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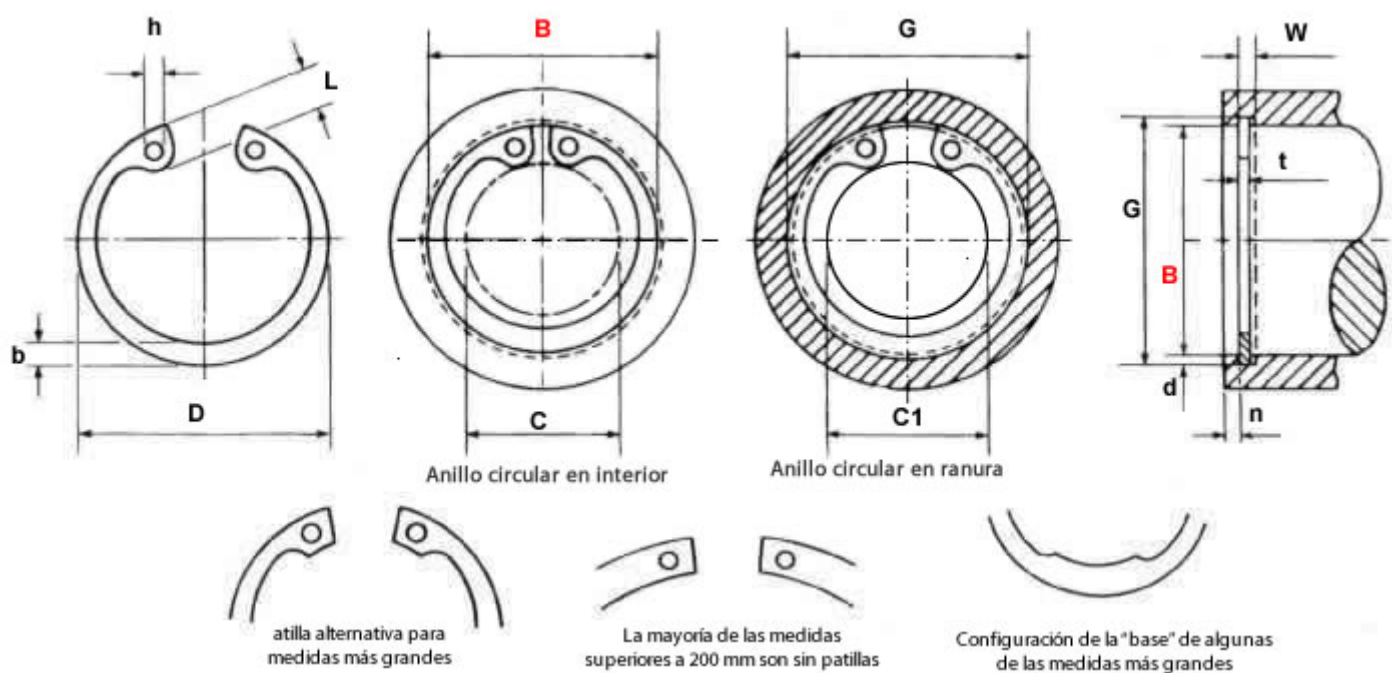
## ***TÉCNICO***

### ***Seguro DIN 472***

anillos **DIN 472** o seguros segers(seggers,seagers,seager,circlip). En norma ANDERTON **1300** y norma WALDES TRUCK **5000**. Estos son utilizados para el montaje de piezas y su posterior desmontaje solamente cerrando el anillo Los podemos encontrar en automóviles,máquinas de coser,aviones,carros,viales,mineras,electrodomésticos y muchas otras posibilidades de mecanismos. Los seguros son fabricados en acero para resortes SAE 1070 cuya composición química es la siguiente:

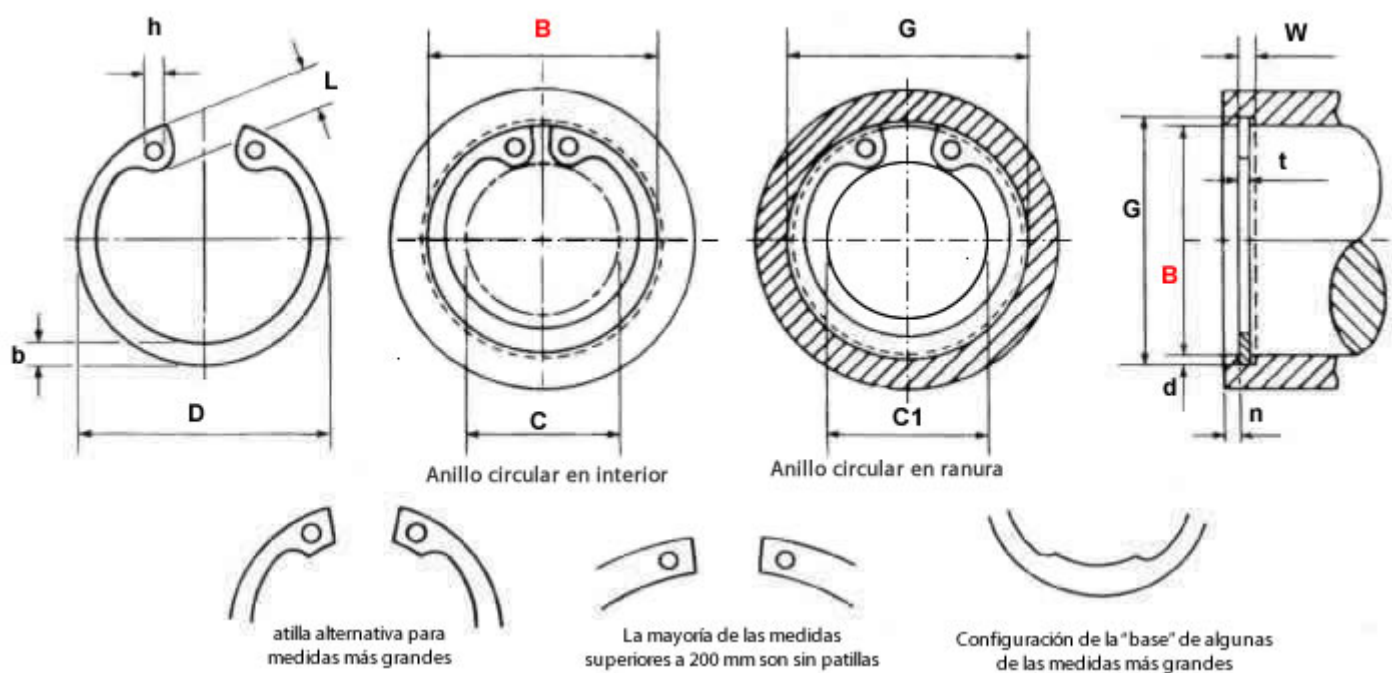
Acero para muelle al carbono. acabado estándar - fosfato y aceite.

Carbono máx. **0,75** -manganeso **0,60** al **0,90**- Fósforo máx **0,04** - Azufre máx **0,50** con una dureza de 45-55 HRC.



| Ranura (G) |      |                |     |      | Añillo circular (F) |       |                |                |      |      |               |     |               | Wt.    |       |
|------------|------|----------------|-----|------|---------------------|-------|----------------|----------------|------|------|---------------|-----|---------------|--------|-------|
| Tol.       | w    | Tol.           | n   | d    | t                   | Tol.  | D              | Tol.           | C    | C1   | L<br>(máximo) | b   | h<br>(mínimo) | (kg/k) | (mm)  |
| +0.09      | 0.90 | +0.14<br>-0.00 | 0.6 | 0.2  | 0.80                | +0.00 | 8.7            | +0.36<br>-0.10 | 3.0  | 3.6  | 2.4           | 1.1 | 1.0           | 0.11   | 6.35  |
| -0.00      | 0.90 |                | 0.6 | 0.2  | 0.80                | -0.05 | 9.8            |                | 3.7  | 4.4  | 2.5           | 1.3 | 1.0           | 0.17   | 7.62  |
|            | 1.10 |                | 0.6 | 0.2  | 1.00                |       | 10.3           |                | 3.2  | 3.9  | 3.0           | 1.3 | 1.2           | 0.22   | 9.14  |
|            | 1.10 |                | 0.6 | 0.2  | 1.00                |       | 10.8           |                | 3.3  | 4.0  | 3.2           | 1.4 | 1.2           | 0.24   | 9.52  |
|            | 1.10 |                | 0.6 | 0.2  | 1.00                |       | 11.8           |                | 4.1  | 4.8  | 3.3           | 1.5 | 1.2           | 0.30   | 10.16 |
|            | 1.10 |                | 0.8 | 0.3  | 1.00                |       | 13.0           |                | 4.9  | 5.7  | 3.4           | 1.7 | 1.5           | 0.34   | 11.18 |
| +0.11      | 1.10 |                | 0.9 | 0.3  | 1.00                |       | 14.1           |                | 5.4  | 6.4  | 3.6           | 1.8 | 1.5           | 0.39   | 12.07 |
| -0.00      | 1.10 |                | 0.9 | 0.3  | 1.00                |       | 15.1           |                | 6.2  | 7.2  | 3.7           | 1.9 | 1.7           | 0.45   | 13.00 |
|            | 1.10 |                | 1.1 | 0.4  | 1.00                |       | 16.2           |                | 7.2  | 8.3  | 3.7           | 2.0 | 1.7           | 0.48   | 14.00 |
|            | 1.10 |                | 1.2 | 0.4  | 1.00                |       | 17.3           |                | 8.0  | 9.2  | 3.8           | 2.0 | 1.7           | 0.54   | 15.24 |
|            | 1.10 |                | 1.2 | 0.4  | 1.00                |       | 18.3           |                | 8.8  | 10.0 | 3.9           | 2.1 | 1.7           | 0.59   | 16.51 |
|            | 1.10 |                | 1.5 | 0.5  | 1.00                |       | 19.5           |                | 9.4  | 10.8 | 4.1           | 2.2 | 2.0           | 0.61   | 17.18 |
| +0.13      | 1.10 |                | 1.5 | 0.5  | 1.00                |       | 20.5           | +0.42<br>-0.13 | 10.4 | 11.8 | 4.1           | 2.2 | 2.0           | 0.72   | 18.29 |
| -0.00      | 1.10 |                | 1.5 | 0.5  | 1.00                |       | 21.5           |                | 11.2 | 12.6 | 4.2           | 2.3 | 2.0           | 0.75   | 19.05 |
|            | 1.10 |                | 1.5 | 0.5  | 1.00                |       | 22.5           |                | 12.2 | 13.6 | 4.2           | 2.4 | 2.0           | 0.84   | 20.32 |
|            | 1.10 |                | 1.5 | 0.5  | 1.00                |       | 23.5           |                | 13.2 | 14.6 | 4.2           | 2.5 | 2.0           | 0.86   | 21.09 |
|            | 1.30 |                | 1.7 | 0.6  | 1.20                |       | 24.6           | +0.42<br>-0.21 | 14.2 | 15.7 | 4.2           | 2.5 | 2.0           | 1.20   | 26.17 |
|            | 1.30 |                | 1.8 | 0.6  | 1.20                |       | 25.9           |                | 14.8 | 16.4 | 4.4           | 2.6 | 2.0           | 1.21   | 28.13 |
| +0.21      | 1.30 |                | 1.8 | 0.6  | 1.20                |       | 26.9           |                | 15.5 | 17.2 | 4.5           | 2.7 | 2.0           | 1.33   | 29.27 |
| -0.00      | 1.30 |                | 1.8 | 0.6  | 1.20                | +0.00 | 27.9           |                | 16.1 | 17.8 | 4.7           | 2.8 | 2.0           | 1.35   | 30.48 |
|            | 1.30 |                | 2.1 | 0.7  | 1.20                | -0.06 | 29.1           |                | 17.1 | 19.0 | 4.7           | 2.9 | 2.0           | 1.55   | 31.76 |
|            | 1.30 |                | 2.1 | 0.7  | 1.20                |       | 30.1           |                | 17.9 | 19.8 | 4.8           | 2.9 | 2.0           | 1.64   | 32.55 |
|            | 1.30 |                | 2.1 | 0.7  | 1.20                |       | 31.1           |                | 18.9 | 20.8 | 4.8           | 3.0 | 2.0           | 1.74   | 33.83 |
|            | 1.30 |                | 2.1 | 0.7  | 1.20                |       | 32.1           |                | 19.9 | 21.8 | 4.8           | 3.0 | 2.0           | 1.87   | 35.41 |
|            | 1.30 | +0.14          | 2.6 | 0.9  | 1.20                |       | 33.4           |                | 20.0 | 22.3 | 5.2           | 3.2 | 2.5           | 2.20   | 36.58 |
|            | 1.30 | -0.00          | 2.6 | 0.9  | 1.20                |       | 34.4           |                | 20.6 | 22.9 | 5.4           | 3.2 | 2.5           | 1.98   | 37.46 |
|            | 1.30 | 2.6            | 0.9 | 1.20 |                     | 35.5  | +0.50<br>-0.25 | 21.6           | 23.9 | 5.4  | 3.3           | 2.5 | 2.13          | 36.58  |       |
|            | 1.60 | 2.6            | 0.9 | 1.50 |                     | 36.5  |                | 22.6           | 24.9 | 5.4  | 3.3           | 2.5 | 2.88          | 49.63  |       |
|            | 1.60 | 3.0            | 1.0 | 1.50 |                     | 37.8  |                | 23.6           | 26.2 | 5.4  | 3.4           | 2.5 | 2.93          | 51.42  |       |
| +0.25      | 1.60 | 3.0            | 1.0 | 1.50 |                     | 38.8  |                | 24.6           | 27.2 | 5.4  | 4.0           | 2.5 | 3.23          | 52.71  |       |
| -0.00      | 1.60 | 3.0            | 1.0 | 1.50 |                     | 39.8  |                | 25.4           | 28.0 | 5.5  | 3.2           | 2.5 | 2.98          | 54.43  |       |
|            | 1.60 | 3.0            | 1.0 | 1.50 |                     | 40.8  |                | 26.4           | 29.0 | 5.5  | 3.7           | 2.5 | 3.54          | 55.86  |       |
|            | 1.85 | 3.8            | 1.3 | 1.75 |                     | 43.5  | +0.90<br>-0.39 | 27.8           | 30.9 | 5.8  | 3.9           | 2.5 | 4.63          | 56.69  |       |
|            | 1.85 | 3.8            | 1.3 | 1.75 |                     | 44.5  |                | 28.6           | 31.7 | 5.9  | 4.0           | 2.5 | 5.37          | 58.43  |       |
|            | 1.85 | 3.8            | 1.3 | 1.75 |                     | 45.5  |                | 29.6           | 32.7 | 5.9  | 4.1           | 2.5 | 5.21          | 59.72  |       |
|            | 1.85 | 3.8            | 1.3 | 1.75 |                     | 48.5  |                | 32.0           | 35.1 | 6.2  | 4.3           | 2.5 | 5.88          | 63.50  |       |
|            | 1.85 | 3.8            | 1.3 | 1.75 |                     | 50.5  |                | 33.5           | 36.7 | 6.4  | 4.4           | 2.5 | 6.13          | 66.15  |       |
|            | 1.85 | 3.8            | 1.3 | 1.75 |                     | 51.5  |                | 34.5           | 37.7 | 6.4  | 4.5           | 2.5 | 6.31          | 68.27  |       |
|            | 2.15 | 4.5            | 1.5 | 2.00 |                     | 54.2  |                | 36.3           | 40.0 | 6.5  | 4.6           | 2.5 | 8.01          | 80.06  |       |
|            | 2.15 | 4.5            | 1.5 | 2.00 |                     | 55.2  |                | 37.3           | 41.0 | 6.5  | 4.7           | 2.5 | 8.72          | 82.28  |       |
|            | 2.15 | 4.5            | 1.5 | 2.00 |                     | 56.2  |                | 37.9           | 41.6 | 6.7  | 4.7           | 2.5 | 8.91          | 84.14  |       |

|       |      |  |     |     |      |       |      |       |      |      |     |      |     |       |    |
|-------|------|--|-----|-----|------|-------|------|-------|------|------|-----|------|-----|-------|----|
|       | 2.15 |  | 4.5 | 1.5 | 2.00 |       | 59.2 |       | 40.7 | 44.4 | 6.8 | 5.0  | 2.5 | 9.44  | 89 |
|       | 2.15 |  | 4.5 | 1.5 | 2.00 |       | 60.2 | +1.10 | 41.7 | 45.4 | 6.8 | 5.1  | 2.5 | 9.75  | 90 |
| +0.30 | 2.15 |  | 4.5 | 1.5 | 2.00 | +0.00 | 62.2 |       | 42.7 | 46.4 | 6.8 | 5.1  | 2.5 | 9.56  | 92 |
| -0.00 | 2.15 |  | 4.5 | 1.5 | 2.00 | -0.07 | 62.2 | -0.46 | 43.5 | 47.2 | 6.9 | 5.2  | 2.5 | 10.36 | 93 |
|       | 2.15 |  | 4.5 | 1.5 | 2.00 |       | 64.2 |       | 44.7 | 48.4 | 7.3 | 5.4  | 2.5 | 11.15 | 97 |
|       | 2.15 |  | 4.5 | 1.5 | 2.00 |       | 66.2 |       | 46.7 | 50.4 | 7.3 | 5.5  | 2.5 | 11.59 | 10 |
|       | 2.15 |  | 4.5 | 1.5 | 2.00 |       | 67.2 |       | 47.7 | 51.4 | 7.3 | 5.6  | 2.5 | 11.78 | 10 |
|       | 2.15 |  | 4.5 | 1.5 | 2.00 |       | 68.2 |       | 48.7 | 52.4 | 7.3 | 5.2  | 2.5 | 16.80 | 10 |
|       | 2.65 |  | 4.5 | 1.5 | 2.50 |       | 69.2 |       | 49.0 | 52.8 | 7.6 | 5.8, | 3.0 | 17.71 | 13 |



| Ranura (G) |       |      |       |     |     | Anillo Circular |       |       |       |       |       |               |        |               | Wt     |    |
|------------|-------|------|-------|-----|-----|-----------------|-------|-------|-------|-------|-------|---------------|--------|---------------|--------|----|
|            | Tol.  | W    | Tol.  | n   | d   | t               | Tol.  | D     | Tol.  | c     | c1    | L<br>(Máximo) | b<br>— | h<br>(Mínimo) | (Kg/K) |    |
| 0          |       | 2.65 |       | 4.5 | 1.5 | 2.50            |       | 72.5  |       | 50.8  | 54.6  | 7.7           | 6.0    | 3.0           | 17.71  | 13 |
| 0          |       | 2.65 |       | 4.5 | 1.5 | 2.50            |       | 72.5  |       | 51.6  | 55.4  | 7.8           | 6.1    | 3.0           | 17.72  | 13 |
| 0          |       | 2.65 |       | 4.5 | 1.5 | 2.50            | +0.00 | 74.5  | +1.10 | 53.6  | 57.4  | 7.8           | 6.2    | 3.0           | 17.65  | 14 |
| 0          | +0.30 | 2.65 |       | 4.5 | 1.5 | 2.50            | -0.07 | 76.5  | -0.46 | 55.6  | 59.4  | 7.8           | 6.4    | 3.0           | 19.70  | 14 |
| 0          | -0.00 | 2.65 | +0.14 | 4.5 | 1.5 | 2.50            |       | 79.5  |       | 58.6  | 62.4  | 7.8           | 6.6    | 3.0           | 20.62  | 15 |
| 0          |       | 2.65 | -0.00 | 4.5 | 1.5 | 2.50            |       | 80.7  |       | 59.6  | 63.4  | 7.8           | 6.1    | 3.0           | 22.68  | 15 |
| 0          |       | 2.65 |       | 4.5 | 1.5 | 2.50            |       | 82.5  |       | 60.1  | 64.0  | 8.5           | 6.8    | 3.0           | 22.46  | 15 |
| 5          |       | 2.65 |       | 5.3 | 1.8 | 2.50            |       | 85.5  |       | 62.1  | 66.5  | 8.5           | 7.0    | 3.0           | 21.38  | 16 |
| 5          |       | 2.65 |       | 5.3 | 1.8 | 2.50            |       | 87.5  |       | 64.1  | 68.5  | 8.5           | 6.2    | 3.0           | 22.27  | 16 |
| 5          |       | 3.15 |       | 5.3 | 1.8 | 3.00            |       | 90.5  |       | 66.9  | 71.3  | 8.6           | 7.2    | 3.5           | 31.78  | 20 |
| 5          | +0.35 | 3.15 |       | 5.3 | 1.8 | 3.00            |       | 93.5  |       | 69.9  | 74.3  | 8.6           | 7.4    | 3.5           | 32.94  | 21 |
| 5          | -0.00 | 3.15 |       | 5.3 | 1.8 | 3.00            | +0.00 | 95.5  | +1.30 | 71.9  | 76.3  | 8.6           | 7.6    | 3.5           | 33.35  | 21 |
| 5          |       | 3.15 |       | 5.3 | 1.8 | 3.00            | -0.08 | 97.5  | -0.54 | 73.7  | 78.1  | 8.7           | 7.8    | 3.5           | 35.72  | 22 |
| 5          |       | 3.15 |       | 5.3 | 1.8 | 3.00            |       | 100.5 |       | 76.5  | 80.9  | 8.8           | 8.1    | 3.5           | 38.88  | 23 |
| .5         |       | 3.15 |       | 5.3 | 1.8 | 3.00            |       | 103.5 |       | 79.0  | 83.5  | 9.0           | 8.3    | 3.5           | 42.16  | 23 |
| .5         |       | 3.15 |       | 5.3 | 1.8 | 3.00            |       | 105.5 |       | 80.6  | 85.1  | 9.2           | 8.4    | 3.5           | 43.41  | 24 |
| .0         |       | 4.15 |       | 6.0 | 2.0 | 4.00            |       | 108.0 |       | 82.0  | 87.0  | 9.5           | 8.5    | 3.5           | 55.20  | 33 |
| .0         |       | 4.15 |       | 6.0 | 2.0 | 4.00            |       | 112.0 |       | 85.0  | 90.0  | 9.5           | 8.7    | 3.5           | 59.20  | 34 |
| .0         | +0.54 | 4.15 |       | 6.0 | 2.0 | 4.00            |       | 115.0 |       | 88.0  | 93.0  | 9.5           | 8.9    | 3.5           | 62.60  | 35 |
| .0         | -0.00 | 4.15 |       | 6.0 | 2.0 | 4.00            |       | 117.0 |       | 88.2  | 93.2  | 10.4          | 9.0    | 3.5           | 71.75  | 35 |
| .0         |       | 4.15 |       | 6.0 | 2.0 | 4.00            |       | 119.0 |       | 90.0  | 95.0  | 10.5          | 9.1    | 3.5           | 70.68  | 36 |
| .0         |       | 4.15 |       | 6.0 | 2.0 | 4.00            |       | 122.0 |       | 93.0  | 98.0  | 10.5          | 9.3    | 3.5           | 73.16  | 37 |
| .0         |       | 4.15 |       | 6.0 | 2.0 | 4.00            |       | 127.0 |       | 96.9  | 102.0 | 11.0          | 9.7    | 3.5           | 80.40  | 38 |
| .0         |       | 4.15 |       | 6.0 | 2.0 | 4.00            |       | 132.0 |       | 101.9 | 107.0 | 11.0          | 10.0   | 4.0           | 81.20  | 40 |
| .0         |       | 4.15 |       | 6.0 | 2.0 | 4.00            |       | 135.0 |       | 103.9 | 109.0 | 11.0          | 10.0   | 4.0           | 80.80  | 41 |
| .0         |       | 4.15 |       | 6.0 | 2.0 | 4.00            |       | 137.0 |       | 106.9 | 112.0 | 11.0          | 10.2   | 4.0           | 85.13  | 42 |
| .0         |       | 4.15 |       | 6.0 | 2.0 | 4.00            | +0.00 | 142.0 | +1.50 | 111.5 | 116.0 | 11.2          | 10.5   | 4.0           | 94.79  | 43 |
| .0         | +0.63 | 4.15 |       | 6.0 | 2.0 | 4.00            | -0.10 | 147.0 | -0.63 | 116.5 | 121.0 | 11.2          | 10.7   | 4.0           | 98.61  | 45 |
| .0         | -0.00 | 4.15 | +0.18 | 6.0 | 2.0 | 4.00            |       | 152.0 |       | 121.0 | 126.0 | 11.4          | 10.9   | 4.0           | 10650  | 46 |
| .0         |       | 4.15 | -0.00 | 7.5 | 2.5 | 4.00            |       | 158.0 |       | 124.8 | 131.0 | 12.0          | 11.2   | 4.0           | 10680  | 48 |
| .0         |       | 4.15 |       | 7.5 | 2.5 | 4.00            |       | 164.0 |       | 129.8 | 136.0 | 12.0          | 11.4   | 4.0           | 128.00 | 50 |
| .0         |       | 4.15 |       | 7.5 | 2.5 | 4.00            |       | 169.0 |       | 132.7 | 139.0 | 13.0          | 11.6   | 4.0           | 130.50 | 51 |
| .0         |       | 4.15 |       | 7.5 | 2.5 | 4.00            |       | 174.5 |       | 137.7 | 144.0 | 13.0          | 11.8   | 4.0           | 132.00 | 53 |
| .0         |       | 4.15 |       | 7.5 | 2.5 | 4.00            |       | 179.5 |       | 141.6 | 148.0 | 13.5          | 12.0   | 4.0           | 149.50 | 55 |
| .0         |       | 4.15 |       | 7.5 | 2.5 | 4.00            |       | 184.5 |       | 146.6 | 153.0 | 13.5          | 12.0   | 4.0           | 158.50 | 56 |
| .0         |       | 4.15 |       | 7.5 | 2.5 | 4.00            |       | 189.5 |       | 150.2 | 156.0 | 14.2          | 13.0   | 4.0           | 168.00 | 58 |
| .0         |       | 4.15 |       | 7.5 | 2.5 | 4.00            |       | 194.5 |       | 155.2 | 161.0 | 14.2          | 13.0   | 4.0           | 177.50 | 59 |
| .0         |       | 4.15 |       | 7.5 | 2.5 | 4.00            |       | 199.5 |       | 160.2 | 166.0 | 14.3          | 13.0   | 4.0           | 184.00 | 61 |
| .0         |       | 4.15 |       | 7.5 | 2.5 | 4.00            |       | 204.5 | +1.70 | 165.2 | 171.0 | 14.2          | 13.0   | 4.0           | 189.60 | 63 |
| .0         | +0.72 | 4.15 |       | 7.5 | 2.5 | 4.00            |       | 209.5 | -0.12 | 170.2 | 176.0 | 14.3          | 13.0   | 4.0           | 196.00 | 64 |

|    |       |      |      |     |      |       |       |       |       |       |      |      |     |        |     |
|----|-------|------|------|-----|------|-------|-------|-------|-------|-------|------|------|-----|--------|-----|
| .0 | -0.00 | 5.15 | 9.0  | 3.0 | 5.00 |       | 222.0 |       | 180.2 | 187.0 | 14.2 | 14.0 | 4.0 | 263.00 | 73  |
| .0 |       | 5.15 | 9.0  | 3.0 | 5.00 |       | 232.0 |       | 190.2 | 197.0 | 14.2 | 14.0 | 4.0 | 276.00 | 77  |
| .0 |       | 5.15 | 9.0  | 3.0 | 5.00 |       | 242.0 |       | 200.2 | 207.0 | 14.2 | 14.0 | 4.0 | 291.00 | 80  |
| .0 |       | 5.15 | 9.0  | 3.0 | 5.00 |       | 252.0 |       | 210.2 | 217.0 | 14.2 | 14.0 | 4.0 | 304.00 | 84  |
| .0 |       | 5.15 | 9.0  | 3.0 | 5.00 | +0.00 | 262.0 |       | 220.2 | 227.0 | 14.2 | 14.0 | 4.0 | 318.50 | 88  |
| .0 |       | 5.15 | 12.0 | 4.0 | 5.00 | -0.12 | 275.0 | +2.00 | 226.0 | 235.0 | 16.2 | 16.0 | 5.0 | 385.00 | 91  |
| .0 | +0.81 | 5.15 | 12.0 | 4.0 | 5.00 |       | 285.0 |       | 236.0 | 245.0 | 16.2 | 16.0 | 5.0 | 401.50 | 95  |
| .0 | -0.00 | 5.15 | 12.0 | 4.0 | 5.00 |       | 295.0 | -0.81 | 246.0 | 255.0 | 16.2 | 16.0 | 5.0 | 417.50 | 98  |
| .0 |       | 5.15 | 12.0 | 4.0 | 5.00 |       | 305.0 |       | 256.0 | 265.0 | 16.2 | 16.0 | 5.0 | 433.40 | 102 |

| REFERENCIA |   |                                  |  |                 |                                 |
|------------|---|----------------------------------|--|-----------------|---------------------------------|
| <b>B</b>   | = | Agujero,Perforación              |  | <b>L</b>        | = Profundidad de la pata        |
| <b>-</b>   | = | -                                |  | <b>b</b>        | = Alma del anillo               |
| <b>G</b>   | = | Ranura de la perforación         |  | <b>h</b>        | = Agujero                       |
| <b>Tol</b> | = | Tolerancia                       |  | <b>F</b>        | = Anillo                        |
| <b>W</b>   | = | Ancho de la ranura               |  | <b>Wt</b>       | = Peso Kg/1000                  |
| <b>n</b>   | = | Margen de arista                 |  | <b>min</b>      | = Mínimo                        |
| <b>d</b>   | = | Profundidad de la ranura         |  | <b>~</b>        | = Aproximadamente               |
| <b>t</b>   | = | Espesor                          |  | <b>max</b>      | = Máximo                        |
| <b>D</b>   | = | Diámetro libre interior/exterior |  | <b>Ref. No.</b> | = Número de referencia          |
| <b>C</b>   | = | •Anillo en el eje/en el agujero  |  | <b>Tc(N)</b>    | = Carga Axial (Newtones) anillo |
| <b>C1</b>  | = | Anillo en la ranura              |  | <b>Tg(N)</b>    | = Carga Axial (Newtones) ranura |