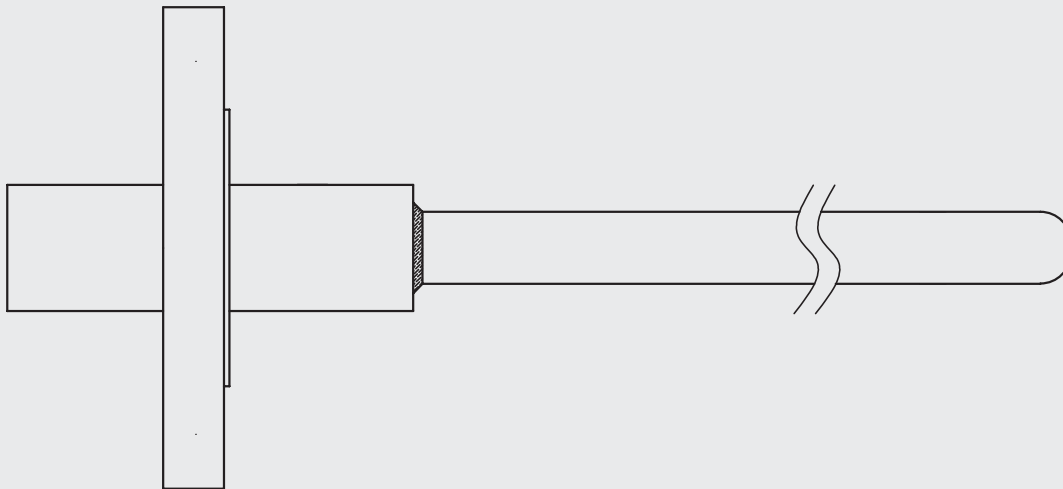


Ceramic Flanged Thermowell

SILICIUM CARBIDE HEXOLOY®

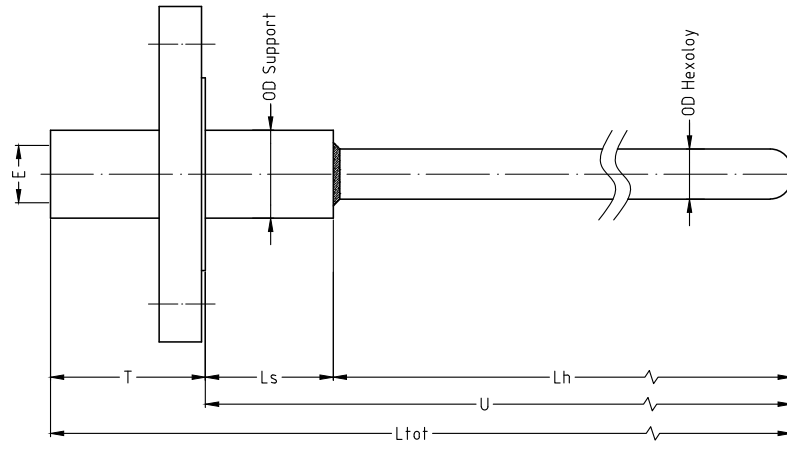
THFN - THFP CONFIGURATIONS



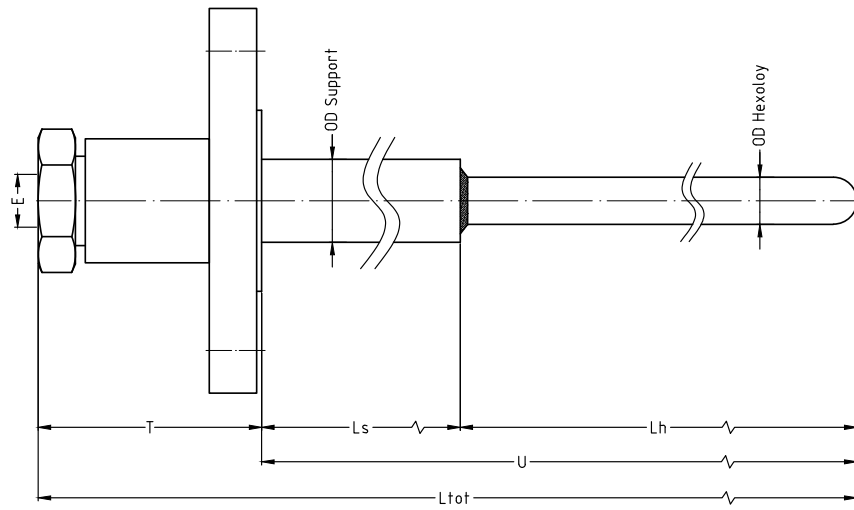
RODAX^o
new temperature solutions

Product series THF

THFN



THFP



Features

Hexoloy® SA SiC is produced by pressureless sintering submicron silicon carbide powder. The sintering process results in a self-bonded, fine grain (less than 10 µm) SiC product which is extremely hard, lightweight and low in porosity. The material can be formed into complex shapes with greater than 98 % theoretical density. Rodax offers a low pressure and a higher pressure (10 barg) model.

Corrosion Resistance

The corrosion resistance of Hexoloy® SA SiC permits superior performance in environments of hot gasses and liquids including strong acids and bases, even at extremely high temperatures. The results indicate that by comparison Hexoloy® SA SiC outperforms tungsten carbide and aluminum oxide in all chemical categories. The ability of Hexoloy® SA SiC to resist corrosion along with its excellent surface finish characteristics makes it ideally suited to applications involving heat exchangers, mechanical seal faces, valves, bearings and other mineral and chemical processing equipment components.

Erosion Resistance

Erosion resistance is usually associated with high hardness. Hexoloy® SA SiC is 50 % harder than tungsten carbide and ten times harder than conventional stainless steel. This extreme hardness combined with high purity and fine microstructure makes Hexoloy® SA SiC particularly resistant to wear and erosion under mechanically abrasive conditions. The results are tested in accordance with ASTM 76. The test results clearly demonstrate the superiority of Hexoloy® SA SiC, especially at higher impingement angles. Hexoloy® SA SiC's excellent erosion and wear resistant properties make it ideally suited for sand blast and spray nozzles, abrasion resistant linings and mechanical seal and bearing surfaces.

High Temperature Properties

The single phase composition of Hexoloy® SA SiC enables it to reliably perform in air at temperatures in excess of 1900 °C (3450 °F). Where dimensional changes at high temperature are a concern, Hexoloy® SA SiC has a consistently low coefficient of thermal expansion. This feature allows design flexibility for shrink fit or leak-tight joint applications. Oxidation resistance is also important for certain high temperature applications. Hexoloy® SA SiC, due to its high purity and high density, is more stable in longterm applications because it is more oxidation resistant. A protective coating of SiO₂ is formed on the surface of SiC which slows the oxidation process.

Higher Pressure Options

The seal between the hexoloy SA SiC stem and the stainless steel flange-stem can be strengthened with a compression packing. This allows the thermowell to be used up to 10 bar gauge. Higher pressures on request.

Thermal Shock

Because of its high thermal conductivity and low coefficient of thermal expansion, it is very resistant to thermal shock and will survive rapid thermal cycling as compared to other refractory materials. Typical thermal applications include thermocouple protection tubes, kiln beams, burner components and other furnace and high temperature applications

Flexural Strength

Hexoloy® SA SiC exhibits excellent strength at room temperature and maintains that strength even at elevated temperatures as depicted above due to its single phase fine grain structure.

Technical specification

- Maximum service temperature (air): 1900 °C
- Hardness (Knoop): 2800 kg/mm²
- Thermal conductivity: 200 °C: 102.6 W/m.K
400 °C: 77.5 W/m.K
- Permeability at RT1000 °C: impervious to gases over 31 MPa

Table 1: Main model

Metal - SiC Hexoloy Seal

	Description	For use with	Minimum T (mm)	Minimum Ls (mm)
THFN	Normal	No pressure or slight underpressure	70	100
THFP	Compression packing	Higher over pressure (10 bar g)	95	100

Table 2: Thermowell

Flange details

Flange material is standard SS316L. Other material on request.

Flange standard	A	ASME B16.5			
	E	EN 1092-1			
Flange material	M2108	M2110/8			Other on request
	SS316L	SS310/310S			
	1.4404	1.4841/1.4845			

Flange details according to ANSI B16.5

Pressure rating (lbs/inch²)	1	2	3				
	150#	300#	600#				
Nominal size	05	06	07	09	10	11	12
	1/2"	3/4"	1"	1 1/2"	2"	2 1/2"	3"

Flange facing	RF	Raised face
	FF	Flat face
	RTJ	Ring type joint
Surface finish	SF	Smooth finish 3,2-6,3 µm (125-250 µ inch)
	ST	Stock finish 3,2-12,5 µm (125-500 µ inch)
	Other on request	

Flange details according to EN 1092-1

Pressure rating (PN)	1	2	3	4	5	6	7
	PN 6	PN 10	PN 16	PN 25	PN 40	PN 63	PN 100

Nominal size (DN)	D04	D05	D06	D07	D08	D09	D10	D11	D12	D13	D14	D15	D16
	DN10	DN15	DN20	DN25	DN32	DN40	DN50	DN65	DN80	DN100	DN125	DN150	DN200

		Flange facing	Surface finish (RA)
Flange facing & Surface finish (RA)	A	Flat face	3,2-12,5 µm max
	B1	Raised face PN10 to PN40	3,2-12,5 µm max
	B2	Raised face PN63 to PN100	0,8-3,2 µm max
	C	Tongue	0,8-3,2 µm max
	D	Groove	0,8-3,2 µm max
	E	Project	3,2-12,5 µm max
	F	Recess	3,2-12,5 µm max

Hexoloy dimensions

Code	Hexoloy OD/ID		L tot max	Recommended support diameter OD/ID	Other on request
	inches	mm	mm	mm	
01	5/8 - 3/8	15 - 9.53	650	24/19	
02	3/4 - 1/2	19 - 12.7	1200	27/23	
03	1 - 1/2	25.4 - 12.7	1200	33/30	

Support details

Support material	M2108	M2110/8	M2202	M0703	
	SS316L	SS310/310S	SS446	Incoloy 800HT	
	1.4404	1.4841/1.4845	1.4762	1.4959	
Support OD	OD24	OD27	OD33	Note: Recommended support diameters. Other only on request.	
	OD/ID	OD/ID	OD/ID		
	24/19	27/23	33/30		

Instrument connection

E205	E405	E206	E406	
1/2" G	1/2" NPT	3/4" G	3/4" NPT	

Table 3: Certification possibilities

Certificates

Following tests and certificates are possible and are either done in-house or done by an external party.

Code	Certificates
Q04110	Material certificate for flange and extension EN10204-3.1 material certificate is NOT available for SiC material. You can use A10204-2.2 test certificate.
Q04330	External pneumatic pressure test at 10 barg Only for THFS
Q02040	Test report EN10204-2.2

HOW TO ORDER (example)

Code		Example	Your code
Main model	See table 1	THFP	
Flange standard	See table 2	A	
Flange material	See table 2	M2108	
Pressure rating	See table 2	1	
Nominal size	See table 2	07	
Flange facing / Surface finish	See table 2	RF SF	
Hexoloy dimensions	See table 2	01	
Hexoloy length Lh	in mm	Lh500	
Support material	See table 2	M2108	
Support OD	See table 2	OD24	
Support length Ls	in mm	Ls150	
Instrument connection	See table 2	E405	
Dimension T (THFN min 70, THFS min 95)	in mm	T100	

Ordering code example:

THFP A M2108 1 07 RF SF 01 Lh500 M2108 OD24 Ls150 E405 T100

For all options: please contact Rodax

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