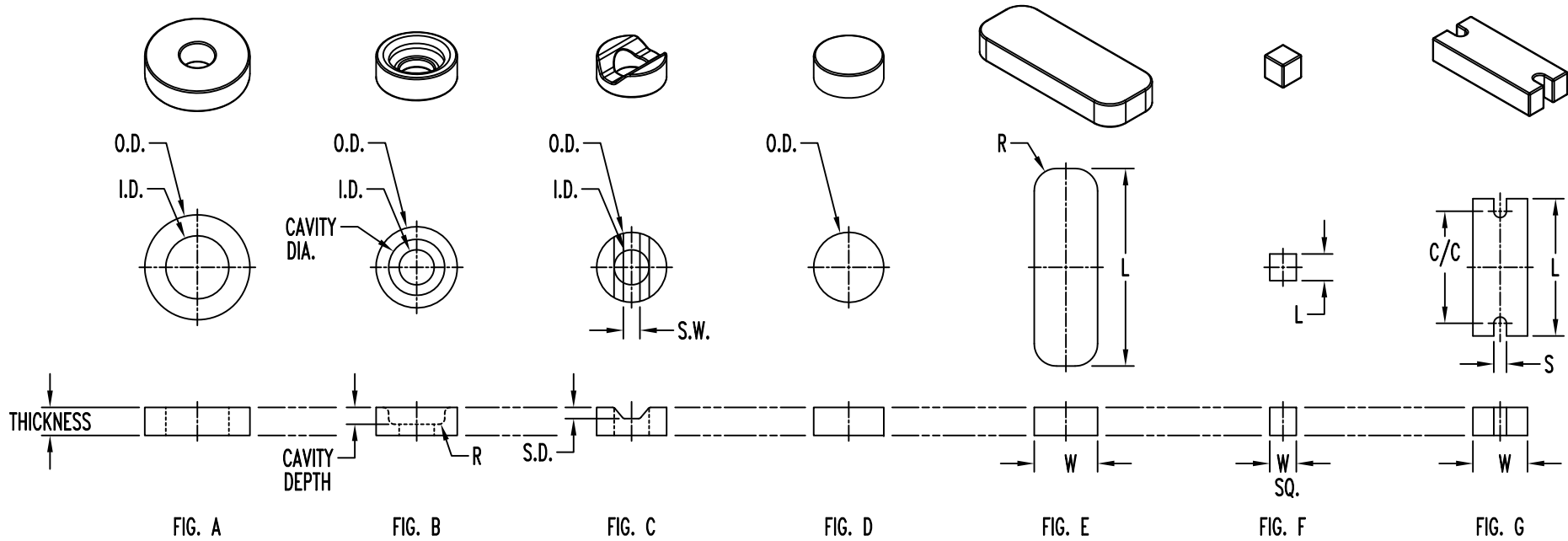


| REV | DESCRIPTION                               | DATE     | APPROVED |
|-----|-------------------------------------------|----------|----------|
| A   | ENGINEERING RELEASE.                      | 10/15/03 | MC       |
| B   | Updated TO-21 ID                          | 09/05/06 | MC       |
| C   | Updated Part Thicknesses Offered          | 09/08/10 | TY       |
| D   | Corrected TO-13 O.D. Typo. Should be .310 | 07/03/12 | TY       |



EXAMPLE:

TO-200-100E  
 TO Style  
 Part Thickness  
 Suffix I.D. (see Table 1)  
 Series

Table 1

| SUFFIX I.D. | I.D. DESCRIPTION  |
|-------------|-------------------|
| NONE        | Wax               |
| E           | Effervescent      |
| CR          | Color Removed     |
| DR          | Detergent Removed |
| H           | Salt              |
| XH          | Extra Hard        |

|                                                         |         |                                                                                        |                  |           |                        |                       |          |              |
|---------------------------------------------------------|---------|----------------------------------------------------------------------------------------|------------------|-----------|------------------------|-----------------------|----------|--------------|
| UNLESS OTHERWISE SPECIFIED:<br>DIMENSIONS ARE IN INCHES |         | <b>Bivar®</b><br>4 THOMAS, IRVINE, CA.92618<br>TEL: (949) 951-8808 FAX: (949) 951-3974 |                  |           |                        |                       |          |              |
| TOLERANCES                                              |         |                                                                                        |                  |           |                        |                       |          |              |
| DECIMALS                                                | ANGULAR | PART NAME: DISS-O-PADS,<br>WASH-AWAY COMPONENTS & GENERAL PURPOSE SPACERS              |                  |           |                        |                       |          |              |
| .X ± .1                                                 | X° ± 1° |                                                                                        |                  |           |                        |                       |          |              |
| .XX ± .01                                               |         |                                                                                        |                  |           |                        |                       |          |              |
| .XXX ± .005                                             |         | DESIGNER<br>DAVID GREEN                                                                | DATE<br>10/15/03 | SIZE<br>A | DWG NAME<br>TO-XXX-XXX | DWG NO.<br>TO-XXX-XXX | REV<br>D |              |
| CHECKER<br>M CHEN                                       |         | DATE<br>10/15/03                                                                       |                  | SCALE 1=1 |                        | CAGE CODE 32559       |          | SHEET 1 OF 3 |

| REV | DESCRIPTION   | DATE | APPROVED |
|-----|---------------|------|----------|
|     | SEE SHEET #1. |      |          |
|     |               |      |          |

# TO-5

| PART NO. | I.D.         | O.D.          | THICKNESS                                                                                | FIG. | TO-5              |
|----------|--------------|---------------|------------------------------------------------------------------------------------------|------|-------------------|
| TO-5     | .225 (5.7mm) | .375 (9.5mm)  | .030, .040, .050, .060, .070, .085, .090, .100, .120, .130, .150, .170, .200, .230, .300 | A    | Spacer            |
| TO-6     | .250 (6.4mm) | .375 (9.5mm)  | .030, .040, .050, .060, .070, .090, .100, .120, .130, .150, .160, .180, .190             | A    | I.C. Spacer       |
| TO-9     | .300 (7.8mm) | .437 (11.1mm) | .030, .040, .050, .070, .080, .090, .100, .120, .130, .150, .180, .200, .300             | A    | .300 (7.6mm) L.S. |
| TO-13    | .225 (5.7mm) | .310 (7.9mm)  | .030, .040, .050, .060, .070, .080, .090, .100, .120, .130, .150                         | A    | Epoxy Case        |

# TO-18

| PART NO. | I.D.         | O.D.         | CAVITY DIA.  | CAVITY DEPTH | THICKNESS                                                                                                  | FIG. | TO-18             |
|----------|--------------|--------------|--------------|--------------|------------------------------------------------------------------------------------------------------------|------|-------------------|
| TO-12    | .125 (3.2mm) | .310 (7.9mm) | .215 (5.5mm) | .065 (1.7mm) | .080, .090, .100, .120, .130, .180                                                                         | B    | .250 (6.4mm) L.S. |
| TO-16    | .125 (3.2mm) | .205 (5.2mm) | -            | -            | .030, .040, .045, .050, .060, .070, .080, .090, .100, .120, .130, .150, .175, .200                         | A    | Epoxy Case        |
| TO-17    | .170 (4.3mm) | .250 (6.4mm) | -            | -            | .030, .035, .040, .050, .060, .070, .090, .100, .120, .130, .140, .150, .170, .180, .200                   | A    | Thin Walls        |
| TO-18    | .125 (3.2mm) | .250 (6.4mm) | -            | -            | .030, .040, .045, .050, .055, .060, .070, .080, .090, .100, .120, .125, .130, .150, .170, .190, .200, .250 | A    | Standard          |
| TO-20    | .125 (3.2mm) | .290 (7.4mm) | .200 (5.1mm) | .065 (1.7mm) | .070, .090, .100, .120, .130, .150                                                                         | B    | .200 (5.1mm) L.S. |
| TO-27    | .125 (3.2mm) | .290 (7.4mm) | -            | -            | .030, .040, .050, .060, .070, .090, .100, .120, .130                                                       | A    | Heavy Walls       |

# AXIAL

| PART NO. | I.D.         | O.D.          | THICKNESS                                                              | SLOT DEPTH   | SLOT WIDTH   | FIG. |
|----------|--------------|---------------|------------------------------------------------------------------------|--------------|--------------|------|
| TO-21    | .125 (3.2mm) | .250 (6.4mm)  | .050, .070, .080, .090, .100, .120, .130, .150, .170, .200, .230, .250 | .045 (1.1mm) | .060 (1.5mm) | C    |
| TO-35    | -            | .440 (11.2mm) | .100, .120, .130, .140, .150, .170, .180, .190, .220, .230, .250       | .065 (1.7mm) | .230 (5.8mm) | C    |
| TO-36    | -            | .187 (4.7mm)  | .050, .060, .070, .080, .090, .100, .120, .130, .150                   | .040 (1.0mm) | .080 (2.0mm) | C    |
| TO-37    | -            | .156 (4.0mm)  | .050, .070, .080, .090, .100, .120                                     | .025 (.64mm) | .050 (1.3mm) | C    |

# ON-END/CORDWOOD

| PART NO. | I.D.         | O.D.         | CAVITY DIA.  | CAVITY DEPTH | THICKNESS                                                                                                              | FIG. |
|----------|--------------|--------------|--------------|--------------|------------------------------------------------------------------------------------------------------------------------|------|
| TO-7     | .075 (1.9mm) | .175 (4.4mm) | -            | -            | .030, .040, .050, .060, .070, .090, .100, .120, .130, .150, .180, .210                                                 | A    |
| TO-8     | .062 (1.6mm) | .156 (4.0mm) | -            | -            | .030, .035, .040, .050, .055, .060, .065, .070, .080, .085, .090, .100, .105, .120, .130, .150, .160, .190, .200, .210 | A    |
| TO-10    | .040 (1.0mm) | .085 (2.2mm) | -            | -            | .025, .030, .040, .050, .060, .065, .070, .080, .090, .100                                                             | A    |
| TO-11    | .045 (1.1mm) | .100 (2.5mm) | -            | -            | .030, .040, .050, .060, .070, .080, .100, .110, .120                                                                   | A    |
| TO-26    | .070 (1.8mm) | .187 (4.7mm) | -            | -            | .030, .040, .050, .060, .070, .090, .100, .120, .125, .150                                                             | A    |
| TO-40    | .045 (1.1mm) | .156 (4.0mm) | -            | -            | .030, .040, .050, .060, .070, .080, .090, .100, .120, .130, .150, .160                                                 | A    |
| TO-64    | .045 (1.1mm) | .140 (3.6mm) | -            | -            | .030, .035, .040, .050, .060, .070, .090, .100, .120, .125, .130, .140, .150, .160, .175                               | A    |
| TO-65    | .075 (1.9mm) | .140 (3.6mm) | -            | -            | .030, .040, .045, .050, .060, .070, .080, .090, .100, .120, .125, .130, .150, .175                                     | A    |
| TO-67    | .045 (1.1mm) | .140 (3.6mm) | .090 (2.3mm) | .025 (.64mm) | .050, .055, .060, .070, .090, .100, .120, .130                                                                         | B    |
| TO-68    | .045 (1.1mm) | .110 (2.8mm) | .075 (1.9mm) | .025 (.64mm) | .040, .050, .055, .060, .070, .090, .100, .120, .130, .150, .160                                                       | B    |

# SOLID

| PART NO. | I.D. | O.D.         | THICKNESS                                                  | FIG. |
|----------|------|--------------|------------------------------------------------------------|------|
| TO-29    | -    | .156 (4.0mm) | .040, .050, .060, .070, .090, .100, .120, .130             | D    |
| TO-31    | -    | .125 (3.2mm) | .040, .050, .060, .070, .090, .100, .120, .130             | D    |
| TO-32    | -    | .187 (4.7mm) | .030, .040, .050, .060, .070, .080, .090, .100, .120, .130 | D    |
| TO-33    | -    | .250 (6.4mm) | .030, .040, .050, .060, .070, .080, .090, .100, .120, .130 | D    |
| TO-34    | -    | .375 (9.5mm) | .040, .050, .060, .070, .090, .100, .120, .130, .250       | D    |

|                                                         |                         |                                                                                                                                                                              |                               |
|---------------------------------------------------------|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
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| TOLERANCES                                              |                         |                                                                                                                                                                              |                               |
| DECIMALS                                                | ANGULAR                 | <b>PART NAME: DISS-O-PADS,<br/>WASH-AWAY COMPONENTS &amp; GENERAL PURPOSE SPACERS</b>                                                                                        |                               |
| .X ± .1                                                 | X° ± 1°                 |                                                                                                                                                                              |                               |
| .XX ± .01                                               |                         |                                                                                                                                                                              |                               |
| .XXX ± .005                                             |                         |                                                                                                                                                                              |                               |
| DESIGNER<br><b>DAVID GREEN</b>                          | DATE<br><b>10/15/03</b> |                                                                                         |                               |
| CHECKER<br><b>M CHEN</b>                                | DATE<br><b>10/15/03</b> | SIZE<br><b>A</b>                                                                                                                                                             | DWG NAME<br><b>TO-XXX-XXX</b> |
| SCALE <b>1=1</b>                                        |                         | CAGE CODE <b>32559</b>                                                                                                                                                       | SHEET <b>2</b> OF <b>3</b>    |

| REV | DESCRIPTION   | DATE | APPROVED |
|-----|---------------|------|----------|
|     | SEE SHEET #1. |      |          |
|     |               |      |          |

#### GENERAL PURPOSE

| PART NO. | I.D.         | O.D.          | THICKNESS                                                                                | FIG. |
|----------|--------------|---------------|------------------------------------------------------------------------------------------|------|
| TO-46    | .090 (2.3mm) | .250 (6.4mm)  | .030, .040, .050, .060, .070, .090, .100, .120, .130, .150, .200, .240                   | A    |
| TO-19    | .250 (6.4mm) | .480 (12.2mm) | .030, .040, .050, .060, .070, .090, .100, .120, .130, .150, .190, .200, .230, .250       | A    |
| TO-22    | .225 (5.7mm) | .437 (11.1mm) | .030, .040, .050, .060, .070, .080, .090, .100, .110, .120, .130, .150, .190, .200, .250 | A    |
| TO-23    | .090 (2.3mm) | .310 (7.9mm)  | .030, .040, .050, .055, .060, .070, .090, .100, .120, .130, .150, .180, .190, .200, .250 | A    |
| TO-24    | .090 (2.3mm) | .340 (8.6mm)  | .030, .040, .050, .060, .070, .090, .100, .120, .130, .150                               | A    |
| TO-30    | .275 (7.0mm) | .397 (10.0mm) | .030, .040, .050, .060, .070, .090, .100, .120, .130, .150                               | A    |
| TO-25    | .180 (4.6mm) | .480 (12.2mm) | .030, .040, .050, .060, .070, .090, .100, .120, .130, .150, .250                         | A    |
| TO-28    | .172 (4.4mm) | .343 (8.7mm)  | .030, .040, .050, .060, .070, .090, .100, .120, .130, .180, .190                         | A    |
| TO-41    | .156 (4.0mm) | .360 (9.1mm)  | .030, .040, .050, .060, .070, .090, .100, .120, .130, .140                               | A    |
| TO-42    | .250 (6.4mm) | .438 (11.1mm) | .030, .040, .050, .060, .070, .090, .100, .120, .130                                     | A    |

#### RECTANGULAR & SQUARE

| PART NO. | L             | W            | R             | THICKNESS                                                                                                  | FIG. |             |
|----------|---------------|--------------|---------------|------------------------------------------------------------------------------------------------------------|------|-------------|
| TO-100   | .670 (17.0mm) | .100 (2.5mm) | .031 (.79mm)  | .030, .035, .040, .045, .050, .060, .065, .070, .075, .080, .090, .100, .120, .130, .150, .200             | E    | Rectangular |
| TO-101   | .562 (14.3mm) | .185 (4.7mm) | -             | .030, .040, .050, .060, .070, .080, .090, .100, .120, .130, .150, .160, .220                               | E    | Rectangular |
| TO-102   | .505 (12.8mm) | .160 (4.1mm) | -             | .040, .050, .060, .070, .090, .100, .120, .130, .150                                                       | E    | Rectangular |
| TO-116   | .666 (16.9mm) | .300 (7.8mm) | .063 (1.6mm)  | .030, .040, .050, .055, .060, .065, .070, .075, .080, .090, .100, .110, .120, .125, .130, .150, .180, .200 | E    | Rectangular |
| TO-117   | .666 (16.9mm) | .281 (7.1mm) | .100 (2.54mm) | .030, .040, .050, .060, .070, .080, .090, .100, .120, .125, .130, .140, .150, .160                         | E    | Rectangular |
| TO-118   | .705 (17.9mm) | .260 (6.6mm) | .080 (2.0mm)  | .030, .040, .050, .060, .070, .080, .090, .100, .110, .120, .130, .150, .160, .170, .175, .200             | E    | Rectangular |
| TO-120   | .085 (2.2mm)  | .085 (2.2mm) | -             | .030, .035, .040, .045, .050, .060, .070, .090, .100, .120                                                 | F    | Square      |
| TO-121   | .095 (2.4mm)  | .095 (2.4mm) | -             | .030, .035, .040, .045, .050, .060, .070, .075, .085, .090, .095, .100, .120                               | F    | Square      |

#### RADIAL & AXIAL DEVICE

| PART NO. | C/C           | S            | W            | L             | THICKNESS                                                              | FIG. |
|----------|---------------|--------------|--------------|---------------|------------------------------------------------------------------------|------|
| TO-200   | .100 (2.5mm)  | .035 (.89mm) | .095 (2.4mm) | .190 (4.8mm)  | .030, .035, .040, .050, .060, .070, .080, .090, .100, .120, .130, .150 | G    |
| TO-201   | .150 (3.8mm)  | .035 (.89mm) | .095 (2.4mm) | .240 (6.1mm)  | .030, .040, .050, .060, .070, .090, .100, .120, .130, .150             | G    |
| TO-203   | .200 (5.1mm)  | .035 (.89mm) | .095 (2.4mm) | .290 (7.4mm)  | .030, .040, .050, .060, .070, .090, .100, .120, .130, .140, .150, .200 | G    |
| TO-204   | .250 (6.4mm)  | .040 (1.0mm) | .145 (3.7mm) | .340 (8.6mm)  | .040, .050, .060, .070, .080, .090, .100, .120, .130, .150             | G    |
| TO-205   | .300 (7.8mm)  | .040 (1.0mm) | .145 (3.7mm) | .390 (9.9mm)  | .040, .050, .060, .070, .090, .100, .120, .130, .150, .215             | G    |
| TO-206   | .400 (10.2mm) | .045 (1.1mm) | .195 (5.0mm) | .490 (12.4mm) | .040, .050, .060, .070, .080, .090, .100, .120, .130, .150, .215       | G    |
| TO-207   | .500 (12.7mm) | .045 (1.1mm) | .195 (5.0mm) | .590 (15.0mm) | .040, .050, .060, .070, .090, .100, .120, .130, .150                   | G    |

|                                                         |                         |                                                                                                                                                                              |                  |                        |                              |                 |
|---------------------------------------------------------|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|------------------------|------------------------------|-----------------|
| UNLESS OTHERWISE SPECIFIED:<br>DIMENSIONS ARE IN INCHES |                         | <br><b>4 THOMAS, IRVINE, CA.92618</b><br><b>TEL: (949) 951-8808 FAX: (949) 951-3974</b> |                  |                        |                              |                 |
| TOLERANCES                                              |                         |                                                                                                                                                                              |                  |                        |                              |                 |
| DECIMALS                                                | ANGULAR                 | <b>PART NAME: DISS-O-PADS,<br/>WASH-AWAY COMPONENTS &amp; GENERAL PURPOSE SPACERS</b>                                                                                        |                  |                        |                              |                 |
| .X ± .1                                                 | X° ± 1°                 |                                                                                                                                                                              |                  |                        |                              |                 |
| .XX ± .01                                               |                         |                                                                                                                                                                              |                  |                        |                              |                 |
| .XXX ± .005                                             |                         |                                                                                                                                                                              |                  |                        |                              |                 |
| DESIGNER<br><b>DAVID GREEN</b>                          | DATE<br><b>10/15/03</b> |                                                                                         | SIZE<br><b>A</b> | DWG NAME               | DWG NO.<br><b>TO-XXX-XXX</b> | REV<br><b>D</b> |
| CHECKER<br><b>M CHEN</b>                                | DATE<br><b>10/15/03</b> |                                                                                                                                                                              | SCALE <b>1=1</b> | CAGE CODE <b>32559</b> | SHEET <b>3</b> OF <b>3</b>   |                 |

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