0.300 T, Frequency 60.0 Hz	@Magnetic Field 0.300 T, Frequency 60.0 Hz	ASTM A804, 0.23 mm
	0.0199 RMS AT/cm	0.0315 RMS VA/lb	
	@Magnetic Field 0.400 T, Frequency 50.0 Hz	@Magnetic Field 0.400 T, Frequency 50.0 Hz	ASTM A804, 0.23 mm
	0.0251 RMS AT/cm	0.0397 RMS VA/lb	
	@Magnetic Field 0.400 T, Frequency 60.0 Hz	@Magnetic Field 0.400 T, Frequency 60.0 Hz	ASTM A804, 0.23 mm
	0.0294 RMS AT/cm	0.0465 RMS VA/lb	
	@Magnetic Field 0.500 T, Frequency 50.0 Hz	@Magnetic Field 0.500 T, Frequency 50.0 Hz	ASTM A804, 0.23 mm
	0.0372 RMS AT/cm	0.0588 RMS VA/lb	
	@Magnetic Field 0.500 T, Frequency 60.0 Hz	@Magnetic Field 0.500 T, Frequency 60.0 Hz	ASTM A804, 0.23 mm
	0.0403 RMS AT/cm	0.0637 RMS VA/lb	

Electrical Properties	Metric	English	Comments
	@Magnetic Field 0.600 T, Frequency 50.0 Hz	@Magnetic Field 0.600 T, Frequency 50.0 Hz	1, 0.23 mm
	0.0511 RMS AT/cm	0.0807 RMS VA/lb	
	@Magnetic Field 0.600 T, Frequency 60.0 Hz	@Magnetic Field 0.600 T, Frequency 60.0 Hz	ASTM A804, 0.23 mm
	0.0528 RMS AT/cm	0.0834 RMS VA/lb	
	@Magnetic Field 0.700 T, Frequency 50.0 Hz	@Magnetic Field 0.700 T, Frequency 50.0 Hz	ASTM A804, 0.23 mm
	0.06675 RMS AT/cm	0.1055 RMS VA/lb	
	@Magnetic Field 0.800 T, Frequency 50.0 Hz	@Magnetic Field 0.800 T, Frequency 50.0 Hz	ASTM A804, 0.23 mm
	0.06700 RMS AT/cm	0.1059 RMS VA/lb	
	@Magnetic Field 0.700 T, Frequency 60.0 Hz	@Magnetic Field 0.700 T, Frequency 60.0 Hz	ASTM A804, 0.23 mm
	0.08282 RMS AT/cm	0.1309 RMS VA/lb	
	@Magnetic Field 0.900 T, Frequency 50.0 Hz	@Magnetic Field 0.900 T, Frequency 50.0 Hz	ASTM A804, 0.23 mm
	0.08485 RMS AT/cm	0.1341 RMS VA/lb	
	@Magnetic Field 0.800 T, Frequency 60.0 Hz	@Magnetic Field 0.800 T, Frequency 60.0 Hz	ASTM A804, 0.23 mm
	0.1018 RMS AT/cm	0.1609 RMS VA/lb	
	@Magnetic Field 1.00 T, Frequency 50.0 Hz	@Magnetic Field 1.00 T, Frequency 50.0 Hz	ASTM A804, 0.23 mm
	0.1055 RMS AT/cm	0.1668 RMS VA/lb	
	@Magnetic Field 0.900 T, Frequency 60.0 Hz	@Magnetic Field 0.900 T, Frequency 60.0 Hz	ASTM A804, 0.23 mm
	0.1245 RMS AT/cm	0.1968 RMS VA/lb	
	@Magnetic Field 1.10 T, Frequency 50.0 Hz	@Magnetic Field 1.10 T, Frequency 50.0 Hz	ASTM A804, 0.23 mm
	0.1294 RMS AT/cm	0.2045 RMS VA/lb	
	@Magnetic Field 1.00 T, Frequency 60.0 Hz	@Magnetic Field 1.00 T, Frequency 60.0 Hz	ASTM A804, 0.23 mm

Electrical Properties	Metric ¹ RMS AT/cm	English ² RMS VA/lb	Comments
	@Magnetic Field 1.20 T, Frequency 50.0 Hz	@Magnetic Field 1.20 T, Frequency 50.0 Hz	ASTM A804, 0.23 mm
	0.1585 RMS AT/cm	0.2505 RMS VA/lb	
	@Magnetic Field 1.10 T, Frequency 60.0 Hz	@Magnetic Field 1.10 T, Frequency 60.0 Hz	ASTM A804, 0.23 mm
	0.1863 RMS AT/cm	0.2945 RMS VA/lb	
	@Magnetic Field 1.30 T, Frequency 50.0 Hz	@Magnetic Field 1.30 T, Frequency 50.0 Hz	ASTM A804, 0.23 mm
	0.193 RMS AT/cm	0.305 RMS VA/lb	
	@Magnetic Field 1.20 T, Frequency 60.0 Hz	@Magnetic Field 1.20 T, Frequency 60.0 Hz	ASTM A804, 0.23 mm
	0.2287 RMS AT/cm	0.3614 RMS VA/lb	
	@Magnetic Field 1.40 T, Frequency 50.0 Hz	@Magnetic Field 1.40 T, Frequency 50.0 Hz	ASTM A804, 0.23 mm
	0.2356 RMS AT/cm	0.3723 RMS VA/lb	
	@Magnetic Field 1.30 T, Frequency 60.0 Hz	@Magnetic Field 1.30 T, Frequency 60.0 Hz	ASTM A804, 0.23 mm
	0.2819 RMS AT/cm	0.4455 RMS VA/lb	
	@Magnetic Field 1.50 T, Frequency 50.0 Hz	@Magnetic Field 1.50 T, Frequency 50.0 Hz	ASTM A804, 0.23 mm
	0.2876 RMS AT/cm	0.4545 RMS VA/lb	
	@Magnetic Field 1.40 T, Frequency 60.0 Hz	@Magnetic Field 1.40 T, Frequency 60.0 Hz	ASTM A804, 0.23 mm
	0.3523 RMS AT/cm	0.5568 RMS VA/lb	
	@Magnetic Field 1.50 T, Frequency 60.0 Hz	@Magnetic Field 1.50 T, Frequency 60.0 Hz	ASTM A804, 0.23 mm
	0.3532 RMS AT/cm	0.5582 RMS VA/lb	
	@Magnetic Field 1.60 T, Frequency 50.0 Hz	@Magnetic Field 1.60 T, Frequency 50.0 Hz	ASTM A804, 0.23 mm
	0.4383 RMS AT/cm	0.6927 RMS VA/lb	
	@Magnetic Field 1.60	@Magnetic Field 1.60	ASTM A804, 0.23 mm

Electrical Properties	Metric	English	Comments
	0.4774 RMS AT/cm	0.7545 RMS VA/lb	
	@Magnetic Field 1.70 T, Frequency 50.0 Hz	@Magnetic Field 1.70 T, Frequency 50.0 Hz	ASTM A804, 0.23 mm
	0.5867 RMS AT/cm	0.9273 RMS VA/lb	
	@Magnetic Field 1.70 T, Frequency 60.0 Hz	@Magnetic Field 1.70 T, Frequency 60.0 Hz	ASTM A804, 0.23 mm
	0.82536 RMS AT/cm	1.3045 RMS VA/lb	
	@Magnetic Field 1.80 T, Frequency 50.0 Hz	@Magnetic Field 1.80 T, Frequency 50.0 Hz	ASTM A804, 0.23 mm
	1.0008 RMS AT/cm	1.5818 RMS VA/lb	
	@Magnetic Field 1.80 T, Frequency 60.0 Hz	@Magnetic Field 1.80 T, Frequency 60.0 Hz	ASTM A804, 0.23 mm
	2.8558 RMS AT/cm	4.5136 RMS VA/lb	
	@Magnetic Field 1.90 T, Frequency 50.0 Hz	@Magnetic Field 1.90 T, Frequency 50.0 Hz	ASTM A804, 0.23 mm
	3.5057 RMS AT/cm	5.5409 RMS VA/lb	
	@Magnetic Field 1.90 T, Frequency 60.0 Hz	@Magnetic Field 1.90 T, Frequency 60.0 Hz	ASTM A804, 0.23 mm
Electrical Resistivity	0.0000500 ohm-cm	0.0000500 ohm-cm	

Magnetic Properties	Metric	English	Comments
Core Loss	0.00289 W/kg	0.00131 W/lb	
	@Magnetic Field 0.100 T, Frequency 50.0 Hz	@Magnetic Field 0.100 T, Frequency 50.0 Hz	ASTM A804, 0.23 mm
	0.00385 W/kg	0.00175 W/lb	
	@Magnetic Field 0.100 T, Frequency 60.0 Hz	@Magnetic Field 0.100 T, Frequency 60.0 Hz	ASTM A804, 0.23 mm
	0.01082 W/kg	0.004908 W/lb	
	@Magnetic Field 0.200 T, Frequency 50.0 Hz	@Magnetic Field 0.200 T, Frequency 50.0 Hz	ASTM A804, 0.23 mm
	0.01451 W/kg	0.006582 W/lb	

Magnetic Properties	@Magnetic Field 0.200 T, Metric Frequency 60.0 Hz	@Magnetic Field 0.200 T, English Frequency 60.0 Hz	ASTM A804, 0.23 mm Comments
	0.0236 W/kg	0.0107 W/lb	
	@Magnetic Field 0.300 T, Frequency 50.0 Hz	@Magnetic Field 0.300 T, Frequency 50.0 Hz	ASTM A804, 0.23 mm
	0.0317 W/kg	0.0144 W/lb	
	@Magnetic Field 0.300 T, Frequency 60.0 Hz	@Magnetic Field 0.300 T, Frequency 60.0 Hz	ASTM A804, 0.23 mm
	0.0413 W/kg	0.0187 W/lb	
	@Magnetic Field 0.400 T, Frequency 50.0 Hz	@Magnetic Field 0.400 T, Frequency 50.0 Hz	ASTM A804, 0.23 mm
	0.0554 W/kg	0.0251 W/lb	
	@Magnetic Field 0.400 T, Frequency 60.0 Hz	@Magnetic Field 0.400 T, Frequency 60.0 Hz	ASTM A804, 0.23 mm
	0.0635 W/kg	0.0288 W/lb	
	@Magnetic Field 0.500 T, Frequency 50.0 Hz	@Magnetic Field 0.500 T, Frequency 50.0 Hz	ASTM A804, 0.23 mm
	0.0852 W/kg	0.0386 W/lb	
	@Magnetic Field 0.500 T, Frequency 60.0 Hz	@Magnetic Field 0.500 T, Frequency 60.0 Hz	ASTM A804, 0.23 mm
	0.0903 W/kg	0.0410 W/lb	
	@Magnetic Field 0.600 T, Frequency 50.0 Hz	@Magnetic Field 0.600 T, Frequency 50.0 Hz	ASTM A804, 0.23 mm

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