AK Steel TRAN-COR® H-1 CARLITE® 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-1-CARLITE-Grain-Oriented-Electrical-Steel.php

Physical Properties	Metric	English	Comments
Density	7.65 g/cc	0.276 lb/in³	
Thickness	240 - 280 microns	9.45 - 11.0 mil	
	270 microns	10.6 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)	0.00196 RMS AT/cm @Magnetic Field 0.100 T, Frequency 50.0 Hz	0.00310 RMS VA/lb @Magnetic Field 0.100 T, Frequency 50.0 Hz	ASTM A343, 0.23 mm
	3.1693 RMS AT/cm @Magnetic Field 1.90 T, Frequency 60.0 Hz	5.0091 RMS VA/lb @Magnetic Field 1.90 T, Frequency 60.0 Hz	ASTM A804, 0.27 mm
Electrical Resistivity	0.0000500 ohm-cm	0.0000500 ohm-cm	

Magnetic Properties	Metric	English	Comments
Core Loss	0.00362 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, 0.27 mm
	2.11 W/kg @Magnetic Field 1.90 T, Frequency 60.0 Hz	0.957 W/lb @Magnetic Field 1.90 T, Frequency 60.0 Hz	ASTM A343, 0.23 mm

Descriptive Properties	Value	Comments
Approximate Equivalent International Grade	M100-27P5	
Magnetostriction 10^8	-39	ASTM A876, 1.4T, 60Hz, 0.27 mm
	-40	ASTM A876, 1.5T, 60Hz, 0.27 mm
	-44	ASTM A876, 1.6T, 60Hz, 0.27 mm
	-48	ASTM A876, 1.7T, 60Hz, 0.27 mm
Maximum Induction at 800 A/m (T)	1.88	
Minimum Lamination Factor (%)	95	
Typical Induction at 800 A/m (T)	1.918	
Typical Lamination Factor (%)	97	

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