

# OPTICORE™

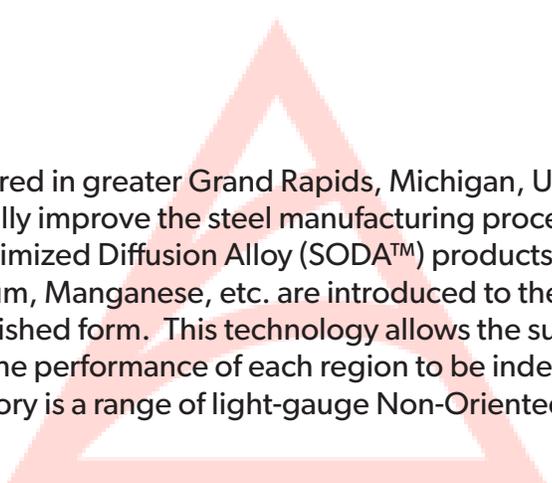
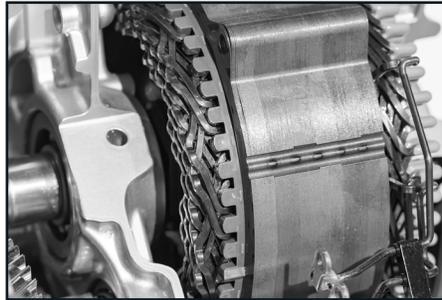
0.004" (0.10-mm)

**Opticore 4 Non-Oriented Electrical Steel**

SPATIALLY OPTIMIZED DIFFUSION ALLOY (SODA)

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**Opticore 4** is a fully processed, non-oriented electrical steel designed for use in high-frequency applications such as highspeed motors and generators used in the aerospace and medical industries, amongst others. Opticore 7 is made using Arcanum Alloys' spatially optimized diffusion alloy (SODA™) manufacturing technology and is offered at a nominal thickness of 0.004 inches.



Arcanum Alloys Inc., head-quartered in greater Grand Rapids, Michigan, USA, uses a revolutionary platform technology to dramatically improve the steel manufacturing process. Arcanum Alloys uses its technology to make Spatially Optimized Diffusion Alloy (SODA™) products. In the SODA process, alloying elements such as Silicon, Aluminum, Manganese, etc. are introduced to the steel by vapor transport after it has reached a finished or semi-finished form. This technology allows the surface and bulk properties of the steel to be decoupled, allowing the performance of each region to be independently optimized. Arcanum Alloys' Opticore™ product category is a range of light-gauge Non-Oriented Electrical Steels (NOES).



## SPECIFICATIONS

### MAGNETIC CORE LOSS

**Core Loss (W/kg) at Polarization/Frequency (Tesla/Hz)**

1.0/50	1.0/400	1.0/1000	1.0/1500	1.0/2000	1.0/2500	0.2/5000	0.1/10k	0.05/20k
0.8	9.5	32.1	55.7	83.8	115.8	15.7	11.6	9.0

Typical core loss properties of Opticore 4 after stress relief at 850°C in H<sub>2</sub>, measured using a 150-mm x 150-mm single sheet test apparatus with 90 primary windings and 90 secondary windings, constructed in accordance with IEC 60404-3, on a Brockhaus MPG-200D.

### MAGNETIC INDUCTION

50-Hz

1000-Hz

Magnetic Induction at 400-A/m (B<sub>4</sub>):

1.39-T

1.39-T

Magnetic Induction at 2500-A/m (B<sub>25</sub>):

1.61-T

1.61-T

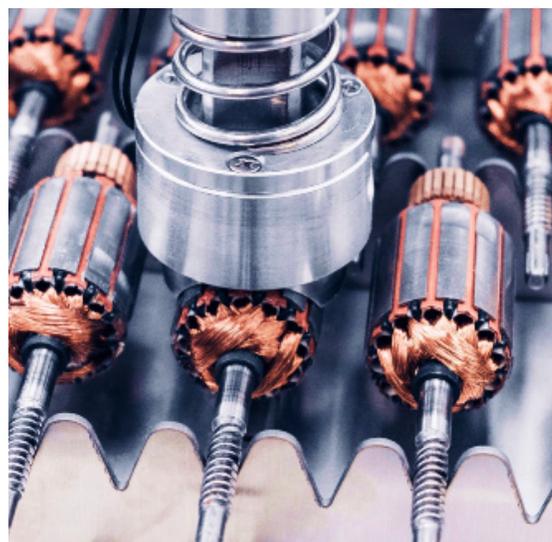
Magnetic Induction at 5000-A/m (B<sub>50</sub>):

1.72-T

1.71-T

### OTHER TYPICAL PROPERTIES

Density:	7.55-g/cm <sup>3</sup>
Resistivity:	42-μΩ·cm
Yield Strength:	42-KSI (290-MPa)
Tensile Strength:	55-KSI (379-MPa)
% Elongation in 2":	13%
Hardness (Knoop):	171 HK
Nominal Thickness:	0.004" (0.10-mm)
Thickness Variation:	± 0.0005" (0.02-mm)
Coeff. of Thermal Expansion:	12.6E-6-K <sup>-1</sup>



The information and data contained within this document are accurate to the best of Arcanum Alloys Incorporated's knowledge, and are intended for general information and illustrative purposes only. The applications suggested for Opticore materials are listed only to help readers make their own evaluations and decisions. The applications are suggested but are neither guarantees nor are they to be construed as express or implied warranties of material suitability for these or other applications. Arcanum Alloys and the Phase Diagram Logo are registered trademarks of Arcanum Alloys Incorporated. ©2020 Arcanum Alloys. All rights reserved. 9/20Rev3