UNWIND TENSION CONTROL

Brake mounted on shaft of unwind spool or bobbin.

Information required: (Example)

- Full diameter = 6 in.
- Empty core diameter = 3 in.
- Average tension = 1 lbf
- Velocity = 150 ft./min.

How to size:

1. Select Catalog Number S90MCC-MTL37505 based on 2.25 lbf in.
2. Check Operating Curve

The Max. rpm occurs at the min. radius

Max. rpm = \( \frac{\text{Velocity}}{\text{Empty dia.} \times \pi} \)

= \( \frac{150 \text{ ft./min.}}{(0.25 \text{ feet}) \times \pi} \)

= 191 rpm

2.25 lbf in. at 191 rpm is okay.

NIP ROLL OR PULLEY TENSION CONTROL

Coil Winding - Constant tension provided by hysteresis unit.

Information required: (Example)

- Pulley diameter or nip roll = 3 in.
- Tension = 2.5 lbf
- Velocity = 300 ft./min.

How to size:

Torque (lbf in.) = Tension x Radius

= 2.5 lbf x (3 in.) / 2 = 3.75 lbf in.

Film Tensioning - Constant tensioning supplied by hysteresis unit.

1. Select Catalog Number S90MCC-MTL37505 based on 3.75 lbf in.
2. Check Operating Curve

Max. rpm = \( \frac{\text{Velocity}}{\text{Empty dia.} \times \pi} \)

= \( \frac{300 \text{ ft./min.}}{(0.25 \text{ feet}) \times \pi} \)

= 382 rpm

382 rpm is too high for continuous duty on the S90MCC-MTL37505 unit.
3. Select Catalog Number S90MCC-MTL62510
**CYCLING**

Bottle Capping - Constant torque provided by a hysteresis clutch.

**OVERLOAD PROTECTION TORQUE LIMITING SOFT START** (Motor Horsepower Method)

Torque Limiting - Hysteresis clutch provides overload protection.

Information required: (Example)
- **Motor hp** = 1/10 hp
- **Motor rpm** = 900 rpm

How to size:
- Torque (lbf in.) = (Motor hp x 63000) / Motor rpm
  = (1/10 hp x 63000) / 900 = 7 lbf in.

Material Handling - Hysteresis clutch can provide overload protection and soft start.

1. Select Catalog Number S90MCC-MTL62525 based on 7 lbf in.
2. Check Operating Curve
   7 lbf in. is at the upper limit of safe continuous operation, but is okay.
ADVANTAGES:
- No electricity
- No breakaway torque
- Constant torque independent of shaft (rotor) speed
- No contacting or wearing parts
- No friction elements – same smooth torque year after year
- No magnetic particles to leak or contaminate end product
- Operable in some of the most difficult environments
- Brake (with shaft) and clutch (with hollow shaft) available
- Custom designs available

APPLICATIONS:
- **Fig. 1 As a Coupling**
  This is for load protection or torque limiting. The coupling style unit is directly connected to a motor and turns at the same speed as the motor until the torque is reached. At this point it will slip and still generate the maximum torque.

- **Fig. 2 As a Clutch**
  The unit is connected to a motor by a timing belt or gear. The housing is driven and the shaft is the output end.

- **Fig. 3 As a Payout Brake**
  Brake is stationary and the reel or material is fitted to the output shaft. The tension on the material will vary with the diameter.

HOW THEY OPERATE:
- **For Maximum Torque**
  All important internal clearances are ground to tolerances of less than .001 in. (0.025 mm). Magnet assemblies surround hysteresis assembly. When like poles face each other, they produce maximum magnetic saturation of the hysteresis disc, forcing lines of flux to travel circumferentially through the hysteresis disc.

- **For Minimum Torque**
  When opposite poles face each other they produce minimum saturation of the hysteresis disc. The lines of flux travel through the hysteresis disc.

Combinations of adjustment angles between the two extremes give infinite adjustability. Because there are no contacting surfaces, the setting can be maintained indefinitely.
HOW TO USE THE CURVES:
Find the slip rpm on the X-axis and the torque on the Y-axis. Notice the areas that represent safe, continuous duty; intermittent duty, such as five minutes on, five minutes off; and the area which is not recommended. Operating above that line for any period of time will cause overheating and possible damage to the unit.
MAGNETIC CLUTCHES & COUPLINGS

MATERIAL:
Housing and Shaft - Stainless Steel

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Shaft Dia. +.000 -.001</th>
<th>Shaft Length</th>
<th>Torque Range lbf in.</th>
<th>Weight lb.</th>
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<tbody>
<tr>
<td>S90MCC-5130151</td>
<td>3/16</td>
<td>.51</td>
<td>.003 – .018</td>
<td>.16</td>
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## MAGNETIC CLUTCHES & COUPLINGS

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<thead>
<tr>
<th>Catalog Number</th>
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<th>L Length</th>
<th>L1</th>
<th>D Dia.</th>
<th>d Dia.</th>
<th>A Dia.</th>
<th>Torque Range lbf in.</th>
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<td>2.441</td>
<td>1.00 – 25.00</td>
</tr>
</tbody>
</table>

### MATERIAL:
- **Housing** - Aluminum, Black Anodized Finish
- **Dial** - Steel, Black Oxide Finish

### Dimensions:
- ØA Ød
- ØF
- L
- L1

- **Set Screw**: 2 Places 90° Apart
- **Keyway**: (.625 Bore Only)

- **(3X) Tapped Holes On Both Ends**

- **(3X) Tapped Holes On Both Ends**

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**Phone:** 516.328.3300 • **Fax:** 516.326.8827 • **www.sdp-si.com**
MAGNETIC CLUTCHES & COUPLINGS

70 lbf in. TORQUE
NONELECTRIC
NO WEARING PARTS
NO FRICTION
HOLLOW BORE

> MATERIAL:
  Housing - Aluminum, Black Anodized Finish
  Dial - Steel, Black Oxide Finish

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Bore (.001 to -.000)</th>
<th>Torque Range (lbf in.)</th>
<th>Weight (lb.)</th>
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<td>S90MCC-80610</td>
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