AK Steel TRAN-COR® H-2 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-2-CARLITE-DR-Grain-Oriented-Electrical-Steel.php

Physical Properties	Metric	English	Comments
Density	7.65 g/cc	0.276 lb/in³	
Thickness	270 - 310 microns	10.6 - 12.2 mil	
	300 microns	11.8 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)	0.00171 RMS AT/cm @Magnetic Field 0.100 T, Frequency 50.0 Hz	0.00270 RMS VA/lb @Magnetic Field 0.100 T, Frequency 50.0 Hz	ASTM A804, 0.30 mm
	0.00215 RMS AT/cm @Magnetic Field 0.100 T, Frequency 60.0 Hz	0.00340 RMS VA/lb @Magnetic Field 0.100 T, Frequency 60.0 Hz	ASTM A804, 0.30 mm
	0.00601 RMS AT/cm @Magnetic Field 0.200 T, Frequency 50.0 Hz	0.00950 RMS VA/lb @Magnetic Field 0.200 T, Frequency 50.0 Hz	ASTM A804, 0.30 mm
	0.00772 RMS AT/cm @Magnetic Field 0.200 T, Frequency 60.0 Hz	0.0122 RMS VA/lb @Magnetic Field 0.200 T, Frequency 60.0 Hz	ASTM A804, 0.30 mm
	0.0126 RMS AT/cm @Magnetic Field 0.300 T, Frequency 50.0 Hz	0.0199 RMS VA/lb @Magnetic Field 0.300 T, Frequency 50.0 Hz	ASTM A804, 0.30 mm
	0.0163 RMS AT/cm @Magnetic Field 0.300 T, Frequency 60.0 Hz	0.0257 RMS VA/lb @Magnetic Field 0.300 T, Frequency 60.0 Hz	ASTM A804, 0.30 mm
	0.0212 RMS AT/cm @Magnetic Field 0.400 T, Frequency 50.0 Hz	0.0335 RMS VA/lb @Magnetic Field 0.400 T, Frequency 50.0 Hz	ASTM A804, 0.30 mm
	0.0274 RMS AT/cm @Magnetic Field 0.400 T, Frequency 60.0 Hz	0.0433 RMS VA/lb @Magnetic Field 0.400 T, Frequency 60.0 Hz	ASTM A804, 0.30 mm
	0.0314 RMS AT/cm @Magnetic Field 0.500 T, Frequency 50.0 Hz	0.0496 RMS VA/lb @Magnetic Field 0.500 T, Frequency 50.0 Hz	ASTM A804, 0.30 mm
	0.0407 RMS AT/cm @Magnetic Field 0.500 T, Frequency 60.0 Hz	0.0644 RMS VA/lb @Magnetic Field 0.500 T, Frequency 60.0 Hz	ASTM A804, 0.30 mm
	0.0433 RMS AT/cm	0.0684 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	ASTM A804, 0.30 mm
	0.0562 RMS AT/cm @Magnetic Field 0.600 T, Frequency 60.0 Hz	0.0888 RMS VA/lb @Magnetic Field 0.600 T, Frequency 60.0 Hz	ASTM A804, 0.30 mm
	0.0568 RMS AT/cm @Magnetic Field 0.700 T, Frequency 50.0 Hz	0.0897 RMS VA/lb @Magnetic Field 0.700 T, Frequency 50.0 Hz	ASTM A804, 0.30 mm
	0.07219 RMS AT/cm @Magnetic Field 0.800 T, Frequency 50.0 Hz	0.1141 RMS VA/lb @Magnetic Field 0.800 T, Frequency 50.0 Hz	ASTM A804, 0.30 mm
	0.07390 RMS AT/cm @Magnetic Field 0.700 T, Frequency 60.0 Hz	0.1168 RMS VA/lb @Magnetic Field 0.700 T, Frequency 60.0 Hz	ASTM A804, 0.30 mm
	0.08972 RMS AT/cm @Magnetic Field 0.900 T, Frequency 50.0 Hz	0.1418 RMS VA/lb @Magnetic Field 0.900 T, Frequency 50.0 Hz	ASTM A804, 0.30 mm
	0.09377 RMS AT/cm @Magnetic Field 0.800 T, Frequency 60.0 Hz	0.1482 RMS VA/lb @Magnetic Field 0.800 T, Frequency 60.0 Hz	ASTM A804, 0.30 mm
	0.1102 RMS AT/cm @Magnetic Field 1.00 T, Frequency 50.0 Hz	0.1741 RMS VA/lb @Magnetic Field 1.00 T, Frequency 50.0 Hz	ASTM A804, 0.30 mm
	0.1165 RMS AT/cm @Magnetic Field 0.900 T, Frequency 60.0 Hz	0.1841 RMS VA/lb @Magnetic Field 0.900 T, Frequency 60.0 Hz	ASTM A804, 0.30 mm
	0.1340 RMS AT/cm @Magnetic Field 1.10 T, Frequency 50.0 Hz	0.2118 RMS VA/lb @Magnetic Field 1.10 T, Frequency 50.0 Hz	ASTM A804, 0.30 mm
	0.1432 RMS AT/cm @Magnetic Field 1.00 T, Frequency 60.0 Hz	0.2264 RMS VA/lb @Magnetic Field 1.00 T, Frequency 60.0 Hz	ASTM A804, 0.30 mm

Electrical Properties	Metric	English	Comments
	@Magnetic Field 1.20 T, Frequency 50.0 Hz	@Magnetic Field 1.20 T, Frequency 50.0 Hz	ASTM A804, 0.30 mm
	0.174 RMS AT/cm @Magnetic Field 1.10 T, Frequency 60.0 Hz	0.275 RMS VA/lb @Magnetic Field 1.10 T, Frequency 60.0 Hz	ASTM A804, 0.30 mm
	0.1953 RMS AT/cm @Magnetic Field 1.30 T, Frequency 50.0 Hz	0.3086 RMS VA/lb @Magnetic Field 1.30 T, Frequency 50.0 Hz	ASTM A804, 0.30 mm
	0.2099 RMS AT/cm @Magnetic Field 1.20 T, Frequency 60.0 Hz	0.3318 RMS VA/lb @Magnetic Field 1.20 T, Frequency 60.0 Hz	ASTM A804, 0.30 mm
	0.2352 RMS AT/cm @Magnetic Field 1.40 T, Frequency 50.0 Hz	0.3718 RMS VA/lb @Magnetic Field 1.40 T, Frequency 50.0 Hz	ASTM A804, 0.30 mm
	0.2522 RMS AT/cm @Magnetic Field 1.30 T, Frequency 60.0 Hz	0.3986 RMS VA/lb @Magnetic Field 1.30 T, Frequency 60.0 Hz	ASTM A804, 0.30 mm
	0.2856 RMS AT/cm @Magnetic Field 1.50 T, Frequency 50.0 Hz	0.4514 RMS VA/lb @Magnetic Field 1.50 T, Frequency 50.0 Hz	ASTM A804, 0.30 mm
	0.3028 RMS AT/cm @Magnetic Field 1.40 T, Frequency 60.0 Hz	0.4786 RMS VA/lb @Magnetic Field 1.40 T, Frequency 60.0 Hz	ASTM A804, 0.30 mm
	0.3549 RMS AT/cm @Magnetic Field 1.60 T, Frequency 50.0 Hz	0.5609 RMS VA/lb @Magnetic Field 1.60 T, Frequency 50.0 Hz	ASTM A804, 0.30 mm
	0.3655 RMS AT/cm @Magnetic Field 1.50 T, Frequency 60.0 Hz	0.5777 RMS VA/lb @Magnetic Field 1.50 T, Frequency 60.0 Hz	ASTM A804, 0.30 mm
	0.4504 RMS AT/cm @Magnetic Field 1.60	0.7118 RMS VA/lb @Magnetic Field 1.60	ASTM A804, 0.30 mm

Electrical Properties	Metric	English	Comments
	0.4702 RMS AT/cm @Magnetic Field 1.70 T, Frequency 50.0 Hz	0.7432 RMS VA/lb @Magnetic Field 1.70 T, Frequency 50.0 Hz	ASTM A804, 0.30 mm
	0.5895 RMS AT/cm @Magnetic Field 1.70 T, Frequency 60.0 Hz	0.9318 RMS VA/lb @Magnetic Field 1.70 T, Frequency 60.0 Hz	ASTM A804, 0.30 mm
	0.77651 RMS AT/cm @Magnetic Field 1.80 T, Frequency 50.0 Hz	1.2273 RMS VA/lb @Magnetic Field 1.80 T, Frequency 50.0 Hz	ASTM A804, 0.30 mm
	0.95190 RMS AT/cm @Magnetic Field 1.80 T, Frequency 60.0 Hz	1.5045 RMS VA/lb @Magnetic Field 1.80 T, Frequency 60.0 Hz	ASTM A804, 0.30 mm
	2.8414 RMS AT/cm @Magnetic Field 1.90 T, Frequency 50.0 Hz	4.4909 RMS VA/lb @Magnetic Field 1.90 T, Frequency 50.0 Hz	ASTM A804, 0.30 mm
	3.5230 RMS AT/cm @Magnetic Field 1.90 T, Frequency 60.0 Hz	5.5682 RMS VA/lb @Magnetic Field 1.90 T, Frequency 60.0 Hz	ASTM A804, 0.30 mm
Electrical Resistivity	0.0000500 ohm-cm	0.0000500 ohm-cm	

Magnetic Properties	Metric	English	Comments
Core Loss	0.00361 W/kg @Magnetic Field 0.100 T, Frequency 50.0 Hz	0.00164 W/lb @Magnetic Field 0.100 T, Frequency 50.0 Hz	ASTM A804, 0.30 mm
	0.00487 W/kg @Magnetic Field 0.100 T, Frequency 60.0 Hz	0.00221 W/lb @Magnetic Field 0.100 T, Frequency 60.0 Hz	ASTM A804, 0.30 mm
	0.01382 W/kg @Magnetic Field 0.200 T, Frequency 50.0 Hz	0.006269 W/lb @Magnetic Field 0.200 T, Frequency 50.0 Hz	ASTM A804, 0.30 mm
	0.01871 W/kg	0.008487 W/lb	

Magnetic Properties	Metric	English	Comments
	@Magnetic Field 0.200 T, Frequency 60.0 Hz	@Magnetic Field 0.200 T, Frequency 60.0 Hz	ASTM A804, 0.30 mm
	0.0305 W/kg @Magnetic Field 0.300 T, Frequency 50.0 Hz	0.0138 W/lb @Magnetic Field 0.300 T, Frequency 50.0 Hz	ASTM A804, 0.30 mm
	0.0413 W/kg @Magnetic Field 0.300 T, Frequency 60.0 Hz	0.0187 W/lb @Magnetic Field 0.300 T, Frequency 60.0 Hz	ASTM A804, 0.30 mm
	0.0533 W/kg @Magnetic Field 0.400 T, Frequency 50.0 Hz	0.0242 W/lb @Magnetic Field 0.400 T, Frequency 50.0 Hz	ASTM A804, 0.30 mm
	0.0720 W/kg @Magnetic Field 0.400 T, Frequency 60.0 Hz	0.0327 W/lb @Magnetic Field 0.400 T, Frequency 60.0 Hz	ASTM A804, 0.30 mm
	0.0818 W/kg @Magnetic Field 0.500 T, Frequency 50.0 Hz	0.0371 W/lb @Magnetic Field 0.500 T, Frequency 50.0 Hz	ASTM A804, 0.30 mm
	0.1103 W/kg @Magnetic Field 0.500 T, Frequency 60.0 Hz	0.05003 W/lb @Magnetic Field 0.500 T, Frequency 60.0 Hz	ASTM A804, 0.30 mm
	0.1159 W/kg @Magnetic Field 0.600 T, Frequency 50.0 Hz	0.05257 W/lb @Magnetic Field 0.600 T, Frequency 50.0 Hz	ASTM A804, 0.30 mm

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