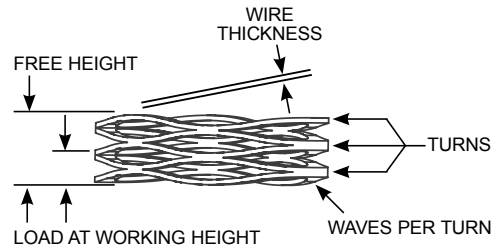
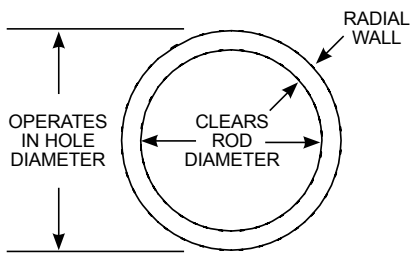
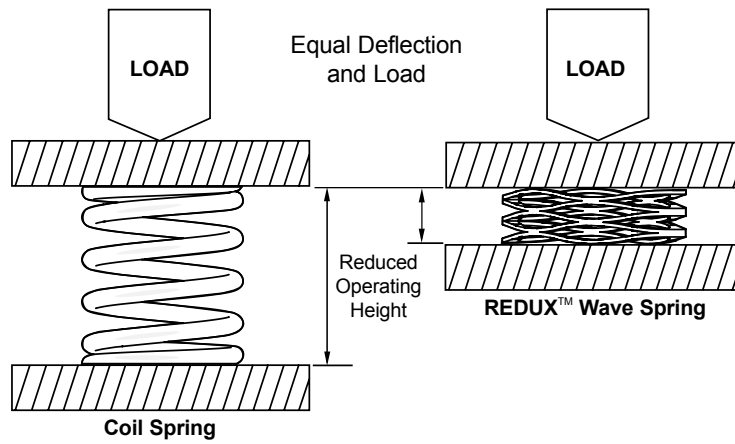


# WAVE SPRINGS SPECIFICATION FORM



INDICATE UNITS OF MEASURE (IN. & LB.), (MM & N)

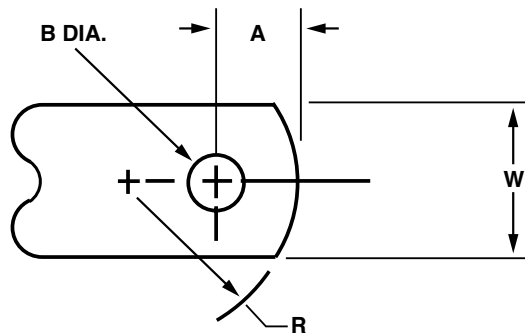
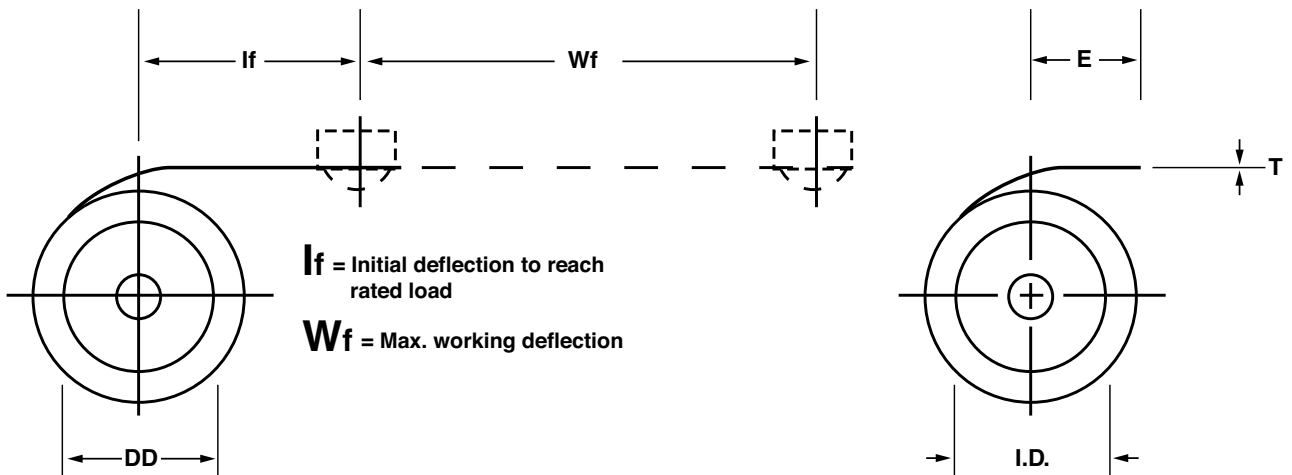
1. MATERIAL \_\_\_\_\_
2. WIRE THICKNESS \_\_\_\_\_
3. RADIAL WALL \_\_\_\_\_
4. DIRECTION OF WIND    OPT        LH        RH  
 OUTSIDE DIAMETER \_\_\_\_\_  
 INSIDE DIAMETER \_\_\_\_\_
5. FREE HEIGHT \_\_\_\_\_
6. RATE \_\_\_\_\_ +/- \_\_\_\_\_ BETWEEN \_\_\_\_\_ & \_\_\_\_\_
7. LOAD 1    \_\_\_\_\_ +/- \_\_\_\_\_ @ \_\_\_\_\_
8. LOAD 2    \_\_\_\_\_ +/- \_\_\_\_\_ @ \_\_\_\_\_

9. HOLE DIAMETER \_\_\_\_\_
10. ROD DIAMETER \_\_\_\_\_
11. NUMBER OF TURNS \_\_\_\_\_
12. WAVES PER TURN \_\_\_\_\_
13. SQUARENESS \_\_\_\_\_
14. FINISH \_\_\_\_\_
15. FREQUENCY OF COMPRESSION  
 \_\_\_\_\_ CYCLES/SEC. AND WORKING RANGE  
 \_\_\_\_\_ HEIGHT 1 TO \_\_\_\_\_ HEIGHT 2
16. OPERATING TEMP. \_\_\_\_\_ °F/°C
17. OTHER: \_\_\_\_\_

QUANTITY TO QUOTE FOR \_\_\_\_\_

CUSTOMER NAME:	A/C No:	ENQUIRY TAKEN BY:
CUSTOMER CONTACT		DATE TO SUPPLIER:
TEL No:	EMAIL:	DATE PRICE RECEIVED:

# CONSTANT FORCE SPRINGS SPECIFICATION FORM



INDICATE UNITS OF MEASURE (IN. & LB.), (MM & N)

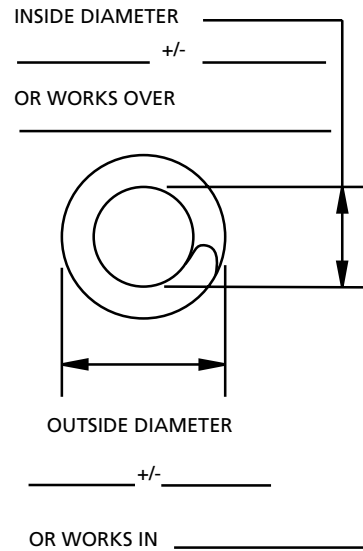
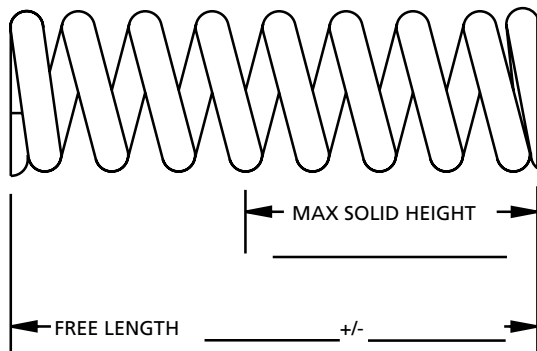
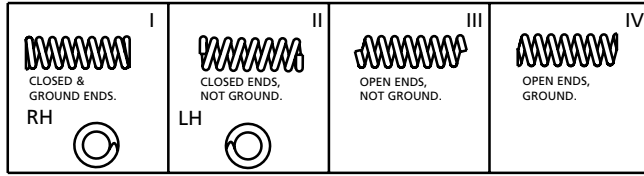
- |  |   |
|--|---|
| <p>1. MATERIAL _____</p> <p>2. MATERIAL THICKNESS _____</p> <p>3. MATERIAL WIDTH _____</p> <p>4. LENGTH _____</p> <p>5. INSIDE DIA _____</p> <p>6. DRUM DIA _____</p> <p>7. LOAD _____ +/- _____<br/>         @ WORKING DEFLECTION _____</p> | <p>8. LIFE CYCLES _____</p> <p>9. STANDARD END CONFIGURATION: (OTHER CONFIGURATIONS AVAILABLE UPON REQUEST)</p> <p>DIMENSION 'A' _____</p> <p>DIMENSION 'B' (DIA) _____</p> <p>END RADIUS 'R' _____</p> <p>PICKUP LENGTH 'E' _____</p> <p>10. FINISH _____</p> <p>11. OPERATING TEMP. _____ °F/°C</p> <p>12. OTHER: _____</p> |
|--|---|

QUANTITY TO QUOTE FOR \_\_\_\_\_

CUSTOMER NAME:	A/C No:	ENQUIRY TAKEN BY:
CUSTOMER CONTACT		DATE TO SUPPLIER:
TEL No:	EMAIL:	DATE PRICE RECEIVED:

# COMPRESSION SPRINGS SPECIFICATION FORM

Compression springs are generally specified to work in a bore or over a rod. They can be supplied with end coils closed and ground square for optimum alignment and reduced solid height. Springs can also be pre-stressed during manufacture to maintain length at elevated stress levels.



INDICATE UNITS OF MEASURE (IN & LB), (MM & N)

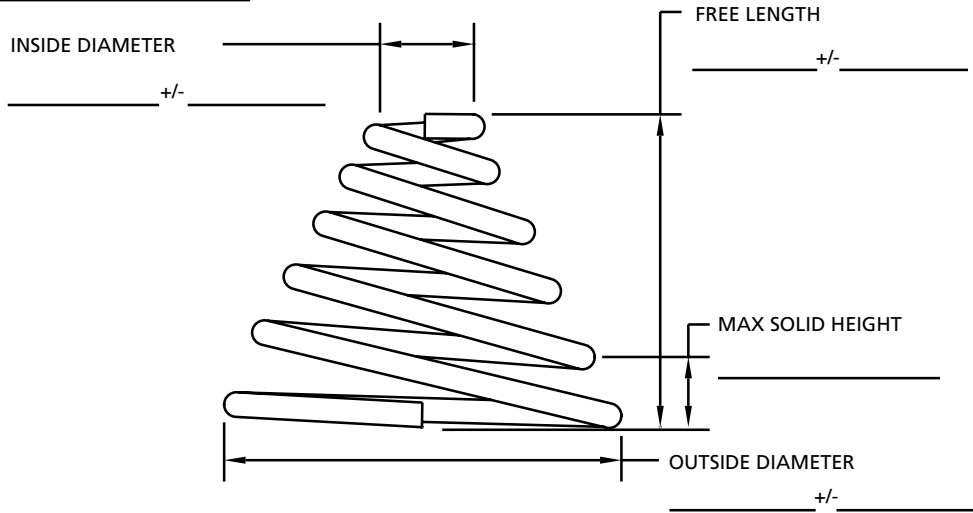
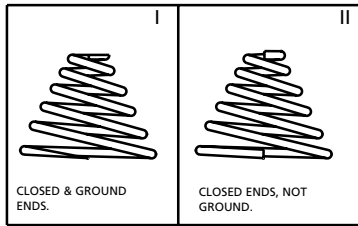
- |   |  |
|---|--|
| 1. MATERIAL _____                                       | 8. LOAD 2 _____ +/- _____ @ _____                  |
| 2. WIRE DIA. _____                                      | 9. No. OF ACTIVE COILS _____                       |
| 3. DIRECTION OF WIND <u>OPT</u> LH RH                   | 10. TOTAL No. OF COILS _____                       |
| 4. STYLE OF END <u>I</u> <u>II</u> <u>III</u> <u>IV</u> | 11. FINISH _____                                   |
| 5. SQUARENESS _____                                     | 12. FREQUENCY OF COMPRESSION _____ CYCLES/SEC      |
| 6. RATE _____ +/- _____ BETWEEN _____ & _____           | AND WORKING RANGE _____ LENGTH 1 TO _____ LENGTH 2 |
| 7. LOAD 1 _____ +/- _____ @ _____                       | 13. OPERATING TEMP _____ °F/ °C                    |
|   | 14. OTHER _____                                    |

QUANTITY TO QUOTE FOR \_\_\_\_\_

CUSTOMER NAME:	A/C No:	ENQUIRY TAKEN BY:
		DATE TO SUPPLIER:
CUSTOMER CONTACT		DATE PRICE RECEIVED:
TEL No:	EMAIL:	

# CONICAL SPRINGS SPECIFICATION FORM

Conical springs are specified where the large end is designed to work in a bore and the small end fits over a rod. Springs of this type offer reduced solid height compared to straight compression springs, especially when they are capable of 'telescoping'.



INDICATE UNITS OF MEASURE (IN & LB), (MM & N)

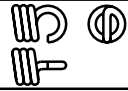
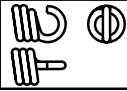


- |   |  |
|---|--|
| 1. MATERIAL _____                                   | 8. No. OF ACTIVE COILS _____                       |
| 2. WIRE DIA. _____                                  | 9. TOTAL No. OF COILS _____                        |
| 3. DIRECTION OF WIND <u>OPT</u> <u>LH</u> <u>RH</u> | 10. FINISH _____                                   |
| 4. STYLE OF END <u>I</u> <u>II</u>                  | 11. FREQUENCY OF COMPRESSION _____ CYCLES/SEC      |
| 5. RATE _____ +/- _____ BETWEEN _____ & _____       | AND WORKING RANGE _____ LENGTH 1 TO _____ LENGTH 2 |
| 6. LOAD 1 _____ +/- _____ @ _____                   | 12. OPERATING TEMP _____ °F/ °C                    |
| 7. LOAD 2 _____ +/- _____ @ _____                   | 13. OTHER _____                                    |

QUANTITY TO QUOTE FOR \_\_\_\_\_

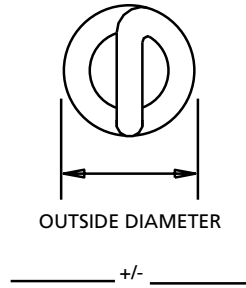
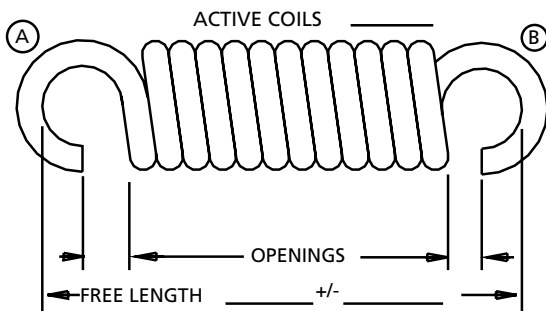
CUSTOMER NAME:	A/C No:	ENQUIRY TAKEN BY:
CUSTOMER CONTACT		DATE TO SUPPLIER:
TEL No:	EMAIL:	DATE PRICE RECEIVED:

# EXTENSION SPRINGS SPECIFICATION FORM

Extension springs feature a close wound body with loops on both ends to facilitate attachment. They are supplied wound with initial tension that can be varied within a limited range to achieve different loading characteristics. Other features such as loop diameter, opening and relative position can be modified to ensure a proper fit.

END STYLE	I MACHINE LOOPS	II CROSSOVER	III SIDE LOOPS	IV EXTENDED HOOKS
LOOP TYPE				
RECOMMENDED LOOP LENGTH.				
MIN	1/2 I.D.	I.D.	I.D.	1.1 x I.D.
MAX	1.1 x I.D.	I.D.	I.D.	AS REQUIRED

LOOP/HOOK (A) LENGTH \_\_\_\_\_ +/- \_\_\_\_\_ OPENING. \_\_\_\_\_ +/- \_\_\_\_\_  
 LOOP/HOOK (B) LENGTH \_\_\_\_\_ +/- \_\_\_\_\_ OPENING. \_\_\_\_\_ +/- \_\_\_\_\_



INDICATE UNITS OF MEASURE (IN & LB), (MM & N)

1. MATERIAL \_\_\_\_\_
2. WIRE DIA. \_\_\_\_\_
3. DIRECTION OF WIND    OPT   LH   RH
4. END STYLE (A) I II III IV   (B) I II III IV   (SEE ABOVE)
5. INITIAL TENSION \_\_\_\_\_ +/- \_\_\_\_\_
6. RATE \_\_\_\_\_ +/- \_\_\_\_\_ BETWEEN \_\_\_\_\_ & \_\_\_\_\_
7. LOAD 1 \_\_\_\_\_ +/- \_\_\_\_\_ @ \_\_\_\_\_
8. LOAD 2 \_\_\_\_\_ +/- \_\_\_\_\_ @ \_\_\_\_\_

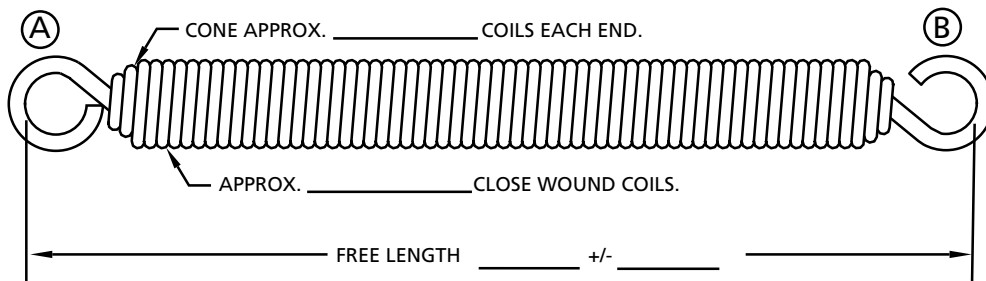
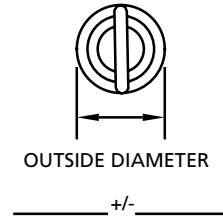
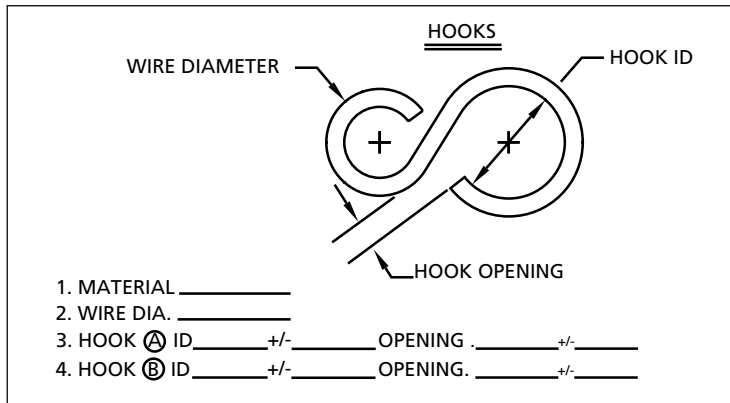
9. MAXIMUM EXTENDED LENGTH (INSIDE ENDS) WITHOUT SET \_\_\_\_\_
10. RELATIVE LOOP POSITION \_\_\_\_\_ RANDOM OR \_\_\_\_\_ ALIGNED  
 AT \_\_\_\_\_ DEGREES +/- \_\_\_\_\_ DEGREES
11. FINISH \_\_\_\_\_
12. FREQUENCY OF EXTENSION \_\_\_\_\_ CYCLES/SEC  
 AND WORKING RANGE \_\_\_\_\_ LENGTH 1 TO \_\_\_\_\_ LENGTH 2
13. OPERATING TEMP \_\_\_\_\_ °F/ °C
14. OTHER \_\_\_\_\_

QUANTITY TO QUOTE FOR \_\_\_\_\_

CUSTOMER NAME:	A/C No:	ENQUIRY TAKEN BY:
CUSTOMER CONTACT		DATE TO SUPPLIER:
TEL No:	EMAIL:	DATE PRICE RECEIVED:

# SWIVEL HOOK SPRINGS SPECIFICATION FORM

Swivel hook springs are best suited to heavy duty or high cycle applications. Unlike standard extension springs of similar dimension the hooks on these springs can be designed for optimum life cycle requirements and can also rotate to suit alignment conditions.



INDICATE UNITS OF MEASURE (IN & LB), (MM & N)

8. MAXIMUM EXTENDED LENGTH (INSIDE ENDS) WITHOUT SET \_\_\_\_\_

1. MATERIAL \_\_\_\_\_
2. WIRE DIA. \_\_\_\_\_
3. DIRECTION OF WIND OPT LH RH
4. INITIAL TENSION \_\_\_\_\_ +/- \_\_\_\_\_
5. RATE \_\_\_\_\_ +/- \_\_\_\_\_ BETWEEN \_\_\_\_\_ & \_\_\_\_\_
6. LOAD 1 \_\_\_\_\_ +/- \_\_\_\_\_ @ \_\_\_\_\_
7. LOAD 2 \_\_\_\_\_ +/- \_\_\_\_\_ @ \_\_\_\_\_
9. FINISH \_\_\_\_\_
10. FREQUENCY OF EXTENSION \_\_\_\_\_ CYCLES/SEC AND WORKING RANGE \_\_\_\_\_ LENGTH 1 TO \_\_\_\_\_ LENGTH 2
11. OPERATING TEMP \_\_\_\_\_ °F/ °C
12. OTHER \_\_\_\_\_

QUANTITY TO QUOTE FOR \_\_\_\_\_

CUSTOMER NAME:	A/C No:	ENQUIRY TAKEN BY:
		DATE TO SUPPLIER:
CUSTOMER CONTACT		DATE PRICE RECEIVED:
TEL No:	EMAIL:	

# TORSION SPRINGS SPECIFICATION FORM

Torsion springs are designed to operate over a mandrel. They are wound left or right hand as required to withstand the loads applied. Spring legs are specified to ensure proper fit and function.

TABLE 1

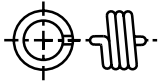
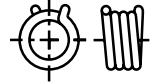

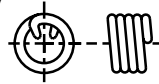


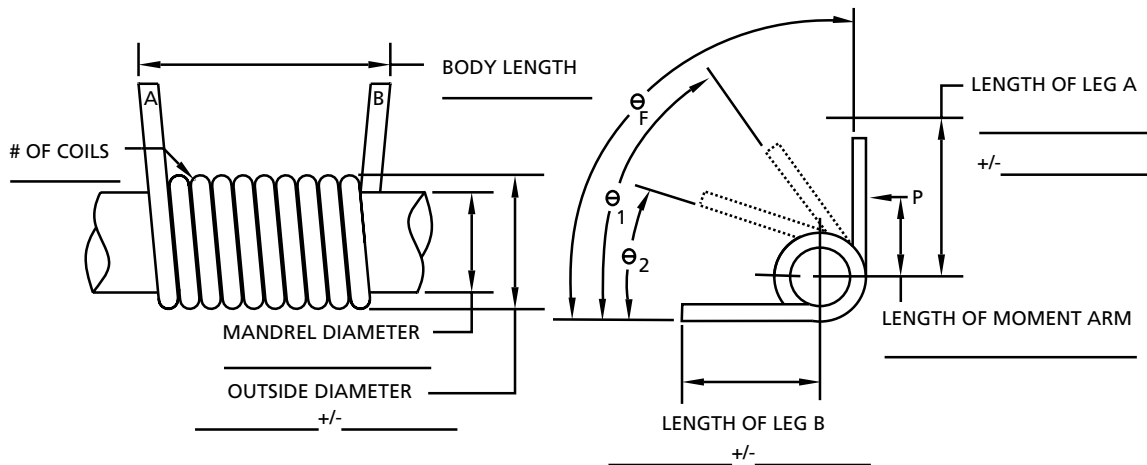
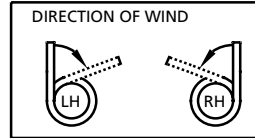
I  Straight Offset Ends	II  Short Hook Ends	III  Double Torsion
IV  Hinge Ends	V  Straight Torsion Ends	VI  Special Ends

TABLE 2



INDICATE UNITS OF MEASURE (IN & LB), (MM & N)

1. MATERIAL \_\_\_\_\_

2. WIRE DIA. \_\_\_\_\_

3. DIRECTION OF WIND  LH   RH  (SEE TABLE 2)

4. END STYLE (A)  I   II   III   IV   V   VI  (SEE TABLE 1)

5. STYLE OF END (B)  I   II   III   IV   V   VI  (SEE TABLE 1)

6. RATE \_\_\_\_\_ +/- \_\_\_\_\_ BETWEEN \_\_\_\_\_ PER TURN (360°)

7. TORQUE 1 \_\_\_\_\_ +/- \_\_\_\_\_ AT  $\ominus$  1 \_\_\_\_\_ °

8. TORQUE 2 \_\_\_\_\_ +/- \_\_\_\_\_ AT  $\ominus$  2 \_\_\_\_\_ °

9. LENGTH OF SPACE AVAILABLE \_\_\_\_\_

10. MAXIMUM WOUND POSITION \_\_\_\_\_ ° FROM FREE POSITION

11.  $\ominus$  F \_\_\_\_\_ FREE ANGLE OR POSITION

12. FINISH \_\_\_\_\_

13. FREQUENCY OF ROTATION \_\_\_\_\_ CYCLES/SEC

AND WORKING RANGE  $\ominus$  \_\_\_\_\_ ° TO  $\ominus$  \_\_\_\_\_ ° DEFLECTION

13. OPERATING TEMP \_\_\_\_\_ °F/ °C

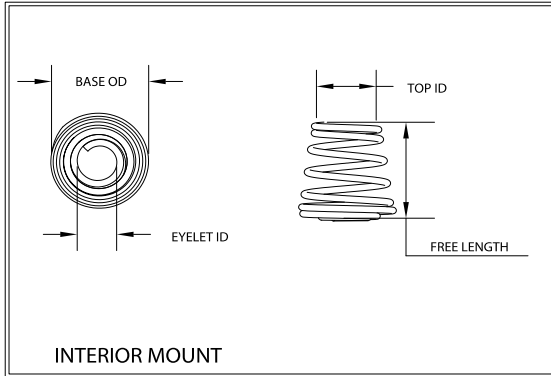
QUANTITY TO QUOTE FOR \_\_\_\_\_

CUSTOMER NAME:	A/C No:	ENQUIRY TAKEN BY:
CUSTOMER CONTACT		DATE TO SUPPLIER:
TEL No:	EMAIL:	DATE PRICE RECEIVED:

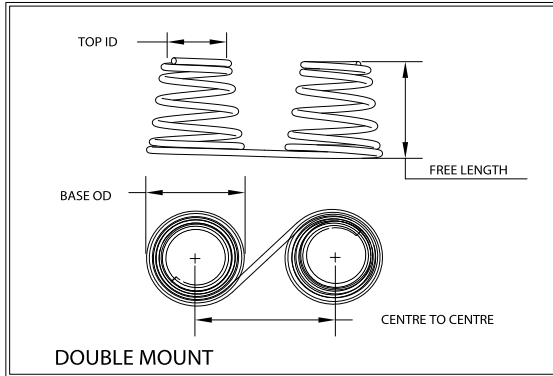
# BATTERY SPRINGS SPECIFICATION FORM

Battery springs can be configured to meet custom specifications and materials. When designing Battery springs, determine contact location based on the American National Standards Institute's and IEC standard dimensions. Refer to ANSI Standard C18 and International Electrotechnical Commission IEC86.

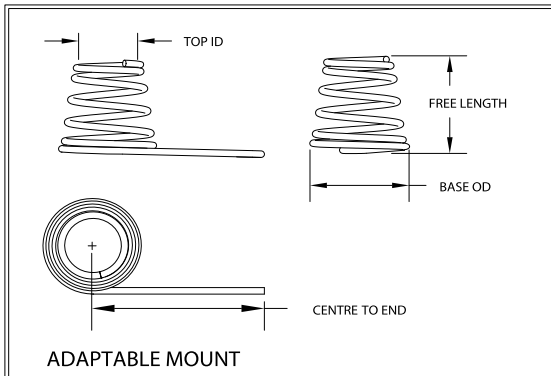
SPRING TYPE (I)



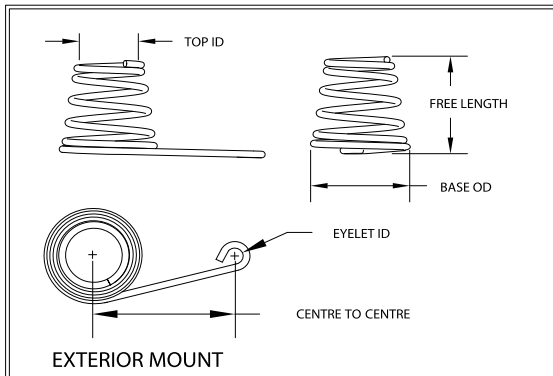
SPRING TYPE (II)



SPRING TYPE (III)



SPRING TYPE (IV)



INDICATE UNITS OF MEASURE (IN & LB), (MM & N)

1. SPRING TYPE  I  II  III  IV

2. BATTERY TYPE AA  AAA  C  D

3. MATERIAL \_\_\_\_\_

4. WIRE DIAMETER \_\_\_\_\_

5. BASE OD \_\_\_\_\_ +/- \_\_\_\_\_

6. TOP ID \_\_\_\_\_ +/- \_\_\_\_\_

7. FREE LENGTH \_\_\_\_\_ +/- \_\_\_\_\_

8. CENTRE TO CENTRE/END \_\_\_\_\_ +/- \_\_\_\_\_

9. EYELET ID \_\_\_\_\_ +/- \_\_\_\_\_

10. NUMBER OF ACTIVE COILS \_\_\_\_\_

11. TOTAL NUMBER OF COILS \_\_\_\_\_

12. APPROX LOAD \_\_\_\_\_ @ \_\_\_\_\_

13. FINISH \_\_\_\_\_

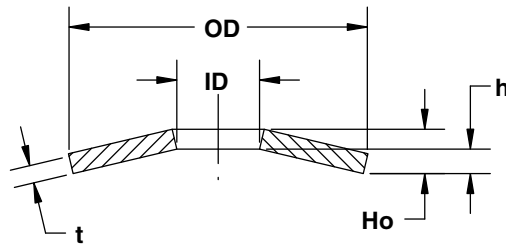
QUANTITY TO QUOTE FOR \_\_\_\_\_

CUSTOMER NAME:	A/C No:	ENQUIRY TAKEN BY:
		DATE TO SUPPLIER:
CUSTOMER CONTACT		DATE PRICE RECEIVED:
TEL No:	EMAIL:	



# BELLEVILLE SPRINGS SPECIFICATION FORM

When a compression spring application requires a high load in a small space Belleville washers provide a solution. The conical form of these springs enables them to support high loads with relatively small deflections and solid heights compared with helical springs. Belleville springs are often used to solve vibration, thermal expansion, relaxation and bolt creep problems.



## ARRANGEMENT TYPE

A. Single Disk	B. Parallel	C. Series	D. Series-Parallel
Disks: _____	Disks: _____	Disks: _____	Disks in Series: _____ Disks in Parallel: _____
Load: _____	Load: _____	Load: _____	Load: _____
@ <input type="checkbox"/> Deflection <input type="checkbox"/> Flat	@ <input type="checkbox"/> Deflection <input type="checkbox"/> Flat	@ <input type="checkbox"/> Deflection <input type="checkbox"/> Flat	@ <input type="checkbox"/> Deflection <input type="checkbox"/> Flat
_____	_____	_____	_____

INDICATE UNITS OF MEASURE (IN & LB), (MM & N)

- MATERIAL \_\_\_\_\_
- THICKNESS (t) \_\_\_\_\_
- OD \_\_\_\_\_ +/- \_\_\_\_\_ OR WORKS IN \_\_\_\_\_
- ID \_\_\_\_\_ +/- \_\_\_\_\_ OR WORKS OVER \_\_\_\_\_
- HEIGHT (Ho) \_\_\_\_\_ +/- \_\_\_\_\_
- (h) \_\_\_\_\_

- (h/t) \_\_\_\_\_
- ARRANGEMENT TYPE A  B  C  D
- STACK HEIGHT \_\_\_\_\_
- OPERATING TEMP \_\_\_\_\_ °F/ °C
- FINISH \_\_\_\_\_
- OTHER \_\_\_\_\_

QUANTITY TO QUOTE FOR \_\_\_\_\_

CUSTOMER NAME:	A/C No:	ENQUIRY TAKEN BY:
		DATE TO SUPPLIER:
CUSTOMER CONTACT		
		DATE PRICE RECEIVED:
TEL No:	EMAIL:	

# Custom Springs, Wire Forms, Stampings and Fourslide Parts

## Lee Spring Offers Support for Every Stage of Custom Design, Manufacturing And Distribution

- Applications/concurrent engineering staff
- Regulatory expertise including RoHS, REACH and DFARS
- Proof of concept methodologies
- CAD assisted product design, drawing and modeling
- In-house prototype production services for rapid turnaround
- Global supply chain network for both production and distribution
- Blanket agreement and consignment inventory management capabilities
- Short and long production run capabilities
- In-house tooling production including EDM
- Proprietary integrated quality control system
- Extensive experience working with Aerospace/Military specifications (AS9100), automotive specifications (TS16949) and FDA Trial Support (21 CFR Part 820)
- ISO 9001 registered quality management system



## From Start to Finish, Lee Spring has the Custom Capabilities You Need!

Spring Types and Dimensions		
<b>Compressed Springs</b>	Outside Diameter: 0.010"– 5.75"/0.25 mm – 146.1 mm	Wire Diameter: 0.002"– 0.625"/0.05 mm – 15.88 mm
<b>Extension Springs</b>	Outside Diameter: 0.010"– 5.75"/0.25 mm – 146.1 mm	Wire Diameter: 0.002"– 0.625"/0.05 mm – 15.88 mm
<b>Torsion Springs</b>	Outside Diameter: 0.010"– 5.75"/0.25 mm – 146.1 mm	Wire Diameter: 0.002"– 0.625"/0.05 mm – 15.88 mm
<b>Wave Springs</b>	Outside Diameter: 0.210"– 5.000"/5.33 mm – 127.0 mm	Inside Diameter: 0.150"– 4.54"/3.81 mm – 115.32 mm
<b>Constant Force</b>	Min. Outside Diameter: 0.340"/8.636 mm Min. Length: 11.80"/299.72 mm	Inside Diameter: 0.280"– 1.97"/7.11 mm – 50.04 mm
<b>Wire Forms</b>	Wire Diameters: 0.010"– 0.24"/0.25 mm – 6 mm	Maximum Finished Length: 60"/1524 mm
<b>Stampings</b>	Strip Width: up to 3" /76.20 mm	Strip Thickness: 0.005 to 0.062"/0.13 mm – 1.57 mm
<b>Fourslide Parts</b>	Strip Width: 0.010"– 0.500"/0.25 mm – 12.70 mm Strip Thickness: 0.003"– 0.125"/0.08 mm – 3.18 mm	Wire Diameter: 0.005"– 0.187"/0.13 mm – 4.75 mm

Distinct production capabilities including: Plastic Compression, Drawbar, Cone, Double Torsion, Specialty Extension and more.

Materials	
• Beryllium Copper	• Inconel®§
• Brass	• Monel®§
• Carbon Steel, Hard Drawn	• Music Wire
• Carbon Steel, Oil Tempered	• Phosphor Bronze
• Chrome Silicon, Oil Tempered	• Plastic Composites
• Chrome Vanadium, Oil Tempered	• Stainless Steel, 300 Series
• Elgiloy®*	• Stainless Steel, 17-7
• Hastelloy®**	
Inquire regarding additional materials.	

Secondary Operations, Finishing and Services	
• Assembly	• Passivation
• Color Coding	• Powder Coating
• Electropolishing	• Shot Peening
• Grinding	• Spring Setting
• Heat Treating	• Plating: Nickel, Zinc, Cadmium
• Looping	• Special Finishes: (e.g., Black Oxide)

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\*\*Hastelloy is a registered trademark of Haynes International Inc.

§ Inconel and Monel are registered trademarks of Special Metals Corporation