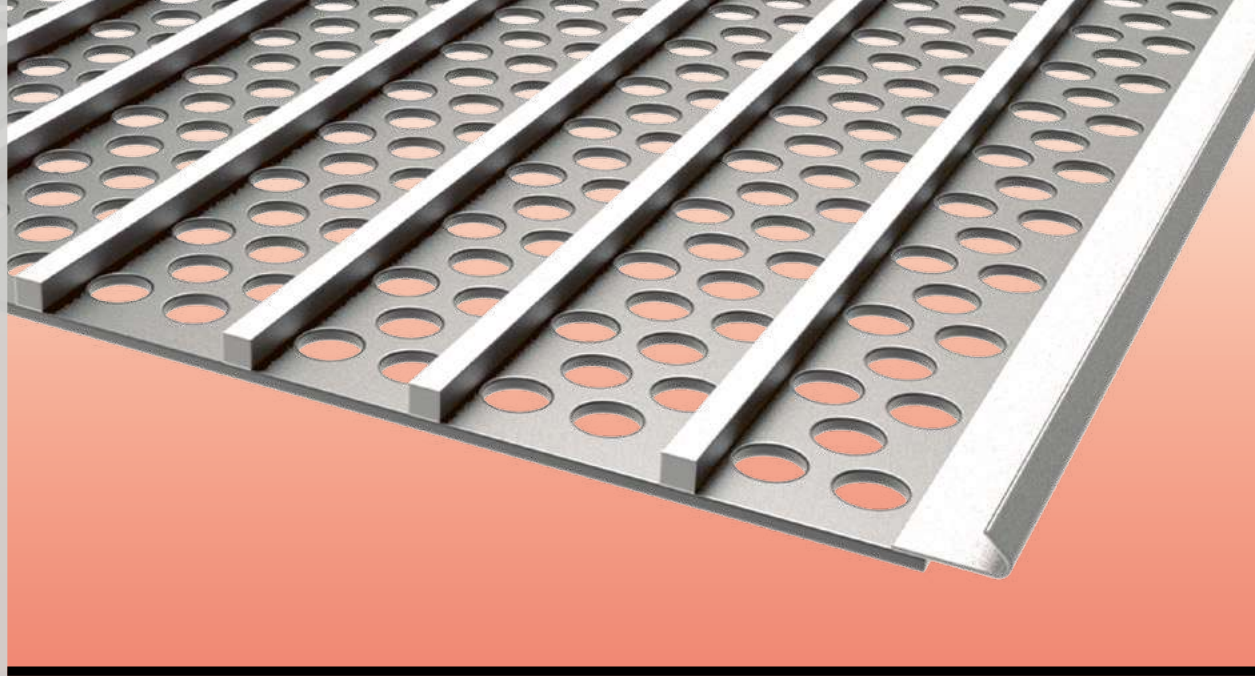
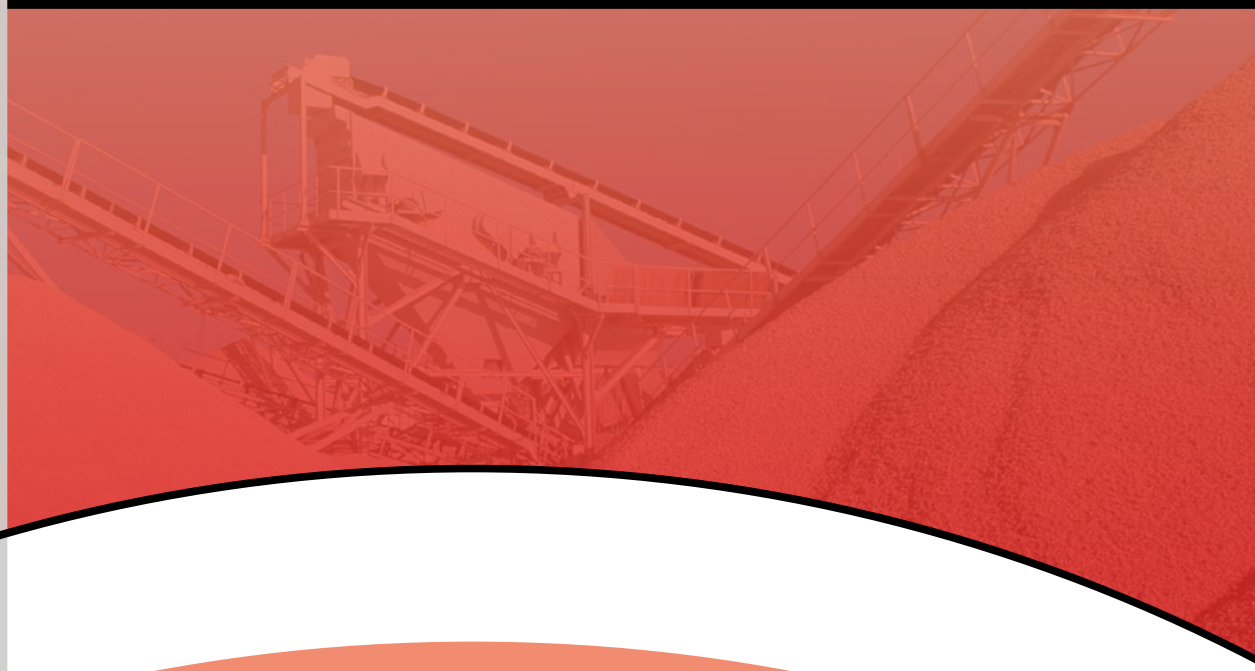
# Chapas Perforadas





Superficies
Cribantes

8

NUBA
Screening Media

&

NUBA
Technical Advice

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&
NUBA
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# Chapas Perforadas

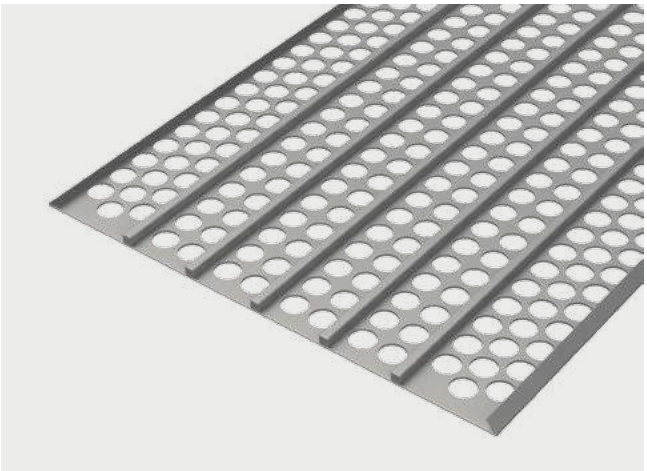
Por su resistencia a la abrasión y al impacto, son utilizadas principalmente para el precribado, montadas en los pisos superiores de las cribas con uñas de tensión o fijadas mediante tornillería.

Se fabrican con agujeros redondos, cuadrados, rectangulares o hexagonales, con la disposición de los agujeros en forma lineal o a tresbolillo.

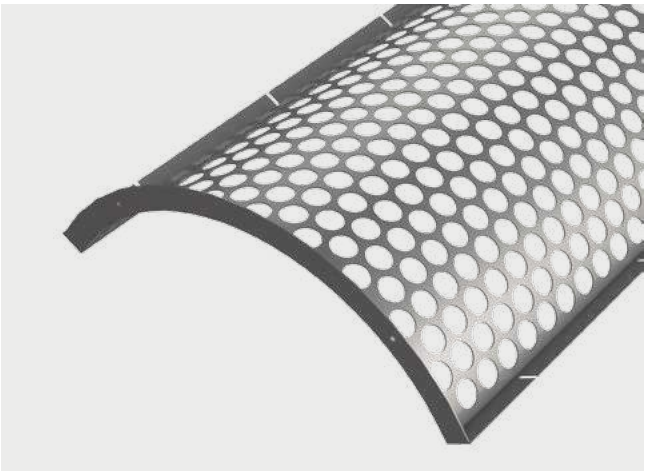
También es común utilizarlas reforzadas con cuadradillos soldados para soportar tamaños más gruesos o curvadas para su aplicación en Trómeles.

## Fabricadas en:

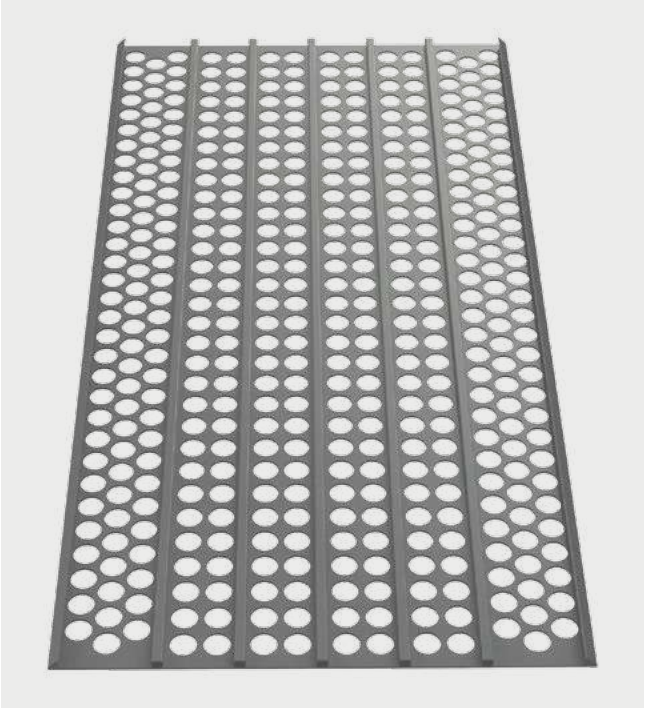
- Acero al Carbono:
  S235 JR y S275 JR (EN-10025)
- Acero Inoxidable:
  AISI 304 y AISI 316 (EN 10088)
- Antidesgaste:
  HB 400 – 600

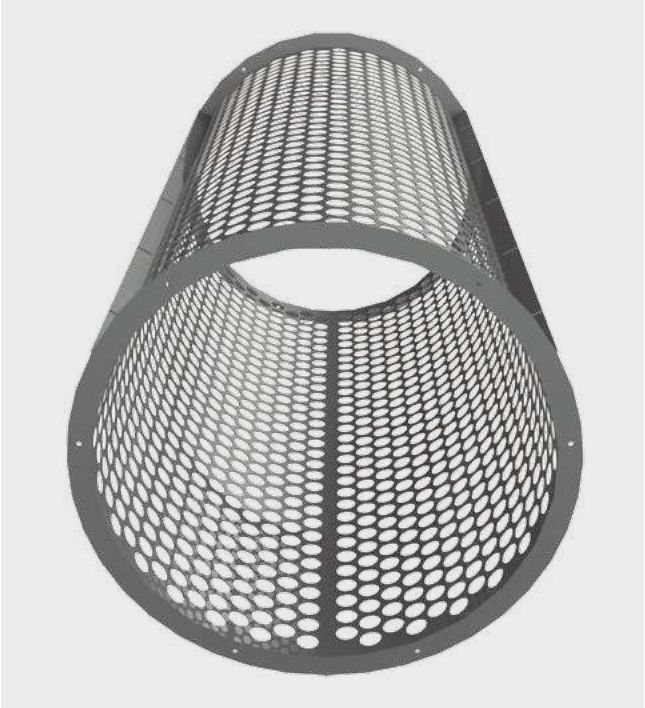


Chapas reforzadas con cuadradillos



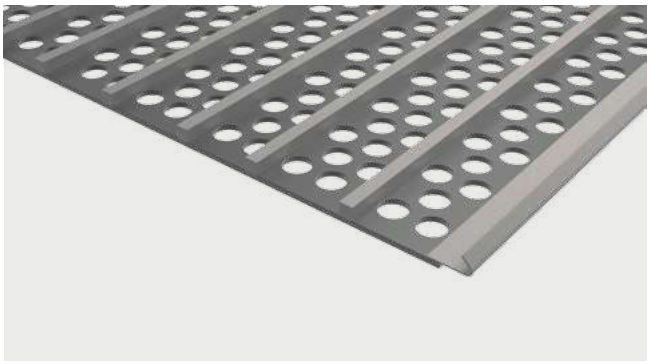
Chapas perforadas curvadas





NUBA Screening Media ofrece chapas perforadas en una gran diversidad de materiales. Los materiales más comunes en los que fabricamos se indican a continuación:

## Chapas Perforadas
# Acero al Carbono

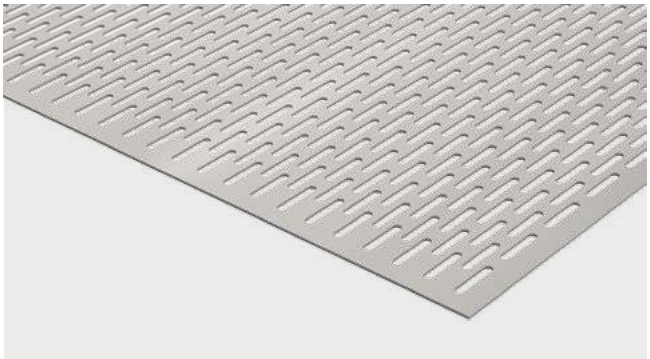


### Características

Las chapas perforadas en acero al carbono (laminado en caliente y decapado) son las más consumidas. Se caracterizan por su facilidad de plegado y embutición. Para conformado directo en frío.

| Tipo de Acero | Norma | Equivalencia Nomenclatura | C (%) | Mn (%) | P (%) | S (%) | Resistencia ($N/mm^2$) | Límite elástico ($N/mm^2$) | Alargamiento a la rotura (%) |
|---|---|---|---|---|---|---|---|---|---|
| Chapa laminado en caliente y decapada | | | | | | | | | |
| **S235 JR** | EN-10025 | Stw 37 | ≤ 0.17 | ≤1.40 | ≤ 0.045 | ≤ 0.045 | ≥ 235 | 360-510 | ≥ 27 |
| **S275 JR** | EN-10025 | Stw 44 | ≤ 0.21 | ≤1.60 | ≤ 0.045 | ≤ 0.045 | ≥ 275 | 430-580 | ≥ 27 |

## Chapas Perforadas
# Acero Inoxidable



### Características

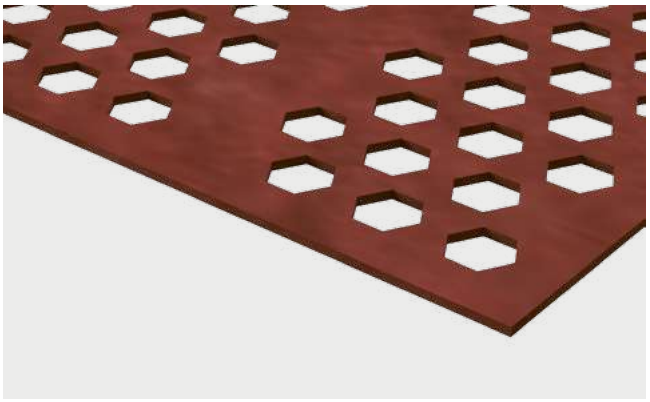
Las chapas en AISI 304 presentan unas características mecánicas excelentes y una alta resistencia a la corrosión.

Las chapas en acero AISI 316 se caracterizan por su composición química, contiene molibdeno, lo que le proporciona una mayor resistencia a agentes corrosivos más violentos.

| Tipo de Acero | Equivalencia | Norma | C (%) | Si (%) | Mn (%) | P max (%) | S max (%) | Cr (%) | Ni (%) | Mo (%) |
|---|---|---|---|---|---|---|---|---|---|---|
| **AISI 304** | EN 1.4301 | EN 10088 | ≤ 0.07 | ≤ 1.00 | ≤ 2.00 | 0.045 | 0.030 | 17-19.5 | 8-10.5 | - |
| **AISI 316** | EN 1.4401 | EN 10088 | ≤ 0.07 | ≤ 1.00 | ≤ 2.00 | 0.045 | 0.030 | 16.5-18.5 | 10-13 | 2-2.50 |

## Chapas Perforadas

# Acero Antidesgaste



## Características

Fabricamos a medida chapas perforadas en acero antidesgaste especialmente indicadas para situaciones altamente abrasivas. Se caracterizan por su gran dureza, alta resistencia y excelente resiliencia.

Los aceros HB 400 – 450 presentan una alta elasticidad y resistencia siendo apropiadas para su plegado, curvado, mecanizado y soldado.

Los aceros HB 500 soportan un intenso desgaste y son apropiados para casos de fuerte erosión de minerales duros y otros materiales abrasivos.

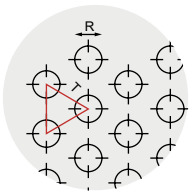
Los aceros de calidad HB 550 combina las mejores propiedades del HB 500 y el 600.

Los aceros HB 600 presentan la mayor dureza en acero antidesgaste del mercado, siendo un producto preparado para soportar un índice de abrasión extremo.

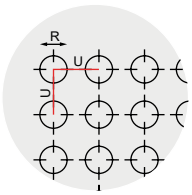
Perforación por chorro de agua y laser.

| Tipo de Acero | Espesor | C max (%) | Mn max (%) | P max (%) | S max (%) | Resistencia (MPa) | Límite elástico (MPa) | Dureza (HB) |
|---|---|---|---|---|---|---|---|---|
| **HB-400** | 3-20 | 0.15 | 1.6 | 0.025 | 0.010 | 1250 | 1000 | 370-430 |
| **HB-450** | 3-20 | 0.21 | 1.6 | 0.025 | 0.010 | 1400 | 1200 | 425-475 |
| **HB-500** | 4-30 | 0.29 | 1.6 | 0.025 | 0.010 | 1600 | 1250 | 470-530 |
| **HB-550** | 10-50 | 0.37 | 1.3 | 0.020 | 0.010 | - | - | 525-575 |
| **HB-600** | 8-30 | 0.45 | 1.0 | 0.015 | 0.010 | - | - | 570-640 |

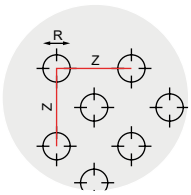
# Superficie Libre



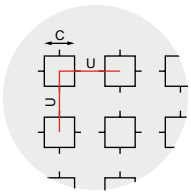

$SL = 0{,}906 \times (R/T)^2$



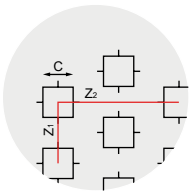

$SL = 0{,}785 \times (R/U)^2$



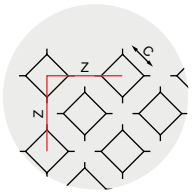

$SL = 1{,}57 \times (R/Z)^2$



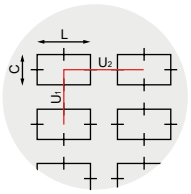

$SL = (C/U)^2$



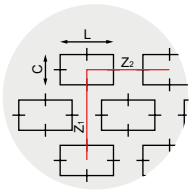

$SL = 2C^2 \times Z_1 Z_2$



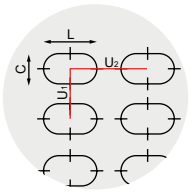

$SL = 2 \times \left(\frac{CD}{Z}\right)^2$



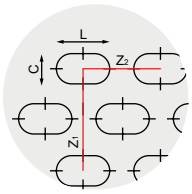

$SL = 2\,\frac{C \times L}{U_1 \times U_2}$




$SL = 2\,\frac{C \times L}{Z_1 \times Z_2}$




$SL = 2\,\frac{C \times L - 0{,}215\,C^2}{U_1 \times U_2}$




$SL = 2\,\frac{C \times L - 0{,}43\,C^2}{Z_1 \times Z_2}$

# Tipos de perforación

## Agujeros redondos

- Perforaciones: Desde 0,5 mm a 120 mm.
- Espesores: Desde 0,5 mm a 20 mm *(según perforación).*
- Dimensiones: En chapa hasta 2.000 mm ancho *(según perforación).*

  En bobina hasta 1.500 mm ancho *(según perforación).*

*Para otro tipo de perforaciones, consultar.*

**R 1,5 T 3**

**R 3 T 5**

**R 5 T 7**

**R 10 T 14**

## Chapas perforadas de 2.000 x 1.000 mm

| R | T | % | Espesores | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0,5 | 0,8 | 1 | 1,5 | 2 | 2,5 | 3 | 4 | 5 | 6 | 8 | 10 |
| 0,5 | 1,25 | 14,5 | ● | | | | | | | | | | | |
| 0,5 | 1,5 | 10 | ● | | | | | | | | | | | |
| 0,8 | 1,60 | 22,5 | ● | | | | | | | | | | | |
| 0,8 | 1,75 | 19 | ● | | | | | | | | | | | |
| 0,8 | 2 | 26 | | ● | | | | | | | | | | |
| 1 | 2 | 23 | ● | ● | ● | | | | | | | | | |
| 1,2 | 2,25 | 26 | | | ● | | | | | | | | | |
| 1,5 | 3 | 23 | ● | ● | ● | ● | | | | | | | | |
| 1,8 | 3 | 33 | ● | ● | ● | | | | | | | | | |
| 2 | 3,5 | 30 | ● | ● | ▲● | ● | | | | | | | | |
| 2 | 4 | 23 | | | | ● | ● | | | | | | | |
| 2,5 | 4 | 35 | ● | ● | ● | ● | | | | | | | | |
| 2,5 | 5 | 23 | | | | | ● | ● | | | | | | |
| 3 | 5 | 33 | ● | ▲● | ▲●■ | ▲●■ | ▲● | | | | | | | |
| 3 | 6 | 23 | | | | | | | ● | | | | | |
| 3,5 | 5 | 44 | ● | ● | ● | ● | | | | | | | | |
| 3,5 | 6 | 31 | | | | | ● | | ● | | | | | |
| 4 | 6 | 40 | ● | ● | ▲● | ▲●■ | | | | | | | | |
| 4 | 7 | 30 | | | | | ▲● | | ● | ● | | | | |
| 5 | 7 | 46 | ● | ● | ▲● | ▲●■ | | | | | | | | |
| 5 | 8 | 35 | | | ▲● | ▲●■ | ▲●■ | | ● | ● | ● | | | |
| 6 | 8,5 | 44 | ● | ● | ▲● | ▲●■ | | | | | | | | |
| 6 | 9 | 40 | | | ● | ● | | | | | | | | |
| 6 | 10 | 33 | | | | | ▲●■ | | ● | ● | ● | ● | | |
| 7 | 10 | 44 | | | ● | ● | | | | | | | | |
| 7 | 11 | 37 | | | | | ● | | ● | ● | ● | ● | | |
| 8 | 11 | 48 | ● | ▲● | ▲● | ▲●■ | | ● | | | | | | |
| 8 | 12 | 40 | | | | ▲● | ▲●■ | | ● | ● | ● | ● | | |
| 8 | 13 | 34 | | | | | | | | | | | ● | |
| 8 | 15 | 26 | | | | | | | | | | | ● | |
| 8 | Aboc. | 4,5 | | | | | ▲● | | | | | | | |
| 9 | 13 | 45 | ● | | ● | ● | | | | | | | | |
| 9 | 14 | 37 | | | | | ● | | ● | ● | ● | ● | | |
| 10 | 14 | 46 | ● | ● | ▲● | ▲●■ | | | | | | | | |
| 10 | 15 | 40 | | | | ● | ▲●■ | | ▲● | ● | ● | ● | | |
| 10 | 18 | 28 | | | | | | | | | | | ● | ● |
| 12 | 16 | 51 | | | ▲● | ▲● | | | | | | | | |
| 12 | 17 | 45 | | | | | ▲● | | ● | ● | ● | ● | | |
| 12 | 20 | 32 | | | | | | | | | | | ● | ● |
| 14 | 19 | 49 | | | ● | ● | ● | | ● | ● | ● | ● | | |
| 14 | 20 | 44 | | | | | | | | | | | ● | ● |
| 15 | 18 | 63 | | | ● | ▲● | | | | | | | | |
| 15 | 22 | 42 | | | | | ▲● | | ● | ● | ● | ● | | |
| 15 | 24 | 35 | | | | | | | | | | | ● | ● |
| 15 | Aboc. | 22,5 | | | | | ▲● | | | | | | | |
| 16 | 20 | 58 | | | ● | ● | ● | | ● | ● | ● | ● | | |
| 16 | 24 | 40 | | | | | | | | | | | ● | ● |
| 18 | 22,5 | 56 | | | ● | ● | | | | | | | | |
| 18 | 25 | 47 | | | | | ● | | ● | | | | | |
| 18 | 27 | 40 | | | | | | | | ● | ● | ● | ● | ● |
| 20 | 25 | 58 | | | ● | ▲● | | | | | | | | |
| 20 | 27 | 49 | | | | | ●■ | | ● | ● | ● | ● | | |
| 20 | 30 | 40 | | | | | | | | | | | ● | ● |
| 22 | 28 | 56 | | | | | ● | | ● | ● | ● | ● | ● | ● |
| 25 | 34 | 49 | | | ● | ● | ● | | ● | ● | ● | ● | ● | ● |
| 28 | 35 | 58 | | | | | ● | | ● | ● | ● | ● | ● | ● |
| 30 | 37 | 60 | | | ● | ● | ● | | ● | ● | ● | ● | | |
| 30 | 40 | 51 | | | | | | | | | | | ● | ● |
| 35 | 46 | 52 | | | | | ● | | ● | ● | ● | ● | ● | ● |
| 40 | 50 | 58 | | | | | ● | | ● | ● | ● | ● | ● | ● |
| 45 | 60 | 51 | | | | | | | ● | ● | ● | ● | ● | ● |
| 50 | 62 | 59 | | | | | ● | | ● | ● | ● | ● | ● | ● |
| 60 | 75 | 58 | | | | | | | ● | ● | ● | ● | ● | ● |
| 70 | 75 | 58 | | | | | | | | | ● | ● | ● | ● |
| 80 | 96 | 62 | | | | | | | ● | ● | ● | ● | ● | ● |
| 90 | 112 | 58 | | | | | | | ● | ● | ● | ● | ● | ● |
| 100 | 124 | 58 | | | | | | | ● | ● | ● | ● | ● | ● |

● Acero dulce 2.000 x 1.000

■ Acero dulce 2.500 x 1.250

▲ Acero Galvanizado 2.000 x 1.000

## Agujeros redondos molinería

- Perforaciones: Desde 2 mm a 8 mm.
- Espesores: Desde 0,8 mm a 3 mm *(según perforación).*
- Dimensiones: En chapa hasta 1.500 mm ancho *(según perforación).*

  En bobina hasta 1.500 mm ancho *(según perforación).*

*Para otro tipo de perforaciones, consultar.*

**R 2,5 T 3,5**

**R 3 T4**

## Chapas perforadas de 2.000 x 1.000 mm

| R | T | % | Espesores | | | | |
|---|---|---|---|---|---|---|---|
| | | | 1 | 1,5 | 2 | 2,5 | 3 |
| 2 | 3 | 40 | • | • | • | | |
| 2,5 | 3,5 | 46 | • | • | • | • | |
| 3 | 4 | 51 | • | • | • | • | • |
| 3,5 | 4,5 | 55 | | • | • | • | • |
| 4 | 5,5 | 48 | | • | • | • | • |
| 4,5 | 6 | 51 | | • | • | • | • |
| 5 | 6,5 | 54 | | • | • | • | • |
| 6 | 7,5 | 58 | | | • | • | • |
| 7 | 10 | 44 | | | | | • |
| 8 | 11 | 48 | | | | | • |

Chapas de Acero dulce

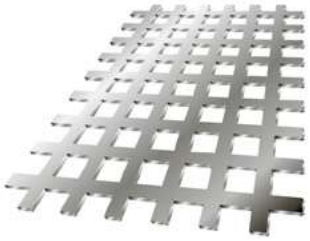
## Agujeros cuadrados

- Perforaciones: Desde 3 mm a 120 mm.
- Espesores: Desde 0,5 mm a 5 mm *(según perforación).*
- Dimensiones: En chapa hasta 2.000 mm ancho *(según perforación).*

  En bobina hasta 1.500 mm ancho *(según perforación).*

*Para otro tipo de perforaciones, consultar.*

**C5 U7,5**



**C10 U15**

## Chapas perforadas de 2.000 x 1.000 mm

| ⍁ C | U | % | Espesores | | | | |
|---|---|---|---|---|---|---|---|
| | | | 0,8 | 1 | 1,5 | 2 | 3 |
| 3 | 5 | 36 | | • | • | | |
| 5 | 7,5 | 44 | • | • | • | | |
| 5 | 8 | 39 | | • | • | • | |
| 8 | 11 | 53 | • | • | • | • | |
| 10 | 12 | 69 | | • | • | | |
| 10 | 13 | 59 | | • | • | • | |
| 10 | 15 | 44 | | • | • | • | • |
| 10 | 20 | 25 | | • | • | • | |
| 15 | 20 | 56 | | • | • | • | • |
| 15 | 30 | 25 | | | • | • | |
| 20 | 25 | 64 | | • | • | • | • |
| 20 | 40 | 25 | | • | • | • | • |
| 22 | 44 | 25 | | • | • | • | • |
| 25 | 50 | 25 | | | • | • | |
| 30 | 35 | 73 | | • | • | • | • |
| 30 | 60 | 25 | | • | • | • | • |
| 40 | 50 | 64 | | | • | • | • |
| 40 | 80 | 25 | | | • | • | • |
| 50 | 100 | 25 | | | • | • | • |

Chapas de Acero dulce

# Agujeros oblongos

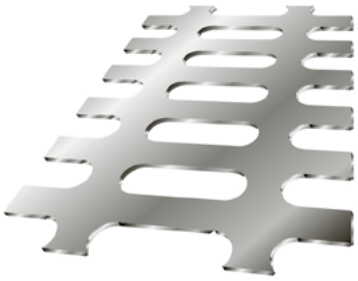
- Perforaciones: Desde 1 x 20 mm a 10 x 40 mm.
- Espesores: Desde 0,5 mm a 8 mm *(según perforación).*
- Dimensiones: En chapa hasta 2.000 mm ancho *(según perforación).*

  En bobina hasta 1.500 mm ancho *(según perforación).*

*Para otro tipo de perforaciones, consultar.*

**LR4 x 20 ZI**

**LR3 x 20 UII**



## Chapas perforadas de 2.000 x 1.000 mm

| LR | Distancia | Disposición perforación | % | Espesores | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1 | 1,5 | 2 | 3 | 4 | 5 | 6 |
| 1,5 x 20 | 4 x 26 | U II | 28,3 | | ● | | | | | |
| 2,5 x 20 | 5 x 26 | U II | 37,4 | ● | | | | | | |
| 3 x 20 | 6 x 26 | U II | 37,2 | | ● | ● | | | | |
| 3 x 20 | 14 x 26 | Z I | 32 | | | ● | | | | |
| 4 x 20 | 16 x 25 | Z II | 38,2 | ● | | | | | | |
| 4 x 20 | 16 x 25 | Z I | 38,2 | | ● | ● | ● | | | |
| 4 x 20 | 8 x 25 | U II | 38,2 | ● | ● | | | | | |
| 5 x 20 | 10 x 25 | U II | 37,8 | | ● | ● | | | | |
| 5 x 20 | 20 x 25 | Z II | 37,8 | | ● | | | | | |
| 5 x 20 | 20 x 25 | Z I | 37,8 | ● | ● | ● | ● | | | |
| 6 x 25 | 22 x 31 | Z I | 39,4 | | | | | | | |
| 6 x 30 | 26 x 37 | Z I | 33 | | ● | | | | | |
| 7 x 20 | 12 x 26,5 | U II | 40,7 | | ● | | | | | |
| 8 x 40 | 13 x 47,5 | U II | 49,5 | | ● | ● | | | | |
| 8 x 40 | 26 x 47,5 | Z II | 49,5 | | | ● | | | | |
| 10 x 40 | 20 x 50 | U II | 34,85 | | | ● | | | | |

Chapas de Acero dulce

# Chapas perforadas de acero inoxidable

- Perforaciones: Desde 0,4 mm a 120 mm.
- Espesores: Desde 0,4 mm a 12 mm *(según perforación).*
- Dimensiones: En chapa hasta 2.000 mm ancho *(según perforación).*

  En bobina hasta 1.500 mm ancho *(según perforación).*

*Para otro tipo de perforaciones, consultar.*

**R 1 T 2,2**

**R 2 T 3,5**

**R 4 T 6**

## Chapas perforadas de 2.000 x 1.000 mm

| R | T | % | Espesores | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0,4 | 0,5 | 0,6 | 0,8 | 1 | 1,5 | 2 | 3 | 4 |
| 0,4 | 1,5 | 6 | ● | | | | | | | | |
| 0,5 | 1,5 | 10 | ● | ● | | | | | | | |
| 0,6 | 1,5 | 15 | ● | | | | | | | | |
| 0,8 | 1,75 | 19 | | ● | ● | | | | | | |
| 0,8 | 2 | 15 | | | | ● | | | | | |
| 1 | 2 | 23 | | | | | ● | | | | |
| 1 | 2,2 | 19 | | ● | | ● | | | | | |
| 1,2 | 2,25 | 26 | | | | ● | ● | | | | |
| 1,5 | 3 | 23 | | ● | | ● | ● | ● | | | |
| 2 | 3,5 | 30 | | | | | ● ■ | ● ■ | | | |
| 2 | 4 | 23 | | | | | | | ● | | |
| 2,5 | 4 | 35 | | | | | ● ■ | ● ■ | | | |
| 2,5 | 5 | 23 | | | | | | ● | ● ■ | | |
| 3 | 5 | 33 | | | | | ● ■ | ● ■ | ● ■ | | |
| 3 | 6 | 23 | | | | | | | | ● | |
| 3 | 6 | | | | | | | | | ● | |
| 3,5 | 6 | | | | | | ■ | | ■ | | |
| 4 | 6 | 40 | | ● | | | ● ■ | ● ■ | | | |
| 4 | 7 | 30 | | | | | | | ● ■ | ● | ● |
| 5 | 7 | 46 | | | | | ● ■ | ● ■ | | | |
| 5 | 8 | 35 | | | | | | | ● ■ | ● ■ | ● |
| 6 | 8,5 | 45 | | | | | ● ■ | ● ■ | | | |
| 6 | 10 | 33 | | | | | | | ● ■ | ● | ● |
| 7 | 10 | | | | | | ● | | | | |
| 8 | 11 | 48 | | | | | ● ■ | ● ■ | | | |
| 8 | 12 | 40 | | | | | ● | | ● ■ | ● | ● |
| 8 | emb.47,5 | | | | | | | | ● | | |
| 10 | 14 | 46 | | | | | ● ■ | ● ■ | | | |
| 10 | 15 | 40 | | | | | | | ● ■ | ● | ● |
| 12 | 16 | 51 | | | | | ● ■ | ● ■ | | | |
| 12 | 17 | 45 | | | | | | | ● ■ | ● | ● |
| 15 | 18 | 63 | | | | | ● ■ | ● ■ | | | |
| 15 | 22 | 42 | | | | | | | ● ■ | ● | ● |
| 15 | emb.30 | | | | | | | | ● | | |
| 20 | 27 | 50 | | | | | | | | | ● |

● AISI 304
2.000 x 1.000

■ AISI 316 L
2.500 x 1.250

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