



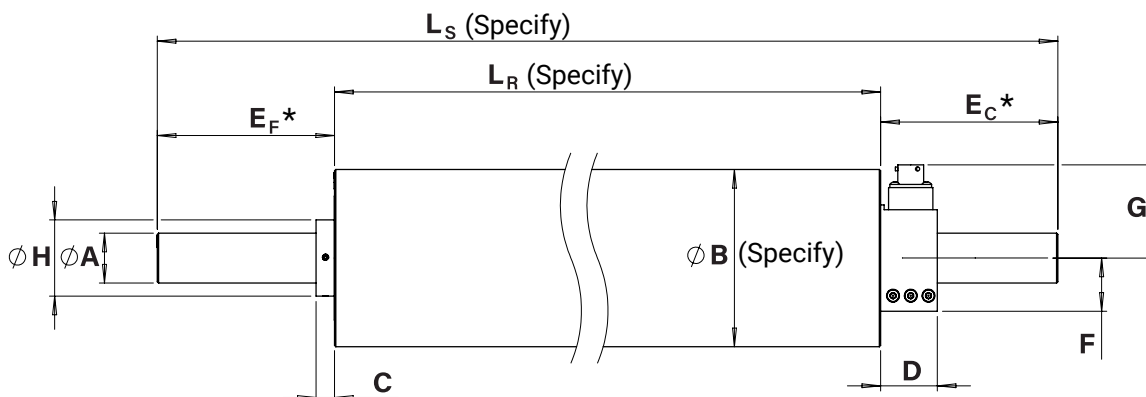
# Tension Roll® Transducer Specification and Load Rating Worksheet

To be used in conjunction with Tension Roll® Transducer Data Sheet

Contact: \_\_\_\_\_ Phone: \_\_\_\_\_ Email: \_\_\_\_\_

Company: \_\_\_\_\_ Address: \_\_\_\_\_

## Roll and Shaft Dimensions



|        |    | A     | B     |       |       | C    | D    | F      | G    | H    |
|--------|----|-------|-------|-------|-------|------|------|--------|------|------|
| SIZE 0 | in | 1.000 | 2.25  |       |       | 0.33 | 1.17 | R 2.20 | 1.96 | 1.56 |
|        | mm | 25.40 | 57.1  |       |       | 8.5  | 29.8 | 55.9   | 49.8 | 39.7 |
| SIZE 1 | in | 1.000 | 3.00  |       |       | 0.29 | 1.17 | R 2.40 | 2.12 | 1.56 |
|        | mm | 25.40 | 76.2  |       |       | 7.4  | 29.8 | 61.0   | 53.8 | 39.7 |
| SIZE 2 | in | 1.125 | 4.00  | 5.00  | 6.00  | 0.41 | 1.28 | R 2.40 | 2.10 | 1.72 |
|        | mm | 28.57 | 101.6 | 127.0 | 152.4 | 10.4 | 32.5 | 61.0   | 53.4 | 43.7 |

## Roll and Shaft Configuration

Shaft Length ( $L_S$ ) \_\_\_\_\_

Roll Face Width ( $L_R$ ) \_\_\_\_\_

Roll Diameter ( $B$ ) \_\_\_\_\_

Shaft Extension, Connector End ( $E_C$ )\* \_\_\_\_\_

Shaft Extension, Nonconnector End ( $E_F$ )\* \_\_\_\_\_

Roll Material: Aluminum (Std), Steel, Stainless Steel \_\_\_\_\_

Roll Surface (16 RMS Std) \_\_\_\_\_

Load Rating (lbs) \_\_\_\_\_

Load rating should be higher than maximum Net force. See page 2 for Net force calculation or contact DFE for assistance.

Connector Position 6 (Std) 3 9 12

\* $E_C$ / $E_F$  dimensions required if roll is not centered on the shaft. \*\*OB option voids DFE 5 year warranty. \*\*\*Size 0 & 1 only.

## Options

Check all that apply, see data sheet for details.

Counterbore, Drill & Tap (CDT)

Drill & Tap (D&T)

Extended Range (XR)

Milled Flats (MF)

Non-Standard Shaft Extensions (NSE)

Oiled Bearings (OB)\*\*

Reduce shaft diameter to 3/4" (RD3)\*\*\*

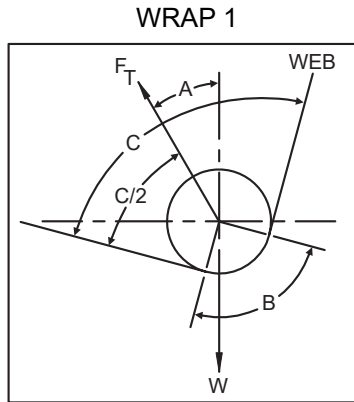
**Web Characteristics** - If more than one is used, give information for the two requiring the most and least tension.

Total Web Tension (lbs), Max \_\_\_\_\_ Min \_\_\_\_\_ (if known)

Type of Web Material \_\_\_\_\_ (if known)

Max. Web Speed (fpm) \_\_\_\_\_ (if known)

## Formulas to Calculate Net Force



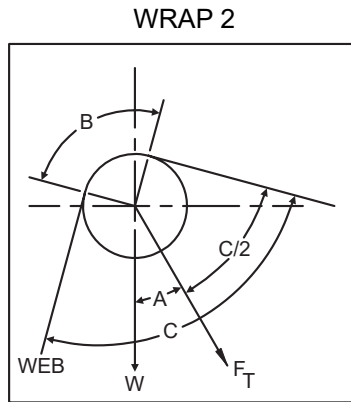
$$\text{NET FORCE} = \frac{4T \sin\left(\frac{B}{2}\right) - W \cos(A)}{2}$$

**W** = Idler Roll Weight

**T** = Maximum Web Tension

**B** = Wrap Angle =  $180^\circ - C^\circ$

**A** = Angle Between Tension Force  $F_T$  and Vertical



$$\text{NET FORCE} = \frac{4T \sin\left(\frac{B}{2}\right) + W \cos(A)}{2}$$

**TABLE 1**

| ANGLE | SINE  | COSINE |
|-------|-------|--------|
| 0°    | 0.000 | 1.000  |
| 5°    | 0.087 | 0.996  |
| 10°   | 0.174 | 0.985  |
| 15°   | 0.259 | 0.966  |
| 20°   | 0.342 | 0.940  |
| 25°   | 0.423 | 0.906  |
| 30°   | 0.500 | 0.866  |
| 35°   | 0.574 | 0.819  |
| 40°   | 0.643 | 0.766  |
| 45°   | 0.707 | 0.707  |
| 50°   | 0.766 | 0.643  |
| 55°   | 0.819 | 0.574  |
| 60°   | 0.866 | 0.500  |
| 65°   | 0.906 | 0.423  |
| 70°   | 0.940 | 0.342  |
| 75°   | 0.966 | 0.259  |
| 80°   | 0.985 | 0.174  |
| 85°   | 0.996 | 0.087  |
| 90°   | 1.000 | 0.000  |

| Value of W for Aluminum Rolls (lbs) |               |                            | Notes  |
|-------------------------------------|---------------|----------------------------|--|
| SIZE                                | ROLL DIAMETER | FORMULA                    |  |
| SIZE 0                              | 2.25 inch     | $W = 0.3 + 0.16 \times LR$ | <ul style="list-style-type: none"> <li>• LR = width of roll face (inches).</li> <li>• Any covering applied to the roll will affect the load rating calculation.</li> <li>• Consult factory for sizing of units with steel or stainless steel rolls.</li> <li>• Refer to the TR Transducer data sheets for length limitations, W formulas, options, and accessories.</li> <li>• For other roll materials, refer to data sheet.</li> </ul> |
| SIZE 1                              | 3 inch        | $W = 1.4 + 0.30 \times LR$ |  |
| SIZE 2                              | 4 inch        | $W = 4.3 + 0.54 \times LR$ |  |
|                                     | 5 inch        | $W = 4.3 + 0.69 \times LR$ |  |
|                                     | 6 inch        | $W = 4.3 + 0.85 \times LR$ |  |

| Available Load Ratings |        |        |         |         |         |
|------------------------|--------|--------|---------|---------|---------|
| SIZE 0                 | 12 lbs | 25 lbs | 50 lbs  | 100 lbs |         |
| SIZE 1                 | 12 lbs | 25 lbs | 50 lbs  | 100 lbs | 150 lbs |
| SIZE 2                 | 25 lbs | 50 lbs | 100 lbs | 200 lbs | 400 lbs |

## Web Geometry and Roll Weight

W = roll weight \_\_\_\_\_ pounds

B = wrap angle \_\_\_\_\_ degrees or

C = angle between entering and exiting web \_\_\_\_\_ degrees

$F_T$  = force on idler roll due to web tension.  $F_T$  is in the same direction as the arrow on the transducer.

A = angle between  $F_T$  and vertical axis \_\_\_\_\_ degrees