



TALLERES **ZIE**, S.A.L.

**FONDOS EMBUTIDOS
PARA DEPÓSITOS Y CALDERAS**

**FONDOS PARA DEPÓSITOS, CALDERAS Y RECIPIENTES A PRESIÓN.
SEMIESFERAS, ESFERAS Y OVALOS.
CONOS Y VIROLAS.**

FONDOS DE ACERO INOXIDABLE LIJADOS Y PULIDOS.

“Talleres ZIC, S.A.L. fue constituido en el año 1966 y está dedicado al estudio y conformado de todo tipo de fondos para depósitos a presión en el sector de la calderería ligera y pesada. La dinámica de esta empresa ha sido, desde sus comienzos, dar al cliente un trabajo de absoluta calidad en el campo de la siderometalurgia, calderería...

Para ello, nuestro equipo está en constante formación y siempre al tanto de los avances y nuevas técnicas del sector.”



TALLERES ZIC, S.A.L.

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TELÉFONOS INTERNACIONALES +34 94 631 31 01 • +34 94 631 34 00 • +34 94 631 34 01

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Programa de fabricación

Fabricamos bajo demanda, fondos de diámetros superiores a 5.000 mm compuestos de casquete central y sectores soldados, pudiéndose suministrar totalmente terminados, parcialmente o en piezas sueltas para su posterior montaje.

MATERIALES:

Aceros al carbono, aceros inoxidable, aceros bimetálicos, níquel y sus aleaciones, cobre y sus aleaciones, aluminio y sus aleaciones.

CERTIFICADOS:

Se facilitarán los correspondientes certificados del material empleado en cada caso, ajustándose a la norma: DIN 50049/EN10204 3.1B y DIN 50049/EN10204 3.1C.

ENSAYOS NO DESTRUCTIVOS:

Bajo demanda se realizarán los ensayos no destructivos, tales como control radiográfico total o parcial, control de ultrasonidos, partículas magnéticas, control de tintes penetrantes, etc., todo ello a través de una entidad colaboradora de la Administración, certificando los ensayos y resultados realizados.

TRATAMIENTOS TERMICOS:

Recocidos s/normas (atenuación de tensiones) y Normalizados.

INSPECCIONES:

Todos nuestros productos podrán ser inspeccionados en nuestros Talleres por el Cliente u organismo oficial designado, los cuales tendrán acceso a nuestros Talleres durante la jornada de trabajo.

NORMAS DE FABRICACION Y TOLERANCIAS:

Según normas EN, DIN, AFNOR, ASME, ASTM, UNE, etc., a determinar por el Cliente.



Nomenclatura de símbolos

De = DIAMETRO EXTERIOR

R = RADIO ESFERICO

r = RADIO DE REBORDEADO

h = ALTURA BORDE RECTO

f = FLECHA INTERIOR

H = ALTURA TOTAL

e = ESPESOR

Dd = DIAMETRO DISCO

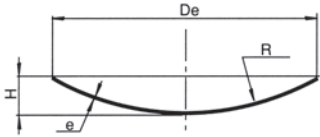
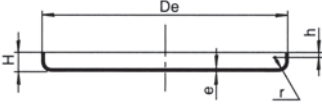
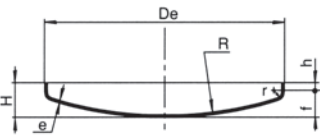
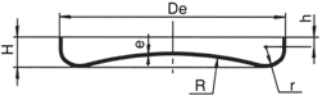
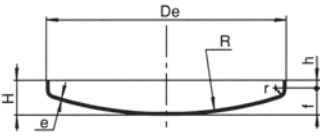
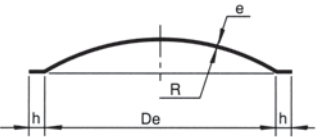
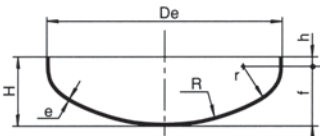
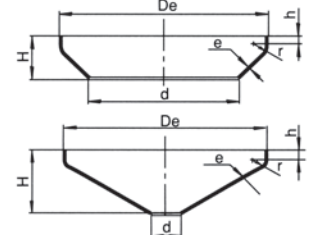
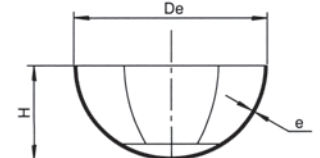
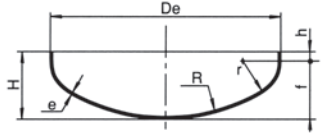
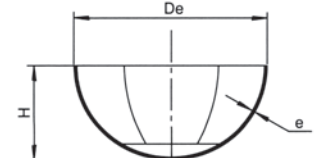
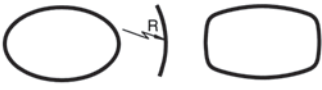
V = VOLUMEN

S = SUPERFICIE

P = PESO TEORICO

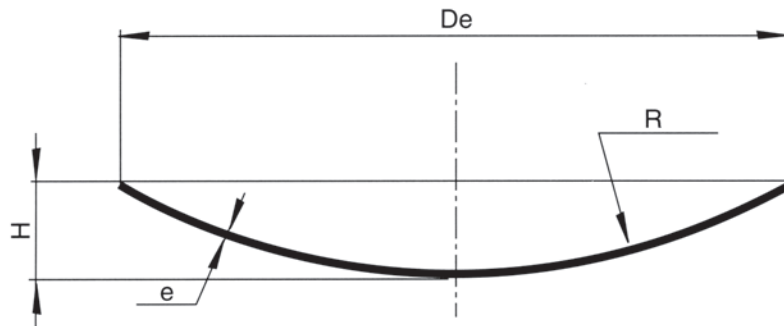
d = DIAMETRO BOCA MENOR DE CONOS

Referencia y denominación de fondos

| | | | |
|---|---|-------------------------------|---|
| <p>FZ-1 Fondo casquete</p> |  | <p>FZ-6 Fondo plano</p> |  |
| <p>FZ-2 FZ-2.A FZ-2.B</p> <p>Fondo Baja presión tipo Campsa Fondo tipo pequeño radio de acuerdo Fondo tipo medio radio de acuerdo</p> |  | <p>FZ-7 Fondo difusor</p> |  |
| <p>FZ-3 Fondo toriesférico Tipo Klopper</p> |  | <p>FZ-8 Fondo tapa</p> |  |
| <p>FZ-4 Fondo semielíptico Tipo Korbogen</p> |  | <p>FZ-9 Fondo cónico</p> |  |
| <p>FZ-5 Fondo semiesférico</p> |  | <p>FZ-10 Fondo caps</p> |  |
| <p>FZ-11 Ovalos</p> |  | <p>FZ-11 Ovalos</p> |  |

Referencia
FZ-1

Fondo casquete



| DATOS TEORICOS PARA CALCULO | R | D _d | H | V |
|--------------------------------------|--------------------|-----------------------|-----------------------|-----------------------|
| | 0,7 D _e | 1,116 D _e | 0,2101 D _e | 0,087 D ³ |
| | 0,8 D _e | 1,0817 D _e | 0,1755 D _e | 0,0718 D ³ |
| | 1,0 D _e | 1,0472 D _e | 0,1340 D _e | 0,054 D ³ |
| | 1,5 D _e | 1,0197 D _e | 0,0858 D _e | 0,034 D ³ |
| | 2,0 D _e | 1,0106 D _e | 0,0636 D _e | 0,025 D ³ |

DENTRO DE LAS MEDIDAS INDICADAS EN LA TABLA, PODEMOS FABRICAR CUALQUIER PERFIL Y DIAMETRO INTERMEDIO DE MILIMETRO EN MILIMETRO, PRACTICAMENTE SIN LIMITACION.

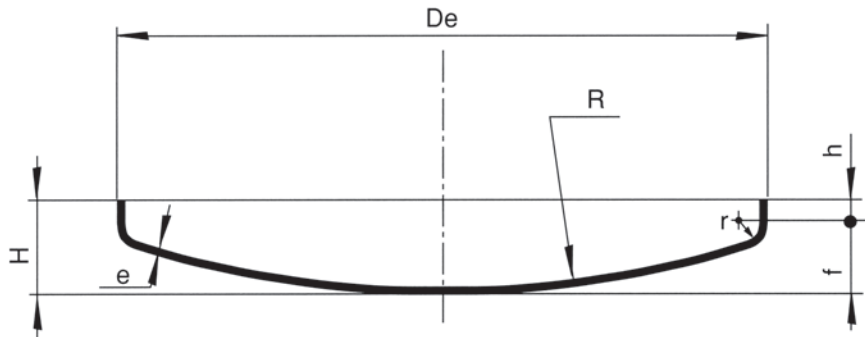
DATOS ORIENTATIVOS CASQUETES R = D_e

| D _e mm | e mm | D _d mm | H mm | V litros | Peso Kg/ mm e |
|----------------------|---------|----------------------|---------|-------------|---------------------|
| 300 | 3-30 | 315 | 40 | 1,5 | 0,62 |
| 400 | 3-30 | 420 | 54 | 3,5 | 1,11 |
| 500 | 3-30 | 520 | 67 | 6,8 | 1,70 |
| 600 | 3-40 | 625 | 80 | 11,7 | 2,45 |
| 700 | 3-40 | 730 | 94 | 18,5 | 3,35 |
| 800 | 3-40 | 835 | 107 | 27,6 | 4,38 |
| 900 | 3-40 | 940 | 121 | 39,4 | 5,55 |
| 1000 | 3-40 | 1040 | 134 | 54,0 | 6,80 |
| 1100 | 3-40 | 1145 | 147 | 71,9 | 8,24 |
| 1200 | 3-40 | 1250 | 161 | 93,3 | 9,82 |
| 1300 | 3-40 | 1350 | 174 | 118,6 | 11,45 |
| 1400 | 3-40 | 1460 | 188 | 148,2 | 13,39 |
| 1500 | 3-40 | 1560 | 201 | 182,3 | 15,29 |
| 1600 | 3-40 | 1660 | 214 | 221,2 | 17,31 |
| 1700 | 3-40 | 1770 | 228 | 265,3 | 19,68 |
| 1800 | 3-40 | 1875 | 241 | 314,9 | 22,09 |
| 1900 | 3-40 | 1980 | 255 | 370,4 | 24,63 |

| D _e mm | e mm | D _d mm | H mm | V litros | Peso Kg/ mm e |
|----------------------|---------|----------------------|---------|-------------|---------------------|
| 2000 | 3-40 | 2080 | 268 | 432 | 27,18 |
| 2100 | 3-40 | 2185 | 281 | 500 | 30,00 |
| 2200 | 3-40 | 2290 | 295 | 575 | 32,95 |
| 2400 | 3-40 | 2500 | 322 | 746 | 39,27 |
| 2600 | 3-40 | 2700 | 348 | 949 | 45,80 |
| 2800 | 3-40 | 2915 | 375 | 1185 | 53,39 |
| 3000 | 3-40 | 3120 | 402 | 1458 | 61,16 |
| 3200 | 3-40 | 3330 | 429 | 1769 | 69,67 |
| 3400 | 3-40 | 3540 | 456 | 2122 | 78,74 |
| 3600 | 3-40 | 3745 | 482 | 2519 | 88,12 |
| 3800 | 3-40 | 3950 | 509 | 2963 | 98,03 |
| 4000 | 3-40 | 4160 | 536 | 3456 | 108,73 |
| 4200 | 3-40 | 4370 | 563 | 4001 | 119,99 |
| 4400 | 3-40 | 4575 | 590 | 4600 | 131,51 |
| 4600 | 3-40 | 4785 | 616 | 5256 | 143,86 |
| 4800 | 3-40 | 4995 | 643 | 5972 | 156,77 |
| 5000 | 3-40 | 5200 | 670 | 6750 | 169,90 |

Referencia
FZ-2

Fondos baja presión tipo campsa



| DATOS TEORICOS PARA CALCULO | R | r | D _d | f | V (sin h) | Fórmulas generales |
|-----------------------------|--------------------|---------|---------------------------|-------------------------|---|----------------------------|
| | 1,0 D _e | 20 a 50 | 1,05 D _e +r+2h | 0,134 D _e +r | 0,054 (D _e -2e) ³ + 0,44 (D _e -2e) ² . r | h ≥ 3,5 e H = f + h + e |
| | 1,5 D _e | 20 a 50 | 1,02 D _e +r+2h | 0,085 D _e +r | 0,034 (D _e -2e) ³ + 0,28 (D _e -2e) ² . r | |
| | 2,0 D _e | 20 a 50 | 1,01 D _e +r+2h | 0,063 D _e +r | 0,025 (D _e -2e) ³ + 0,025 (D _e -2e) ² . r | |

DENTRO DE LAS MEDIDAS INDICADAS EN LA TABLA, PODEMOS FABRICAR CUALQUIER PERFIL Y DIAMETRO INTERMEDIO DE MILIMETRO EN MILIMETRO, PRACTICAMENTE SIN LIMITACION.

DATOS ORIENTATIVOS FONDOS R = 1,5 D_e (CAMPESA)

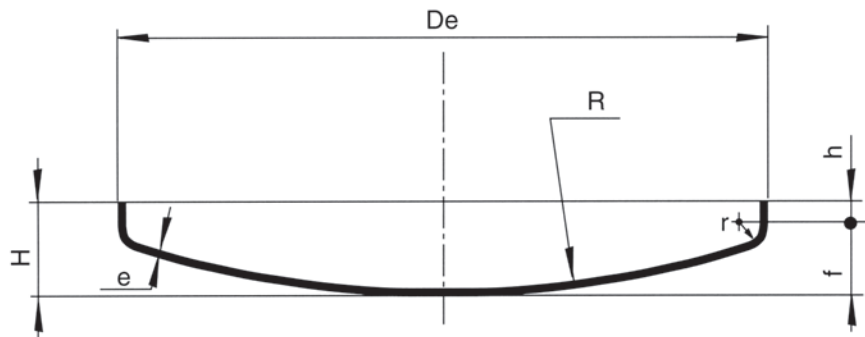
| D _e mm | e mm | D _d mm | f mm | V litros | Peso Kg/mm e |
|-------------------|------|-------------------|------|----------|--------------|
| 350 | 3-12 | 420 | 70 | 3,0 | 1,11 |
| 400 | 3-12 | 470 | 74 | 4,3 | 1,39 |
| 450 | 3-12 | 530 | 78 | 5,7 | 1,76 |
| 500 | 3-12 | 580 | 83 | 7,5 | 2,11 |
| 600 | 3-20 | 680 | 91 | 12,1 | 2,91 |
| 700 | 3-20 | 780 | 100 | 18,1 | 3,82 |
| 800 | 3-20 | 880 | 108 | 25,8 | 4,87 |
| 900 | 3-20 | 1000 | 117 | 35,5 | 6,28 |
| 1000 | 3-20 | 1100 | 125 | 47,2 | 7,60 |
| 1140 | 3-20 | 1240 | 137 | 67,6 | 9,66 |
| 1200 | 3-20 | 1300 | 142 | 77,8 | 10,62 |
| 1300 | 3-30 | 1400 | 151 | 97,1 | 12,32 |
| 1440 | 3-30 | 1540 | 162 | 129,0 | 14,90 |
| 1500 | 3-30 | 1600 | 168 | 144,6 | 16,08 |
| 1600 | 3-30 | 1730 | 176 | 173,3 | 18,80 |

| D _e mm | e mm | D _d mm | f mm | V litros | Peso Kg/mm e |
|-------------------|------|-------------------|------|----------|--------------|
| 1750 | 3-30 | 1880 | 189 | 222,9 | 22,21 |
| 1850 | 3-30 | 1980 | 197 | 260,8 | 24,63 |
| 2000 | 3-30 | 2130 | 210 | 325,2 | 28,51 |
| 2200 | 3-30 | 2330 | 227 | 426,5 | 34,11 |
| 2450 | 4-30 | 2580 | 248 | 579 | 41,82 |
| 2500 | 4-30 | 2640 | 253 | 613 | 43,79 |
| 2600 | 4-30 | 2750 | 261 | 686 | 47,52 |
| 2700 | 4-30 | 2850 | 270 | 765 | 51,04 |
| 2900 | 4-30 | 3070 | 287 | 939 | 59,22 |
| 3000 | 4-30 | 3180 | 295 | 1036 | 63,54 |
| 3200 | 4-30 | 3380 | 312 | 1248 | 71,78 |
| 3400 | 4-30 | 3580 | 329 | 1488 | 80,53 |
| 3600 | 4-30 | 3790 | 346 | 1756 | 90,25 |
| 3800 | 4-30 | 3990 | 363 | 2055 | 100,03 |
| 4000 | 4-30 | 4200 | 380 | 2386 | 110,84 |

Referencia
FZ-2-A

Fondos tipo pequeño radio
de acuerdo (P.R.C.)

NF E 81.101



DENTRO DE LAS MEDIDAS INDICADAS EN LA TABLA, PODEMOS FABRICAR CUALQUIER PERFIL Y DIAMETRO INTERMEDIO DE MILIMETRO EN MILIMETRO, PRACTICAMENTE SIN LIMITACION.

DATOS ORIENTATIVOS

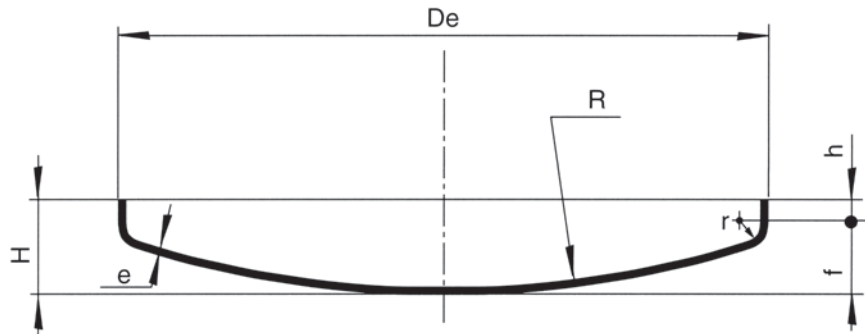
| D _e mm | e mm | R mm | r mm | h mm | f mm | D _d mm | Peso Kg/ mm e | V litros |
|----------------------|---------|---------|---------|---------|---------|----------------------|---------------------|-------------|
| 350 | 3-12 | 350 | 25 | 25-55 | 58 | 455 | 1,30 | 7 |
| 400 | 3-12 | 400 | 30 | 25-55 | 70 | 515 | 1,67 | 10 |
| 450 | 3-12 | 450 | 30 | 25-55 | 75 | 570 | 2,04 | 13 |
| 500 | 3-12 | 500 | 30 | 25-55 | 80 | 625 | 2,45 | 16,5 |
| 600 | 3-20 | 600 | 30 | 25-70 | 92 | 735 | 3,39 | 26,5 |
| 700 | 3-20 | 700 | 30 | 25-70 | 105 | 840 | 4,43 | 39 |
| 800 | 3-20 | 800 | 40 | 25-70 | 125 | 950 | 5,67 | 58 |
| 900 | 3-20 | 900 | 40 | 25-70 | 138 | 1060 | 7,06 | 77,5 |
| 1000 | 3-20 | 1100 | 50 | 25-70 | 146 | 1170 | 8,60 | 102 |
| 1100 | 3-20 | 1250 | 50 | 25-70 | 154 | 1270 | 10,13 | 128 |
| 1200 | 3-20 | 1350 | 50 | 25-70 | 167 | 1370 | 11,79 | 160 |
| 1300 | 3-30 | 1500 | 50 | 25-100 | 173 | 1500 | 14,14 | 207 |
| 1400 | 3-30 | 1600 | 50 | 25-100 | 185 | 1600 | 16,08 | 250 |
| 1500 | 3-30 | 1700 | 50 | 25-100 | 198 | 1700 | 18,16 | 300 |
| 1600 | 3-30 | 1800 | 50 | 25-100 | 211 | 1810 | 20,58 | 355 |
| 1700 | 3-30 | 1900 | 50 | 25-100 | 224 | 1910 | 22,92 | 416 |
| 1800 | 3-30 | 2100 | 50 | 25-100 | 227 | 2020 | 25,64 | 472 |
| 1900 | 3-30 | 2300 | 50 | 25-100 | 231 | 2115 | 28,11 | 532,5 |
| 2000 | 3-30 | 2300 | 50 | 25-100 | 253 | 2220 | 30,97 | 624,5 |
| 2100 | 3-30 | 2500 | 50 | 25-100 | 256 | 2320 | 33,82 | 694,5 |

| D _e mm | e mm | R mm | r mm | h mm | f mm | D _d mm | Peso Kg/ mm e | V litros |
|----------------------|---------|---------|---------|---------|---------|----------------------|---------------------|-------------|
| 2200 | 3-30 | 2750 | 50 | 25-100 | 256 | 2420 | 36,80 | 764 |
| 2300 | 3-30 | 2750 | 50 | 25-100 | 277 | 2530 | 40,22 | 878,5 |
| 2400 | 4-30 | 3000 | 50 | 25-100 | 277 | 2630 | 43,46 | 958 |
| 2500 | 4-30 | 3000 | 50 | 25-100 | 298 | 2735 | 47,00 | 1092 |
| 2600 | 4-30 | 3300 | 50 | 25-100 | 293 | 2830 | 50,32 | 1171 |
| 2700 | 4-30 | 3300 | 50 | 30-100 | 314 | 2945 | 54,49 | 1336 |
| 2800 | 4-30 | 3600 | 50 | 30-100 | 310 | 3040 | 58,07 | 1426 |
| 2900 | 4-30 | 3600 | 50 | 30-100 | 331 | 3145 | 62,15 | 1598,5 |
| 3000 | 4-30 | 4000 | 50 | 30-100 | 319 | 3240 | 65,96 | 1673,5 |
| 3100 | 4-30 | 4400 | 50 | 30-100 | 311 | 3335 | 69,88 | 1758,5 |
| 3200 | 4-30 | 4400 | 50 | 30-100 | 329 | 3440 | 74,35 | 1948 |
| 3300 | 4-30 | 4400 | 50 | 40-100 | 348 | 3560 | 79,63 | 2194 |
| 3400 | 4-30 | 4400 | 50 | 40-100 | 368 | 3670 | 84,63 | 2419,5 |
| 3500 | 4-30 | 5000 | 50 | 40-100 | 345 | 3755 | 88,59 | 2458 |
| 3600 | 4-30 | 5000 | 50 | 50-100 | 363 | 3870 | 94,10 | 2739,5 |
| 3700 | 4-30 | 5000 | 50 | 50-100 | 384 | 3950 | 98,03 | 2866 |
| 3800 | 4-30 | 5000 | 50 | 50-100 | 403 | 4050 | 103,06 | 3134,5 |
| 3900 | 4-30 | 5000 | 50 | 50-100 | 424 | 4160 | 108,73 | 3423 |
| 4000 | 4-30 | 5000 | 50 | 50-100 | 445 | 4270 | 114,56 | 3734 |
| 4100 | 4-30 | 5000 | 50 | 50-100 | 466 | 4370 | 119,99 | 4067 |

Referencia
FZ-2-B

Fondos tipo medio radio
de acuerdo (M.R.C.)

NF E 81.104



DENTRO DE LAS MEDIDAS INDICADAS EN LA TABLA, PODEMOS FABRICAR CUALQUIER PERFIL Y DIAMETRO INTERMEDIO DE MILIMETRO EN MILIMETRO, PRACTICAMENTE SIN LIMITACION.

DATOS TEORICOS

| D _e mm | e mm | R mm | r mm | h mm | f mm | D _d mm | Peso Kg/mm e | V litros |
|----------------------|---------|---------|---------|---------|---------|----------------------|-----------------|-------------|
| 950 | 3 | 950 | 50 | 25 | 155 | 1090 | 7,47 | 83 |
| 950 | 4 | 950 | 50 | 25 | 155 | 1090 | 7,47 | 82 |
| 950 | 5 | 950 | 50 | 25 | 154 | 1090 | 7,47 | 82 |
| 1250 | 3 | 1250 | 50 | 25 | 195 | 1400 | 12,32 | 169 |
| 1250 | 4 | 1250 | 50 | 25 | 195 | 1400 | 12,32 | 168 |
| 1250 | 5 | 1250 | 50 | 25 | 194 | 1400 | 12,32 | 167 |
| 1500 | 4 | 1500 | 55 | 25 | 231 | 1660 | 17,31 | 277 |
| 1500 | 5 | 1500 | 55 | 25 | 230 | 1660 | 17,31 | 276 |
| 1600 | 5 | 1600 | 53 | 30 | 243 | 1780 | 19,91 | 335 |
| 1900 | 5 | 1900 | 70 | 20 | 293 | 2070 | 26,92 | 531 |
| 1900 | 6 | 1900 | 70 | 25 | 292 | 2070 | 26,92 | 543 |
| 2000 | 6 | 2000 | 65 | 30 | 303 | 2190 | 30,13 | 632 |
| 2500 | 6 | 2500 | 95 | 35 | 387 | 2760 | 47,86 | 1262 |
| 2500 | 7 | 2500 | 95 | 30 | 387 | 2740 | 47,17 | 1234 |
| 2500 | 8 | 2500 | 95 | 30 | 386 | 2750 | 47,52 | 1231 |
| 2900 | 9 | 2900 | 95 | 30 | 440 | 3150 | 62,34 | 1838 |
| 3000 | 6 | 3000 | 180 | 35 | 505 | 3340 | 70,09 | 2404 |

FONDOS DOBLE ENVOLVENTE (M.R.C.) - DATOS TEORICOS

| D _e mm | e mm | R mm | r mm | h mm | f mm | D _d mm | Peso Kg/mm e | V litros |
|----------------------|---------|---------|---------|---------|---------|----------------------|-----------------|-------------|
| 1258 | 3 | 1250 | 50 | 35 | 197 | 1420 | 12,67 | 185 |
| 1508 | 3 | 1500 | 55 | 35 | 234 | 1700 | 18,16 | 301 |
| 1608 | 3 | 1600 | 50 | 40 | 246 | 1810 | 20,58 | 364 |
| 1908 | 3,5 | 1900 | 70 | 25 | 296 | 2100 | 27,71 | 556 |
| 2010 | 4 | 2000 | 65 | 40 | 307 | 2220 | 30,97 | 678 |
| 2512 | 5 | 2500 | 95 | 45 | 391 | 2790 | 48,91 | 1335 |
| 2912 | 5 | 2900 | 95 | 40 | 445 | 3200 | 64,34 | 1948 |
| 3012 | 5 | 3000 | 180 | 45 | 509 | 3340 | 70,09 | 2510 |

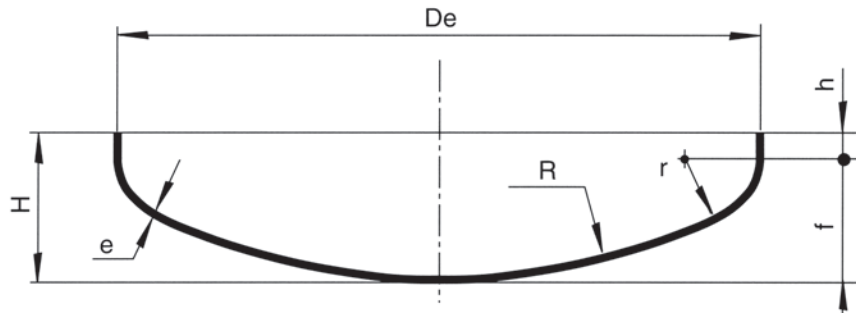
FONDOS TABIQUE (M.R.C.) - DATOS TEORICOS

| D _e mm | e mm | R mm | r mm | h mm | f mm | D _d mm | Peso Kg/mm e | V litros |
|----------------------|---------|---------|---------|---------|---------|----------------------|-----------------|-------------|
| 1590 | 5 | 1600 | 50 | 30 | 238 | 1780 | 19,91 | 325 |
| 1888 | 5 | 1900 | 70 | 25 | 290 | 2000 | 25,13 | 534 |
| 1988 | 6 | 2000 | 70 | 30 | 302 | 2190 | 30,13 | 626 |
| 2486 | 6 | 2500 | 95 | 30 | 383 | 2720 | 46,49 | 1215 |
| 2486 | 7 | 2500 | 95 | 30 | 383 | 2750 | 47,52 | 1211 |
| 2882 | 9 | 2900 | 100 | 30 | 437 | 3150 | 62,34 | 1814 |
| 2986 | 6 | 3000 | 180 | 25 | 501 | 3340 | 70,09 | 2300 |

Referencia
FZ-3

Fondos toriesféricos tipo klopper
($R=D$) o asa de cesta gran radio
de acuerdo.

DIN-28011
UNE-9201



| | | | | |
|--------------------------------------|-------|--------------------------------|--------------|------------------------|
| DATOS TEORICOS PARA CALCULO | D_d | $(D_e 1,13 + 2 h) \times 0,98$ | f | $0,1935 D_e - 0,455 e$ |
| | R | D_e | H | $f + h + e$ |
| | r | $0,1 D_e$ | | |
| | h | $\geq 3,5 e$ | $V (\sin h)$ | $0,1 (D_e - 2e)^3$ |

DENTRO DE LAS MEDIDAS INDICADAS EN LA TABLA, PODEMOS FABRICAR CUALQUIER PERFIL Y DIAMETRO INTERMEDIO DE MILIMETRO EN MILIMETRO, PRACTICAMENTE SIN LIMITACION.

DATOS ORIENTATIVOS

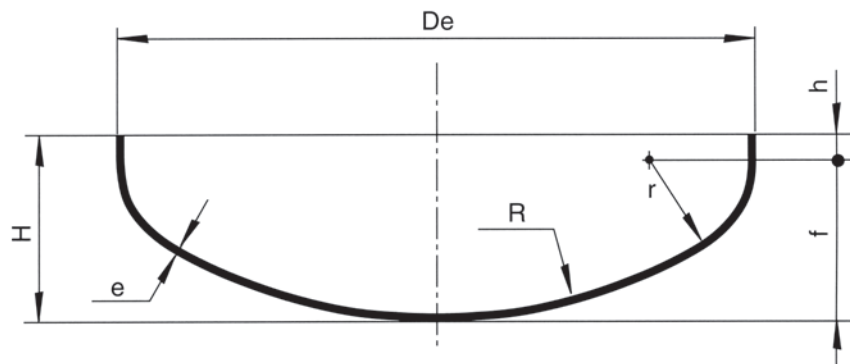
| D_e mm | e mm | D_d mm | f mm | V litros | Peso Kg/ mm e |
|-------------|-----------|-------------|-----------|---------------|---------------------|
| 350 | 3-12 | 410 | 66 | 4,1 | 1,06 |
| 400 | 3-12 | 460 | 76 | 6,1 | 1,33 |
| 450 | 3-12 | 520 | 86 | 8,8 | 1,70 |
| 500 | 3-12 | 575 | 95 | 12 | 2,08 |
| 600 | 3-20 | 680 | 115 | 21 | 2,91 |
| 700 | 3-20 | 800 | 134 | 33 | 4,02 |
| 800 | 3-20 | 910 | 153 | 50 | 5,20 |
| 900 | 3-20 | 1020 | 173 | 71 | 6,54 |
| 1000 | 3-20 | 1130 | 192 | 98 | 8,02 |
| 1100 | 3-20 | 1240 | 211 | 131 | 9,66 |
| 1200 | 3-30 | 1350 | 231 | 170 | 11,45 |
| 1300 | 3-30 | 1460 | 250 | 217 | 13,39 |
| 1400 | 3-30 | 1570 | 270 | 271 | 15,49 |
| 1500 | 3-30 | 1680 | 289 | 333 | 17,73 |
| 1600 | 4-30 | 1800 | 308 | 403 | 20,36 |
| 1800 | 4-30 | 2020 | 346 | 575 | 25,64 |

| D_e mm | e mm | D_d mm | f mm | V litros | Peso Kg/ mm e |
|-------------|-----------|-------------|-----------|---------------|---------------------|
| 1900 | 4-30 | 2130 | 366 | 677 | 28,51 |
| 2000 | 4-30 | 2240 | 385 | 790 | 31,53 |
| 2200 | 4-30 | 2470 | 424 | 1053 | 38,33 |
| 2400 | 5-30 | 2700 | 462 | 1365 | 45,80 |
| 2600 | 5-30 | 2920 | 501 | 1737 | 53,57 |
| 2800 | 6-30 | 3150 | 539 | 2167 | 62,34 |
| 3000 | 6-30 | 3370 | 578 | 2668 | 71,36 |
| 3200 | 6-30 | 3590 | 616 | 3240 | 80,98 |
| 3400 | 8-30 | 3820 | 654 | 3875 | 91,69 |
| 3600 | 8-30 | 4050 | 693 | 4604 | 103,06 |
| 3800 | 8-30 | 4270 | 732 | 5418 | 114,56 |
| 4000 | 8-30 | 4490 | 770 | 6324 | 126,67 |
| 4200 | 8-30 | 4710 | 809 | 7324 | 139,39 |
| 4400 | 8-30 | 4930 | 848 | 8426 | 152,71 |
| 4600 | 8-30 | 5150 | 886 | 9632 | 166,65 |
| 4800 | 8-30 | 5370 | 925 | 10949 | 181,19 |

Referencia
FZ-4

Fondos semielípticos
Tipo Korbogen ($R = 0,8 D_e$)

DIN - 28013



| | | | | |
|--------------------------------------|-------|-------------------------------|-------------|-----------------------|
| DATOS TEORICOS PARA CALCULO | D_d | $(D_e 1,2 + 2 h) \times 0,97$ | f | $0,255 D_e - 0,635 e$ |
| | R | $0,8 D_e$ | H | $f + h + e$ |
| | r | $0,154 D_e$ | V (sin h) | $0,1298 (D_e - 2e)^3$ |
| | h | $\geq 3 e$ | | |

DENTRO DE LAS MEDIDAS INDICADAS EN LA TABLA, PODEMOS FABRICAR CUALQUIER PERFIL Y DIAMETRO INTERMEDIO DE MILIMETRO EN MILIMETRO, PRACTICAMENTE SIN LIMITACION.

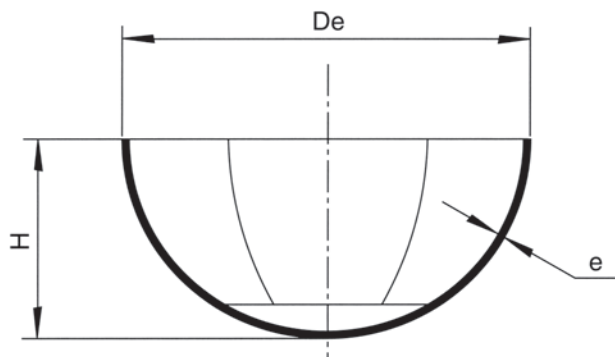
DATOS ORIENTATIVOS

| D_e mm | e mm | D_d mm | f mm | V litros | Peso Kg/ mm e |
|-------------|-----------|-------------|-----------|---------------|---------------------|
| 350 | 3-12 | 430 | 87 | 5,3 | 1,16 |
| 400 | 3-12 | 480 | 100 | 7,9 | 1,45 |
| 450 | 3-12 | 540 | 113 | 11,4 | 1,83 |
| 500 | 3-12 | 600 | 126 | 15,6 | 2,26 |
| 550 | 3-12 | 660 | 138 | 20,9 | 2,74 |
| 600 | 3-20 | 720 | 151 | 27 | 3,26 |
| 650 | 3-20 | 780 | 164 | 35 | 3,82 |
| 700 | 3-20 | 830 | 177 | 43 | 4,33 |
| 750 | 3-20 | 890 | 189 | 53 | 4,98 |
| 800 | 3-20 | 950 | 202 | 65 | 5,67 |
| 900 | 3-20 | 1070 | 228 | 93 | 7,19 |
| 1000 | 3-20 | 1180 | 253 | 127 | 8,75 |
| 1100 | 3-20 | 1300 | 279 | 170 | 10,62 |
| 1200 | 4-20 | 1430 | 303 | 220 | 12,85 |

| D_e mm | e mm | D_d mm | f mm | V litros | Peso Kg/ mm e |
|-------------|-----------|-------------|-----------|---------------|---------------------|
| 1400 | 4-30 | 1660 | 354 | 350 | 17,31 |
| 1600 | 5-30 | 1890 | 405 | 522 | 22,44 |
| 1800 | 6-30 | 2130 | 455 | 742 | 28,51 |
| 2000 | 6-30 | 2370 | 506 | 1020 | 35,29 |
| 2200 | 6-30 | 2600 | 557 | 1360 | 42,47 |
| 2400 | 6-30 | 2830 | 608 | 1768 | 50,32 |
| 2600 | 8-30 | 3080 | 658 | 2240 | 59,60 |
| 2800 | 8-30 | 3310 | 709 | 2801 | 68,84 |
| 3000 | 8-30 | 3540 | 760 | 3449 | 78,74 |
| 3200 | 8-30 | 3770 | 811 | 4190 | 89,30 |
| 3400 | 8-30 | 4010 | 862 | 5030 | 101,03 |
| 3600 | 8-30 | 4240 | 913 | 5976 | 112,96 |
| 3800 | 8-30 | 4470 | 964 | 7033 | 125,54 |
| 4000 | 8-30 | 4710 | 1015 | 8208 | 139,39 |

Referencia
FZ-5

Fondos semiesféricos



| DATOS TEORICOS PARA CALCULO | Superficie exterior | Volumen | Peso |
|-----------------------------|-----------------------------------|---|-------------------------|
| | $S = \frac{1}{2} \pi \cdot D_e^2$ | $V = \frac{1}{12} \pi \cdot (D_e - 2e)^3$ | $P = S \cdot 8 \cdot e$ |

DENTRO DE LAS MEDIDAS INDICADAS EN LA TABLA, PODEMOS FABRICAR CUALQUIER PERFIL Y DIAMETRO INTERMEDIO DE MILIMETRO EN MILIMETRO, PRACTICAMENTE SIN LIMITACION.

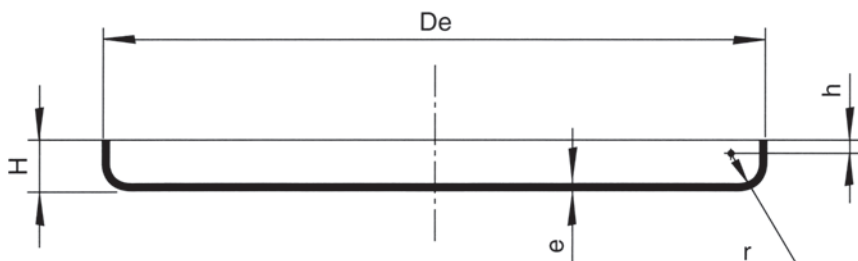
DATOS ORIENTATIVOS

| D _e mm | e mm | S m ² | V litros | P Kg/mm e |
|----------------------|---------|---------------------|-------------|--------------|
| 400 | 3-20 | 0,25 | 16 | 2,01 |
| 500 | 3-20 | 0,39 | 32 | 3,14 |
| 600 | 3-20 | 0,57 | 55 | 4,52 |
| 800 | 3-20 | 1,01 | 131 | 8,04 |
| 1000 | 3-25 | 1,57 | 257 | 12,57 |
| 1100 | 3-25 | 1,90 | 343 | 15,21 |
| 1200 | 3-25 | 2,26 | 446 | 18,10 |
| 1300 | 3-30 | 2,65 | 567 | 21,24 |
| 1400 | 3-30 | 3,08 | 709 | 24,63 |
| 1500 | 3-30 | 3,53 | 873 | 28,27 |
| 1600 | 3-30 | 4,02 | 1060 | 32,17 |
| 1700 | 3-30 | 4,54 | 1273 | 36,32 |
| 1800 | 3-35 | 5,09 | 1512 | 40,72 |
| 1900 | 3-35 | 5,67 | 1779 | 45,36 |
| 2000 | 3-35 | 6,28 | 2076 | 50,27 |

| D _e mm | e mm | S m ² | V litros | P Kg/mm e |
|----------------------|---------|---------------------|-------------|--------------|
| 2200 | 4-40 | 7,60 | 2757 | 60,82 |
| 2400 | 4-40 | 9,05 | 3583 | 72,38 |
| 2600 | 4-40 | 10,62 | 4559 | 84,95 |
| 2800 | 4-40 | 12,32 | 5698 | 98,52 |
| 3000 | 4-40 | 14,14 | 7012 | 113,10 |
| 3200 | 5-40 | 16,08 | 8498 | 128,68 |
| 3400 | 5-40 | 18,16 | 10199 | 145,27 |
| 3600 | 5-40 | 20,36 | 12113 | 162,86 |
| 3800 | 5-40 | 22,68 | 14252 | 181,46 |
| 4000 | 6-40 | 25,13 | 16605 | 201,06 |
| 4200 | 6-40 | 27,71 | 19230 | 221,67 |
| 4400 | 6-40 | 30,41 | 22119 | 243,28 |
| 4600 | 6-40 | 33,24 | 25284 | 265,90 |
| 4800 | 6-40 | 36,19 | 28736 | 289,53 |
| 5000 | 6-40 | 39,27 | 32490 | 314,16 |

Referencia
FZ-6

Fondos planos



| DATOS TEORICOS PARA CALCULO | r | D_d | h | H | V |
|-----------------------------|---------|----------------|--------------|-------------|--|
| | 20 a 50 | $D_e + r + 2h$ | $\geq 3,5 e$ | $r + h + e$ | $\frac{\pi}{4} (D_e - 2e)^2 r - 0,660 r^2$ |

DENTRO DE LAS MEDIDAS INDICADAS EN LA TABLA, PODEMOS FABRICAR CUALQUIER PERFIL Y DIAMETRO INTERMEDIO DE MILIMETRO EN MILIMETRO, PRACTICAMENTE SIN LIMITACION.

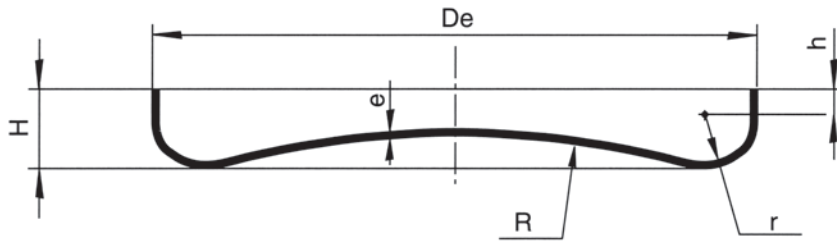
DATOS ORIENTATIVOS

| D_e mm | e mm | D_d mm | r mm | V litros | Peso Kg/ mm e |
|-------------|-----------|-------------|-----------|---------------|---------------------|
| 350 | 3-12 | 400 | 30 | 2,19 | 1,01 |
| 400 | 3-12 | 450 | 30 | 3,06 | 1,27 |
| 500 | 3-12 | 550 | 30 | 5,16 | 1,90 |
| 600 | 3-12 | 650 | 30 | 7,72 | 2,65 |
| 700 | 3-20 | 760 | 40 | 14,08 | 3,63 |
| 800 | 3-20 | 860 | 40 | 18,75 | 4,65 |
| 900 | 3-20 | 960 | 40 | 24,05 | 5,79 |
| 1000 | 3-20 | 1060 | 40 | 29,98 | 7,06 |
| 1100 | 3-20 | 1170 | 50 | 45,35 | 8,60 |
| 1200 | 4-20 | 1280 | 50 | 54,15 | 10,29 |
| 1300 | 4-30 | 1380 | 50 | 63,90 | 11,97 |
| 1400 | 4-30 | 1480 | 50 | 74,44 | 13,76 |
| 1500 | 4-30 | 1580 | 50 | 85,77 | 15,69 |
| 1600 | 4-30 | 1680 | 50 | 97,88 | 17,73 |
| 1700 | 4-30 | 1780 | 50 | 110,77 | 19,91 |

| D_e mm | e mm | D_d mm | r mm | V litros | Peso Kg/ mm e |
|-------------|-----------|-------------|-----------|---------------|---------------------|
| 1800 | 4-30 | 1880 | 50 | 124,46 | 22,21 |
| 1900 | 4-30 | 1980 | 50 | 138,92 | 24,63 |
| 2000 | 6-30 | 2100 | 50 | 153,55 | 27,71 |
| 2200 | 6-30 | 2300 | 50 | 186,35 | 33,24 |
| 2400 | 6-30 | 2500 | 50 | 222,29 | 39,27 |
| 2600 | 6-30 | 2700 | 50 | 261,37 | 45,80 |
| 2800 | 6-30 | 2900 | 50 | 303,59 | 52,84 |
| 3000 | 8-30 | 3110 | 50 | 348,02 | 60,77 |
| 3200 | 8-30 | 3310 | 50 | 396,46 | 68,84 |
| 3400 | 8-30 | 3510 | 50 | 448,05 | 77,41 |
| 3600 | 8-30 | 3710 | 50 | 502,77 | 86,48 |
| 3800 | 8-30 | 3910 | 50 | 560,64 | 96,06 |
| 4000 | 8-30 | 4110 | 50 | 621,65 | 106,14 |
| 4200 | 8-30 | 4310 | 50 | 685,80 | 116,72 |
| 4400 | 8-30 | 4510 | 50 | 753,10 | 127,80 |

**Referencia
FZ-7**

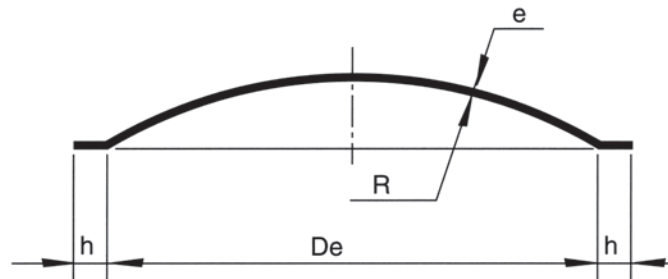
Fondos difusores



| | | | |
|---|--|----|----------------------|
| r | D_e 20 a 150 | Dd | D_e 1,02 + r + 2 h |
| h | $\geq 3,5 e$ | H | h + r + e |
| v | $\frac{\pi}{4} (D_e - 2e)^2 r - [0,65 (D_e - 2e) \cdot r^2 - \pi]$ | R | s/ demanda |

**Referencia
FZ-8**

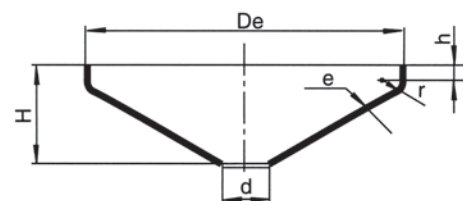
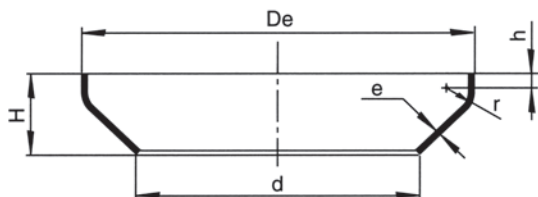
Fondos tapas



| | | | |
|----|------------------|---|------------|
| Dd | D_e 1,04 + 2 h | v | $0,054D^3$ |
|----|------------------|---|------------|

**Referencia
FZ-9**

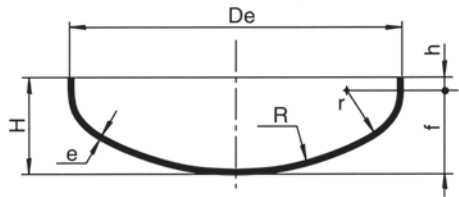
Fondos cónicos



| | |
|--------------------|--------------------|
| De máx: 5.000 mm. | De mín.: 350 mm. |
| d máx.: S/ Demanda | d mín.: 30 mm. |
| H máx.: S/ Demanda | r: de 20 a 600 mm. |
| e mín.: 3 mm. | e máx.: 30 mm |

**Referencia
FZ-10**

FONDOS CAPS (TIPO SEMIELIPTICOS)



| DATOS PARA CALCULO | |
|--------------------|-----------------------|
| R | $0,8 D_e$ |
| r | $0,154 D_e$ |
| h | $\geq 3e$ |
| f | $0,255 D_e - 0,635 e$ |
| H | $f + h + e$ |
| V | $0,1298 (D_e - 2e)^3$ |

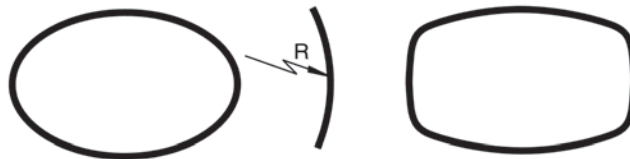
| D _e (pulgadas) | D _e (mm) | e |
|---------------------------|---------------------|------|
| 12" | 323,8 | 3-12 |
| 14" | 355,6 | 3-12 |
| 16" | 406,4 | 3-12 |
| 18" | 457,2 | 3-12 |
| 20" | 508,0 | 3-12 |
| 22" | 558,8 | 3-12 |

| D _e (pulgadas) | D _e (mm) | e |
|---------------------------|---------------------|------|
| 24" | 609,6 | 3-20 |
| 26" | 660,4 | 3-20 |
| 30" | 762,0 | 3-20 |
| 34" | 863,6 | 3-20 |
| 36" | 914,4 | 3-20 |
| 42" | 1066,8 | 3-20 |

Estos fondos Caps llevarán un taladro central de 30 ó 40 mm. de diámetro.

**Referencia
FZ-11**

OVALOS

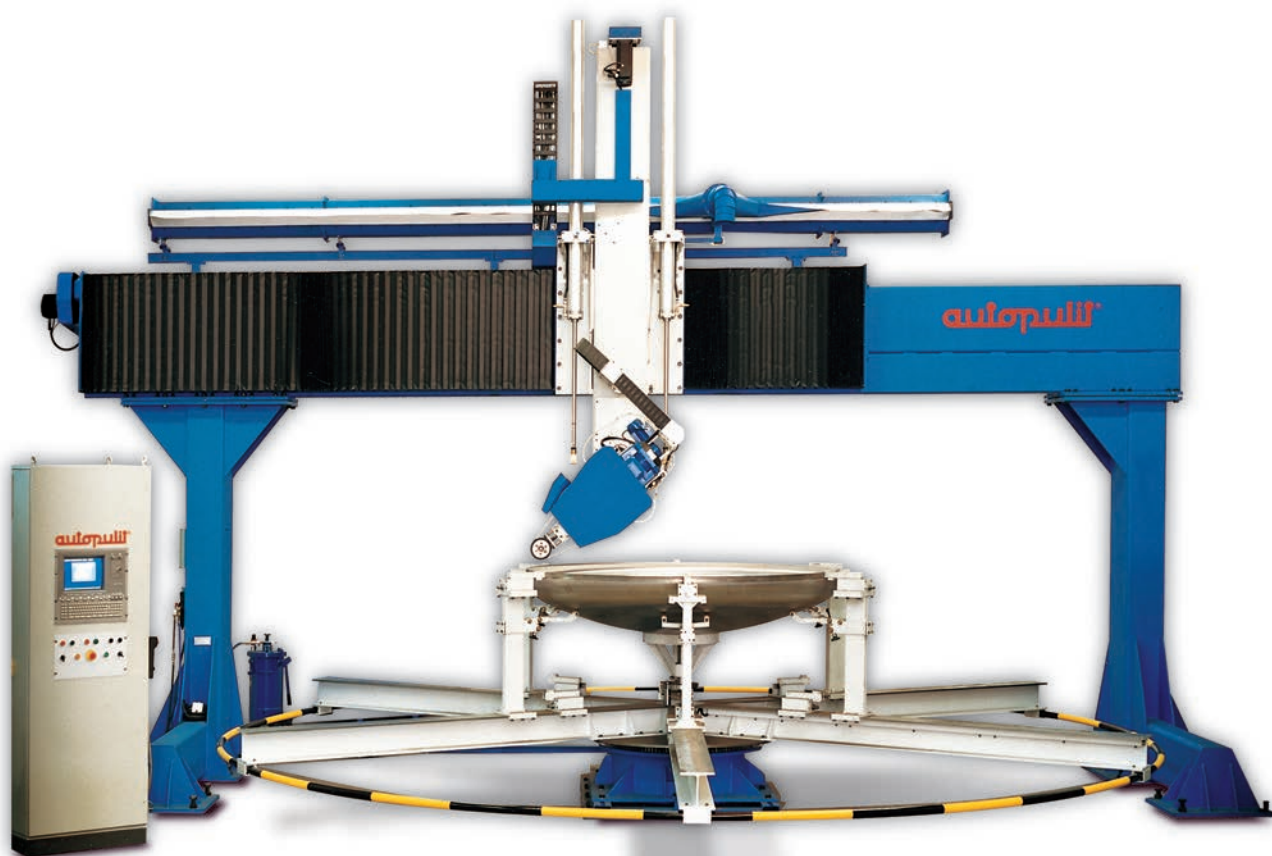


Ovalos Bombeados a un radio esférico (R) s/ demanda

BISELADO DE BORDES

| | Borde Recto | Chaflan exterior | Chaflan interior | Doble chaflan |
|--|----------------|------------------|------------------|----------------|
| Sin destalonamiento | BZ1 | BZ2 | BZ3 | BZ4 |
| Con destalonamiento cónico interior | BZ5 | BZ6 | BZ7 | BZ8 |

LIJADO Y PULIDO DE FONDOS DE ACERO INOXIDABLE (INTERIOR Y EXTERIOR)



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