**Springs Overview**

*The heat resistance temperatures shown in the tables are for the spring wire material. The data are obtained in room temperature. Allowable load and durability may decrease depending on the various conditions under higher temperature.*

### Type Features

<table>
<thead>
<tr>
<th>Type</th>
<th>Features</th>
<th>Type</th>
<th>Type</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Straight One-Point-Bend</td>
<td>Light Medium-Light</td>
<td>Medium Heavy</td>
<td>Heavy Medium</td>
<td>Arm Angle 90° Arm Angle 135° Arm Angle 180° Main Body Bracket</td>
</tr>
<tr>
<td>Flat Springs</td>
<td>Torsion Springs</td>
<td>Constant Force Springs</td>
<td>Tension Springs</td>
<td>Configurable</td>
</tr>
</tbody>
</table>

### Tension Springs

- **MISUMI Tension Springs** (except for Specified Types) are standardized to maintain the maximum load constantly to the same diameter. The load tolerances depend on the spring type, please refer to the respective page.
- Use the springs within the range of the allowable deflection $F_{\text{max}}$. Using at higher than the allowable deflection values may cause deformation or failure after a few uses. Also, do not exceed tension springs more than its allowable deflection during the installation.
- For Tension Springs durability cannot be shown because stress concentration may occur depending on the hook installment. It is recommended to use the springs within 70% of allowable deflection $F_{\text{max}}$.
- It is recommended to use the tension springs (AW, **AW**, **AWFM**, **AWSP**, **LWS**, **LWSH**) under ambient temperature at 40°C or less. Load value attenuates when tension springs are used in temperature higher than 40°C, although it depends on other conditions.

### Round Coil Springs / Irregular Shaped Coil Springs

- **MISUMI Round Coil Springs** are standardized to maintain the spring constant constant to the same diameter. The tolerance of spring constant is ±10%.
- Irregular shaped coil springs are standardized to maintain the maximum load constantly to the same diameter. The load tolerances depend on the spring type, please refer to the respective page.
- Use the springs within the range of the allowable deflection $F_{\text{max}}$. Using at higher than the allowable deflection values may cause deformation or failure.
- The values of solid length are for reference only. Using it compressed to the solid length may cause deformation or break after a few uses.
- Round Coil Springs are manufactured based on the following diametric tolerance priorities given. I.D. Selectable Type: Inner diameter tolerance prioritized / O.D. Selectable Type: Outer diameter tolerance prioritized. For inner/outer diameter tolerances of irregular shaped coil springs, refer to the respective pages.
- It is recommended to use the round coil springs and irregular shaped coil springs under ambient temperature at 40°C or less. Load value attenuates when tension springs are used in temperature higher than 40°C, although it depends on other conditions. (Most resistant springs are listed on “Standard Components for Plastic Mold”.)
- Irregular Shaped Coil Springs are listed on “Standard Components for Press Dies” and “Standard Components for Plastic Mold” (Large Dia. Sizes are also available.)

### Relationship between Spring Length L and Load P

#### Tension Springs

Load $P(N) = \text{Initial Tension } P(N) + \text{(Spring Constant } k/\text{Nm) \times \text{Deflection } F(mm)}$

#### Round Coil Springs

Load $P(N) = \text{(Spring Constant } k/\text{Nm) \times \text{Deflection } F(mm)}$

0.327-0328_F37-002_cENG 0327-0328_F37-002_cENG 2nd

Page 339 P340 P341

- **Spring Length L** and **Load P**

<table>
<thead>
<tr>
<th>Type</th>
<th>Features</th>
<th>Type</th>
<th>Material</th>
<th>Color</th>
<th>No. Standard Length</th>
<th>Standard Usage Count</th>
<th>Load $P(N)$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Straight</td>
<td>Light</td>
<td>Medium-Light</td>
<td>Heavy Heavy Medium</td>
<td>Arm Angle 90° Arm Angle 135° Arm Angle 180° Main Body Bracket</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flat Springs</td>
<td>Torsion Springs</td>
<td>Constant Force Springs</td>
<td>Tension Springs</td>
<td>Configurable</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*The heat resistance temperatures shown in the tables are for the spring wire material. The data are obtained in room temperature. Allowable load and durability may decrease depending on the various conditions under higher temperature.*

### Round Coil Springs / Irregular Shaped Coil Springs

- **MISUMI Round Coil Springs** are standardized to maintain the spring constant constant to the same diameter. The tolerance of spring constant is ±10%.
- Irregular shaped coil springs are standardized to maintain the maximum load constantly to the same diameter. The load tolerances depend on the spring type, please refer to the respective page.
- Use the springs within the range of the allowable deflection $F_{\text{max}}$. Using at higher than the allowable deflection values may cause deformation or failure.
- The values of solid length are for reference only. Using it compressed to the solid length may cause deformation or break after a few uses.
- Round Coil Springs are manufactured based on the following diametric tolerance priorities given. I.D. Selectable Type: Inner diameter tolerance prioritized / O.D. Selectable Type: Outer diameter tolerance prioritized. For inner/outer diameter tolerances of irregular shaped coil springs, refer to the respective pages.
- It is recommended to use the round coil springs and irregular shaped coil springs under ambient temperature at 40°C or less. Load value attenuates when tension springs are used in temperature higher than 40°C, although it depends on other conditions. (Most resistant springs are listed on “Standard Components for Plastic Mold”.)
- Irregular Shaped Coil Springs are listed on “Standard Components for Press Dies” and “Standard Components for Plastic Mold” (Large Dia. Sizes are also available.)

### Relationship between Spring Length L and Load P

#### Tension Springs

Load $P(N) = \text{Initial Tension } P(N) + \text{(Spring Constant } k/\text{Nm) \times \text{Deflection } F(mm)}$

#### Round Coil Springs

Load $P(N) = \text{(Spring Constant } k/\text{Nm) \times \text{Deflection } F(mm)}$

0.327-0328_F37-002_cENG 0327-0328_F37-002_cENG 2nd

Page 339 P340 P341

- **Spring Length L** and **Load P**

<table>
<thead>
<tr>
<th>Type</th>
<th>Features</th>
<th>Type</th>
<th>Material</th>
<th>Color</th>
<th>No. Standard Length</th>
<th>Standard Usage Count</th>
<th>Load $P(N)$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Straight</td>
<td>Light</td>
<td>Medium-Light</td>
<td>Heavy Heavy Medium</td>
<td>Arm Angle 90° Arm Angle 135° Arm Angle 180° Main Body Bracket</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flat Springs</td>
<td>Torsion Springs</td>
<td>Constant Force Springs</td>
<td>Tension Springs</td>
<td>Configurable</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*The heat resistance temperatures shown in the tables are for the spring wire material. The data are obtained in room temperature. Allowable load and durability may decrease depending on the various conditions under higher temperature.*