Demagnetizers permit efficient, continuous elimination of unwanted magnetism in ferrous rod, wire, bar and tubing. Unwanted magnetism can develop during production, or it can be intentionally introduced to permit the material to be tested, such as when using MAC eddy current saturation coil test systems or flux leakage rotaries.

MAC Demagnetizers can also be used for general applications, including finished parts where the fields of residual magnetism are complex and require the unique features of these units.

Demagnetizers can be installed as independent stations, or on the production line in conjunction with eddy current and/or flux leakage test equipment. Models are available to handle material sizes up to 8.5” (215 mm) with various metallurgical characteristics.

MAC Demagnetizers include a control unit and a demagnetizing coil. A flux coil with a separate meter may be included with some models, and offered as an option with others. For high power models designed for demagnetizing larger or difficult material, an appropriate input transformer with disconnect switch is required. The demagnetizer coil creates the demagnetizing field, while the flux coil detects the degree of residual magnetism in the material, if any, after demagnetizing.

MAC’s Demagnetizers use a unique technique which simultaneously applies both alternating and direct current demagnetizing fields. The AC field serves to break up the alignment of the domains that, when magnetized, are uniformly orientated with their north poles in the same direction. The DC field overcomes the realignment of domains caused by external influences and is adjusted in field strength and direction with fine tuning to ensure the material is thoroughly demagnetized.

The final level of residual magnetization can be verified automatically by the flux coil which produces a meter reading, or by hand with a MAC Magnetism Detector.
Demagnetizing Large Cut Lengths

Variations in the strength of the residual magnetic field in the ends of cut length bar stock can interfere with effective demagnetization of the full length of the bar.

MAC’s Models 400, 475, or 750 provide DC power control to automatically compensate for different levels in field strength near the ends. This DC Power Control can automatically switch between two levels which may be individually pre-set.

For example, when the cut end leaves the eddy current saturation test coil while the bar is still passing through the demagnetizing coil, the DC Field strength required to demagnetize the bar decreases because of a decoupling effect.

The pre-set DC Power Control will automatically shift to a lower power level in the demagnetizing coil to compensate and ensure uniform demagnetization over the entire cut length.

Demagnetizing Heavy Wall Tubing

To successfully demagnetize heavy wall tubing and certain materials, a high current AC field operating at reduced voltage is used with Demagnetizer Models 400, 475, 600, or 750. Their Demagnetizer coils are water cooled to permit continuous operation. A 25 KVA or 75 KVA power transformer is supplied with these models.

High Speed Applications

For some high speed applications, generally greater than 500 fpm, use of MAC’s specially developed longer Demagnetizer coil may be necessary. High speed applications can cause problems in achieving adequate demagnetization because they do not allow a full 60 Hz wave to penetrate each portion of the material as it passes through the standard length coil. The longer air cooled coil, used with a 476 Demagnetizer control unit, usually provides a solution to this problem.

Specialized Applications

Demagnetizing bundles, large parts, certain alloys and unusual patterns of magnetization, particularly in barstock, may require more power than any of MAC’s standard Demagnetizers can apply to achieve low gauss readings in one pass.

Magnetic Analysis Corp. has available an additional line of custom built high power demagnetization systems that are suitable for special applications. You should consult MAC’s Field Staff or Engineering Department for more information on these custom systems.
The primary factor in selecting the most appropriate Demagnetizer model for a specific application is the AC power needed to properly demagnetize the material. The more substantial the material, the greater the power needed.

### Low Power for up to 1.75” (44 mm) Diameter Light Material such as thin wall tube and small parts

**MODEL 200 - Ambient Air Cooled**
- **Direct Current Control**: None - AC power only
- **Display**: No meter provided. Optional Magnetism Detector available
- **Cabinet Dimensions & Weight**:
  - Outside dimensions: 12” H x 10” W x 5” D (30.5 cm x 25.4 cm x 12.7 cm)
  - Weight: approximately 20 lbs (9 Kg)
- **Demagnetizing Coil Dimensions & Weight**:
  - Interior diameter - 2” (5.08 cm)
  - Weight: approximately 25 lbs (11 kg)
- **Power Requirements**: 117 VAC, single phase, 50/60 Hz 3 amps maximum

### 1 KVA Power for 1.75”, 4.75” or 5.75” (44, 114, 146 mm) Diameter Material

**MODELS 470/471 - Ambient Air Cooled**
- **Direct Current Control**: 50 step positive or negative dial adjusts strength and direction of direct current field
- **Display**: Meter shows the degree of magnetism in the material
- **Cabinet Dimensions & Weight**:
  - Outside dimensions: 10” H x 22” W x 16” D (25.4 cm x 55.9 cm x 40.6 cm)
  - Weight: approximately 44 lbs (20 Kg)
- **Demagnetizing Coil Dimensions & Weight**:
  - Interior Diameter: 2” (5.1 cm), 5” (12.7 cm) or 6” (15.2 cm)
  - Weight: approximately 78 lbs (35 Kg)
- **Flux Coil Dimensions & Weight**:
  - Outside dimension & Interior diameter - same as Demagnetizing Coil.
  - Weight: approximately 31 lbs (14 Kg)
- **Power Requirements**: 117 VAC, single phase, 50/60 Hz, 10 amps maximum

### Medium Duty 4 KVA Power for 4.5” (114 mm) Diameter Material

**MODEL 475 - Water Cooled**
- **Direct Current Control**: Front & Back Dual Level DC current control switch, sets two independent levels. Semi Auto & Front Only two position switch sets one level only, or switches from F to B level at a specified point
- **Display**: Optional Flux Coil & Meter
- **Cabinet Dimensions & Weight**:
  - Outside dimensions: 20” H x 20” W x 8” D (50.8 cm x 50.8 cm x 20.3 cm)
  - Weight: approximately 70 lbs (32 Kg)
- **Demagnetizing Coil Dimensions & Weight**:
  - Outside Dimensions: 14” H x 12” W x 6.5” D (35.6 cm x 30.5 cm x 16.5 cm)
  - Interior Diameter: 5” (12.7 cm)
  - Weight: approx. 78lbs (35 Kg)
- **Flux Coil Dimensions & Weight**:
  - Dimensions are same as Demagnetizing coil. Weight: approx 31 lbs. (14 Kg)
- **Power Requirements**: 240/480 VAC single phase 50/60 Hz, 35 amps maximum
- **Water Requirements**: Up to 1 gallon per minute. 40 PSI minimum pressure
- **Transformer & Disconnect**: 4 KVA input transformer with Disconnect unit. 24” x 21 1/2” x 10” enclosure

*Air cooled coils can be used on some thin walled tubing
Also available with optional XDM476 demagnetizing coil for high speed applications on thin wall tubing.
### SPECIFICATIONS (continued)

**Heavy Duty 25 KVA Power for 3.75”, 4.75” or 5.75” (95, 114, 146 mm) Diameter Material**

**MODEL 400 - Water Cooled**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Current Control</td>
<td>Front &amp; Back Dual Level Semi Auto DC current control switch, sets two independent levels for demagnetizing cut lengths. Semi Auto &amp; Front Only two position switch sets one level only, or switches from F to B level at a specified point.</td>
</tr>
<tr>
<td>Display</td>
<td>Optional Flux Coil &amp; Meter</td>
</tr>
<tr>
<td>Cabinet Dimensions &amp; Weight</td>
<td>20” H x 20” W x 8” D (50.8 cm x 50.8 cm x 20.3 cm) Weight: approximately 70 lbs (32 Kg)</td>
</tr>
<tr>
<td>Demagnetizing Coil Dimensions &amp; Weight</td>
<td>Outside dimensions: 11” H 11 7/8” W x 10 3/4” D” (27.9 cm x 30.2 cm x 27.3 cm) Weight: approximately 78 lbs (35 Kg)</td>
</tr>
<tr>
<td>Flux Coil Dimensions &amp; Weight</td>
<td>Outside dimension: 11” H x 11 7/8” W x 6 1/2” D (27.9 cm x 30.2 cm x 16.5 cm) Weight: approximately 31 lbs (14 Kg)</td>
</tr>
<tr>
<td>Power Requirements</td>
<td>240/480 VAC, three phase, 50/60 Hz 40 amps maximum</td>
</tr>
<tr>
<td>Water Requirements</td>
<td>up to 1 gallon per minute, 40 PSI Minimum pressure</td>
</tr>
<tr>
<td>Transformer &amp; Disconnect</td>
<td>25 KVA input transformer with Disconnect unit 33” x 23” x 18 1/2” enclosure. Disconnect unit is in a 30” x 25 1/2” x 10” enclosure.</td>
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</tbody>
</table>

**Extra Heavy Duty 75 KVA for 6”, 7.5” or 8.5” (150,190, 215 mm) Diameter Material**

**MODEL 600/750 - Water Cooled**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
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</thead>
<tbody>
<tr>
<td>Direct Current Control</td>
<td>Front &amp; Back Dual Level Semi Auto DC current control switch, sets two independent levels for demagnetizing cut lengths. Semi Auto and Front only two position switch sets one level only, or switches from F to B level at a specified point.</td>
</tr>
<tr>
<td>Display</td>
<td>Optional Flux Coil &amp; Meter</td>
</tr>
<tr>
<td>Cabinet Dimensions &amp; Weight</td>
<td>24”H x 24”W x 10” D (70 cm x 70 cm x 25.4 cm) Weight: approximately 70 lbs (32 Kg)</td>
</tr>
<tr>
<td>Demagnetizing Coil Dimensions &amp; Weight</td>
<td>Outside dimensions: 20” H x 20” W x 15” D (50.8cm x 50.8 cm x 38.1 cm) Weight: approx 250 lbs (113 Kg)</td>
</tr>
<tr>
<td>Flux Coil Dimensions &amp; Weight</td>
<td>Dimensions are same as Demagnetizing coil. Weight: approx. 31 lbs (14 Kg)</td>
</tr>
<tr>
<td>Power Requirements</td>
<td>480 VAC three phase 50/60 Hz, 100 amps maximum</td>
</tr>
<tr>
<td>Water Requirements</td>
<td>Up to 2 gallons per minute, 40 PSI minimum pressure</td>
</tr>
<tr>
<td>Transformer &amp; AC Disconnect</td>
<td>75 KVA input, 3 phase, 480/208/120 volts transformer unit. AC Contactor &amp; Disconnect Switch</td>
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<td>600 VAC, 3 pole, 270 amp. continuous current limiting.</td>
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</tbody>
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**A 600 Water Cooled Demagnetizer with a junction box to conceal all the cables. Ideal for diameters up to 6” and heavier wall material. May be used with eddy current and/or flux leakage systems to inspect tube or bar. A Common application may include oil & gas or automotive carbon steel tube or bar products.**