# Refrattari termodielettrici

## Thermodielectric Refractories

KANTHAL

Catalogue 9-B-1-3 07-07-3000



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# Refrattari termodielettrici

## Thermodielectric Refractories

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# Refrattari termodielettrici
## Thermodielectric refractories

Uno dei sistemi più comunemente impiegati per il supporto di elementi elettrotermici (resistenze elettriche e termocoppie) si ha con l'impiego di refrattari termodielettrici.

Essi fanno parte della grande famiglia delle ceramiche e sono prodotti con un processo poco dissimile da quello impiegato per la fabbricazione di oggetti presenti anche nelle nostre case come vasi, piatti ed altri articoli artistici.

Per quanto concerne la nostra gamma di prodotti, è necessario però scegliere con molta cura le migliori materie prime che devono soddisfare i seguenti requisiti alle alte temperature:

**Buona resistenza meccanica**
**Alta resistenza elettrica**
**Buona resistenza allo shock termico**

**Buona resistenza meccanica**
Per migliorare la resistenza meccanica vengono utilizzate allumine e chamottes refrattarie che, unite alle argille, formano una struttura densa.

**Alta resistenza elettrica**
Per migliorare le caratteristiche dielettriche (alta resistenza elettrica) è necessario utilizzare argille con basse percentuali di ossido di ferro e di alcali.

**Buona resistenza allo shock termico**
La resistenza allo shock termico si ottiene con un giusto grado di porosità o, in certi casi, con l'apporto di ossido di magnesio.

I refrattari termodielettrici contenenti allumina si possono dividere in tre gruppi:

1) **Allumino-Silicati**
   Sono materiali con un contenuto di allumina inferiore al 50 %. Vengono impiegati per temperature fino a 1100 – 1200°C. Hanno una buona resistenza allo shock termico.
   Codice Kanthal: **A42P**

2) **Alluminosi**
   Sono materiali con un contenuto di allumina superiore al 50 %. Vengono impiegati per temperature fino a circa 1300°C. Hanno una discreta resistenza allo shock termico ed ottime caratteristiche dielettriche.
   Codici Kanthal: **A60P** **A50C** **A73E** **A80E**

3) **Cordierite**
   Sono materiali contenenti anche ossido di magnesio. Possono essere impiegati con temperature fino a 1100°C. Hanno un' ottima resistenza meccanica ed allo shock termico.
   Codice Kanthal: **A38E**

One of the most widely used methods of supporting electrothermal components (electrical resistance and thermocouples) is the use of thermodielectric refractories.

They belong to the extensive family of ceramics and are produced using a process similar to that used to manufacture household articles such as vases, plates and decorative objects.

However, for our product range, the best raw materials are chosen in order to meet the following requirements at high temperatures:

Good mechanical strength
High electrical resistance
Good thermal shock resistance

Good Mechanical Strength
To improve mechanical strength we use alumina and refractory presintered clays which, when combined with basic clays, form a dense structure.

High Electrical Resistance
To improve dielectric properties (high electrical resistance), we use clays with low iron oxide and alkaline content.

Good Thermal Shock Resistance
Thermal shock resistance is obtained by achieving the right level of porosity or, in certain cases, by the addition of magnesium oxide.

Thermodielectric refractories with alumina content can be divided into three groups:

1) Aluminosilicates
   These are materials with an alumina content of less than 50 %. They are used for temperatures up to 1100 – 1200°C (2010 – 2190°F). They have good thermal shock resistance.
   Kanthal code: **A42P**

2) Aluminous
   These are materials with an alumina content of more than 50 %. They are used for temperatures up to about 1300°C (2370°F). They have fairly good thermal shock resistance and excellent dielectric properties.
   Kanthal codes: **A60P** **A50C** **A73E** **A80E**

3) Cordierites
   These are materials with added magnesium oxide. They can be used for temperatures up to 1100°C (2010°F). They have excellent mechanical and thermal shock resistance.
   Kanthal code: **A38E**

# Scelta dei materiali refrattari
## Choice of Refractory Materials

I supporti ceramici sono solitamente prodotti con terre refrattarie contenenti in massima parte ossidi di silicio, alluminio e magnesio.

Per i forni elettrici, occorre porre molta attenzione nella scelta dei supporti a causa del decadimento delle loro proprietà dielettriche alle alte temperature. Il contenuto di $Al_2O_3$ deve essere almeno del 40 %, $Fe_2O_3$ minore del 1 %, $Na_2O$ e $K_2O$ il più basso possibile.
(Kanthal mat. A42P-A50C)

Nei forni elettrici ad alta temperatura dove vengono impiegate leghe FeCrAl è necessario usare supporti con il più basso possibile tenore di $SiO_2$ onde evitare reazioni tra il silicio del supporto e lo strato di alluminio che si forma sulla superficie del filo. In questi casi il contenuto di $Al_2O_3$ del supporto deve essere superiore al 60 %.
(Kanthal mat. A60P-A73E-A80E)

Per applicazioni con temperature più basse e dove è importante un'ottima resistenza agli sbalzi di temperatura è consigliabile usare materiali cordieritici.
(Kanthal mat. A38E)

I codici Kanthal sono composti da una lettera, un numero di due cifre e da un'altra lettera che indicano rispettivamente il componente principale, la sua percentuale ed il tipo di processo produttivo.

**A = Allumina**
**E = Estrusione**
**C = Colaggio**
**P = Pressatura**

Es.:

| | |
|---|---|
| A73E | Materiale al 73 % di Allumina estruso |
| A60P | Materiale al 60 % di Allumina pressato |
| A50C | Materiale al 50 % di Allumina colato |

Ceramic supports are usually manufactured with refractory earths containing oxides of silicon, aluminum and magnesium.

For electric furnaces, great care must be taken in choosing the supports due to the reduction in their dielectric properties at high temperatures. The $Al_2O_3$ content must be at least 40 %, $Fe_2O_3$ less than 1 %, $Na_2O$ and $K_2O$ as low as possible.
(Kanthal mat. A42P-A50C)

Where FeCrAl alloys are used in high temperature furnaces it is necessary to use supports with the lowest possible $SiO_2$ content in order to prevent reaction between the silicon in the support and the aluminum layer which forms on the surface of the wire. In these cases, the $Al_2O_3$ content of the support must be greater than 60 %.
(Kanthal mat. A60P-A73E-A80E)

In lower temperature applications or where excellent resistance to thermal shock is required, it is advisable to use cordieritic materials.
(Kanthal mat. A38E)

The Kanthal codes consist of a letter, a 2-digit number and another letter, which show respectively the main ingredient, its percentage and the type of production process.

A = Alumina
E = Extrusion
C = Casting
P = Pressing

Examples:

| | |
|---|---|
| A73E | Material with 73 % alumina content, extruded |
| A60P | Material with 60 % alumina content, pressed |
| A50C | Material with 50 % alumina content, cast |

## Principali caratteristiche dei refrattari termodielettrici Kanthal

### Main Features of Kanthal Thermodielectric Refractories

| | A38E | A73/80E | A42P | A60P | A50C |
|---|---|---|---|---|---|
| Temp. max di utilizzo<br>Max. operating temperature | 1200°C<br>(2190°F) | 1300°C<br>(2370°F) | 1200°C<br>(2190°F) | 1300°C<br>(2370°F) | 1300°C<br>(2370°F) |
| Assorbimento $H_2O$ in volume, %<br>$H_2O$ absorption as % volume | 12–18 | 12–18 | 12–18 | 12–18 | 12–18 |
| Densità apparente, g/cm$^3$<br>Bulk density, (lbs/in$^3$) | 1.9<br>(0.07) | 2.2<br>(0.08) | 1.9<br>(0.07) | 2.2<br>(0.08) | 2<br>(0.07) |
| Condutt. Termica W/mK 20–1000°C<br>Thermal conductivity, (W/mK 68–1830°F) | 460–585 | 627–836 | 460–627 | 627–836 | 460–627 |
| Resistenza compress. a freddo, kg/cm$^2$<br>Cold compression strength, (lbs/in$^2$) | 300<br>(4267) | 400<br>(5689) | 300<br>(4267) | 400<br>(5689) | 300<br>(4267) |
| Calore specifico kcal/kg/°C 100–1000°C<br>Specific heat, kcal/kg/°C (210–1830°F) | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| Resistenza allo shock termico<br>Thermal shock resistance | eccellente<br>excellent | buona<br>good | buona<br>good | buona<br>good | buona<br>good |
| Coeffic. espansione di termica × 10-6<br>Thermal expansion coefficient × 10-6 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Resistività<br>Resistivity | | 400°C (750°F)<br>600°C (1110°F)<br>800°C (1470°F)<br>1000°C (1830°F) | | 10–100<br>1–10<br>0.1–1<br>10–100 | Mohm cm<br>Mohm cm<br>Mohm cm<br>kohm cm |

## Contenuto medio dei componenti chimici

### Average Content of Chemical Ingredients

| | A38E | A73E | A80E | A42P | A60P | A50C |
|---|---|---|---|---|---|---|
| $SiO_2$ | 53.2 | 21 | 12.4 | 47.2 | 30.5 | 37.8 |
| $Al_2O_3$ | 38 | 73 | 82.2 | 43 | 60 | 53.5 |
| $Fe_2O_3$ | 0.9 | 0.6 | 0.5 | 0.9 | 0.9 | 0.8 |
| MgO | 4 | 0.2 | 0.2 | 0.4 | 0.3 | <0.1 |
| TiO | 0.5 | 0.4 | 0.4 | 0.4 | 0.7 | 0.3 |
| CaO | 0.2 | <0.1 | <0.1 | 0.4 | 0.3 | <0.1 |
| $K_2O$ | 1.2 | <0.1 | <0.1 | 0.3 | 0.9 | 3.2 |
| $Na_2O$ | <0.1 | <0.1 | <0.1 | 0.2 | 0.1 | 0.1 |
| LiO | <0.1 | <0.1 | 0.3 | <0.1 | <0.1 | <0.1 |

## Precauzioni per l'uso

I nostri materiali ceramici non contengono o sviluppano, durante l'uso, sostanze pericolose alla salute, perché sono prodotti con materie prime naturali ed inerti e eventuali leganti organici sono eliminati durante la cottura.

Durante ulteriori lavorazioni come taglio o foratura, è possibile lo sviluppo di polvere inerte. Perciò è necessario fornire agli operatori adeguati sistemi di protezione per evitarne l'inalazione.

### Health and Safety

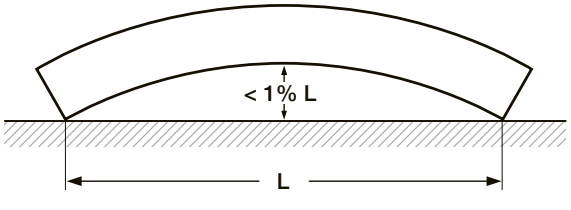
Our ceramic materials do not contain substances dangerous to health, or create them during use. They are produced using inert natural raw materials, and any organic binders used are burned during firing.

During final processing such as cutting or drilling, inert dust may be created. Workers must therefore be provided with suitable protective equipment to prevent inhalation.

## Tabella delle tolleranze secondo DIN 40680

### Table of Tolerances in Accordance with DIN 40680

| Dimensioni Da *From* | *Dimensions* A *To* | Variazioni *Variations* +/- | +0 | -0 |
|---|---|---|---|---|
| 0 | 4 | 0.15 | 0.3 | 0.3 |
| 4.1 | 6 | 0.2 | 0.4 | 0.4 |
| 6.1 | 8 | 0.25 | 0.5 | 0.5 |
| 8.1 | 10 | 0.3 | 0.6 | 0.6 |
| 10.1 | 13 | 0.35 | 0.7 | 0.7 |
| 13.1 | 16 | 0.4 | 0.8 | 0.8 |
| 16.1 | 20 | 0.45 | 0.9 | 0.9 |
| 20.1 | 25 | 0.5 | 1 | 1 |
| 25.1 | 30 | 0.55 | 1.1 | 1.1 |
| 30.1 | 35 | 0.6 | 1.2 | 1.2 |
| 35.1 | 40 | 0.65 | 1.3 | 1.3 |
| 40.1 | 45 | 0.7 | 1.4 | 1.4 |
| 45.1 | 50 | 0.8 | 1.6 | 1.6 |
| 50.1 | 55 | 0.9 | 1.8 | 1.8 |
| 55.1 | 60 | 1 | 2 | 2 |
| 60.1 | 65 | 1.2 | 2.4 | 2.4 |
| 65.1 | 80 | 1.4 | 2.8 | 2.8 |
| 80.1 | 90 | 1.6 | 3.2 | 3.2 |
| 90.1 | 100 | 1.8 | 3.6 | 3.6 |
| 100.1 | 110 | 2 | 4 | 4 |
| 110.1 | 125 | 2.2 | 4.4 | 4.4 |
| 125.1 | 140 | 2.5 | 5 | 5 |
| 140.1 | 155 | 2.8 | 5.6 | 5.6 |
| 155.1 | 170 | 3 | 6 | 6 |
| 170.1 | 185 | 3.4 | 6.8 | 6.8 |
| 185.1 | 200 | 3.8 | 7.6 | 7.6 |
| 200.1 | 250 | 4.2 | 8.4 | 8.4 |
| 250.1 | 300 | 4.6 | 9.2 | 9.2 |
| 300.1 | 350 | 5 | 10 | 10 |
| 350.1 | 400 | 5.5 | 11 | 11 |
| 400.1 | 450 | 6.1 | 12.2 | 12.2 |
| 450.1 | 500 | 6.8 | 13.6 | 13.6 |
| 500.1 | 600 | 7.6 | 15.2 | 15.2 |
| 600.1 | 700 | 8.3 | 16.6 | 16.6 |
| 700.1 | 800 | 9 | 18 | 18 |
| 800.1 | 900 | 9.5 | 19 | 19 |
| 900.1 | 1000 | 10 | 20 | 20 |




*Freccia max sulla curvatura* *Max camber*

# Informazioni generali
## General Information

I nostri prodotti sono fabbricati con composti di prima scelta e non contengono, di base, componenti conduttivi. Sostanze come alcali, residui di lavorazione o combustione presenti all'interno del forno possono però essere assorbite pregiudicando la loro caratteristica dielettrica.

Come in ogni materiale isolante, la caratteristica dielettrica diminuisce con l'aumentare della temperatura; a temperature prossime ai 1000 – 1100°C le correnti di dispersione possono influenzare eventuali protezioni differenziali.

E' necessario, in questo caso, impiegare basse tensioni di alimentazione per contenere questo fenomeno.

1) **Richieste d'offerta**
   Per poter offrire l'elemento più adatto alla Vs. applicazione, è necessario che le richieste d'offerta vengano corredate dei seguenti dati: **Temperatura massima di impiego; Tipo di resistenza; Atmosfera di lavoro; Condizioni operative generali.**

2) **Particolari a disegno**
   Nel caso abbiate necessità di particolari non presenti a catalogo, è necessario che la richiesta d'offerta sia completa di eventuale disegno particolareggiato

3) **Stampi**
   Qualora la produzione dei particolari a disegno richieda la costruzione di stampi, questi saranno a carico del cliente ma di proprietà industriale di Kanthal.
   Kanthal si impegna altresì ad utilizzare questi stampi esclusivamente per la produzione del cliente se non diversamente approvato.
   Gli stampi non potranno essere richiesti in consegna totale o parziale e trascorsi 3 anni dall'ultimo ordine, Kanthal si riserverà la libertà d'uso o distruzione degli stampi.

4) **Tolleranze dimensionali**
   La nostra produzione è regolamentata dalle tolleranze costruttive richiamate nelle norme DIN 40680 media.

5) **Tolleranza sulla quantità**
   Le quantità degli elementi in consegna sono assoggettate ad una tolleranza nominale del ± 5 % con punte del ± 10 % per i particolari a disegno.

Our products are manufactured using raw materials of the highest quality and do not contain conductive ingredients. However, substances such as alkalis, residual products generated by combustion or processing may be absorbed, reducing the dielectric properties of the final product.

As with all insulating materials, dielectric properties reduce as the temperature rises: at values close to 1000 – 1100°C (1830 – 2010°F), leakage currents may affect differential protection systems.

In this case, low supply voltages should be used to limit this effect.

1) Product enquiries
   So that we can offer you the most suitable product for your application, your enquiry should include the following information: Maximum operating temperature; Type of heating element; Ambient atmosphere; General operating conditions.

2) Customized items
   If you require items not shown in our catalogue, your enquiry should include a detailed drawing.

3) Moulds
   When it is necessary to build moulds to manufacture customized items, their cost will be charged to the customer but they will remain the industrial property of Kanthal.
   Kanthal undertakes to use such moulds exclusively for that customers' products unless otherwise agreed.
   Moulds cannot be transferred to the customer and after 3 years following the last order, Kanthal reserves the right to use or to dispose of them.

4) Dimensional tolerances
   Our standard production is in accordance with the tolerances stated in DIN 40680.

5) Quantity tolerance
   Quantities supplied are subject to a nominal tolerance of ± 5 % and ± 10 % for customized articles.

# Piastre portaresistenze per forni – PIA

## Supporting Plates for Electric Furnaces – PIA

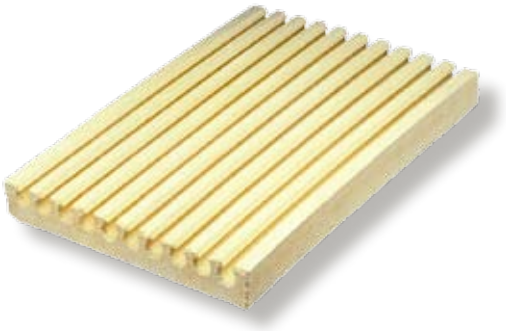


Fig. A

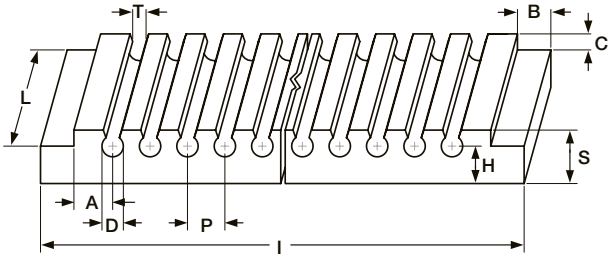



Fig. B

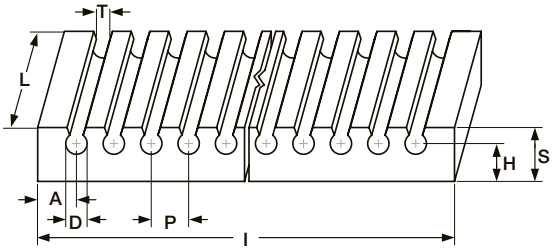
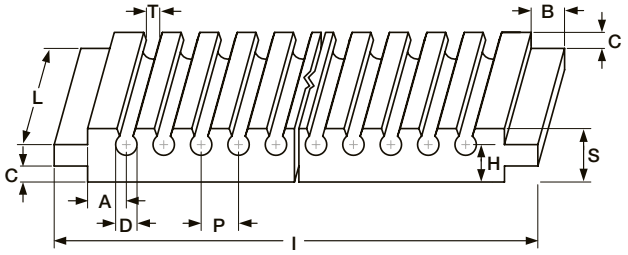



Fig. C




La scelta tra il materiale A42P ad il materiale A60P è determinata dalla lega del filo e dalla temperatura di utilizzo.

The choice between the A42P material and the A60P material is determined by the wire alloy and by the working temperature.

Tolleranze dimensionali secondo le norme DIN 40680

Dimensional tolerances according DIN 40680 norms

### Piastre portaresistenze per forni da laboratorio

#### Supporting Plates for Laboratory Furnaces

| Ref. | Fig. | L | I | B | C | A | H | S | D | P | T | Nr.can. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **PIA 03-26-20-14** | **C** | **260** | **200** | **19** | **3.5** | **6** | **13.5** | **22** | **7** | **11.6** | **4.5** | **14** |
| **PIA 03-26-12-10** | **B** | **260** | **120** | | | **8** | **13.5** | **22** | **7** | **11.6** | **4.5** | **10** |
| PIA 03-26-14-12 | C | 260 | 140 | 12 | 3 | 5 | 13.5 | 20 | 5 | 9.6 | 3.5 | 12 |
| PIA 03-26-8-8 | B | 260 | 80 | | | 7 | 13.5 | 20 | 5 | 9.6 | 3.5 | 8 |
| PIA 03-26-11-10 | B | 260 | 110 | | | 13 | 13.5 | 20 | 5 | 9.6 | 3.5 | 10 |
| PIA 03-30-19-8 | A | 300 | 190 | 20 | 8 | 14 | 20.5 | 30 | 11 | 18.3 | 7 | 8 |
| PIA 03-30-19-10 | B | 300 | 190 | | | 12.5 | 20.5 | 30 | 11 | 18.3 | 7 | 10 |

*In grassetto stock standard*

*Standard stock in bold*

## Piastre portaresistenze per forni elettrici

## Supporting Plates for Electric Furnaces

| Ref. | Fig. | L | l | B | C | A | H | S | D | P | T | Nr.can. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PIA 04-50-21-6/17 | A | 500 | 210 | 10 | 15 | 30 | 18 | 30 | 17 | 30 | 10 | 6 |
| **PIA 04-50-33-12** | **A** | **500** | **330** | **15** | **5** | **33** | **23** | **33** | **17** | **22** | **12** | **12** |
| PIA 04-38-28-10 | A | 380 | 280 | 15 | 12 | 28 | 21 | 30 | 14 | 22 | 8 | 10 |
| PIA 04-38-20-8 | A | 380 | 200 | 15 | 12 | 15 | 21 | 30 | 14 | 20 | 8 | 8 |
| **PIA 04-60-35-16** | **A** | **600** | **350** | **20** | **8** | **16** | **21** | **30** | **12** | **18.5** | **8** | **16** |
| PIA 04-60-20-10 | A | 600 | 200 | | | 15 | 21 | 30 | 12 | 18.5 | 8 | 10 |
| PIA 04-50-35-21 | A | 500 | 350 | 21 | 5 | 8 | 25 | 30 | 8 | 14.6 | 5.5 | 21 |
| PIA 04-50-22-15 | B | 500 | 220 | | | 8 | 25 | 30 | 8 | 14.6 | 5.5 | 15 |
| **PIA 04-50-12-06** | **B** | **500** | **120** | | | **15** | **21** | **30** | **12** | **18.5** | **8** | **6** |
| **PIA 04-50-20-10** | **B** | **500** | **200** | | | **15** | **21** | **30** | **12** | **18.5** | **8** | **10** |
| **PIA 04-50-35-16** | **A** | **500** | **350** | **20** | **8** | **16** | **21** | **30** | **12** | **18.5** | **8** | **16** |
| **PIA 04-50-35-10** | **A** | **500** | **350** | **25** | **12** | **22** | **28** | **40** | **17** | **28.4** | **11** | **10** |
| **PIA 04-50-25-08** | **B** | **500** | **250** | | | **26** | **28** | **40** | **17** | **28.4** | **11** | **8** |
| **PIA 04-50-20-06** | **B** | **500** | **200** | | | **29** | **28** | **40** | **17** | **28.4** | **11** | **6** |
| **PIA 04-50-35-08** | **A** | **500** | **350** | **24** | **10** | **26** | **30** | **45** | **24** | **35.7** | **16** | **8** |
| **PIA 04-50-25-06** | **B** | **500** | **250** | | | **36** | **30** | **45** | **24** | **35.7** | **16** | **6** |
| PIA 04-50-35-09 | B | 500 | 350 | | | 27 | 30 | 45 | 24 | 35.7 | 16 | 9 |
| PIA 04-50-28-08 | B | 500 | 280 | | | 25 | 33 | 50 | 20 | 33 | 14 | 8 |
| PIA 04-50-21-06 | B | 500 | 210 | | | 23 | 33 | 50 | 20 | 33 | 14 | 6 |
| PIA 04-50-35-15 | A | 350 | 500 | 25 | 12 | 29 | 28 | 40 | 17 | 28 | 11 | 15 |
| PIA 04-60-35-15 | A | 350 | 600 | 25 | 12 | 79 | 28 | 40 | 17 | 28 | 11 | 15 |

## Piastre per suoli di forni industriali

## Supporting Plates for Bottom of Industrial Furnaces

| Ref. | Fig. | L | l | B | C | A | H | S | D | P | T | Nr.can. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PIA 05-55-20-12/S | A | 200 | 550 | 20 | 27 | 33 | 40 | 67 | 30 | 40 | 20 | 12 |
| PIA 05-47-20-10/S | A | 200 | 470 | 20 | 27 | 33 | 40 | 67 | 30 | 40 | 20 | 10 |
| PIA 05-39-20-8/S | A | 200 | 390 | 20 | 27 | 33 | 40 | 67 | 30 | 40 | 20 | 8 |
| PIA 05-31-20-6/S | A | 200 | 310 | 20 | 27 | 33 | 40 | 67 | 30 | 40 | 20 | 6 |
| PIA 05-51-20-12/S | B | 200 | 510 | | | 33 | 40 | 67 | 30 | 40 | 20 | 12 |
| PIA 05-43-20-10/S | B | 200 | 430 | | | 33 | 40 | 67 | 30 | 40 | 20 | 10 |
| PIA 05-35-20-8/S | B | 200 | 350 | | | 33 | 40 | 67 | 30 | 40 | 20 | 8 |
| PIA 05-27-20-6/S | B | 200 | 270 | | | 33 | 40 | 67 | 30 | 40 | 20 | 6 |

## Piastre portaresistenze per forni industriali

## Supporting Plates for Industrial Furnaces

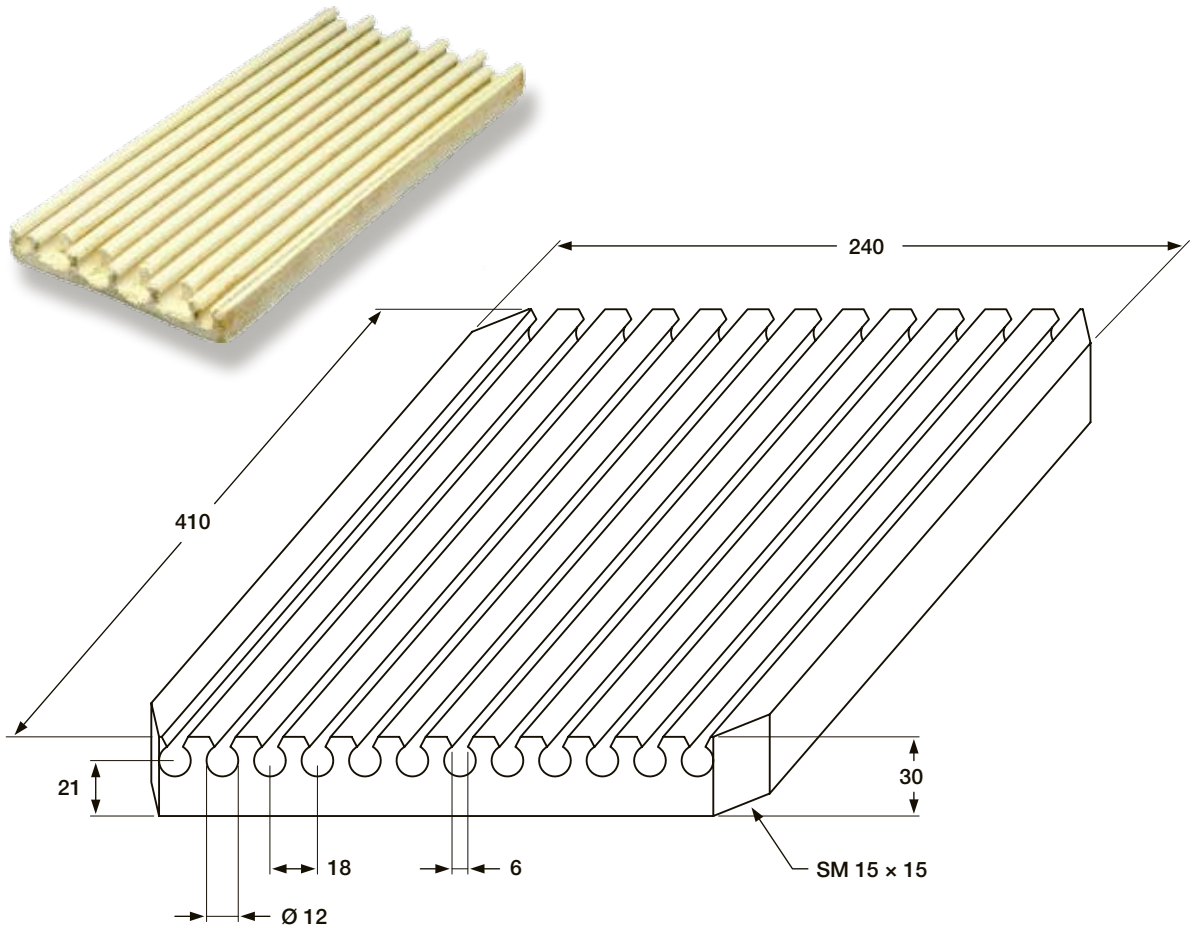
| Ref. | Fig. | L | l | B | C | A | H | S | D | P | T | Nr.can. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **PIA 05-55-18-12** | **A** | **180** | **550** | **20** | **25** | **36** | **37** | **55** | **28** | **40** | **16** | **12** |
| PIA 05-47-18-10 | A | 180 | 470 | 20 | 25 | 36 | 37 | 55 | 28 | 40 | 16 | 10 |
| PIA 05-43-18-09 | A | 180 | 430 | 20 | 25 | 36 | 37 | 55 | 28 | 40 | 16 | 9 |
| **PIA 05-39-18-08** | **A** | **180** | **390** | **20** | **25** | **36** | **37** | **55** | **28** | **40** | **16** | **8** |
| **PIA 05-31-18-06** | **A** | **180** | **310** | **20** | **25** | **36** | **37** | **55** | **28** | **40** | **16** | **6** |
| PIA 05-23-18-04 | A | 180 | 230 | 20 | 25 | 36 | 37 | 55 | 28 | 40 | 16 | 4 |
| PIA 05-51-18-12 | B | 180 | 510 | | | 36 | 37 | 55 | 28 | 40 | 16 | 12 |
| PIA 05-43-18-10 | B | 180 | 430 | | | 36 | 37 | 55 | 28 | 40 | 16 | 10 |
| PIA 05-39-18-09 | B | 180 | 390 | | | 36 | 37 | 55 | 28 | 40 | 16 | 9 |
| PIA 05-35-18-08 | B | 180 | 350 | | | 36 | 37 | 55 | 28 | 40 | 16 | 8 |
| PIA 05-27-18-06 | B | 180 | 270 | | | 36 | 37 | 55 | 28 | 40 | 16 | 6 |
| PIA 05-19-18-04 | B | 180 | 190 | | | 36 | 37 | 55 | 28 | 40 | 16 | 4 |
| | | | | | | | | | | | | |
| **PIA 05-55-20-12** | **A** | **200** | **550** | **20** | **17** | **31.5** | **33** | **50** | **30** | **40** | **20** | **12** |
| **PIA 05-47-20-10** | **A** | **200** | **470** | **20** | **17** | **31.5** | **33** | **50** | **30** | **40** | **20** | **10** |
| PIA 05-43-20-09 | A | 200 | 430 | 20 | 17 | 31.5 | 33 | 50 | 30 | 40 | 20 | 9 |
| **PIA 05-39-20-08** | **A** | **200** | **390** | **20** | **17** | **31.5** | **33** | **50** | **30** | **40** | **20** | **8** |
| PIA 05-31-20-06 | A | 200 | 310 | 20 | 17 | 31.5 | 33 | 50 | 30 | 40 | 20 | 6 |
| PIA 05-51-20-12 | B | 200 | 510 | | | 31.5 | 33 | 50 | 30 | 40 | 20 | 12 |
| PIA 05-43-20-10 | B | 200 | 430 | | | 31.5 | 33 | 50 | 30 | 40 | 20 | 10 |
| PIA 05-39-20-09 | B | 200 | 390 | | | 31.5 | 33 | 50 | 30 | 40 | 20 | 9 |
| **PIA 05-35-20-08** | **B** | **200** | **350** | | | **31.5** | **33** | **50** | **30** | **40** | **20** | **8** |
| PIA 05-27-20-06 | B | 200 | 270 | | | 31.5 | 33 | 50 | 30 | 40 | 20 | 6 |
| | | | | | | | | | | | | |
| PIA 05-17-18-03 | A | 180 | 170 | 20 | 25 | 25 | 30 | 50 | 30 | 40 | 20 | 3 |
| PIA 05-13-18-03 | B | 180 | 130 | | | 25 | 30 | 50 | 30 | 40 | 20 | 3 |
| | | | | | | | | | | | | |
| PIA 05-28-50-04 | A | 500 | 280 | 20 | 35 | 40 | 43 | 65 | 30 | 53 | 20 | 4 |
| PIA 05-20-50-03 | A | 500 | 200 | 15 | 45 | 32 | 43 | 65 | 30 | 53 | 20 | 3 |
| | | | | | | | | | | | | |
| PIA 05-35-20-6/34 | A | 200 | 350 | 17.5 | 32 | 35 | 37 | 62 | 34 | 49 | 19 | 6 |
| PIA 05-39-41-10 | B | 390 | 410 | | | 61 | 30 | 45 | 20 | 32 | 10 | 10 |
| PIA 05-39-41-08 | B | 390 | 410 | | | 65 | 35 | 54 | 30 | 40 | 17 | 8 |
| | | | | | | | | | | | | |
| PIA 05-23-25-06 | A | 250 | 238 | 19 | 24 | 30 | 32 | 48 | 18 | 28 | 10 | 6 |
| PIA 05-35-25-10 | A | 250 | 350 | 19 | 24 | 30 | 32 | 48 | 18 | 28 | 10 | 10 |

*In grassetto stock standard*

*Standard stock in bold*

## Piastre portaresistenze per forni PIA 05-24-41-12

**Supporting Plates for Electric Furnaces PIA 05-24-41-12**




## Standard stock

La scelta tra il materiale A42P ad il materiale A60P è determinata dalla lega del filo e dalla temperatura di utilizzo.

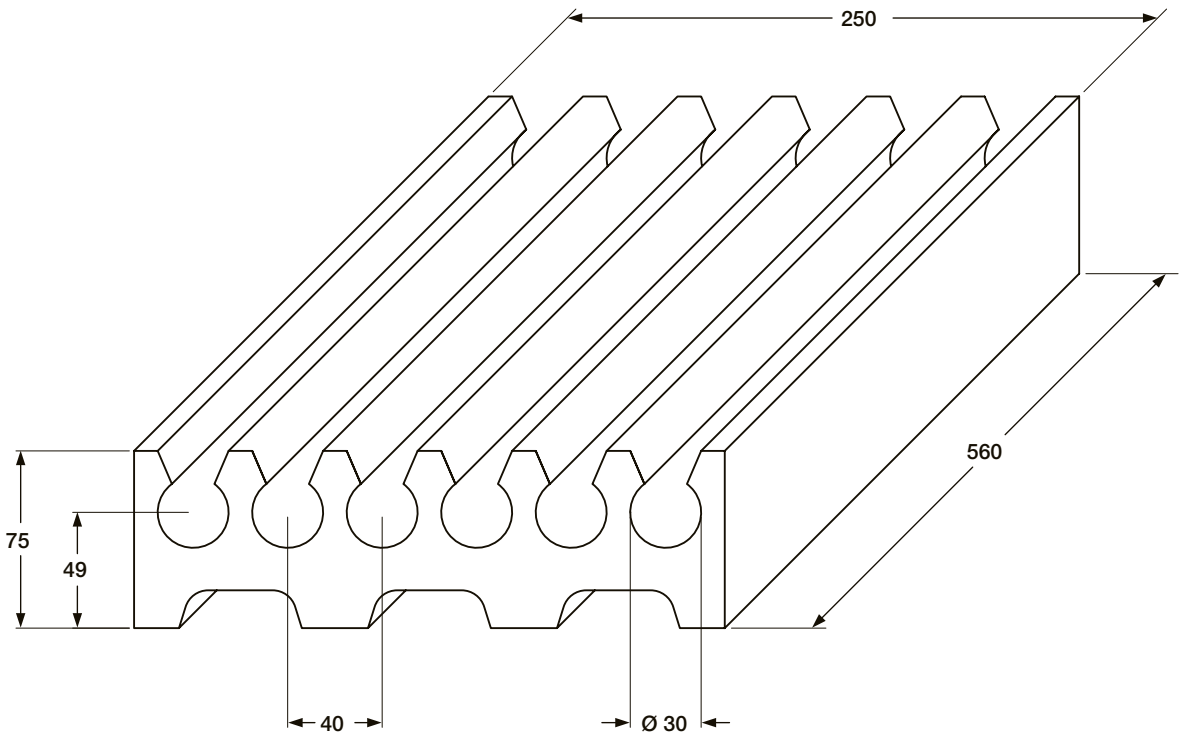
The choice between the A42P material and the A60P material is determined by the wire alloy and by the working temperature.

Tolleranze dimensionali secondo le norme DIN 40680

Dimensional tolerances according DIN 40680 norms

## Piastre portaresistenze per forni PIA 05-56-25-6

**Supporting Plates for Electric Furnaces PIA 05-56-25-6**




La scelta tra il materiale A42P ad il materiale A60P è determinata dalla lega del filo e dalla temperatura di utilizzo.

The choice between the A42P material and the A60P material is determined by the wire alloy and by the working temperature.

Tolleranze dimensionali secondo le norme DIN 40680

Dimensional tolerances according DIN 40680 norms

## Piastre portaresistenze per forni con resistenze a piattina e a filo

### Supporting Plates for Furnaces with Resistance Wire or Ribbon

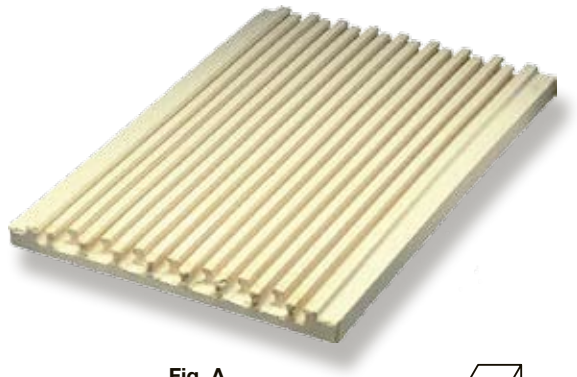


Fig. A

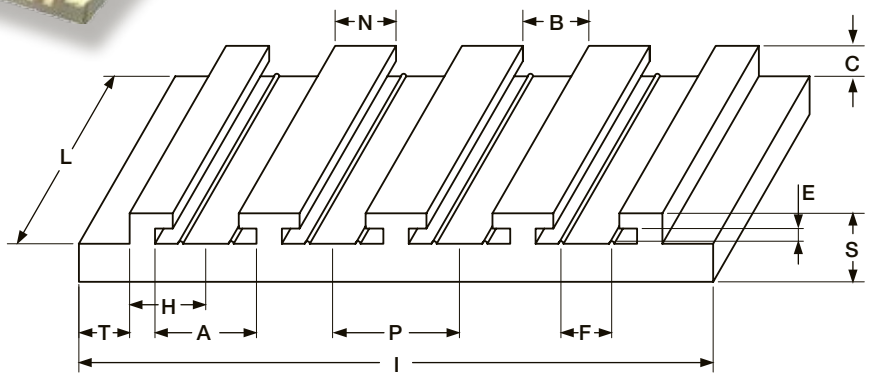
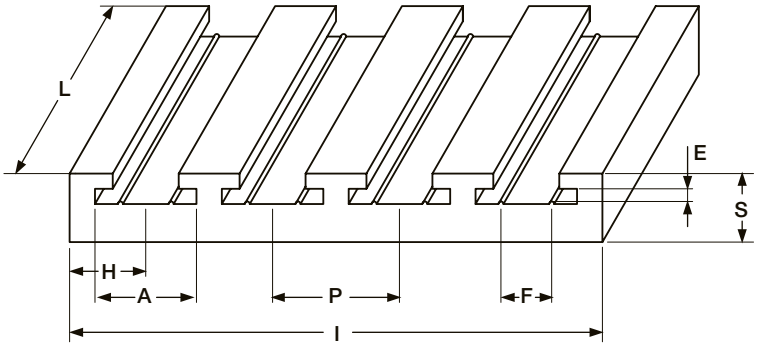



Fig. B




| Ref. | Fig. | I | L | A | E | P | B | F | N | H | T | C | S | Nr.can. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PIA 06-25-21-4 | A | 250 | 210 | 40 | 5 | 50 | 30 | – | 20 | 30 | 20 | 12 | 23 | 4 |
| PIA 06-21-25-4 | B | 210 | 250 | 40 | 15 | 50 | 30 | 20 | 20 | 30 | – | – | 40 | 4 |
| PIA 06-38-25-6 | A | 380 | 250 | 40 | 15 | 50 | 30 | 20 | 20 | 30 | 35 | 20 | 40 | 6 |
| PIA 06-38-25-4 | A | 380 | 250 | 60 | 14 | 72 | 18 | 30 | 24 | 44 | 36 | 20 | 40 | 4 |
| PIA 06-49-20-4 | A | 490 | 200 | 90 | 25 | 108 | 68 | 46 | 40 | 60 | 23 | 43 | 70 | 4 |
| PIA 06-28-50-2 | A | 280 | 500 | 90 | 25 | 110 | 60 | 45 | 50 | 65 | 20 | 40 | 70 | 2 |
| PIA 06-25-50-2 | B | 250 | 500 | 90 | 25 | 110 | 60 | 45 | 50 | 70 | – | 40 | 70 | 2 |

La scelta tra il materiale A42P ad il materiale A60P è determinata dalla lega del filo e dalla temperatura di utilizzo.

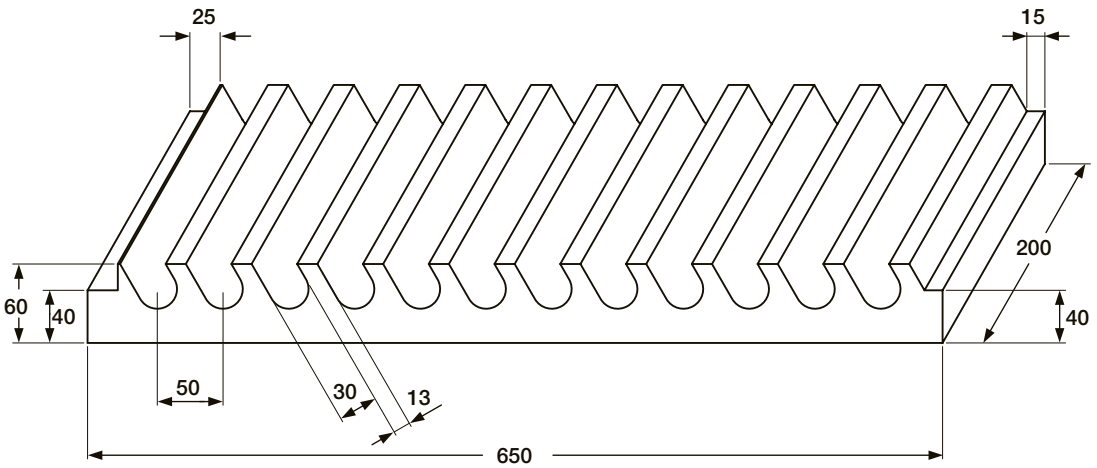
The choice between the A42P material and the A60P material is determined by the wire alloy and by the working temperature.

Tolleranze dimensionali secondo le norme DIN 40680

Dimensional tolerances according DIN 40680 norms

## Piastre portaresistenze per forni PIA 07-20-60-12

**Supporting Plates for Electric Furnaces PIA 07-20-60-12**




## Standard stock

La scelta tra il materiale A42P ad il materiale A60P è determinata dalla lega del filo e dalla temperatura di utilizzo.

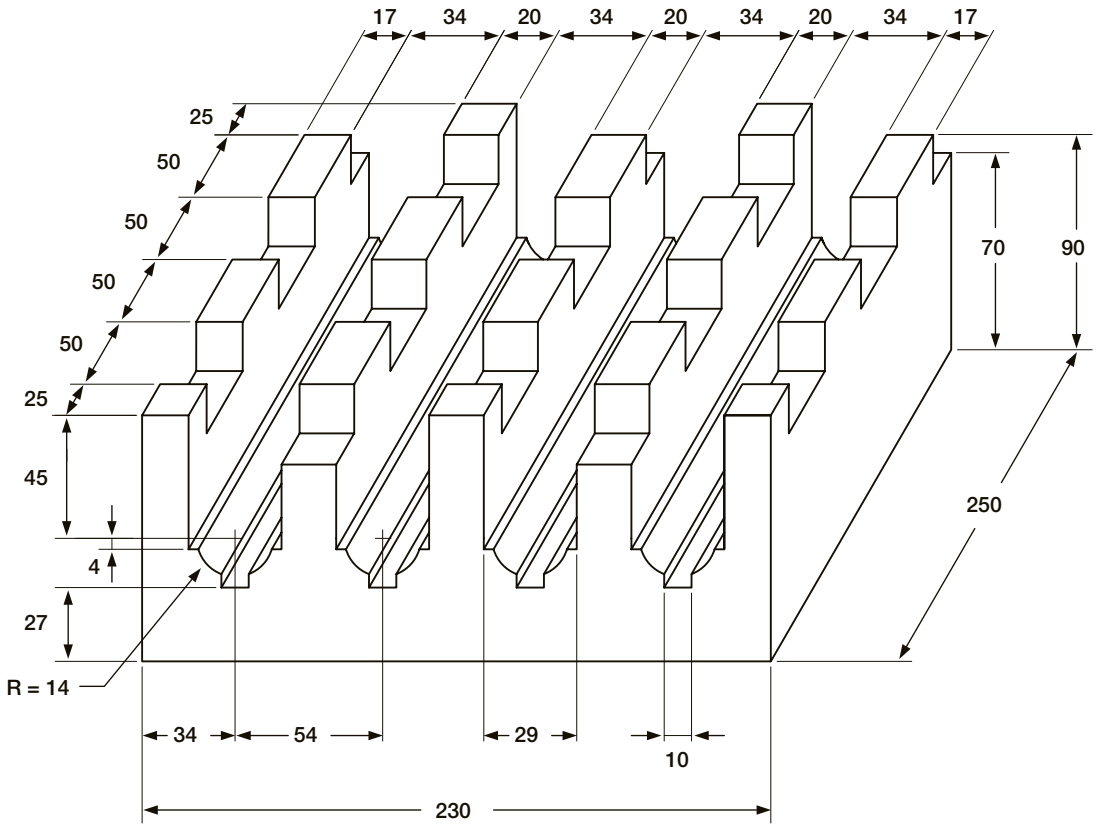
The choice between the A42P material and the A60P material is determined by the wire alloy and by the working temperature.

Tolleranze dimensionali secondo le norme DIN 40680

Dimensional tolerances according DIN 40680 norms

## Piastre portaresistenze per forni PIA 07-23-25-4

**Supporting Plates for Electric Furnaces PIA 07-23-25-4**




La scelta tra il materiale A42P ad il materiale A60P è determinata dalla lega del filo e dalla temperatura di utilizzo.

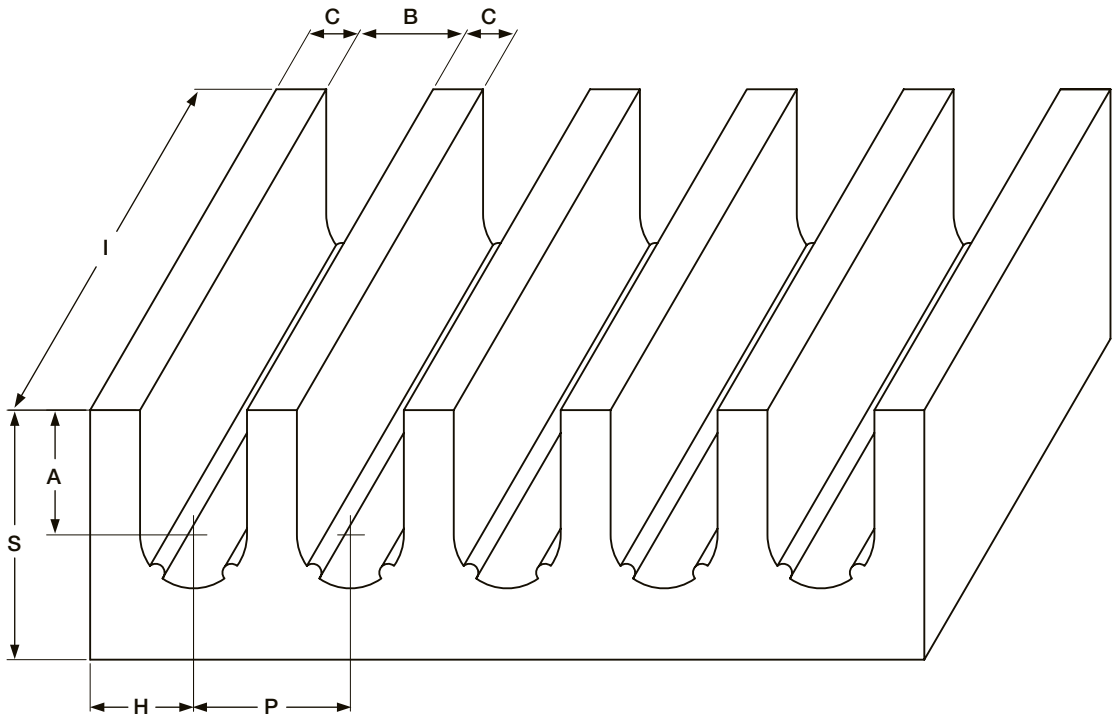
The choice between the A42P material and the A60P material is determined by the wire alloy and by the working temperature.

Tolleranze dimensionali secondo le norme DIN 40680

Dimensional tolerances according DIN 40680 norms

## Piastre portaresistenze per forni a canali aperti

**Supporting Plates for Electric Furnaces with Open Grooves**




| Ref. | L | I | S | A | B | P | C | H | T |
|---|---|---|---|---|---|---|---|---|---|
| PIA 07-25-19-4 | 190 | 250 | 70 | 35 | 30 | 44 | 15 | 30 | 4 |
| PIA 07-25-22-4 | 220 | 250 | 76 | 39 | 34 | 50 | 18 | 35 | 4 |
| PIA 07-25-32-6 | 320 | 250 | 76 | 39 | 34 | 50 | 18 | 35 | 6 |

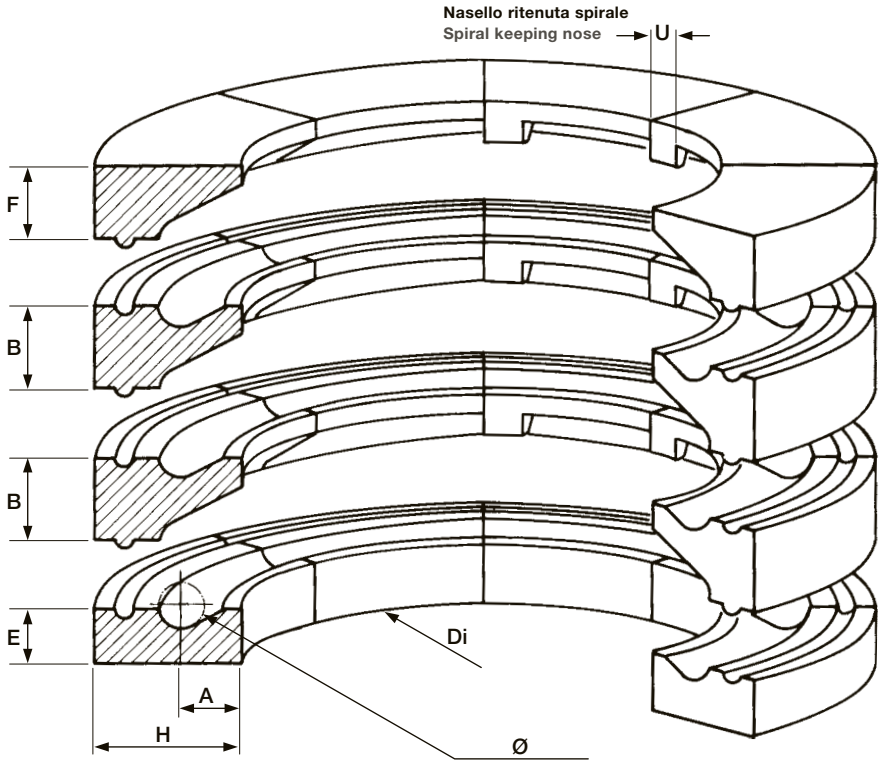
La scelta tra il materiale A42P ad il materiale A60P è determinata dalla lega del filo e dalla temperatura di utilizzo.

The choice between the A42P material and the A60P material is determined by the wire alloy and by the working temperature.

Tolleranze dimensionali secondo le norme DIN 40680

Dimensional tolerances according DIN 40680 norms

# Settori portaresistenze per forni a pozzo
## Heating Element Supports for Well Kilns




| Ref. | D | H | E | B | F | Ø | A | N | U |
|---|---|---|---|---|---|---|---|---|---|
| SET 08-25-3.5-1 | 250 | 50 | 25 | 35 | 30 | 22 | 15 | 6 | 18 |
| SET 08-35-3.8-1 | 350 | 52 | 25 | 38 | 30 | 22 | 15 | 8 | 18 |
| **SET 08-45-5-1** | **450** | **70** | **40** | **50** | **40** | **30** | **25** | **10** | **25** |
| **SET 08-60-5-1** | **600** | **70** | **40** | **50** | **40** | **30** | **25** | **12** | **25** |
| **SET 08-80-5-1** | **800** | **70** | **40** | **50** | **40** | **30** | **25** | **12** | **25** |
| **SET 08-100-5-1** | **1000** | **80** | **40** | **50** | **40** | **30** | **25** | **15** | **25** |
| SET 08-130-6-1 | 1300 | 90 | 45 | 60 | 50 | 35 | 30 | 20 | 25 |
| SET 08-170-6-1 | 1700 | 90 | 45 | 60 | 50 | 35 | 30 | 25 | 25 |
| **SET 07-20-5-1*** | **–** | **–** | **40** | **50** | **40** | **30** | **25** | **–** | **25** |

*In grassetto stock standard*

*Standard stock in bold*

Ø Diametro massimo della spirale
N Numero settori per giro

* Elemento rettilineo L=200 da abbinare con 08-45, 08-60, 08-80 per formazione di forni ovali

Gli elementi Teste e Intermedi possono essere forniti con o senza nasello di ritenuta resistenze
(08-130 & 08-170 solo con nasello)

Tolleranze dimensionali secondo le norme DIN 40680

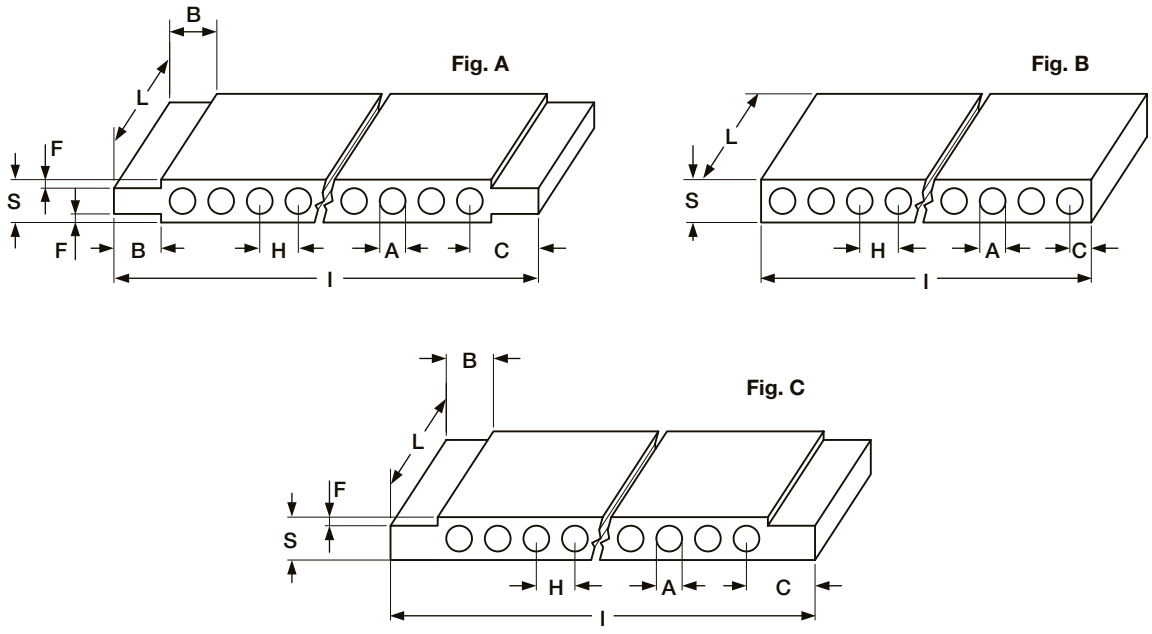
Ø Max spiral diameter
N Nr.sectors per turn

* Straight element to couple with 08-45, 08-60, 08-80 to build oval kilns

The element Heads and Intermediate can be manufactured with or without keeping nose
(08-130 & 08-170 only with nose)

Dimensional tolerances according DIN 40680 norms

## Piastre portaresistenze per forni
### Supporting Plates for Electric Furnaces




## Piastre portaresistenze a canali chiusi
### Supporting Plates with Closed Grooves

| Ref. | Fig. | l | L | S | H | A | B | C | D | E | F | Mat. | Nr.c. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **PIA 09-26-20-14** | **A** | **200** | **260** | **22** | **11.6** | **7** | **20** | **25** | | | **4** | **A50C** | **14** |
| PIA 09-26-12-10 | B | 120 | 260 | 22 | 11.6 | 7 | | 8 | | | | A50C | 10 |
| PIA 09-26-14-12 | C | 140 | 260 | 20 | 9.6 | 5 | 12 | 17 | | | 3.5 | A50C | 12 |
| PIA 09-26-8-8 | B | 80 | 260 | 20 | 9.6 | 5 | | 7 | | | | A50C | 8 |

*In grassetto stock standard*

*Standard stock in bold*

Tolleranze dimensionali secondo le norme DIN 40680

Dimensional tolerances according DIN 40680 norms

# Ganci
## Hooks

Fig. A

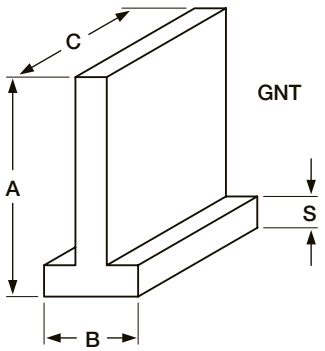



Fig. C

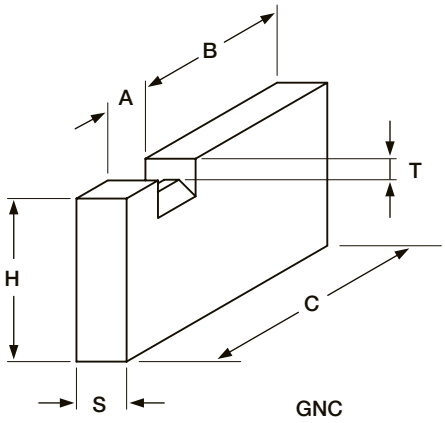



Fig. B

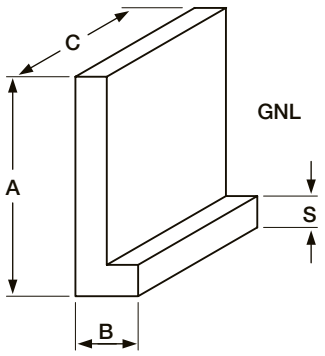
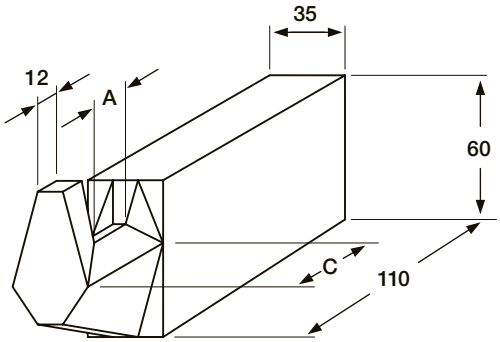



Fig. D




| Code | Ref. | Fig. | A | B | C | H | S | T | Mat. |
|---|---|---|---|---|---|---|---|---|---|
| **GNT** | **015-25-15-2 T** | **A** | **150** | **60** | **250** | **–** | **20** | **–** | |
| GNL | 015-25-15-2 L | B | 150 | 60 | 250 | – | 20 | – | |
| GNT | 015-20-17-3.5 T | A | 175 | 75 | 200 | – | 35 | – | |
| GNL | 015-20-17-3.5 T | B | 175 | 75 | 200 | – | 35 | – | |
| GNC | 016-143 | C | 18 | 110 | 143 | 60 | 15 | 12 | A60P |
| GNC | 016-150 | C | 25 | 110 | 150 | 60 | 15 | 12 | A60P |
| GNC | 016-157 | C | 32 | 110 | 157 | 60 | 15 | 12 | A60P |
| GNC | 016-175 | C | 45 | 110 | 175 | 60 | 24 | 12 | |
| GNC | 016-165 | D | 27 | – | 55 | – | – | – | |
| GNC | 016-180 | D | 42 | – | 70 | – | – | – | |

*In grassetto stock standard*

*Standard stock in bold*

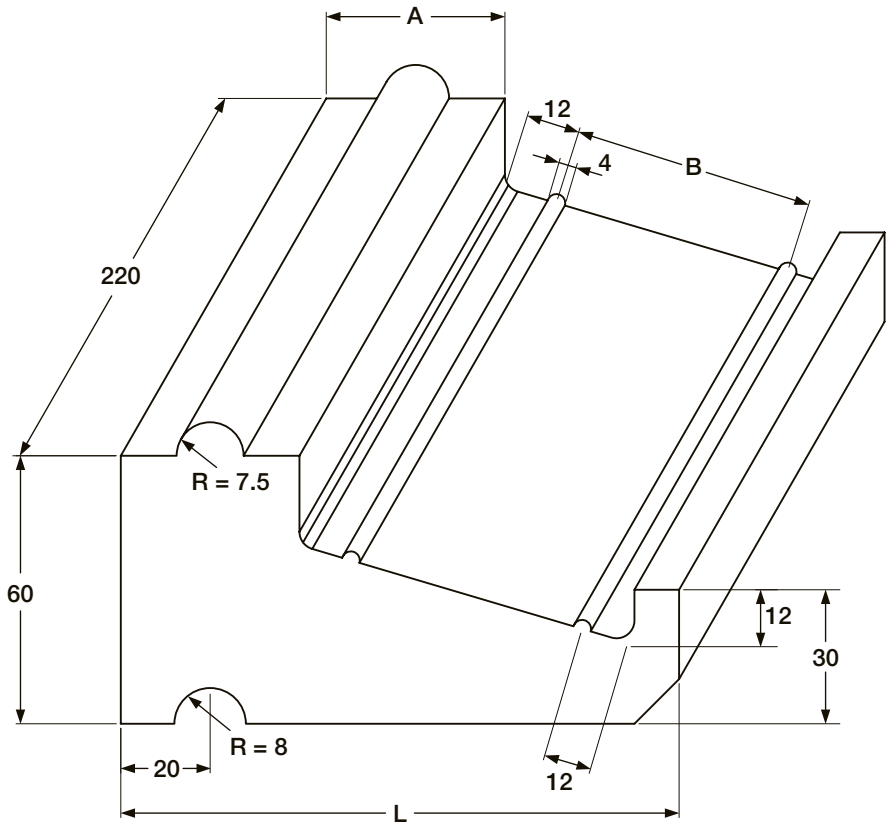
La scelta tra il materiale A42P ad il materiale A60P è determinata dalla lega del filo e dalla temperatura di utilizzo.

The choice between the A42P material and the A60P material is determined by the wire alloy and by the working temperature.

Tolleranze dimensionali secondo le norme DIN 40680

Dimensional tolerances according DIN 40680 norms

# Ganci portaresistenze
## Resistance Supporting Hooks




| Code | Ref. | L | A | B |
|---|---|---|---|---|
| GNC | 016-65 | 110 | 40 | 39 |
| GNC | 016-85 | 125 | 40 | 54 |
| GNC | 016-85-6 | 145 | 60 | 54 |

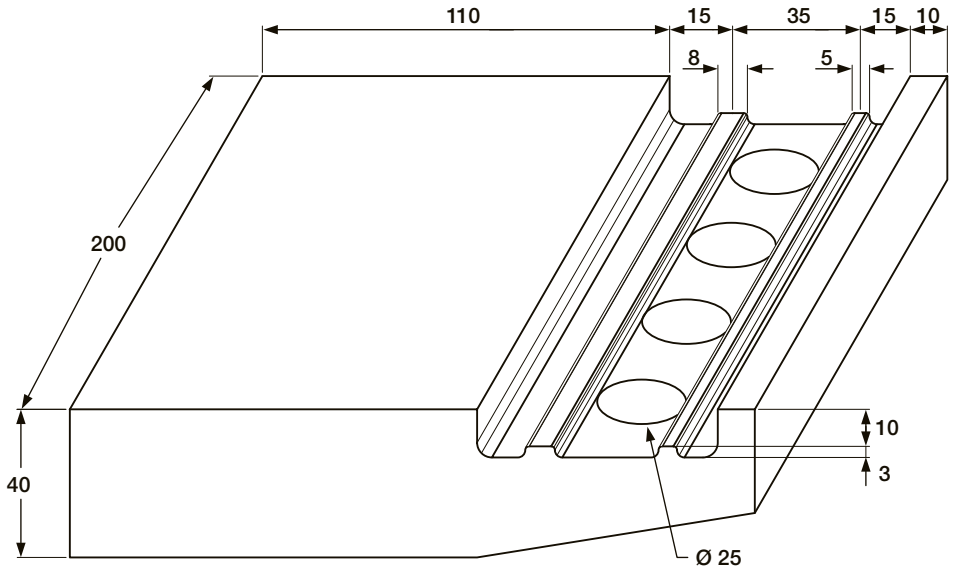
La scelta tra il materiale A42P ad il materiale A60P è determinata dalla lega del filo e dalla temperatura di utilizzo.

The choice between the A42P material and the A60P material is determined by the wire alloy and by the working temperature.

Tolleranze dimensionali secondo le norme DIN 40680

Dimensional tolerances according DIN 40680 norms

## Ganci portaresistenze GNC 016-200
**Resistance Supporting Hooks GNC 016-200**




La scelta tra il materiale A42P ad il materiale A60P è determinata dalla lega del filo e dalla temperatura di utilizzo.

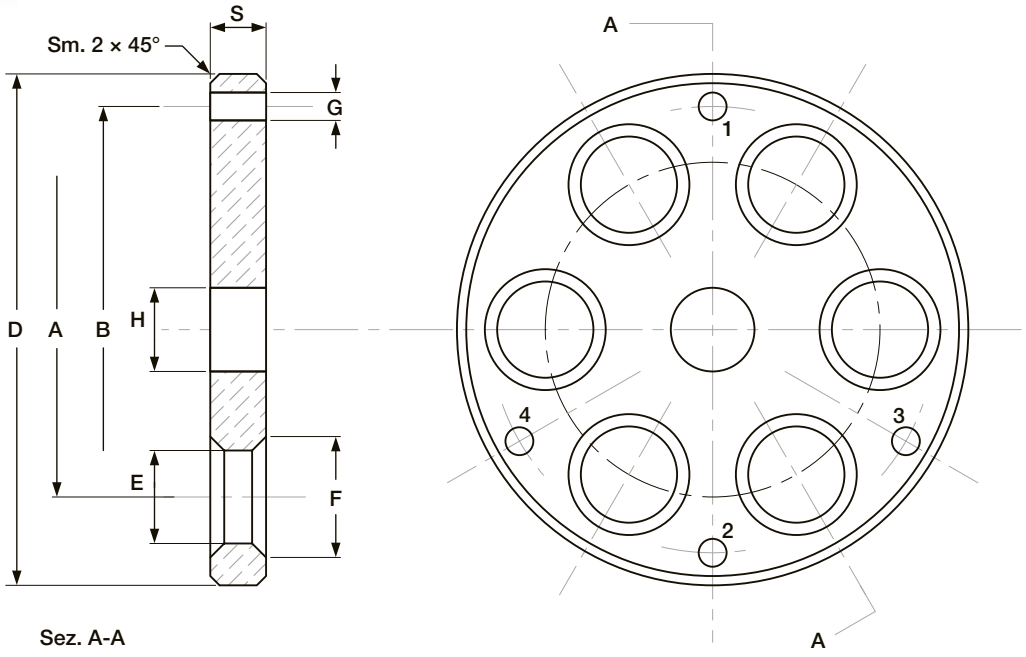
The choice between the A42P material and the A60P material is determined by the wire alloy and by the working temperature.

Tolleranze dimensionali secondo le norme DIN 40680

Dimensional tolerances according DIN 40680 norms

# Supporti ceramici per resistenze in tubi radianti

## Ceramic Supports for Electric Elements in Radiant Tubes




| Code | Ref. | E | nr.E | F | G | pos.G | B | A | D | S | H | Mat. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DCR | 018-96 | 19 | 6 | 23 | 7 | 1-2 | 75 | 55 | 96 | 13 | 10 | A60P |
| DCR | 018-113 | 22 | 6 | 28 | 6 | 1-2 | 84 | 68 | 113 | 12 | 20 | A60P |
| DCR | 018-145 | 33 | 6 | 41 | 5 | 1-3-4 | 126 | 89 | 145 | 14 | 16 | A60P |

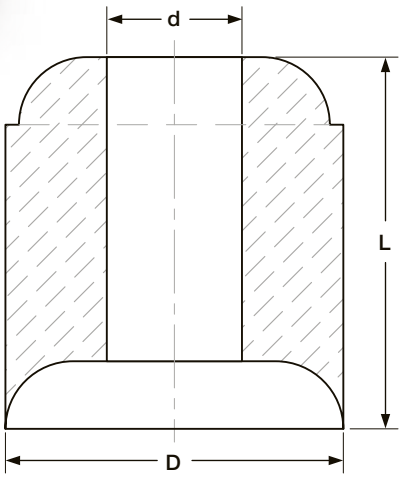
*In grassetto stock standard*

*Standard stock in bold*

Tolleranze dimensionali secondo le norme DIN 40680

Dimensional tolerances according DIN 40680 norms

# Perline in steatite
## Steatite Beads




| Code | Ref. | D | d | L | Nr.× kg |
|---|---|---|---|---|---|
| PRL | 023-00 | 3.3 | 1 | 4.2 | 20000 |
| PRL | 023-01 | 4.3 | 1.5 | 5.5 | 9600 |
| PRL | 023-02 | 5.3 | 2 | 6 | 4400 |
| PRL | 023-02 B | 5.3 | 2.5 | 6 | 5000 |
| PRL | 023-03 | 6.3 | 2.5 | 6.7 | 3180 |
| PRL | 023-03 B | 6.3 | 3 | 6.7 | 3400 |
| PRL | 023-04 | 7.3 | 3 | 7.5 | 2300 |
| PRL | 023-04 B | 7.3 | 3.5 | 7.5 | 3000 |
| PRL | 023-05 | 8.3 | 4 | 9 | 1750 |
| PRL | 023-05 B | 8.3 | 5 | 9 | 2000 |
| PRL | 023-06 | 9.3 | 4.5 | 10 | 1080 |
| PRL | 023-06 B | 9.3 | 5.5 | 10 | 1400 |
| PRL | 023-07 | 10.3 | 5 | 11 | 890 |
| PRL | 023-08 | 11.3 | 5.5 | 11.8 | 600 |
| PRL | 023-08 B | 11.3 | 6.5 | 11.8 | 750 |
| PRL | 023-09 | 12.3 | 6 | 12.8 | 530 |
| PRL | 023-10 | 13.3 | 6.5 | 13.3 | 440 |
| PRL | 023-10 B | 13.3 | 8 | 13.3 | 440 |
| PRL | 023-12 | 19 | 10.7 | 19 | 150 |

*In grassetto stock standard*

*Standard stock in bold*

Tolleranze dimensionali secondo le norme DIN 40680

Dimensional tolerances according DIN 40680 norms

# Isolatori e tappi
## Insulators and Plugs

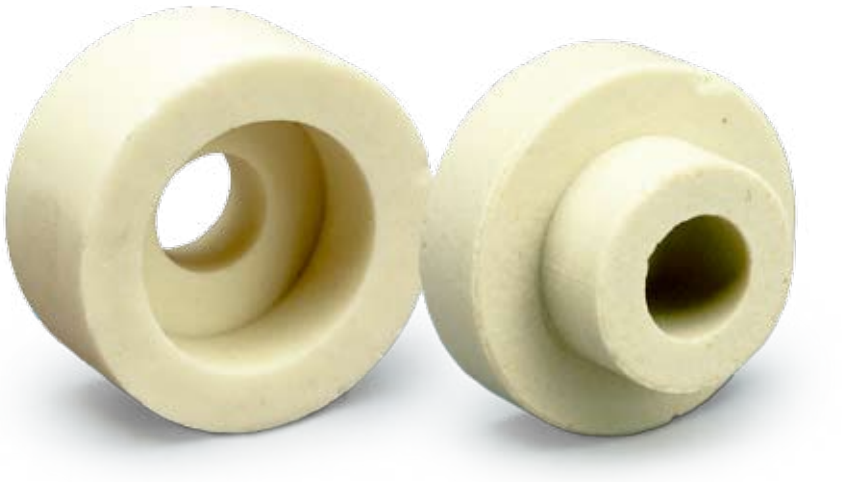


Fig. A

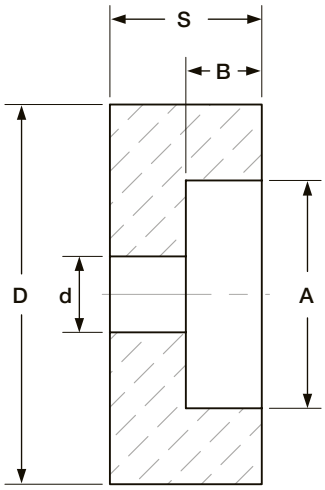
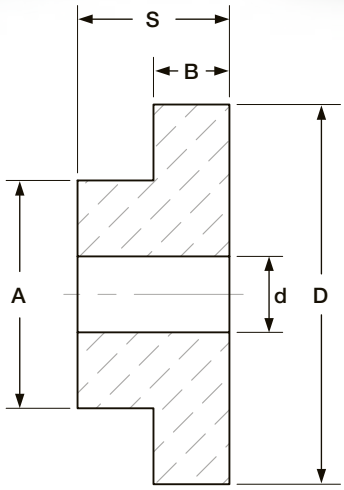



Fig. B




| Code | Ref. | Fig. | D | d | A | B | S | Mat. |
|---|---|---|---|---|---|---|---|---|
| **ISM** | **025-16.5-5 M** | **B** | **15.5** | **5** | **10** | **1.5** | **6** | **Steatite** |
| **ISF** | **025-16.5-5 F** | **A** | **15.5** | **5** | **11** | **1.8** | **5** | **Steatite** |
| **ISM** | **025-22-6.5 M** | **B** | **22.5** | **6.5** | **11.5** | **4** | **10.5** | **Steatite** |
| **ISF** | **025-22-6.5 F** | **A** | **22.5** | **6.5** | **12.3** | **4.3** | **8** | **Steatite** |
| **ISM** | **025-30-8 M** | **B** | **30** | **8.5** | **16** | **7.5** | **15** | **Steatite** |
| **ISF** | **025-30-8 F** | **A** | **30** | **8.5** | **18** | **8.5** | **15** | **Steatite** |
| | | | | | | | | |
| **TAP** | **025-23-7** | **B** | **23** | **7** | **13** | **15** | **20** | **A38E** |
| TAP | 025-45-13 | B | 45 | 13 | 26 | 18 | 30 | A42P |
| TAP | 025-60-15 | B | 60 | 15 | 30 | 18 | 40 | A42P |

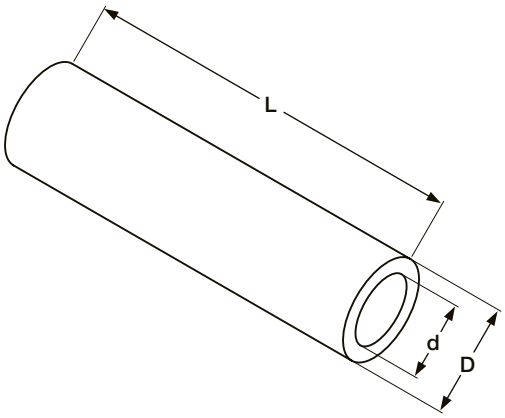
*In grassetto stock standard*

*Standard stock in bold*

Tolleranze dimensionali secondo le norme DIN 40680

Dimensional tolerances according DIN 40680 norms

# Tubi e tubetti semplici
## Tubes with One Hole




| Ref. | D | d | Ref. | D | d |
|---|---|---|---|---|---|
| TUS | 6 | 3 | TUS | 17 | 12 |
| TUS | 6 | 4 | TUS | 20 | 12 |
| TUS | 7 | 4 | TUS | 20 | 14 |
| TUS | 7 | 5 | **TUS** | **25** | **15** |
| TUS | 8 | 4 | TUS | 25 | 20 |
| TUS | 8 | 5 | TUS | 30 | 16 |
| TUS | 8 | 6 | **TUS** | **30** | **20** |
| TUS | 9 | 6 | TUS | 35 | 15 |
| TUS | 10 | 5 | TUS | 35 | 25 |
| **TUS** | **10** | **6** | TUS | 40 | 20 |
| TUS | 10 | 7.5 | TUS | 40 | 28 |
| TUS | 11 | 7 | **TUS** | **40** | **30** |
| TUS | 11 | 8 | TUS | 45 | 25 |
| **TUS** | **12** | **8** | TUS | 45 | 35 |
| TUS | 13 | 7 | TUS | 50 | 30 |
| TUS | 14 | 10 | TUS | 50 | 36 |
| TUS | 15 | 10 | **TUS** | **50** | **40** |
| **TUS** | **15** | **11** | TUS | 60 | 40 |
| TUS | 16 | 12 | **TUS** | **60** | **50** |

*In grassetto stock standard*

*Standard stock in bold*

Altre dimensioni su richiesta
Per temperature max 1100°C: **A38E**

Per temperature max 1300°C: **A80E** per lunghezze < 500
**A73E** per lunghezze > 500

Tolleranze dimensionali
secondo le norme DIN 40680
D < 10 l max 200
D = 10 < 19 l max 800
D > 20 < 50 l max 1000
D > 50 l max 800

**Solo**
**25 × 15 30 × 20 40 × 30 50 × 40 60 × 50** **l max 2000**

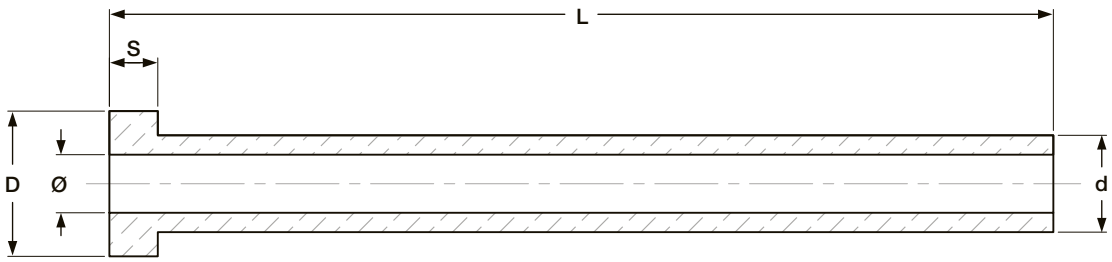
Other dimensions on request
For temperatures max 1100°C: **A38E**

For temperatures max 1300°C: **A80E** for lengths < 500
**A73E** for lengths > 500

Dimensional tolerances
according DIN 40680 norms
D < 10 l max 200
D = 10 < 19 l max 800
D > 20 < 50 l max 1000
D > 50 l max 800

Only
**25 × 15 30 × 20 40 × 30 50 × 40 60 × 50** l max 2000

# Tubi con testata
## Tubes with Flange




| Ref. | D | d | Ø | S | L stock |
|---|---|---|---|---|---|
| TUT-20-10 | 20 | 10 | 6 | 6 | max 300 |
| **TUT-25-15** | **25** | **15** | **9** | **10** | **100-150-200-300** |
| **TUT-30-20** | **30** | **20** | **12** | **15** | **100-150-200-300** |
| **TUT-35-25** | **35** | **25** | **15** | **20** | **150-200-300** |
| **TUT-40-30** | **40** | **30** | **15** | **20** | **200-250-300** |
| **TUT-45-35** | **45** | **35** | **20** | **20** | **150-200-300** |
| **TUT-50-40** | **50** | **40** | **25** | **30** | **300** |

*In grassetto stock standard*

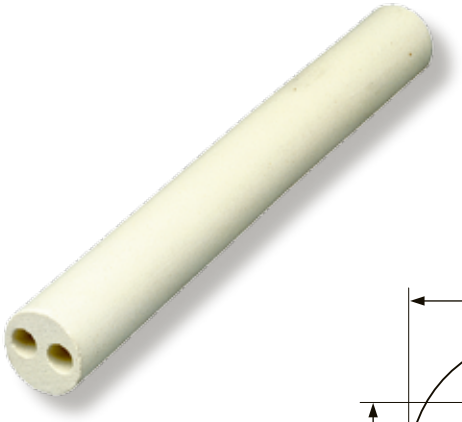
*Standard stock in bold*

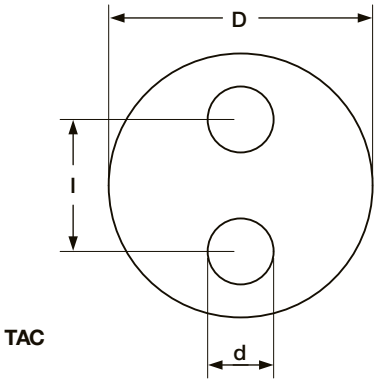
Solitamente prodotti in mat. **A38E**
Tolleranze dimensionali secondo le norme DIN 40680

Usually manufactured in mat. **A38E**
Dimensional tolerances according DIN 40680 norms

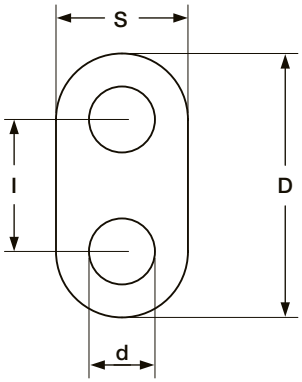
# Tubi abbinati cilindrici e ovali

## Cylindrical and Oval Tubes with Two Holes






TAC




TAO

| Ref. | D | S | d | I |
|---|---|---|---|---|
| **TAC** | **6** | **–** | **2** | **2.8** |
| TAC | 6.5 | – | 2 | 3.2 |
| TAC | 7 | – | 2.5 | 3.2 |
| TAC | 7.5 | – | 2 | 3.6 |
| TAC | 7.5 | – | 2.5 | 3.6 |
| TAC | 8 | – | 2.2 | 3.6 |
| **TAC** | **8** | **–** | **3** | **3.6** |
| TAC | 8.5 | – | 3 | 4.1 |
| TAC | 028 | 9 | – | 3 |
| **TAC** | **028** | **10** | **–** | **3** |
| **TAC** | **028** | **12** | **–** | **4** |
| TAC | 028 | 12 | – | 4.5 |
| TAC | 028 | 14 | – | 4 |
| TAC | 028 | 14 | – | 5 |
| TAC | 028 | 16 | – | 5 |
| | | | | |
| **TAO** | **12** | **7** | **4** | **5.5** |
| TAO | 15 | 9 | 4.5 | 7 |
| TAO | 15 | 9 | 5 | 7 |

*In grassetto stock standard*

*Standard stock in bold*

Lunghezze standard 25-50-100
Solitamente prodotti in mat. **A38E**
Tolleranze dimensionali secondo le norme DIN 40680

Standard length 25-50-100
Usually manufactured in mat. **A38E**
Dimensional tolerances according DIN 40680 norms

# Tubi multiforo
## Tubes with Multiple Holes

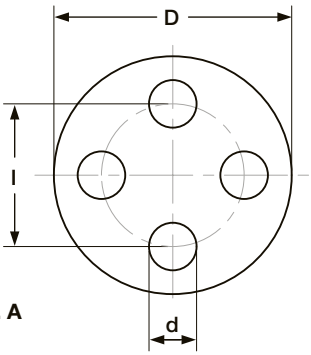


Fig. A

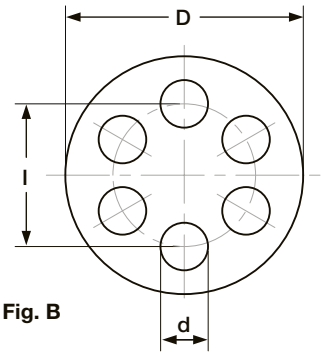


Fig. B

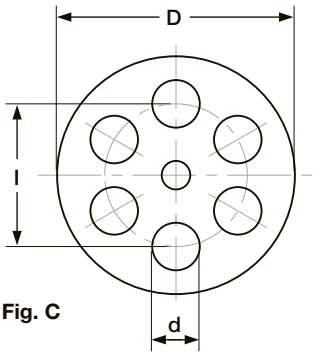


Fig. C

| Ref. | Fig. | D | d | l | Nr.d |
|---|---|---|---|---|---|
| TMF | A | 6 | 1.8 | 3.3 | 4 |
| TMF | A | 6 | 1.5 | 3.3 | 4 |
| TMF | A | 8 | 2 | 4.25 | 4 |
| TMF | A | 8.5 | 1.5 | 4.8 | 4 |
| TMF | A | 8.5 | 2 | 4.8 | 4 |
| TMF | A | 8.5 | 2.5 | 4.8 | 4 |
| TMF | A | 9.5 | 2.8 | 5.2 | 4 |
| TMF | A | 10 | 3 | 5.4 | 4 |
| TMF | A | 12 | 3 | 6.5 | 4 |
| TMF | A | 12 | 3.5 | 6.8 | 4 |
| TMF | A | 13 | 4 | 7.15 | 4 |
| TMF | A | 14 | 4 | 7.7 | 4 |
| TMF | A | 14 | 4.5 | 8 | 4 |
| TMF | A | 16 | 4 | 9.3 | 4 |
| TMF | A | 16 | 4.5 | 9.3 | 4 |
| TMF | A | 16 | 5 | 9.3 | 4 |
| TMF | A | 17 | 5 | 10.2 | 4 |

| Ref. | Fig. | D | d | l | Nr.d |
|---|---|---|---|---|---|
| TMF | B | 8 | 1.6 | 5.1 | 6 |
| TMF | B | 10 | 2.2 | 6.5 | 6 |
| TMF | B | 14 | 3.5 | 9 | 6 |
| TMF | B | 15 | 3.5 | 9.5 | 6 |
| | | | | | |
| TMF | C | 11.5 | 2.7 | 8 | 7 |
| TMF | C | 12.4 | 2.7 | 8 | 7 |
| TMF | C | 13 | 3 | 8.5 | 7 |
| TMF | C | 14.5 | 2 | 9 | 7 |
| TMF | C | 16 | 4 | 10 | 7 |
| TMF | C | 18 | 4.5 | 11.5 | 7 |

Lunghezze standard 25-50-100
Solitamente prodotti in mat. **A38E**
Tolleranze dimensionali secondo le norme DIN 40680

Standard length 25-50-100
Usually manufactured in mat. **A38E**
Dimensional tolerances according DIN 40680 norms

# Candele filettate
## Threaded Candles

Fig. A

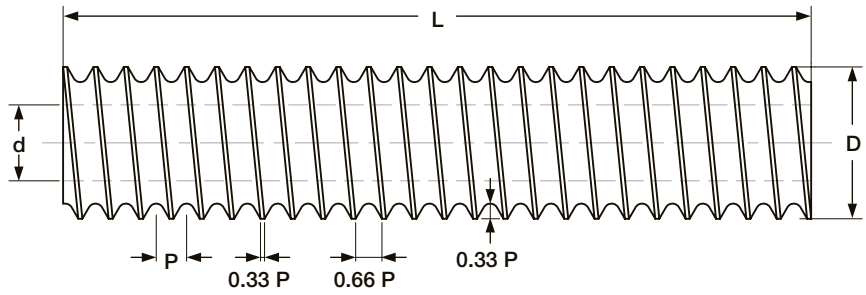
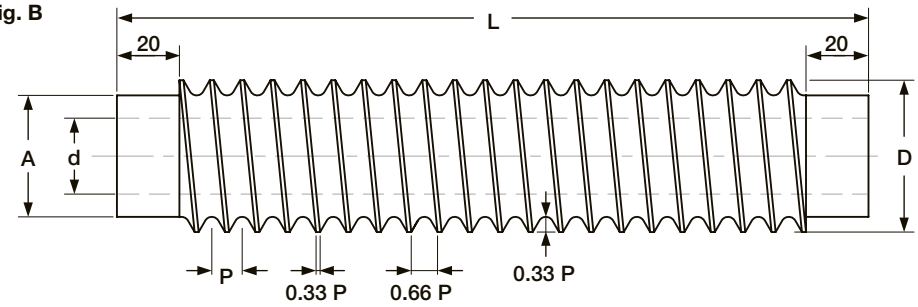



Fig. B




| Ref. | Fig. | D | d | P | L max | Nr.P | A | B |
|---|---|---|---|---|---|---|---|---|
| CND | A | 20 | 9 | 1.5-2-3-4-5 | 300 | 1 | – | – |
| CND | A | 30 | 16 | 1.5-2-3-4-5-6.5 | 300 | 1 | – | – |
| CND | A | 40 | 24 | 1.5-2-3-4-5-6.5 | 500 | 1 | – | – |
| CND | A | 50 | 32 | 1.5-2-3-4-5-6.5 | 500 | 1 | – | – |
| CND | A | 60 | 40 | 3-4-5-6.5 | 500 | 1 | – | – |
| | | | | | | | | |
| CNT | B | 20 | 9 | 5 | 300 | 1 | 20 | 20 |
| CNT | B | 30 | 16 | 5 | 300 | 1 | 25 | 20 |
| CNT | B | 30 | 16 | 6.5 | 300 | 1 | 25 | 20 |
| CNT | B | 40 | 24 | 5 | 300 | 1 | 32 | 20 |
| CNT | B | 40 | 24 | 6.5 | 300 | 1 | 32 | 20 |
| CNT | B | 30 | 16 | 5 | 300 | 2 | 25 | 20 |
| CNT | B | 30 | 16 | 6.5 | 300 | 2 | 25 | 20 |
| CNT | B | 40 | 24 | 5 | 300 | 2 | 32 | 20 |
| CNT | B | 40 | 24 | 6.5 | 300 | 2 | 32 | 20 |

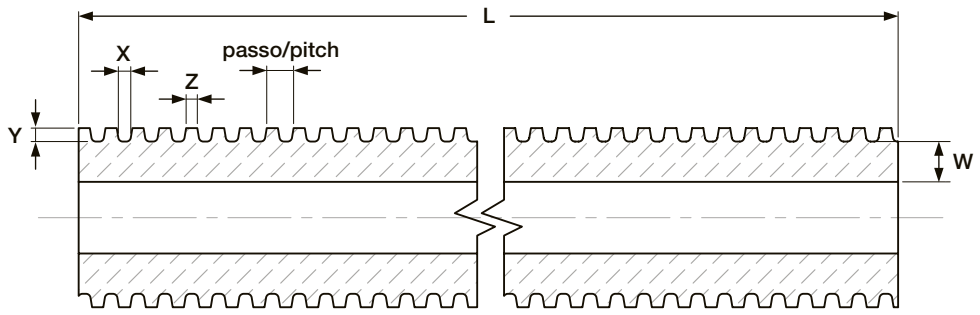
Altre dimensioni su richiesta
Solitamente prodotti in mat. **A38E**

Other dimesions on request
Usually manufactured in mat. **A38E**

Tolleranze dimensionali secondo le norme DIN 40680

Dimensional tolerances according DIN 40680 norms

## Candele filettate non standard
**Not Standard Threaded Candles**




$Y_{max} = X \times 1.2$ $\quad Z > X \times 0.8$ (min. 2.5)

$X_{min} = 2.5$ $\quad W > 8$

Per lunghezza fino a 500 mm
Passi da 1.5 a 30 mm
Anche con doppia spirale

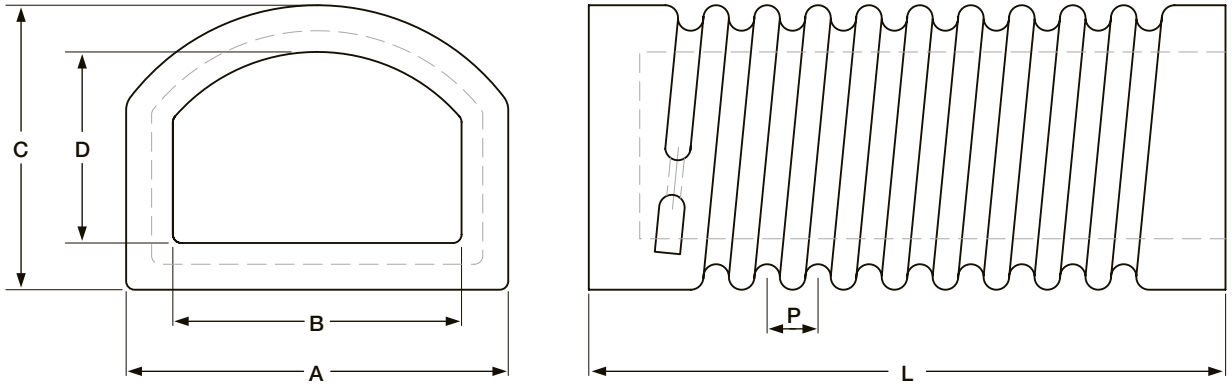
Per lunghezza > 500 mm
Passi 3 - 4 - 5 - 6.5 - 8.5 - 9.5 - 10.7 - 11.5 - 15.5

For length up to 500 mm (19.7 in)
Pitches from 1.5 to 30 mm (0.059 to 1.18 in)
Also with double spiral

For length > 500 mm (19.7 in)
Pitches 3 - 4 - 5 - 6.5 - 8.5 - 9.5 - 10.7 - 11.5 - 15.5

# Muffole
## Muffles

### Muffole 034
### Muffles 034



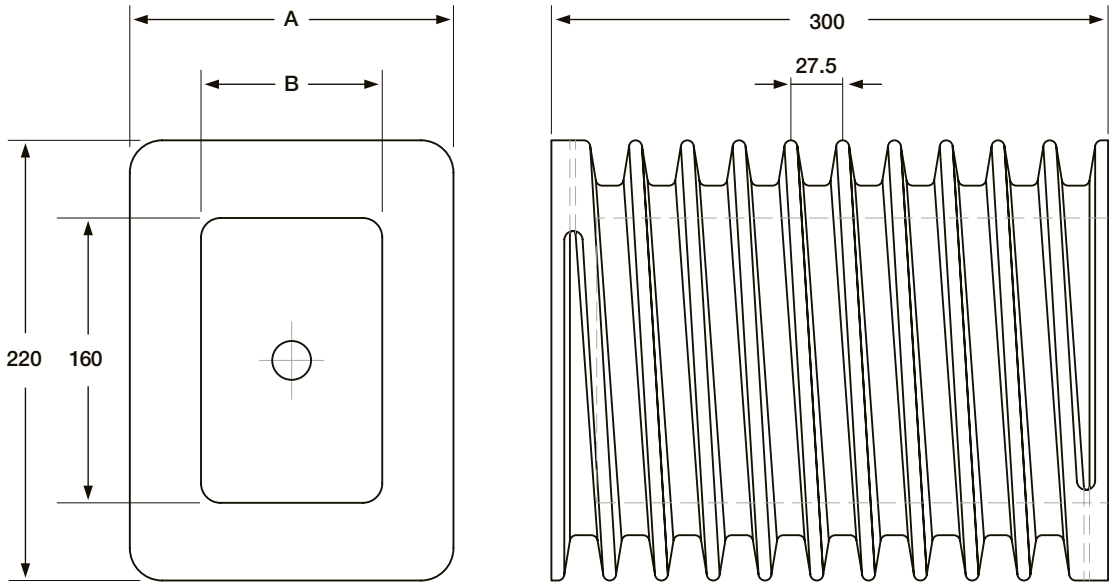

| Ref. | A | B | C | D | L | P |
|---|---|---|---|---|---|---|
| MUFO 230-180-115 | 190 | 170 | 125 | 105 | 240 | 13 |

Solo materiale **A50C**
Tolleranze dimensionali secondo le norme DIN 40680

Material **A50C** only
Dimensional tolerances according DIN 40680 norms

## Muffole 034-300

### Muffles 034-300



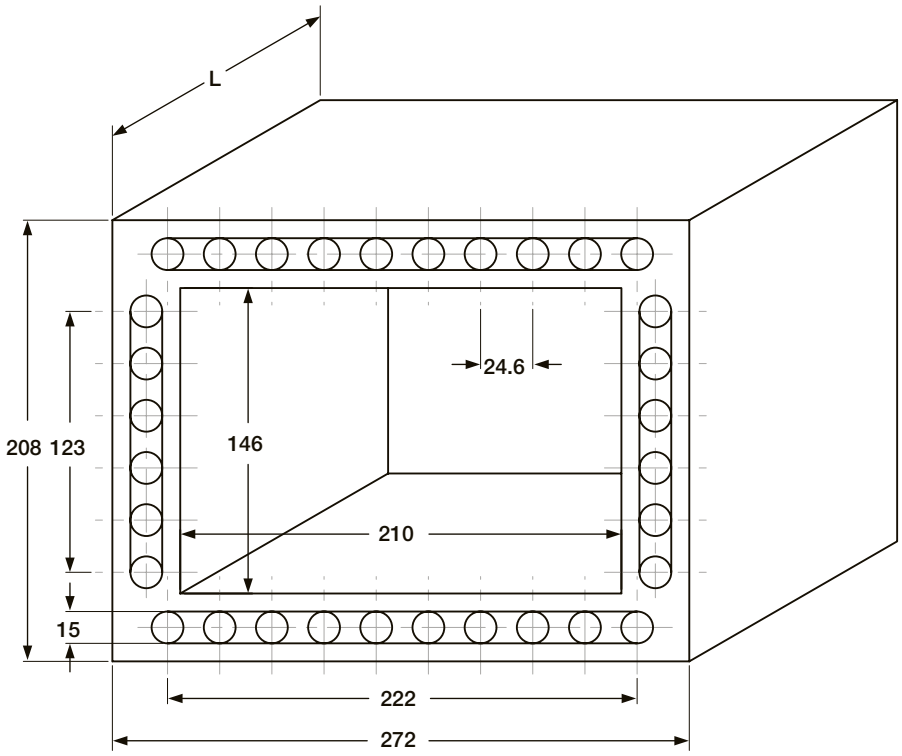

| Ref. | A | B |
|---|---|---|
| MUFO 300-170-220 | 170 | 110 |
| MUFO 300-270-220 | 270 | 210 |

Solo materiale **A50C**
Tolleranze dimensionali secondo le norme DIN 40680

Material **A50C** only
Dimensional tolerances according DIN 40680 norms

## Muffole 034-27

### Muffles 034-27



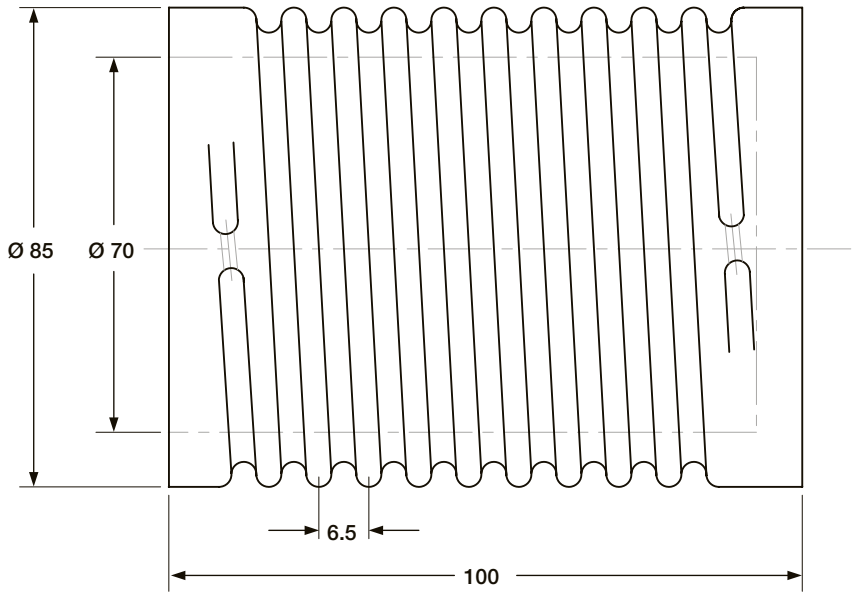

| Ref. | L |
|---|---|
| MUFO-27-28-32 | 280 |
| MUFO-27-32-32 | 320 |

*Stock standard*

Solo materiale **A50C**
Tolleranze dimensionali secondo le norme DIN 40680

Material **A50C** only
Dimensional tolerances according DIN 40680 norms

## Muffole 035
**Muffles 035**



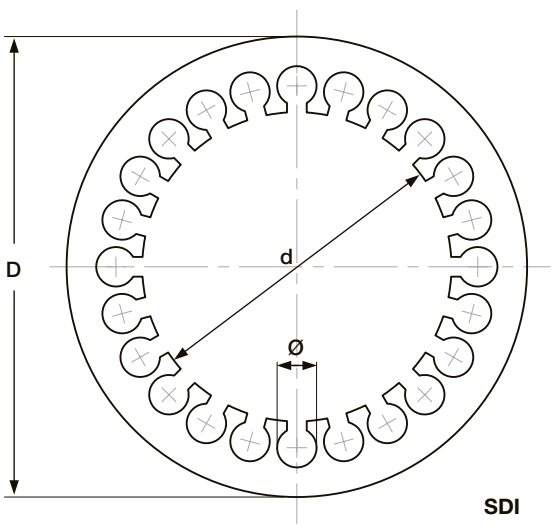

**MUF0-80-100-65**

Solo materiale **A50C**
Tolleranze dimensionali secondo le norme DIN 40680

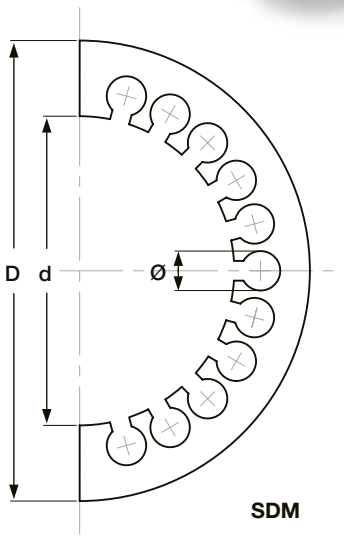
Material **A50C** only
Dimensional tolerances according DIN 40680 norms

# Candele e mezze candele SAIDH a canali interni

## Candles and Half Candles SAIDH with Internal Grooves




SDI



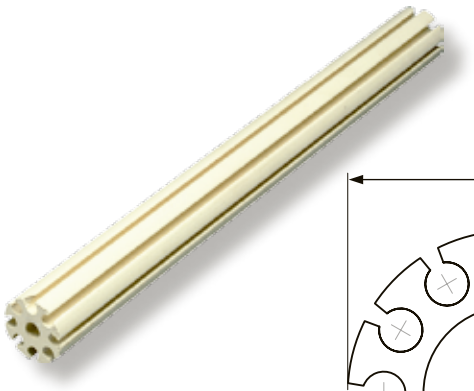

SDM

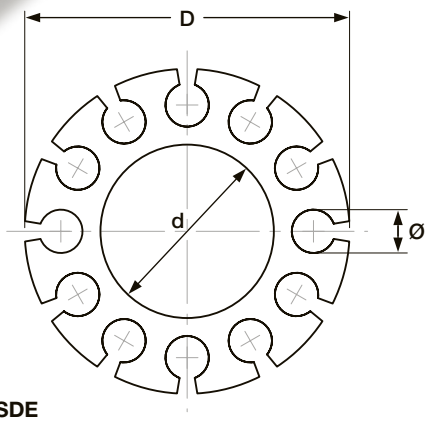
| Ref. | D | d | Ø | Nr.Ø | Mat. | L |
|---|---|---|---|---|---|---|
| SDI | 45 | 20 | 6 | 8 | A80E | 100-200-300 |
| SDI | 55 | 30 | 5 | 10 | A80E | 100-200-300 |
| SDI | 63 | 38 | 5 | 16 | A80E | 100-200-300 |
| SDI | 65 | 30 | 9 | 10 | A80E | 100-200-300 |
| SDI | 83 | 55 | 5 | 16 | A80E | 100-200-300 |
| SDI | 105 | 70 | 7 | 16 | A80E | 100-200-300 |
| SDI | 210 | 150 | 15 | 24 | A50C | solo - only 300 |
| SDI | 450 | 350 | 20 | 36 | A50C | solo - only 300 |
| | | | | | | |
| SDM | 55 | 30 | 5 | 8 | A80E | 100-200-300 |
| SDM | 63 | 40 | 5.5 | 8 | A80E | 100-200-300 |

Altre lunghezze su richiesta
Tolleranze dimensionali secondo le norme DIN 40680

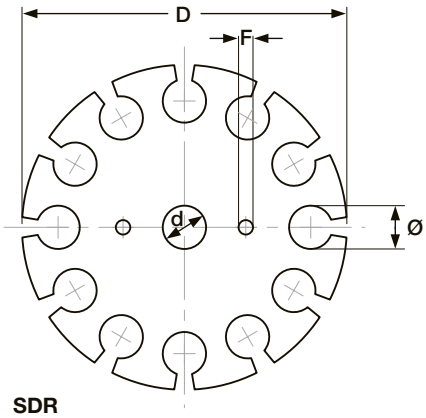
Other lengths on request
Dimensional tolerances according DIN 40680 norms

# Candele SAIDH a canali esterni
## Candles SAIDH with External Grooves






SDE



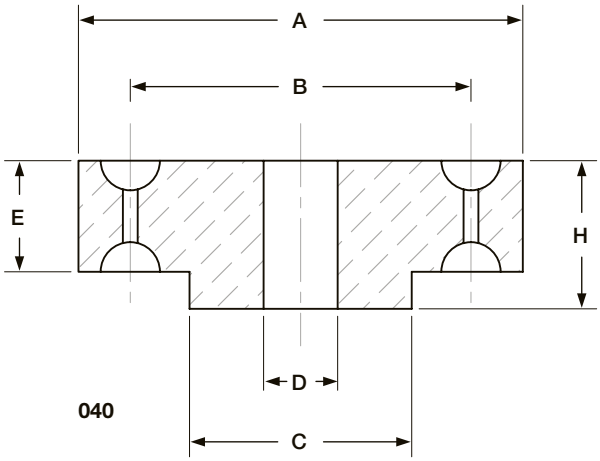

SDR

| Ref. | D | d | Ø | nr.Ø | F | L max |
|---|---|---|---|---|---|---|
| SDE | 20 | 4 | 4 | 6 | – | 300 |
| SDE | 27 | 5 | 4 | 6 | – | 300 |
| SDE | 30 | 7 | 5 | 8 | – | 300 |
| SDE | 30 | 7 | 6.5 | 6 | – | 300 |
| SDE | 35 | 7 | 6 | 8 | – | 300 |
| SDE | 36 | 7 | 7 | 8 | – | 300 |
| SDE | 37 | 12 | 6 | 8 | – | 300 |
| SDE | 40 | 16 | 6 | 10 | – | 300 |
| SDE | 43 | 8 | 8 | 8 | – | 300 |
| SDE | 47 | 15 | 8 | 8 | – | 300 |
| SDE | 50 | 20 | 7.5 | 12 | – | 300 |
| SDE | 57 | 15 | 9 | 8 | – | 300 |
| SDE | 60 | 25 | 8 | 12 | – | 300 |
| SDE | 60 | 20 | 11 | 6 | – | 300 |
| SDE | 70 | 36 | 7 | 16 | – | 300 |
| SDE | 75 | 40 | 6 | 16 | – | 300 |
| SDE | 80 | 35 | 11 | 10 | – | 300 |
| | | | | | | |
| SDR | 27 | 4 | 4 | 6 | 2 | 50-100 |
| SDR | 37 | 6 | 6 | 8 | 3 | 50-100 |
| SDR | 47 | 8 | 8 | 8 | 3 | 50-100 |
| SDR | 57 | 8 | 9 | 8 | 3 | 50-100 |
| SDR | 57 | 8 | 7 | 12 | 3 | 50-100 |
| SDR | 67 | 11 | 10 | 10 | 4 | 50-100 |
| SDR | 77 | 12 | 10 | 12 | 4 | 50-100 |

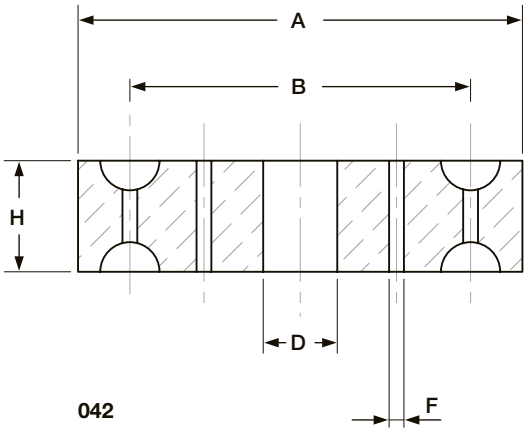
Solo materiale **A38E**
Tolleranze dimensionali secondo le norme DIN 40680

Material **A38E** only
Dimensional tolerances according DIN 40680 norms

# Tappi per candele SAIDH
## Plugs for SAIDH Elements



040



042

| Ref. | A | B | C | D | E | F | H |
|---|---|---|---|---|---|---|---|
| TAP040-20-8 | 20 | 15 | – | 4 | 6 | – | 8 |
| TAP040-30-11 | 30 | 21 | 6 | 3 | 7 | – | 11 |
| TAP040-35-15 | 35 | 25 | 11 | 5 | 10 | – | 13 |
| TAP040-40-15 | 40 | 29 | 11 | 6 | 10 | – | 15 |
| TAP040-47-15 | 47 | 33 | 13 | 5 | 10 | – | 15 |
| TAP040-50-15 | 50 | 38 | 18 | 6 | 10 | – | 15 |
| TAP040-60-15 | 60 | 44 | 23 | 6 | 10 | – | 15 |
| TAP040-70-16 | 70 | 58 | 34 | 8 | 15 | – | 16 |
| TAP040-75-16 | 75 | 60 | 37 | 8 | 15 | – | 16 |
| | | | | | | | |
| TAP042-37-12 | 37 | 26 | – | 6 | – | 3 | 12 |
| TAP042-57-15 | 57 | 45 | – | 8 | – | 3 | 15 |
| TAP042-67-15 | 67 | 50 | – | 12 | – | 4 | 15 |
| TAP042-77-15 | 77 | 60 | – | 12 | – | 4 | 15 |

Solo materiale **A42P**
Tolleranze dimensionali secondo le norme DIN 40680

Material **A42P** only
Dimensional tolerances according DIN 40680 norms

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