

# 3. GASKETS FOR HEAT EXCHANGERS



## PROPERTIES AND APPLICATION

Heat Exchanger Gasket is a term that has been given to gasket used in heat exchangers. The structure of the gasket or its type varies according to the operating conditions of the exchangers. The heat exchanger gaskets come in a wide spectre of types including single or doubl jacketed, corrugated, plain metal, soft and many other. A large selection of different materials allows heat exchangers to operate at temperatures beyond the capabilities of most soft gasket materials.

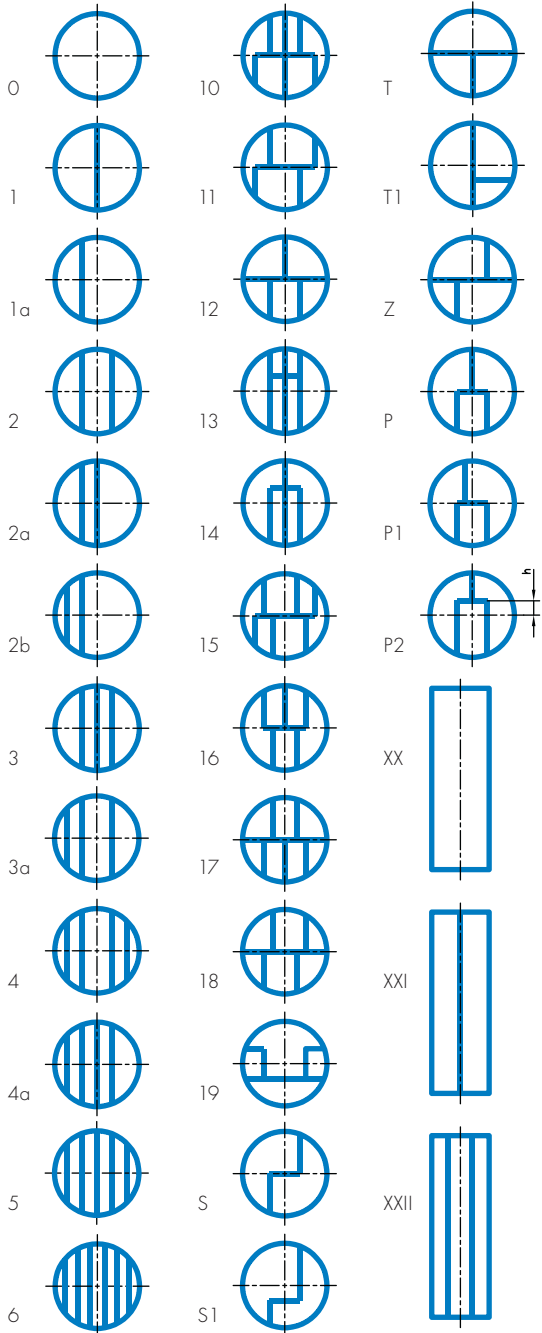
## ADVANTAGES

- Available in wide range of materials, since they are all custom made. There are few limitations regarding size and shape.
- The Metal jacket provides mechanic strength to contain the filler and improves chemical resistance.
- Unique construction provides stability and ensures trouble-free handling and installation.

## SHAPE AND CONSTRUCTION

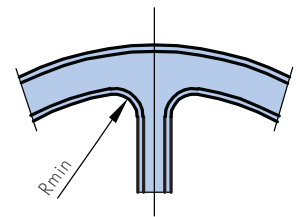
These gaskets are used in shell and tube type heat exchangers. They can be manufactured in very different sizes, shapes, with or without bars. The primary seal is at the inner diameter of the gasket, the outer gasket diameter acts as a secondary seal. The bars seal between the heat exchangers passages.

The Heat exchanger gaskets are produced in several types to meet the most demanding applications. Gaskets for heat exchangers can be manufactured in metal or alloy with a thickness 0.4 mm featuring a soft core inside a metallic jacket.



### Gaskets with integrated bars

Traditionally double-jacketed gaskets for heat exchangers are manufactured with integrated bars. There is a radius between the bars and an internal diameter of the gaskets.

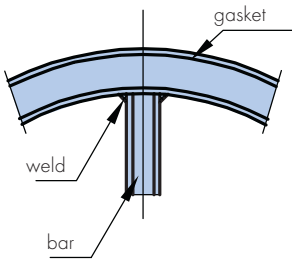


MP10 WITH INTEGRAL BAR

The values of the corresponding radius for the most commonly used metals and alloys are shown in the following table. If a radius is less than R min, the material can crack, reducing the sealing properties of the gaskets.

GASKET MATERIALS and R min	
Gasket material	R min
Copper	8 m
Soft iron (CS)	8 mm
Brass, Monel	10 mm
Stainless steel	10 mm

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MP10 WITH WELDED BAR

#### Gaskets with welded bars

Gaskets with welded bars have eliminated one of the greatest problems of conventional gaskets, which are cracks in the radius area. Metal or alloys are commercially available in sheets or rolls of 1000 mm width.



The primary and secondary seals are continuous all around the gasket. The gasket has an excellent sealability, reducing leaks to the environment. The bars which seal between the heat exchangers passages are plasma or TIG welded with spot welds at each end. These welds should be soft and small to avoid areas of increased resistance to seating.

#### Materials For Heat Exchanger Gaskets

The selection of the jacket material depended on operating conditions. The standard filler is Flexible Graphite.

#### Metallic jacket

MATERIAL	ASTM	DIN Material No.
Low Carbon Steel	Soft iron (CS)	1.0333
Stainless steel	AISI 304	1.4301
Stainless steel	AISI 316, 316 L	1.4401, 1.4404
Stainless steel	AISI 321	1.4541
Stainless steel	AISI 316 Ti	1.4571
Monel (NiCu30Fe)	Alloy 400	2.4360
Copper	Copper	2.0090
Brass	Brass Ms 63	2.0321
Titanium	B348 Gr.1	3.7025

Other alloys available on request

#### Filler

Flexible graphite, ceramic, calandered sealing materials,...

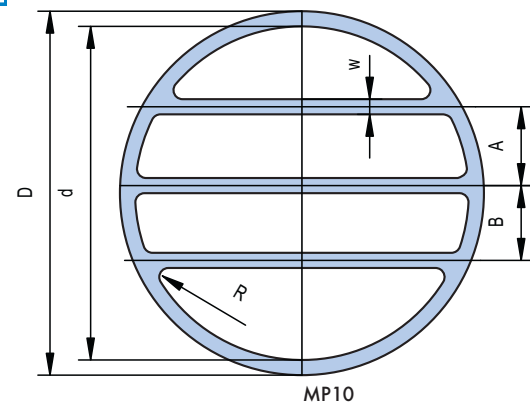
#### SIZES

STANDARD DIMENSIONS	
gasket thickness	3.2 mm
gasket width	10, 13 and 16 mm
bar width	8, 10 and 13 mm

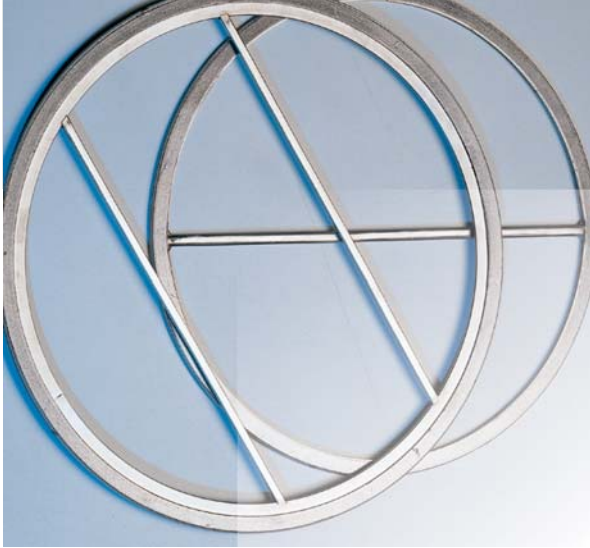
Gaskets with outside diameter to 1000 mm are normally made with integrated bars. Gaskets with an outside diameter greater than 1000 mm are normally made with welded bars. According to the heat exchangers shapes and sizes other dimensions can be manufactured on request.

#### GASKET ORDERING EXAMPLE

Gasket style (MP10, MP14), shape drawing dimensions: outside diameter  $D$ , inside diameter  $d$ , gasket thickness  $s$ , bar width  $w$ , radius  $R$  and distance between bars ( $A$ ,  $B$ ). Material for metal jacket, material for filler.



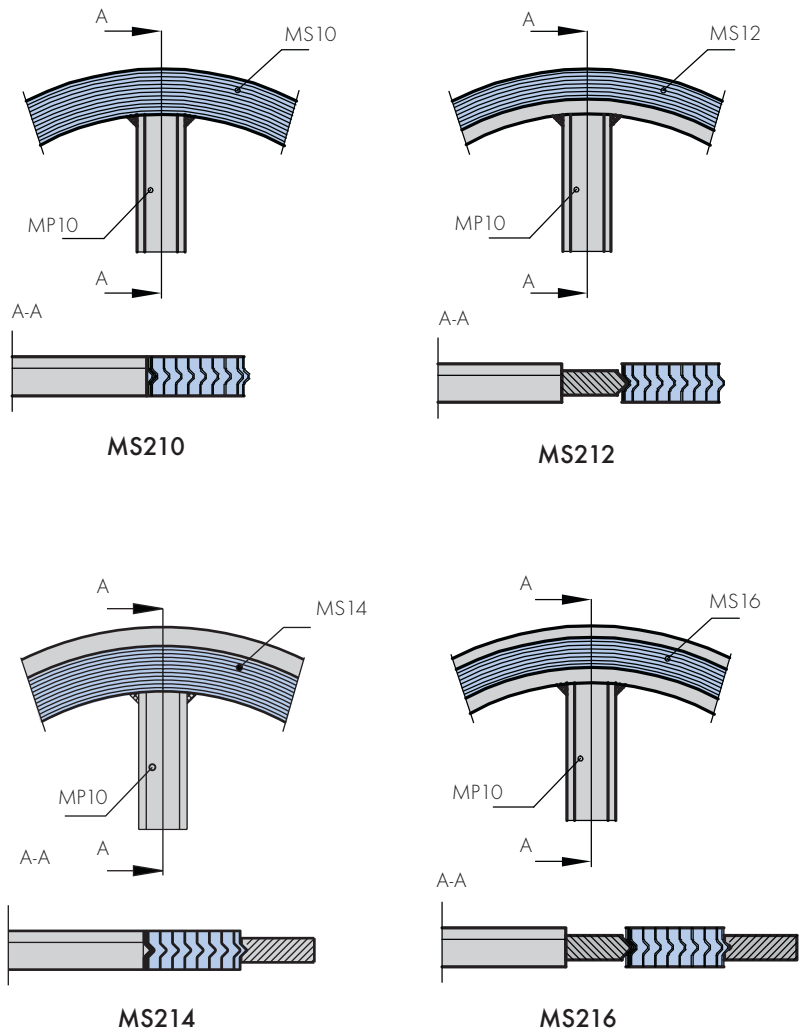
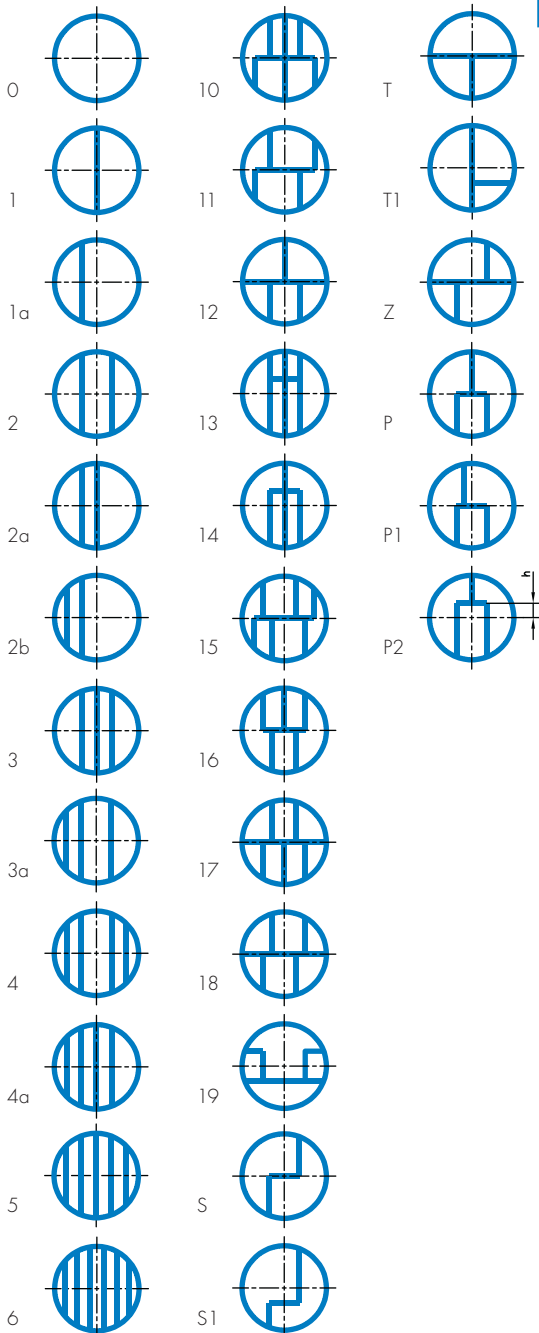
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#### SPIRAL WOUND GASKETS FOR HEAT EXCHANGERS

The spiral wound gaskets of MS10, MS12, MS14 or MS16 type can be manufactured with one or more metal jacketed bars (profile MP10) in different shape shown in drawing. Metal-jacketed bars are welded and made of the same material as the spiral windings. The standard thicknesses are 3.2 mm, 4.5 mm, 6.5 mm and 7.2 mm.

MAX. DIMENSIONS	
Thickness $s$ [mm]	Max. diameter $d_3$ [mm]
3.2	750
4.5	1500
6.5	2200
7.2	2500



#### GASKET ORDERING EXAMPLE

SWG style,  
metal jacketed profile (MP10),  
material,  
shape drawing