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DESCRIPTION

| DATE | APPROVED |
| :---: | :---: |
| $09 / 08 / 10$ | T. Y. |
| $07 / 03 / 12$ | T. Y. |
| $07 / 18 / 12$ | T. Y. |
| $07 / 01 / 14$ | J. C. |
| $03 / 06 / 15$ | J. C. |
| $03 / 31 / 15$ | J. C. |
| $05 / 13 / 16$ | J. C. |
| $07 / 29 / 16$ | J. C. |



O.D


FIG. H

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

TABLE 1

| SUFFIX I.D. | I.D. DESCRIPTION | NOTES |
| :--- | :--- | :--- |
| NONE | Wax | Offered for all part numbers. |
| E | Effervescent | Offered for all part numbers. |
| CR | Color Removed | Offered for all part numbers. |
| DR | Detergent Removed | Offered for all part numbers. |
| H | Salt | Not offered for P/Ns: TO-10, TO-11, TO-64, TO-65, TO-68. |
| XH | Extra Hard | Not offered for P/Ns: TO-10, TO-11, TO-64, TO-65, TO-68. |

S.W.


| STANDARD TOLERANCE ( UNLESS OTHERWISE SPECIFIED ) |  | 4 THOMAS, IRVINE, CA. 92618 <br> TEL: (949) 951-8808 FAX: (949) 951-3974 |  |  |
| :---: | :---: | :---: | :---: | :---: |
| $\begin{array}{ll}. X & \pm .1 \\ . & \\ X X & \pm .01\end{array}$ | $\mathrm{X}^{\circ} \pm 1^{\circ}$ |  |  |  |
| $\begin{array}{ll}. X X & \pm .01 \\ . & \end{array}$ |  |  |  |  |
| .XXX $\pm .005$ | $\oplus \square$ | WASH-AWAY SPACERS |  |  |
| DESIGNED: <br> D. Green | DATE: 10/15/03 | PART NO: TO | X-XXX | ${ }^{\text {REVISION: }} \mathrm{K}$ |
| CHECKED:M. Chen | $\begin{array}{\|c\|} \hline \text { DATE: } \\ \hline 10 / 15 / 03 \\ \hline \end{array}$ | CAGE CODE : 32559 SHEET \# 1 OF 3 <br> CAD GENERATED DOCUMENT. DO NOT MEASURE DRAWING.  |  |  |
|  |  |  |  |  |


TO-5

| PART NO. | I.D. | O.D. | THICKNESS | FIG. | TO-5 |
| :--- | :---: | :---: | :---: | :---: | :---: |
| TO-5 | $.225(5.7 \mathrm{~mm})$ | $.375(9.5 \mathrm{~mm})$ | $.030, .040, .050, .060, .070, .085, .090, .100, .120, .130, .150, .170, .200$ | A | Spacer |
| TO-6 | $.250(6.4 \mathrm{~mm})$ | $.375(9.5 \mathrm{~mm})$ | $.030, .040, .050, .060, .070, .090, .100, .120, .130, .150, .160, .180, .190$ | A | I.C. Spacer |
| TO-9 | $.300(7.6 \mathrm{~mm})$ | $.437(11.1 \mathrm{~mm})$ | $.030, .040, .050, .070, .080, .090, .100, .120, .130, .150, .180, .200$ | A | - |
| TO-13 | $.225(5.7 \mathrm{~mm})$ | $.310(7.9 \mathrm{~mm})$ | $.030, .040, .050, .060, .070, .080, .090, .100, .120, .130, .150$ | 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 ( 4.3 mm ) | . 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 ( 5.1 mm ) | . 065 (1.7mm) | . $070, .090, .100, .120, .130, .150$ | B | . 200 ( 5.1 mm ) 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 | $.125(3.2 \mathrm{~mm})$ | $.250(6.4 \mathrm{~mm})$ | $.050, .070, .080, .090, .100, .120, .130, .150, .170, .200, .230, .250$ | $.045(1.1 \mathrm{~mm})$ | $.060(1.5 \mathrm{~mm})$ | C |
| TO-35 | - | $.440(11.2 \mathrm{~mm})$ | $.100, .120, .130, .140, .150, .170, .180, .190, .220, .230, .250$ | $.065(1.7 \mathrm{~mm})$ | $.230(5.8 \mathrm{~mm})$ | H |
| TO-36 | - | $.187(4.7 \mathrm{~mm})$ | $.050, .060, .070, .080, .090, .100, .120, .130, .150$ | $.040(1.0 \mathrm{~mm})$ | $.080(2.0 \mathrm{~mm})$ | H |
| TO-37 | - | $.156(4.0 \mathrm{~mm})$ | $.050, .070, .080, .090, .100, .120$ | $.025(.64 \mathrm{~mm})$ | $.050(1.3 \mathrm{~mm})$ | H |

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, .035, .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 | - | $.156(4.0 \mathrm{~mm})$ | $.040, .050, .060, .070, .090, .100, .120, .130$ | D |
| TO-31 | - | $.125(3.2 \mathrm{~mm})$ | $.040, .050, .060, .070, .090, .100, .120, .130$ | D |
| TO-32 | - | $.187(4.7 \mathrm{~mm})$ | $.030, .040, .050, .060, .070, .080, .090, .100, .120, .130$ | D |
| TO-33 | - | $.250(6.4 \mathrm{~mm})$ | $.030, .040, .050, .060, .070, .080, .090, .100, .120, .130$ | D |
| TO-34 | - | $.375(9.5 \mathrm{~mm})$ | $.040, .050, .060, .070, .090, .100, .120, .130, .250$ | D |


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|  | $\mathrm{X}^{\circ} \pm 1^{\circ}$ |  |  |
| .XXX $\pm .005$ |  | WASH-AWAY SPACERS |  |
| D. Gree | $\begin{aligned} & \text { DATE: } \\ & 10 / 15 / 0 \end{aligned}$ | PART NO: TO-X | XX-XXX ${ }^{\text {REVISION: }} \mathrm{K}$ |
| CHECKED:M. Chen | DATE | CAGE CODE: 325 | SHEET \# 2 OF |
|  |  | CAD GENERATED DOCuM | NOT MEASURE DRAWING. |

## GENERAL PURPOSE

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

## RECTANGULAR \& SQUARE

| PART NO. | L | W | R | THICKNESS |  |  |
| :--- | :---: | :---: | :---: | :---: | :--- | :--- |
| TO-100 | $.670(17.0 \mathrm{~mm})$ | $.100(2.5 \mathrm{~mm})$ | $.031(.79 \mathrm{~mm})$ | $.030, .035, .040, .045, .050, .060, .065, .070, .075, .080, .090, .100, .120, .130, .150, .200$ | E | Rectangular |
| TO-101 | $.562(14.3 \mathrm{~mm})$ | $.185(4.7 \mathrm{~mm})$ | - | $.030, .040, .050, .060, .070, .080, .090, .100, .120, .130, .150, .160, .220$ | E | Rectangular |
| TO-102 | $.505(12.8 \mathrm{~mm})$ | $.160(4.1 \mathrm{~mm})$ | - | $.040, .050, .060, .070, .090, .100, .120, .130, .150$ | E | Rectangular |
| TO-116 | $.666(16.9 \mathrm{~mm})$ | $.300(7.6 \mathrm{~mm})$ | $.063(1.6 \mathrm{~mm})$ | $.030, .040, .050, .055, .060, .065, .070, .075, .080, .090, .100, .110, .120, .125, .130, .150, .180, .200$ | E | Rectangular |
| TO-117 | $.666(16.9 \mathrm{~mm})$ | $.281(7.1 \mathrm{~mm})$ | $.100(2.54 \mathrm{~mm})$ | $.030, .040, .050, .060, .070, .080, .090, .100, .120, .125, .130, .140, .150, .160$ | E | Rectangular |
| TO-118 | $.705(17.9 \mathrm{~mm})$ | $.260(6.6 \mathrm{~mm})$ | $.080(2.0 \mathrm{~mm})$ | $.030, .040, .050, .060, .070, .080, .090, .100, .110, .120, .130, .150, .160, .170, .175, .200$ | E | Rectangular |
| TO-120 | $.085(2.2 \mathrm{~mm})$ | $.085(2.2 \mathrm{~mm})$ | - | $.030, .035, .040, .045, .050, .060, .070, .090, .100, .120$ | Fquare |  |
| TO-121 | $.095(2.4 \mathrm{~mm})$ | $.095(2.4 \mathrm{~mm})$ | - | $.030, .035, .040, .045, .050, .060, .070, .075, .085, .090, .095, .100, .120$ | F | Square |

RADIAL \& AXIAL DEVICE

| PART NO. | $\mathrm{C} / \mathrm{C}$ | S | W | L | THICKNESS | FIG. |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: |
| TO-200 | $.100(2.5 \mathrm{~mm})$ | $.035(.89 \mathrm{~mm})$ | $.095(2.4 \mathrm{~mm})$ | $.190(4.8 \mathrm{~mm})$ | $.030, .035, .040, .050, .060, .070, .080, .090, .100, .120, .130, .150$ | G |
| TO-201 | $.150(3.8 \mathrm{~mm})$ | $.035(.89 \mathrm{~mm})$ | $.095(2.4 \mathrm{~mm})$ | $.240(6.1 \mathrm{~mm})$ | $.030, .040, .050, .060, .070, .090, .100, .120, .130, .150$ | G |
| TO-203 | $.200(5.1 \mathrm{~mm})$ | $.035(.89 \mathrm{~mm})$ | $.095(2.4 \mathrm{~mm})$ | $.290(7.4 \mathrm{~mm})$ | $.030, .040, .050, .060, .070, .090, .100, .120, .130, .140, .150, .200$ | G |
| TO-204 | $.250(6.4 \mathrm{~mm})$ | $.040(1.0 \mathrm{~mm})$ | $.145(3.7 \mathrm{~mm})$ | $.340(8.6 \mathrm{~mm})$ | $.040, .050, .060, .070, .080, .090, .100, .120, .130, .150$ | G |
| TO-205 | $.300(7.6 \mathrm{~mm})$ | $.040(1.0 \mathrm{~mm})$ | $.145(3.7 \mathrm{~mm})$ | $.390(9.9 \mathrm{~mm})$ | $.040, .050, .060, .070, .090, .100, .120, .130, .150, .215$ | G |
| TO-206 | $.400(10.2 \mathrm{~mm})$ | $.045(1.1 \mathrm{~mm})$ | $.195(5.0 \mathrm{~mm})$ | $.490(12.4 \mathrm{~mm})$ | $.040, .050, .060, .070, .080, .090, .100, .120, .130, .150, .215$ | G |
| TO-207 | $.500(12.7 \mathrm{~mm})$ | $.045(1.1 \mathrm{~mm})$ | $.195(5.0 \mathrm{~mm})$ | $.590(15.0 \mathrm{~mm})$ | $.040, .050, .060, .070, .090, .100, .120, .130, .150$ | G |


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| :---: | :---: | :---: | :---: | :---: |
| $\begin{array}{ll} . x & \pm .1 \\ x x & \end{array}$ | $\mathrm{X}^{\circ} \pm 1^{\circ}$ |  |  |  |
| $\begin{array}{ll}. X X & \pm .01 \\ . X X X & \pm .005\end{array}$ | ¢ $\square$ | WASH-AWAY SPACERS |  |  |
| $\begin{aligned} & \text { DESIGNED: } \\ & \text { D. Green } \end{aligned}$ | $\begin{array}{\|l} \hline \text { DATE: } \\ 10 / 15 / 03 \end{array}$ | PART NO: TO-X | XX-XXX | REVISION: K |
| $\begin{aligned} & \text { CHECKED: } \\ & \text { M. Chen } \end{aligned}$ | $\begin{array}{\|l\|} \hline \text { DATE: } \\ 10 / 15 / 03 \end{array}$ | CAGE CODE: 32559 SHEET \# 3 OF 3 <br> CAD GENERATED DOCUMENT, DO NOT MEASURE DRAWING.  |  |  |
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