Introduction

History

The history of magnetism began with the discovery of the properties of a mineral called magnetite (Fe₃O₄). The most plentiful deposits were found in the district of Magnesia in Asia Minor (hence the mineral’s name) where it was observed, centuries before the birth of Christ, that these naturally occurring stones would attract iron. Later on it found application in the lodestone of early navigators. In 1600 William Gilbert published De Magnete, which would attract iron. Later on it found application in the lodestone before the birth of Christ, that these naturally occurring stones (hence the mineral’s name) where it was observed, centuries deposits were found in the district of Magnesia in Asia Minor.

During the last 50 years the basic constituents of ferrites have changed little, but purity of raw materials and process control have improved dramatically. Ferrites are ceramic materials with the general chemical formula MO.Fe₂O₄, where MO is one or more divalent metal oxides blended with 48 to 60 mole percent of iron oxide. Fair-Rite manufactures three broad groups of soft ferrite materials:

- Manganese zinc (Fair-Rite 31, 33, 73, 75, 76, 77 and 78 material)
- Nickel zinc (Fair-Rite 42, 43, 44, 51, 61, 67 and 68 material)
- Manganese (Fair-Rite 85 material)

Manganese zinc ferrites are completely vitrified and have very low porosity. They have the highest permeabilities and exhibit volume resistivities ranging from one hundred to several thousand ohm-centimeter. Manganese zinc ferrite components are used in tuned circuits and magnetic power designs from the low kilohertz range into the broadcast spectrum. These ferrites have a linear expansion coefficient of approximately 10 ppm/°C.

The nickel zinc ferrites vary in porosity, and frequently contain oxides of other metals, such as those of magnesium, manganese, copper or cobalt. Volume resistivities range from several kilohm-centimeter to tens of megohm-centimeter. In general, they are used at higher frequencies (above 1 MHz), and are suitable for low flux density applications. Nickel zinc ferrite components are used in tuned circuits and magnetic power designs from the low kilohertz range into the broadcast spectrum. These ferrites have a linear expansion coefficient of approximately 8 ppm/°C.

The manganese ferrite is a dense, temperature stable material displaying a high degree of squareness in its hysteresis loop. This makes this material uniquely suited for such applications as multiple output control in switched-mode power supplies and high frequency magnetic amplifiers.

As is evident from the flow diagram on page 3, there is considerable processing involved, and the manufacturing cycle will take a minimum of two weeks. The parts listed in the catalog represent a broad cross section of the wide variety of cores produced by Fair-Rite Products. Large OEM quantities are manufactured by Fair-Rite to order. Most of the more commonly used parts are stocked by our distributors, offering prompt deliveries. For a complete listing of our distributors visit our site on the Internet at www.fair-rite.com.

Many of the parts produced by Fair-Rite are made to customer specifications, and we welcome inquiries involving application-specific designs. We have the capability to design tooling rapidly, and have it fabricated either by our own tool shop or by outside vendors.

*Footnote: The difference between hard and soft ferrite is not tactile, but rather a magnetic characteristic. Soft ferrite does not retain significant magnetization, whereas hard ferrite magnetization is considered permanent.
Introduction

Simplified Process Flow Diagram

Iron Oxide ➔ Batch and Mix ➔ Calcine (Pre-Fire) ➔ Mill ➔ Spray Dry ➔ Form

Binders ➔ Lubricants

X-Ray Fluorescence Chemical Analysis

Off-Kiln QC Inspection ➔ Sinter (Fire) ➔ Grind ➔ Gap ➔ Anneal ➔ Assemble ➔ Coat ➔ Pack & Ship

Pot Cores E Cores EP Cores PQ Cores ETD Cores U Cores Bobbins

Beads Toroids Assembled Multi-Aperture Cores

Anneal

Final QC Inspection

Burnish

Assembled Bobbins

Grind

Fair-Rite Products Corp.  Ferrite Cores
CAGE # 34899  Standard Industrial Classification (SIC) 3264
Federal ID# 141389596  North American Industry
Classification System (NAICS) 327113

Fair-Rite Products Corp.
P.O. Box J, One Commercial Row, Wallkill, NY 12589-0288  Note: (914) Area Code has changed to (845).
Phone: (888) FAIR RITE / (845) 895-2055  •  FAX: (888) FERRITE / (845) 895-2629  •  www.fair-rite.com  •  E-Mail: ferrites@fair-rite.com
(888) 324-7748  •  (888) 337-7483
## Magnetic Properties of Ferrite Materials

<table>
<thead>
<tr>
<th>Property</th>
<th>Unit</th>
<th>Symbol</th>
<th>68</th>
<th>67</th>
<th>61</th>
<th>51*</th>
<th>44</th>
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<tr>
<td>Initial Permeability @ B &lt;10 gauss</td>
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<td>$\mu_i$</td>
<td>20</td>
<td>40</td>
<td>125</td>
<td>350</td>
<td>500</td>
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<tr>
<td>Flux Density @ Field Strength</td>
<td>gauss</td>
<td>$B$</td>
<td>2700</td>
<td>2300</td>
<td>2350</td>
<td>3200</td>
<td>3000</td>
</tr>
<tr>
<td></td>
<td>mT</td>
<td>$B$</td>
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<td>230</td>
<td>235</td>
<td>320</td>
<td>300</td>
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<tr>
<td></td>
<td>oersted</td>
<td>$B$</td>
<td>40</td>
<td>20</td>
<td>15</td>
<td>10</td>
<td>10</td>
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<tr>
<td></td>
<td>A/m</td>
<td>$B$</td>
<td>3200</td>
<td>1600</td>
<td>1200</td>
<td>800</td>
<td>800</td>
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<td>Residual Flux Density</td>
<td>gauss</td>
<td>$B_r$</td>
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<td>Coercive Force</td>
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<td></td>
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</table>

42 Material, specifically developed for absorber applications in anechoic chambers, is listed on page 126.

* New Fair-Rite material, added in this edition of the catalog.

Additional ferrite mechanical and thermal characteristics are tabulated on page 159.
## Magnetic Properties of Ferrite Materials

<table>
<thead>
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<td>&gt;130</td>
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<td>&gt;160</td>
<td>&gt;140</td>
<td>&gt;120</td>
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<td>–</td>
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<td>–</td>
<td>&lt;0.1</td>
<td>&lt;0.5</td>
<td>–</td>
<td>&lt;0.1</td>
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<td>&lt;0.15</td>
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<td>–</td>
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</tr>
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<td>16</td>
<td>18</td>
<td>20</td>
<td>21</td>
<td>22</td>
</tr>
</tbody>
</table>
68 Material

Our highest frequency NiZn ferrite intended for broadband transformers, antennas and HF high Q inductor applications up to 100 MHz. This material is only supplied to customer-specific requirements and close consultation with our application staff is suggested.

Strong magnetic fields or excessive mechanical stresses may result in irreversible changes in permeability and losses.

<table>
<thead>
<tr>
<th>Property</th>
<th>Unit</th>
<th>Symbol</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Permeability</td>
<td></td>
<td>( \mu_i )</td>
<td>20</td>
</tr>
<tr>
<td>@ B &lt; 10 gauss</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flux Density</td>
<td>gauss</td>
<td>B</td>
<td>2700</td>
</tr>
<tr>
<td>@ Field Strength</td>
<td>oersted</td>
<td>H</td>
<td>40</td>
</tr>
<tr>
<td>Residual Flux Density</td>
<td>gauss</td>
<td>( B_r )</td>
<td>1000</td>
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<tr>
<td>Coercive Force</td>
<td>oersted</td>
<td>( H_c )</td>
<td>7.0</td>
</tr>
<tr>
<td>Loss Factor</td>
<td></td>
<td>( \tan \delta \mu_i )</td>
<td>500</td>
</tr>
<tr>
<td>@ Frequency</td>
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<td>MHz</td>
<td>100</td>
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<tr>
<td>Temperature Coefficient of Initial Permeability (20-70°C)</td>
<td>%/°C</td>
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<tr>
<td>Curie Temperature</td>
<td>°C</td>
<td>( T_c )</td>
<td>&gt;500</td>
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<tr>
<td>Resistivity</td>
<td>( \Omega ) cm</td>
<td>( \rho )</td>
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</tbody>
</table>

Measured on an 18/10/6mm toroid using the HP 4284A and the HP 4291A.

Complex Permeability vs. Frequency

Initial Permeability vs. Temperature

Hysteresis Loop

Measured on an 18/10/6mm toroid at 10kHz.
67 Material

A high frequency NiZn ferrite for the design of broadband transformers, antennas and HF, high Q inductor applications up to 50 MHz. This material is only supplied to customer-specific requirements and close consultation with our application staff is suggested.

Strong magnetic fields or excessive mechanical stresses may result in irreversible changes in permeability and losses.

Complex Permeability vs. Frequency

Initial Permeability vs. Temperature

Hysteresis Loop

<table>
<thead>
<tr>
<th>Property</th>
<th>Unit</th>
<th>Symbol</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Permeability @ B &lt; 10 gauss</td>
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<td>(\mu_i)</td>
<td>40</td>
</tr>
<tr>
<td>Flux Density @ Field Strength</td>
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<td>(B)</td>
<td>2300</td>
</tr>
<tr>
<td></td>
<td>oersted</td>
<td>(H)</td>
<td>20</td>
</tr>
<tr>
<td>Residual Flux Density</td>
<td>gauss</td>
<td>(B_r)</td>
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<tr>
<td>Coercive Force</td>
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<td>(10^{-1}) tanh (5\mu_i)</td>
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<td>(%/°C)</td>
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<td>cm</td>
<td>(\rho)</td>
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Measured on an 19/10/6mm toroid using the HP 4284A and the HP 4291A.

Measured on a 19/10/6mm toroid at 100kHz.

Measured on a 19/10/6mm toroid at 10kHz.
61 Material

A high frequency NiZn ferrite developed for a range of inductive applications up to 25 MHz. This material is also used in EMI applications for suppression of noise frequencies above 200 MHz.

EMI suppression beads, beads on leads, SM beads, wound beads, multi-aperture cores, round cable EMI suppression cores, rods, RFID rods, and toroids are all available in 61 material.

Strong magnetic fields or excessive mechanical stresses may result in irreversible changes in permeability and losses.

### 61 Material Specifications:

<table>
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<tr>
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<tr>
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<td>Residual Flux Density</td>
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<td>Loss Factor @ Frequency</td>
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<td>Resistivity</td>
<td>Ω cm</td>
<td>$\rho$</td>
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**Complex Permeability vs. Frequency**

Measured on a 19/10/6mm toroid using the HP 4284A and the HP 4291A.

**Initial Permeability vs. Temperature**

Measured on a 19/10/6mm toroid at 100kHz.

**Hysteresis Loop**

Measured on a 19/10/6mm toroid at 10kHz.

**Percent of Original Impedance vs. Temperature**

Measured on a 2661000301 using the HP4291A.
This NiZn is our most popular ferrite for suppression of conducted EMI from 20 MHz to 250 MHz. This material is also used for inductive applications such as high frequency common-mode chokes.

EMI suppression beads, beads on leads, SM beads, multi-aperture cores, round cable EMI suppression cores, split round EMI suppression cores, round cable snap-its, flat cable EMI suppression cores, flat cable snap-its, miscellaneous suppression cores, bobbins, and toroids are all available in 43 material.

<table>
<thead>
<tr>
<th>Property</th>
<th>Unit</th>
<th>Symbol</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Permeability @ B &lt; 10 gauss</td>
<td>µₐ</td>
<td></td>
<td>850</td>
</tr>
<tr>
<td>Flux Density</td>
<td>gauss</td>
<td>B</td>
<td>2900</td>
</tr>
<tr>
<td>@ Field Strength</td>
<td>oersted</td>
<td>H</td>
<td>10</td>
</tr>
<tr>
<td>Residual Flux Density</td>
<td>gauss</td>
<td>Bᵣ</td>
<td>1300</td>
</tr>
<tr>
<td>Coercive Force</td>
<td>oersted</td>
<td>H₀</td>
<td>0.45</td>
</tr>
<tr>
<td>Loss Factor</td>
<td>10⁻²</td>
<td>tanδµₐ</td>
<td>250</td>
</tr>
<tr>
<td>@ Frequency</td>
<td>MHz</td>
<td></td>
<td>1.0</td>
</tr>
<tr>
<td>Temperature Coefficient of Initial Permeability (20-70°C)</td>
<td>%/°C</td>
<td></td>
<td>1.25</td>
</tr>
<tr>
<td>Curie Temperature</td>
<td>°C</td>
<td>Tₛ</td>
<td>&gt;130</td>
</tr>
<tr>
<td>Resistivity</td>
<td>Ω cm</td>
<td>ρ</td>
<td>1x10⁻⁵</td>
</tr>
</tbody>
</table>

Measured on a 17/10/6mm toroid using the HP 4284A and the HP 4291A.

Measured on a 17/10/6mm toroid at 100kHz.

Measured on a 2643000301 using the HP4291A.

Measured on a 17/10/6mm toroid at 10kHz.
A new MnZn ferrite designed specifically for EMI suppression applications from as low as 1 MHz up to 500 MHz. This material does not have the dimensional resonance limitations associated with conventional MnZn ferrite materials.

EMI suppression beads, round cable EMI suppression cores, round cable snap-its, flat cable EMI suppression cores, and flat cable snap-its are all available in 31 material.

### 31 Material Specifications:

<table>
<thead>
<tr>
<th>Property</th>
<th>Unit</th>
<th>Symbol</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Permeability</td>
<td></td>
<td>(\mu_i)</td>
<td>1500</td>
</tr>
<tr>
<td>@ (B &lt; 10) gauss</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flux Density</td>
<td>gauss</td>
<td>(B)</td>
<td>3400</td>
</tr>
<tr>
<td>@ Field Strength</td>
<td>oersted</td>
<td>(H)</td>
<td>5</td>
</tr>
<tr>
<td>Residual Flux Density</td>
<td>gauss</td>
<td>(B_r)</td>
<td>2500</td>
</tr>
<tr>
<td>Coercive Force</td>
<td>oersted</td>
<td>(H_c)</td>
<td>0.35</td>
</tr>
<tr>
<td>Loss Factor</td>
<td>(10^{-4})</td>
<td>(\tan\delta\mu)</td>
<td>20</td>
</tr>
<tr>
<td>@ Frequency</td>
<td>MHz</td>
<td></td>
<td>0.1</td>
</tr>
<tr>
<td>Temperature Coefficient of Initial Permeability</td>
<td>%/°C</td>
<td>1.6</td>
<td></td>
</tr>
<tr>
<td>Curie Temperature</td>
<td>°C</td>
<td>(T_c)</td>
<td>&gt;130</td>
</tr>
<tr>
<td>Resistivity</td>
<td>Ω cm</td>
<td>(\rho)</td>
<td>3x10^3</td>
</tr>
</tbody>
</table>

---

**Complex Permeability vs. Frequency**

Measured on a 17/10/6mm toroid at 25°C using the HP 4284A and the HP 4291A.

**Initial Permeability vs. Temperature**

Measured on a 17/10/6mm toroid at 100kHz.

**Percent of Original Impedance vs. Temperature**

Measured on a 2631000301 using the HP4291A.

**Hysteresis Loop**

Measured on a 17/10/6mm toroid at 10kHz.
77 Material

A MnZn ferrite for use in a wide range of high and low flux density inductive designs for frequencies up to 100 kHz.

Pot cores, EP cores, PQ cores, ETD cores, E&I cores, U cores, rods, tack bobbin cores, toroids, and bobbins are all available in 77 material.

### 77 Material Specifications:

<table>
<thead>
<tr>
<th>Property</th>
<th>Unit</th>
<th>Symbol</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Permeability</td>
<td></td>
<td>(\mu_1)</td>
<td>2000</td>
</tr>
<tr>
<td>Flux Density @ B &lt; 10 gauss</td>
<td>gauss</td>
<td>(B)</td>
<td>4900</td>
</tr>
<tr>
<td>@ Field Strength</td>
<td>oersted</td>
<td>(H)</td>
<td>5</td>
</tr>
<tr>
<td>Residual Flux Density</td>
<td>gauss</td>
<td>(B_r)</td>
<td>1800</td>
</tr>
<tr>
<td>Coercive Force</td>
<td>oersted</td>
<td>(H_c)</td>
<td>0.30</td>
</tr>
<tr>
<td>Loss Factor @ Frequency</td>
<td>(10^{-6}) MHz</td>
<td>(\tan \delta \mu_i)</td>
<td>15</td>
</tr>
<tr>
<td>Temperature Coefficient of Initial Permeability (20-70°C)</td>
<td>%/°C</td>
<td>0.7</td>
<td></td>
</tr>
<tr>
<td>Curie Temperature</td>
<td>°C</td>
<td>(T_c)</td>
<td>&gt;200</td>
</tr>
<tr>
<td>Resistivity</td>
<td>Ω cm</td>
<td>(\rho)</td>
<td>(1 \times 10^{15})</td>
</tr>
</tbody>
</table>

**Complex Permeability vs. Frequency**

[Complex Permeability vs. Frequency graph]

Measured on an 18/10/6mm toroid using the HP 4284A and the HP 4291A.

**Initial Permeability vs. Temperature**

[Initial Permeability vs. Temperature graph]

Measured on an 18/10/6mm toroid at 100kHz.

**Hysteresis Loop**

[Hysteresis Loop graph]

Measured on an 18/10/6mm toroid at 10kHz.
77 Material

Amplitude Permeability vs. Flux Density

Power Loss Density vs. Flux Density

Measured on an 18/10/6mm toroid at 10kHz.

Measured on an 18/10/6mm toroid using the Clarke Hess 258 VAW at 100°C.

Power Loss Density vs. Temperature

Flux Density vs. Temperature

Measured on an 18/10/6mm toroid using the Clarke Hess 258 VAW.

Measured on an 18/10/6mm toroid at 10kHz and H=5 oersted.
78 Material

A MnZn ferrite specifically designed for power applications for frequencies up to 200 kHz.

RFID rods, toroids, pot cores, EP cores, PQ cores, ETD cores, U cores, and E&I cores are all available in 78 material.

78 Material Specifications:

<table>
<thead>
<tr>
<th>Property</th>
<th>Unit</th>
<th>Symbol</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Permeability @ B &lt; 10 gauss</td>
<td></td>
<td>$\mu_1$</td>
<td>2300</td>
</tr>
<tr>
<td>Flux Density @ Field Strength</td>
<td>gauss</td>
<td>B</td>
<td>4800</td>
</tr>
<tr>
<td>Residual Flux Density</td>
<td>gauss</td>
<td>$B_r$</td>
<td>1500</td>
</tr>
<tr>
<td>Coercive Force</td>
<td>oersted</td>
<td>$H_c$</td>
<td>0.20</td>
</tr>
<tr>
<td>Loss Factor @ Frequency</td>
<td>MHz</td>
<td>$\tan\delta\mu_1$</td>
<td>4.5</td>
</tr>
<tr>
<td>Temperature Coefficient of Initial Permeability (20 -70°C)</td>
<td>%/°C</td>
<td></td>
<td>1.0</td>
</tr>
<tr>
<td>Curie Temperature</td>
<td>°C</td>
<td>$T_c$</td>
<td>&gt;200</td>
</tr>
<tr>
<td>Resistivity</td>
<td>Ω cm</td>
<td>$\rho$</td>
<td>$2\times10^{-1}$</td>
</tr>
</tbody>
</table>

Complex Permeability vs. Frequency

Measured on an 18/10/6mm toroid at 10kHz.

Initial Permeability vs. Temperature

Measured on an 18/10/6mm toroid at 100kHz.

Hysteresis Loop

Measured on an 18/10/6mm toroid at 10kHz.
78 Material

Amplitude Permeability vs. Flux Density

Power Loss Density vs. Flux Density

Measured on an 18/10/6mm toroid at 10kHz.

Measured on an 18/10/6mm toroid using the Clarke Hess 258 VAW at 100°C

Power Loss Density vs. Temperature

 Flux Density vs. Temperature

Measured on an 18/10/6mm toroid using the Clarke Hess 258 VAW.

Measured on an 18/10/6 mm toroid at 10kHz and H=5 oersted.
73 Material

A MnZn ferrite, supplied only in small cores, to suppress conducted EMI frequencies below 30 MHz.

EMI suppression beads, beads on leads, SM beads, and multi-aperture cores are all available in 73 material.

73 Material Specifications:

<table>
<thead>
<tr>
<th>Property</th>
<th>Unit</th>
<th>Symbol</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Permeability @ B &lt; 10 gauss</td>
<td></td>
<td>( \mu_i )</td>
<td>2500</td>
</tr>
<tr>
<td>Flux Density @ Field Strength</td>
<td>gauss</td>
<td>( B )</td>
<td>3900</td>
</tr>
<tr>
<td>Residual Flux Density</td>
<td>gauss</td>
<td>( B_r )</td>
<td>1500</td>
</tr>
<tr>
<td>Coercive Force @ Field Strength</td>
<td>oersted</td>
<td>( H )</td>
<td>0.24</td>
</tr>
<tr>
<td>Loss Factor @ Frequency</td>
<td>( 10^{-2} ) MHz</td>
<td>( \tan \delta \mu )</td>
<td>10</td>
</tr>
<tr>
<td>Temperature Coefficient of Initial Permeability</td>
<td>%/°C</td>
<td>( \Delta \mu )</td>
<td>0.65</td>
</tr>
<tr>
<td>Curie Temperature</td>
<td>°C</td>
<td>( T_c )</td>
<td>&gt;160</td>
</tr>
<tr>
<td>Resistivity</td>
<td>Ω cm</td>
<td>( \rho )</td>
<td>1x10^{-7}</td>
</tr>
</tbody>
</table>

Complex Permeability vs. Frequency

Measured on a 2673000301 bead using the HP 4284A and the HP 4291A.

Initial Permeability vs. Temperature

Measured on a 17/10/6mm toroid at 10kHz.

Percent of Original Impedance vs. Temperature

Measured on a 2673000301 using the HP4291A.

Hysteresis Loop

Measured on a 17/10/6mm toroid at 10kHz.
A high permeability MnZn ferrite intended for a range of broadband and pulse transformer applications and common-mode inductor designs.

Toroids, E&I cores, and EP cores are all available in 75 material.

### 75 Material Specifications:

<table>
<thead>
<tr>
<th>Property</th>
<th>Unit</th>
<th>Symbol</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Permeability @ B &lt; 10 gauss</td>
<td></td>
<td>$\mu_i$</td>
<td>5000</td>
</tr>
<tr>
<td>Flux Density @ Field Strength</td>
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<td>B</td>
<td>4300</td>
</tr>
<tr>
<td></td>
<td>oeared</td>
<td>H</td>
<td>5</td>
</tr>
<tr>
<td>Residual Flux Density</td>
<td>gauss</td>
<td>$B_r$</td>
<td>1400</td>
</tr>
<tr>
<td>Coercive Force</td>
<td>oeared</td>
<td>$H_c$</td>
<td>0.16</td>
</tr>
<tr>
<td>Loss Factor @ Frequency</td>
<td>$10^{-6}$</td>
<td>MHz</td>
<td></td>
</tr>
<tr>
<td>tan $\delta$</td>
<td></td>
<td></td>
<td>15</td>
</tr>
<tr>
<td>Temperature Coefficient of Initial Permeability (20 - 70°C)</td>
<td>%/°C</td>
<td></td>
<td>0.6</td>
</tr>
<tr>
<td>Curie Temperature</td>
<td>°C</td>
<td>$T_c$</td>
<td>&gt;140</td>
</tr>
<tr>
<td>Resistivity</td>
<td>$\Omega$ cm</td>
<td>$\rho$</td>
<td>3x10$^{-7}$</td>
</tr>
</tbody>
</table>

### Complex Permeability vs. Frequency

Measured on a 17/10/6mm toroid using the HP 4284A and the HP 4291A.

### Initial Permeability vs. Temperature

Measured on a 17/10/6mm toroid at 10kHz.

### Power Loss Density vs. Flux Density

Measured on a 17/10/6mm toroid using the Clarke Hess 258 VAW at 100°C.

### Hysteresis Loop

Measured on a 17/10/6mm toroid at 10kHz.
76 Material

A MnZn ferrite with a 10K permeability and an acceptable Curie temperature for broadband and pulse transformer designs and common-mode choke applications.

Toroids are available in 76 material.

### 76 Material Specifications:

<table>
<thead>
<tr>
<th>Property</th>
<th>Unit</th>
<th>Symbol</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Permeability @ B &lt; 10 gauss</td>
<td></td>
<td>(\mu_i)</td>
<td>10000</td>
</tr>
<tr>
<td>Flux Density @ Field Strength</td>
<td>gauss</td>
<td>(B)</td>
<td>4000</td>
</tr>
<tr>
<td>Residual Flux Density</td>
<td>gauss</td>
<td>(B_r)</td>
<td>1800</td>
</tr>
<tr>
<td>Coercive Force</td>
<td>oersted</td>
<td>(H_c)</td>
<td>0.12</td>
</tr>
<tr>
<td>Loss Factor @ Frequency</td>
<td>10(^{-4}) MHz</td>
<td>(\tan\delta\mu_i)</td>
<td>15</td>
</tr>
<tr>
<td>Temperature Coefficient of Initial Permeability</td>
<td>(%/°C)</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>Curie Temperature</td>
<td>°C</td>
<td>(T_c)</td>
<td>&gt;120</td>
</tr>
<tr>
<td>Resistivity</td>
<td>Ω cm</td>
<td>(\rho)</td>
<td>50</td>
</tr>
</tbody>
</table>

Made on a 17/10/6mm toroid using the HP 4284A and the HP 4291A.

Measured on a 17/10/6mm toroid at 10kHz.

Made on a 17/10/6mm toroid using the HP 54510A.

Made on a 17/10/6mm toroid at 10kHz.