Material SIPERM® R

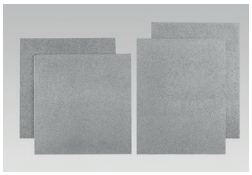
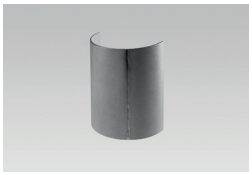
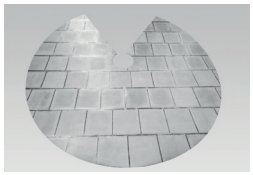
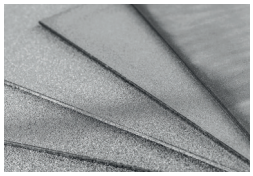
Stainless steel AISI 316L / 1.4404
Temperature resistance: 500 °C oxidizing atmosphere / 650 °C reducing atmosphere

R

Product overview

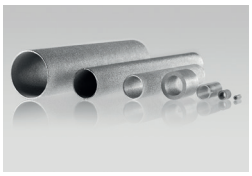
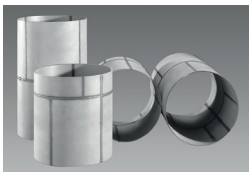
Plates

Size: 280 x 220 mm and 250 x 250 mm, seamless
Thickness: 2 - 10 mm
other sizes (weldments and cuts) upon request

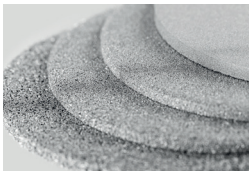
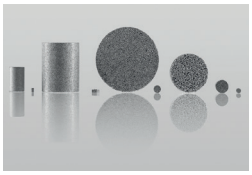
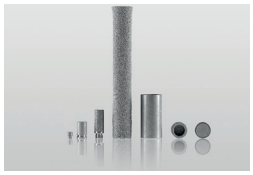
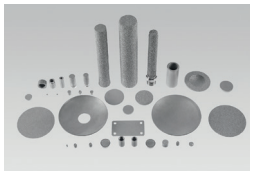
Tubes

seamless and as weldment – dimensions upon request
max. diameter for seamless tubes: 100 mm
max. length for seamless tubes: 1000 mm


Discs and shaped parts

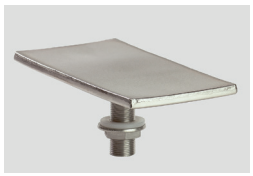
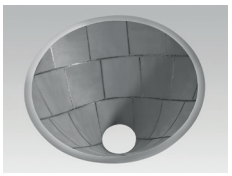
For the production of discs and shaped parts of different sizes, we have a comprehensive tool park at our disposal. Upon request, we will be pleased to inform you on available sizes and special shapes.

Fluidization units

Aeration spot: Ø80 mm, Ø100 mm, Ø105 mm
Aeration pads: 250 x 125 mm, 500 x 125 mm, 1000 x 125 mm and according to customer specification
Fluidization bottoms according to customer specification



Filter cartridges

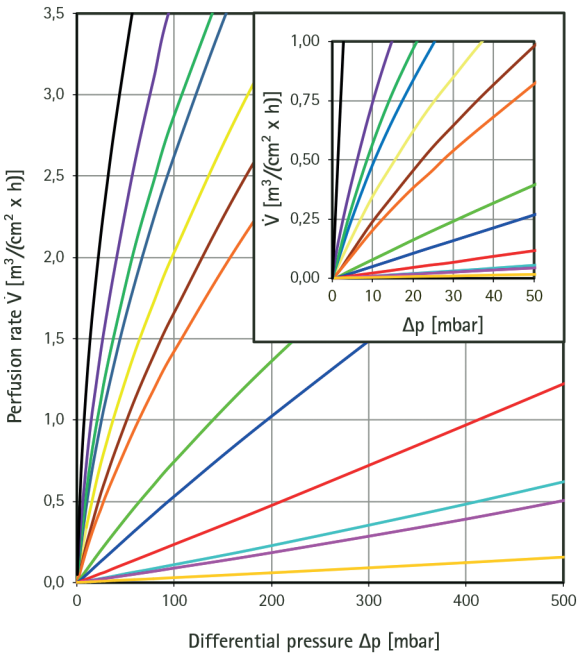
seamless and as weldment – dimensions upon request
max. diameter for seamless tubes: 100 mm
max. length for seamless tubes: 1000 mm



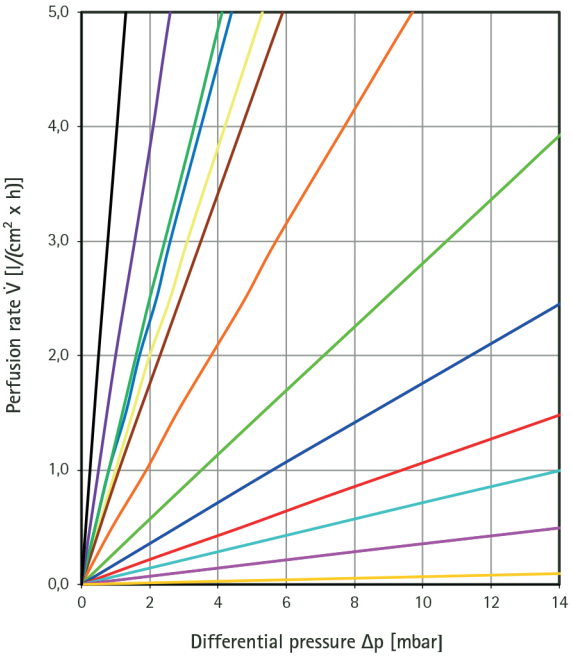
Permeability according to DIN ISO 4022

measured on discs (Ø80 x 3 mm) / surface area perfused: 20 cm² / correspond to 1 mm material thickness

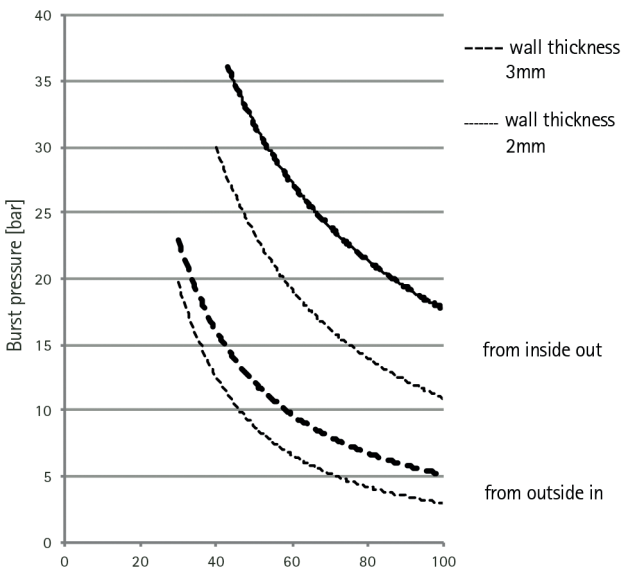
Air at 20 °C

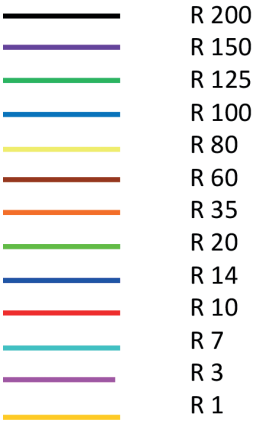


Water at 20 °C



Bursting strength of tubes





Technical data

Stainless steel AISI 316L / 1.4404
Temperature resistance: 500 °C oxidizing atmosphere / 650 °C reducing atmosphere

Filter grade	Density	Porosity	Specific flow coefficient		Separation efficiency (liquid) 98 %	Porometer ø pore size	Bubble Point Pressure difference	Shear strength	Tensile strength	Bending strength		
	[g/cm³]	[%]	laminar [m²] x10⁻¹²	turbulent [m] x10⁻⁷	[µm]	[µm]	[Pa]	[N/mm²]	[N/mm²]	δ el [N/mm²]	δ 0,1 [N/mm²]	δ Breakage [N/mm²]
R 1	5,9 - 6,3	21 - 26	0,2	0,1	4	1,1	6225	390	120	50	75	340
R 3	5,2 - 5,6	30 - 35	1	1	5	2,8	4245	320	110	50	70	310
R 7	5,0 - 5,4	32 - 37	2	6	9	4	3325	280	110	50	70	280
R 10	4,9 - 5,3	33 - 38	3	8	14	6	2535	240	100	50	70	230
R 14	4,7 - 5,1	36 - 41	5	15	18	8	1865	210	90	40	60	200
R 20	4,6 - 5,0	37 - 42	8	30	30	13	1475	180	80	30	40	190
R 35	4,5 - 4,9	38 - 43	15	45	37	20	1015	170	70	30	40	180
R 60	4,4 - 4,8	39 - 44	25	55	49	25	835	160	60	20	30	170
R 80	4,3 - 4,7	40 - 45	28	68	55	32	705	140	50	20	30	140
R 100	4,1 - 4,5	43 - 48	33	140	62	34	645	120	40	20	25	110
R 125	4,0 - 4,4	44 - 49	35	145	65	37	555	110	40	15	20	100
R 150	3,8 - 4,2	46 - 52	55	184	95	41	415	90	35	10	15	95
R 200	3,6 - 4,0	49 - 54	112	300	110	65	215	80	30	10	10	90
	EN ISO 2738	*DIN ISO 30911-3*	*DIN ISO 4022*		*according to ISO 4572*	*ASTM E1294*	*DIN ISO 4003*	*DIN ISO 30911-6*	*according to EN ISO 2740*	*according to DIN ISO 3325*		

All stated values are mean values; the single values can differ according to the dimensions of the components.

Machining instructions

Turning	Tool shape:	Pointed finishing or side tool
	Hard metal grades:	ISO / ANSI K 20
	Effective cutting angle:	12°
	Clearance angle:	7 - 9°
	Depth of cut:	0.4 mm
	Cutting speed:	10 – 30 m/min
Welding	Porous sintered materials are welded by TIG. The material must be free from dirt and grease. The welding speed must be as high as possible to achieve optimal reduction of heat influx into the material.	
	Filler material:	Thermanit JE-308 L Si or GE-316 L Si
	Inert gas flow:	5 l/min
	Electrode diameter:	1.4 – 4 mm
	Current strength:	100 – 150 A (L = 3 mm)

Machining

SIPERM® R can be rolled, bent, pressed, stamped, milled, turned or drilled, either cold after gentle heating. SIPERM® R materials with a finer pore structure are generally more suitable for machining than those of a coarser grade.

Any machining should avoid following the direction of perfusion flow, as the pores could become blocked – water jet cutting and electrical discharge machining is, however, possible. When scrolling or bending SIPERM® R plates, it should be noted that the minimum bending radius is dependent on pore size and the material´s strength. Generally, however, the radius should not be less than 10 times the wall thickness.

SIPERM® R semi-finished products can be joined by welding, riveting or bonding, both to other SIPERM® components or different materials, to form units or components of any size.

Please do not hesitate to contact us!

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Cleaning instructions

When all impurities are retained on the surface of the filter element without the penetration of particles into the pore channels, mechanical cleaning is usually sufficient. The counterflow cleaning is not sufficient when impurities have solidified inside the filter. Then we recommend the chemical dissolution of the residue in solvents which do not attack the filter.

Mechanical cleaning

This can easily be done by reverse washing (back-flushing) in a clean liquid or gas without disassembling the SIPERM®-component. The medium used for the reverse-washing process may either be the filtrate itself or the medium which is flowing through the SIPERM®-component. It is however recommended to work with a gas counterflow, if the filtrate is a gas, or with a liquid counterflow, if it is a liquid filtrate. If very dirty, the cleaning process is more thorough, the more often it is repeated.

Also possible is the back-blowing with a hot steam, for instance for vapor degreasing with a steam cleaner.

The cleaning effect in counterflow can be supported by gently brushing with a soft brush (nylon brush). It is recommended to carry out this process simultaneously with the passage of the counterflow-medium in order to prevent further accumulation.

For smaller, removable filter parts, the ultrasonic cleaning by the resonance method is possible.

Chemical cleaning

The choice of the suitable solvent as well as the success of the cleaning process depends on the nature of the impurity. Therefore, recommendations can only be very general.

For the cleaning of SIPERM® R the following media can be used:

- All standard solvents such as benzene, carbon tetrachloride, alcohol, acetone
- Acetic acid up to 25 % (30 - 60 min)
- Hydrochloric acid up to 10 % (max. 30 min)
- Nitric acid 20 % (30 - 120 min)
- Alkali- and alkaline earth metal solutions

It is not advisable, to use highly concentrated acids or alkalis at higher temperatures. Neutralization with hot water should be done in every case.

The length of cleaning and the temperature used can be varied according to the degree of contamination. However, as a word of caution, it should not be forgotten that compared to solid material, highly porous sintered material has a vastly increased surface area and thus is far more susceptible to any aggressive cleaning medium. For this reason, the cleaning time and cleaning temperature must not exceed the absolutely necessary level.

Depending on the application it must be ensured that the highly porous sintered parts are dried thoroughly after cleaning. Cleaning with solvents in any case requires a complete drying of the porous sintered component before reuse. Solvents should under no circumstances be used for the cleaning of sintered components, which operate in systems where, for safety reasons, the use or insertion of solvents is prohibited.

In the case of metallic materials calcination is also possible, i.e. burning of crop residues at higher temperatures.

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