Arnokrome™ 3

Arnokrome™ 3 is a ductile permanent magnet alloy developed by Arnold Magnetic Technologies, based on the iron-chromium-cobalt alloy system. Since the cobalt content is relatively lower than in alternative magnetic alloys, Arnokrome 3 may offer a significant advantage in replacement situations in terms of price stability. The alloy has good ductility which permits the manufacture of a wide variety of products formed from strip products. Arnokrome 3 may be sheered, stamped, drawn, and blanked. By adjusting the heat treatment, the alloy's magnetic properties can be tailored to lower coercive permanent magnet applications. Arnokrome 3 is isotropic and supplied in the heat treated form, with applications primarily being in sensor systems. By controlled heat treatment, coercive force is varied to specific levels between 50 and 300 Oersteds to optimize the performance of the material for the customer's application. Arnold Magnetic Technologies' applications personnel are available to provide technical assistance to potential customers in their evaluation of Arnokrome 3.

Chemistry

Chromium: 26 to 30%	**Cobalt:** 7 – 10%	**Iron:** Balance

Mechanical Properties

	Solution Heat (Treated condition)	**Heat Treated** (For desired Hc level)
Tensile Strength	75,000 psi	120,000 psi
Yield Strength	50,000 psi	115,000 psi
% Elongation	25	6
Hardness	Rb 75	Rc 25

Magnetic Properties

Magnetic Remanence (gauss)	9,000 - 12,000 Br
Coercivity (Oersteds)	50 - 300 Hc
Energy Product (MGOe)	0.4 – 1.2 MGOe
Temperature - Coefficient of Magnetization	-0.02%/°C
Curie Temperature	625°C
Orientation	Isotropic

Physical Properties

Density	0.277 lbs/cu in (7.6 g/cc)
Thickness Available	0.0008" (0.02mm) - 0.02" (0.51mm)
Widths Available	0.062" (1.575mm) to 9" (228.6mm)
Electrical Resistivity (25°C)	69 x 10^{-6} ohm-cm
Thermal Conductivity (100°C)	0.05 cal/sq cm/cm/sec/,°C
Thermal Expansion (30° to 100°C)	8.67 x 10^{-6} cm-cm^{-1}-°C
Temperature Range: 30° to 400°C	Mean Expansion Coefficient (cm-cm^{-1}-$°C^{-1}$): 10.4 x 10^{-6}
30° to 300°C	10.2 x 10^{-6}
30° to 200°C	9.84 x 10^{-6}
30° to 100°C	8.67 x 10^{-6}

FAST FACTS

When choosing Arnokrome 3, the following factors should be considered:

Magnetic Characteristics:
Arnokrome 3 is best suited for low coercivity applications. Br = 11,000 Gauss Hc = 50-300 Oersteds.

Ductility:
Arnokrome 3 is cold rollable to 0.0005" (.013mm) thick foil, and can be supplied in widths from 0.062" (1.575mm) to 9" (228.6 mm).

Cost:
Due to the nature of the heat treat cycle required to develop magnetic characteristics, the lower coercivities are less expensive. As the coercivity increases, so does the time required for the heat treat cycle.

Forms Available
Arnokrome 3 is commercially available as rolled strip in 0.0008" (0.02mm) - 0.02" (0.51 mm) thicknesses.

With more than four decades of precision rolling experience, Arnold Magnetic Technologies is intimately familiar with the potential magnetic properties of a broad range of magnetic materials.

Our knowledge of the most efficient and effective means of maximizing the potential of various materials has led to the development of numerous alloy innovations, including Arnokrome 3.

If needed, Arnold engineers can help you customize the properties of Arnokrome 3 to satisfy a wide spectrum of magnetic strip and foil applications.

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