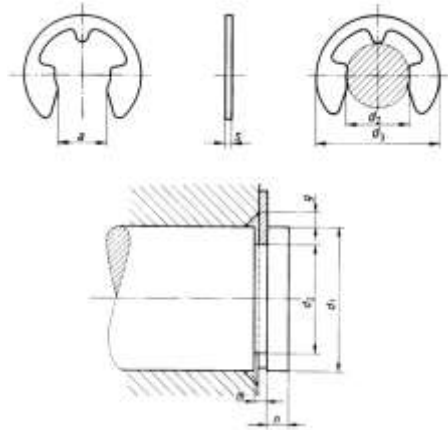


## Metric DIN 6799 E-Type Retaining Ring

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### Dimensions of Metric DIN 6799 E-Type Retaining Ring

| d2<br>nominal<br>size | d1   |      | s   | a    |        | Weight<br>kg/1000pcs | d2   |       | m    | n     | d3  |           | FN   |      | Fs<br>kN | g    | Fsg   | n abl<br>min.-<br>1 |       |
|-----------------------|------|------|-----|------|--------|----------------------|------|-------|------|-------|-----|-----------|------|------|----------|------|-------|---------------------|-------|
|                       | Min. | Max. |     |      |        |                      | Min. | Max.  |      |       | kN  | for<br>d1 | Min. | Max. |          |      |       |                     | kN    |
| 0.8                   | 1    | 1.4  | 0.2 | 0.58 | ±0.04  | 0.003                | 0.8  | 0     | 0.24 | 0.04  | 0   | 0.4       | 2.25 | 0.03 | 1.2      | 0.08 | 0.3   | 0.04                | 50000 |
| 1.2                   | 1.4  | 2    | 0.3 | 1.01 |        | 0.009                | 1.2  | 0     | 0.34 | 0     | 0.6 | 3.25      | 0.04 | 1.5  | 0.12     | 0.4  | 0.06  | 47000               |       |
| 1.5                   | 2    | 2.5  | 0.4 | 1.28 |        | 0.021                | 1.5  | -0.06 | 0.44 | 0     | 0.8 | 4.25      | 0.07 | 2    | 0.22     | 0.6  | 0.11  | 43000               |       |
| 1.9                   | 2.5  | 3    | 0.5 | 1.61 |        | 0.04                 | 1.9  | (h11) | 0.54 | 0.05  | 1   | 4.8       | 0.1  | 2.5  | 0.35     | 0.7  | 0.17  | 40000               |       |
| 2.3                   | 3    | 4    | 0.6 | 1.94 |        | 0.069                | 2.3  |       | 0.64 | 0     | 1   | 6.3       | 0.15 | 3    | 0.5      | 0.9  | 0.24  | 38000               |       |
| 3.2                   | 4    | 5    | 0.6 | 2.7  | 0.088  | 3.2                  | 0    | 0.64  | 0    | 1     | 7.3 | 0.22      | 4    | 0.65 | 0.9      | 0.32 | 35000 |                     |       |
| 4                     | 5    | 7    | 0.7 | 3.34 | ±0.048 | 0.158                | 4    | -     | 0.74 | 0.075 | 1.2 | 9.3       | 0.25 | 5    | 0.95     | 1    | 0.47  | 32000               |       |
| 5                     | 6    | 8    | 0.7 | 4.11 |        | 0.236                | 5    | (h11) | 0.74 | 0     | 1.2 | 11.3      | 0.9  | 7    | 1.15     | 1    | 0.6   | 28000               |       |
| 6                     | 7    | 9    | 0.7 | 5.26 |        | 0.255                | 6    |       | 0.74 | 0     | 1.2 | 12.3      | 1.1  | 8    | 1.35     | 1.1  | 0.7   | 25000               |       |
| 7                     | 8    | 11   | 0.9 | 5.84 |        | 0.474                | 7    | 0     | 0.94 | 0     | 1.5 | 14.3      | 1.25 | 9    | 1.8      | 1.3  | 1     | 22000               |       |
|                       |      |      |     |      |        |                      |      |       |      |       | 1.5 | 14.3      | 1.25 | 9    | 1.8      | 1.3  | 1     | 22000               |       |

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| d2<br>nominal<br>size | d1   |      | s   |       | a    |        | Weight<br>kg/1000pcs | d2    |       | m          |      | n    |      | d3        |      | FN  |      | Fs    |       | n abl<br>min.-<br>1 |
|-----------------------|------|------|-----|-------|------|--------|----------------------|-------|-------|------------|------|------|------|-----------|------|-----|------|-------|-------|---------------------|
|                       | Min. | Max. |     |       |      |        |                      |       |       |            | Min. | Max. | kN   | for<br>d1 | kN   | g   | Fsg  |       |       |                     |
| 8                     | 9    | 12   | 1   | ±0.03 | 6.52 | ±0.058 | 0.66                 | 8     | -0.09 | 1.05       | 0.08 | 1.8  | 16.3 | 1.42      | 10   | 2.5 | 1.5  | 1.25  | 20000 |                     |
| 9                     | 10   | 14   | 1.1 |       | 7.63 |        | 9                    | (h11) | 1.15  | 0          | 2    | 18.8 | 1.6  | 11        | 3    | 1.6 | 1.5  | 17000 |       |                     |
| 10                    | 11   | 15   | 1.2 |       | 8.32 |        | 10                   |       | 1.25  |            | 2    | 20.4 | 1.7  | 12        | 3.5  | 1.8 | 1.75 | 15000 |       |                     |
| 12                    | 13   | 18   | 1.3 |       | 10.5 | ±0.07  | 1.63                 | 12    | 0     | 1.35       |      |      | 2.5  | 23.4      | 3.1  | 15  | 4.7  | 1.9   | 2.3   | 13000               |
| 15                    | 16   | 24   | 1.5 |       | 12.6 |        | 15                   | -0.11 | 1.55  |            | 3    | 29.4 | 7    | 20        | 7.8  | 2.2 | 3.3  | 11000 |       |                     |
| 19                    | 20   | 31   | 1.8 |       | 15.9 |        | 19                   | (h11) | 1.8   |            | 3.5  | 37.6 | 10   | 25        | 11   | 2.5 | 3.6  | 7600  |       |                     |
| 24                    | 25   | 38   | 2   |       | 21.9 |        | ±0.084               | 8.55  | 24    | 0<br>-0.13 | 2.05 |      |      | 4         | 44.6 | 13  | 30   | 15    | 3     | 4                   |
| 30                    | 32   | 42   | 2.5 |       | 25.8 | 30     |                      | (h11) | 2.55  |            | 4.5  | 52.6 | 16.5 | 36        | 23   | 3.5 | 5.3  | 4200  |       |                     |

Metric DIN 6799 E-Type Retaining Rings / circlips are radial retaining rings used on small axles/shafts and pushed into a groove on the shaft. Their name reflect their shape that resembles an “E”. The three prongs are in contact with the groove providing a stable stable and strong shoulder for effective retention of assemblies. Aspen Fasteners offers the following sizes for immediate delivery from stock: Diameters ranging from M1 to M20 available in stainless steel. View available parts by clicking on the following link: [DIN 6799 E-Type Retaining Ring](#)

DIN (Deutsches Institut für Normung - German Institute for Standardization) standards are issued for a variety of components including industrial fasteners as DIN 6799 E-Type Retaining Ring. The DIN standards remain common in Germany, Europe and globally even though the transition to ISO standards is taking place. DIN standards continue to be used for parts which do not have ISO equivalents or for which there is no need for standardization.

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### 1) Mechanical properties of stainless steel for metric DIN 6799 E-Type Retaining Ring

Stainless steels can be divided into three groups of steel - austenitic, ferritic and martensitic. Austenitic steel is by far the most common type (>90% of commercial fasteners). The steel groups and strength classes are designated by a four-digit sequence of letters and numbers (eg A2-70) as shown in the following table. DIN EN ISO 3506 governs screws and nuts made from stainless steel.

| Steel group | Steel grade | Strength class | Screws, Nuts and Bolts             |                      |           |                            |
|-------------|-------------|----------------|------------------------------------|----------------------|-----------|----------------------------|
|             |             |                | Tensile strength N/mm <sup>2</sup> | Tensile strength PSI | Dia range | Nut Load N/mm <sup>2</sup> |
| Austenitic  | A2 and A4   | 50             | 500                                | 70,000               | <=M39     | 500                        |
|             |             | 70             | 700                                | 100,000              | <=M20     | 700                        |
|             |             | 80             | 800                                | 118,000              | <=M20     | 800                        |

The tensile stress is calculated with reference to the tensile stress area (see DIN EN ISO 3506-1979). Nuts to be paired with same grade of stainless steel screws

| Steel group | Property Strength class | Made From | Characteristics  |
|-------------|-------------------------|-----------|--|
| Austenitic  | 50                      | A1, A2    | Soft; cold worked, turned and soft pressed fasteners     |
|             | 70                      | A2, A4    | Cold worked, normal strength formed fasteners            |
|             | 80                      | A2, A4    | Extreme cold worked, high strength, special applications |

## 2) Chemical composition of stainless steel metric DIN 6799 E-Type Retaining Ring

| Grade      | USA Grade  | Material designation | Material no. | C %    | Si ≤ % | Mn ≤ % | Cr %         | Mo %       | Ni %         |
|------------|------------|----------------------|--------------|--------|--------|--------|--------------|------------|--------------|
| <b>A 2</b> | <b>304</b> | X 5Cr Ni 1810        | 1.4301       | ≤ 0.07 | 1.0    | 2.0    | 17.5 to 19.5 | -          | 8.0 to 10.5  |
|            |            | X 2 Cr Ni 1811       | 1.4306       | ≤ 0.03 | 1.0    | 2.0    | 18.0 to 20.0 | -          | 10 to 12.0   |
|            |            | X 8 Cr Ni 19/10      | 1.4303       | ≤ 0.07 | 1.0    | 2.0    | 17.0 to 19.0 | -          | 11.0 to 13.0 |
| <b>A 4</b> | <b>316</b> | X 5 Cr Ni Mo 1712    | 1.4401       | ≤ 0.07 | 1.0    | 2.0    | 16.5 to 18.5 | 2.0 to 2.5 | 10.0 to 13.0 |
|            |            | X 2 Cr Ni Mo 1712    | 1.4404       | ≤ 0.03 | 1.0    | 2.0    | 16.5 to 18.5 | 2.0 to 2.5 | 10 to 13     |

## 3) Chemical composition of steel metric DIN 6799 E-Type Retaining Ring

| PROPERTY CLASS     | MATERIAL AND TREATMENT   | CHEMICAL COMPOSITION LIMITS % |      |       |       | TEMPERING TEMP °C MIN. |
|--------------------|--|-------------------------------|------|-------|-------|------------------------|
|                    |  | C                             |      | P     | S     |                        |
|                    |  | min.                          | max. | max.  | max.  |                        |
| 4.6, 4.8, 5.8, 6.8 | Low or medium carbon steel   | -                             | 0.55 | 0.05  | 0.06  | -                      |
| 8.8                | Medium carbon steel quenched, tempered   | 0.25                          | 0.55 | 0.04  | 0.05  | 425                    |
| 9.8                | Medium carbon steel quenched, tempered   | 0.25                          | 0.55 | 0.04  | 0.05  | 425                    |
| 10.9               | Medium carbon steel additives e.g. boron, Mn, Cr or Alloy steel - quenched, tempered | 0.20                          | 0.55 | 0.04  | 0.05  | 425                    |
| 12.9               | Alloy steel - quenched, tempered   | 0.20                          | 0.50 | 0.035 | 0.035 | 380                    |

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#### 4) Mechanical properties of steel for metric DIN 6799 E-Type Retaining Ring

| MECHANICAL PROPERTY                             |          | PROPERTY CLASS |     |     |     |            |           |     |      |      |
|---|----------|----------------|-----|-----|-----|------------|-----------|-----|------|------|
|   |          | 4.8            | 5.6 | 5.8 | 6.8 | 8.8        |           | 9.8 | 10.9 | 12.9 |
|   |          |                |     |     |     | Up to M 16 | Over M 16 |     |      |      |
| Tensile Strength (Rm, N/mm <sup>2</sup> )       | nom.     | 400            | 500 |     | 600 | 800        |           | 900 | 1000 | 1200 |
|   | min.     | 420            | 500 | 520 | 600 | 800        | 830       | 900 | 1040 | 1220 |
| Vickers Hardness                                | min.     | 130            | 155 | 160 | 190 | 250        | 255       | 290 | 320  | 385  |
|   | max.     | 250            |     |     |     | 320        | 336       | 360 | 380  | 435  |
| Brinell Hardness                                | min.     | 124            | 147 | 152 | 181 | 319        | 242       | 266 | 295  | 353  |
|   | max.     | 238            |     |     |     | 385        | 319       | 342 | 363  | 412  |
| Rockwell Hardness                               | min. HR  | 71             | 79  | 82  | 89  | -          |           |     |      |      |
|   | HRC      | -              | -   | -   | -   | 20         | 23        | 28  | 32   | 39   |
|   | HR       | 95             |     |     |     | 99         | -         |     |      |      |
|   | max. HRC | -              | -   | -   | -   | 32         | 34        | 37  | 39   | 44   |
| Yield Stress ReL. N/mm <sup>2</sup>             | nom.     | 320            | 300 | 400 | 480 | -          |           |     |      |      |
|   | min.     | 340            | 300 | 420 | 480 | -          |           |     |      |      |
| Stress at permanent set limit N/mm <sup>2</sup> | nom.     | -              |     |     |     | 640        |           | 720 | 900  | 1080 |
|   | min.     | -              |     |     |     | 640        | 660       | 720 | 940  | 1100 |

#### Disclaimer

Dimensional data and technical information for metric DIN 6799 E-Type Retaining Ring was obtained from publicly available sources and not acquired through standards agencies. It has been completed and compiled for reference purposes only; where discrepancies are found they are subject to change without notice. Aspen Fasteners makes no warranties or representations regarding the accuracy and validity of the compiled information and data. Contact the relevant standards authorities for accurate and detailed information.