MuMETAL® ALLOY for FABRICATED SHIELDS

Greek Letter μ (Mu) Represents Permeability of Mu-Metal

**HISTORY OF μ (Mu) METAL**

μ (Mu) - The 23rd letter of the Greek alphabet, is used in physics & engineering formulae to represent permeability, the measure of a material's ability to support the formation, or absorption, of a magnetic field within itself. In other words, permeability (μ) is a value representing the degree of magnetization obtained in a material from an externally applied field. Because our alloy provides maximum permeability in magnetic shielding, it has been permanently named after the Greek letter μ (Mu). For decades, scientists, engineers, metal suppliers and fabricators have referred to MuMETAL® as the industry standard. However, MuMETAL® is a registered trade name and exclusively available from Magnetic Shield Corporation, a worldwide leader in low frequency magnetic shielding.

As a leading expert since 1941, Magnetic Shield Corporation has developed thousands of technical solutions, supplied millions of fabricated shields, and refined our shielding materials to be the most effective alloys available. MuMETAL® has been formulated to provide maximum magnetic permeability (highest degree of shielding) for use in most electrical/electronic applications found today. Currently, the company is the most respected shielding alloy by OEMs, fabricators, laboratories & universities, and specialty alloy distributors.

**PRODUCT RANGE:**

<table>
<thead>
<tr>
<th>Thickness (mm)</th>
<th>Stock Type</th>
<th>MuMETAL® Thickness comfort zone</th>
<th>Co-NETIC® AA</th>
<th>NETIC® Alloys</th>
<th>NETIC® Alloys</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.02 (0,0008)</td>
<td>foil (fd)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>0.03 (0,0012)</td>
<td>foil (fd)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>0.04 (0,0016)</td>
<td>foil (fd)</td>
<td>X</td>
<td>X</td>
<td>X</td>
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</tr>
<tr>
<td>0.05 (0,0020)</td>
<td>foil (fd)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>0.06 (0,0024)</td>
<td>foil (fd)</td>
<td>X</td>
<td>X</td>
<td>X</td>
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</tr>
<tr>
<td>0.08 (0,0032)</td>
<td>foil (fd)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>0.10 (0,0040)</td>
<td>foil (fd)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>0.12 (0,0048)</td>
<td>foil (fd)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>0.14 (0,0056)</td>
<td>foil (fd)</td>
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<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>0.16 (0,0064)</td>
<td>foil (fd)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>0.18 (0,0072)</td>
<td>foil (fd)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>0.20 (0,0080)</td>
<td>foil (fd)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

**CO-NETIC** is also used where high attenuation is desired. As fabricated, it is used for shielded applications by specifying, when desired, the material's grain structure, an important mechanical property for ultimate shielding performance. Co-NETIC AA Perfectly Annealed material is available in stock for sheet stock gauges from 0.062” to 0.080” thickness (0.132 mm to 0.203 mm).

**NETIC** is often applied in fields of high intensity strong fields because of its high magnetic saturation characteristics. NETIC is commonly used in combination (in layers) with Co-NETIC or MuMETAL® with the NETIC layer placed closest to the source of interference. Used for either fabricated or flat shields, it may be annealed for better performance. NETIC is available in foil & sheet stock gauges from 0.062” to 0.095” thickness (1.322 mm to 2.362 mm).

**TYPICAL ANNEALED PROPERTIES:**

- DC μ @ 100 gauss
- AC μ @ 100 gauss
- Hardness
- Electrical Resistivity
- Elongation
- Grain Diameter
- Rockwell Hardness

**TYPICAL MAGNETIC PROPERTIES:**

- DC μ (gauss) @ 100 gauss
- AC μ (gauss) @ 100 gauss
- Curie Point

**SPECSIFICATIONS:**

MuMetal conforms to ASTM B 751-96 Alloys 4 and 5. N 44441C, Composition 3

**ZERO GAUSS CHAMBERS:**

MuMETAL® Zero Gauss Chambers are designed to be used in applications where the Earth's magnetic field is not an issue. These chambers are typically used in low magnetic field environments where low flux levels are required, the right shielding alloy can now be selected.

MuMETAL® is a leading expert since 1941, Magnetic Shield Corporation has developed thousands of technical solutions, supplied millions of fabricated shields, and refined our shielding materials to be the most effective alloys available. MuMETAL® has been formulated to provide maximum magnetic permeability (highest degree of shielding) for use in most electrical/electronic applications found today. Currently, the company is the most respected shielding alloy by OEMs, fabricators, laboratories & universities, and specialty alloy distributors.

**CONTACT US TODAY**

**ORDER ONLINE**

www.magnetic-shield.com

P: 630-766-7800

**ORDERS & TECHNICAL SUPPORT**

shields@magnetic-shield.com

**EMAIL US**

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MuMetal © Official Site

MuMetal® Highest permeability alloy

In stock at Magnetic Shield Corp.

www.magnetic-shield.com

MuMetal® Zero Gauss Chambers, visit www.magnetic-shield.com
FABRICATED SHIELDS & FINISHING

FABRICATION
When your shield design requires severe forming, stamping and/or welding, specifying MuMETAL® on your drawings insures you will receive the highest level of initial permeability and shielding efficiency available. And, MuMETAL® is formulated and manufactured to exacting standards which allow consistent fabrication and final anneal.

Not only does Magnetic Shield Corporation offer MuMETAL® alloy, we can provide a full range of manufacturing services. From your drawing or sketch, we can waterjet, laser, EDM, shear, slit, punch, blank, stamp, chemical etch, form, bend, roll, spot-weld, heliarc weld, and/or laser weld. Using MuMETAL® alloy, we can produce complete magnetic shields, to your drawings or specifications.

FINAL ANNEAL
After fabrication, final annealing is required to increase grain structure, which improves shielding efficiency. MuMETAL® magnetic shields are Perfection Annealed (fully annealed in a controlled hydrogen atmosphere) to Magnetic Shield Corporation’s exacting standards. Optimum magnetic properties of MuMETAL® are obtained by annealing at a temperature of 2050°F [1121°C], and cooling at a consistent rate which is critical to maintaining grain structure and part dimensions. To insure your shield is annealed properly, we can measure attenuation (a shield’s ability to absorb magnetic energy) in our ISO 9001:2008 certified Quality Control Lab. Fully annealed MuMETAL® offers magnetic properties that are considered the best available for most applications worldwide.

FINISHING
After full anneal, MuMETAL® shielding alloy exhibits a clean, bright surface condition. Also, because of its high nickel content, MuMETAL® alloy is corrosion resistant. Consequently, MuMETAL® alloys are usually used as annealed, without further finishing operations. We do offer a variety of finishing operations including painting, powder coating, polishing and plating to customers requiring additional corrosion resistance or cosmetically pleasing finished parts.

You are invited to call our Engineering Department to discuss your fabrication and finishing requirements. For a prompt and accurate quotation, send a drawing, sketch, or written description to shields@magnetic-shield.com.