

TEMPERATURE °CONTROLS PTY LTD

ACN: 650 190 183 ABN: 966 501 901 83

7 YAMMA STREET

SEFTON, NSW 2162 AUSTRALIA

PH: (02) 9721 8644 FAX: (02) 9738 9339 EMAIL: sales@temperature.com.au

www.temperature.com.au



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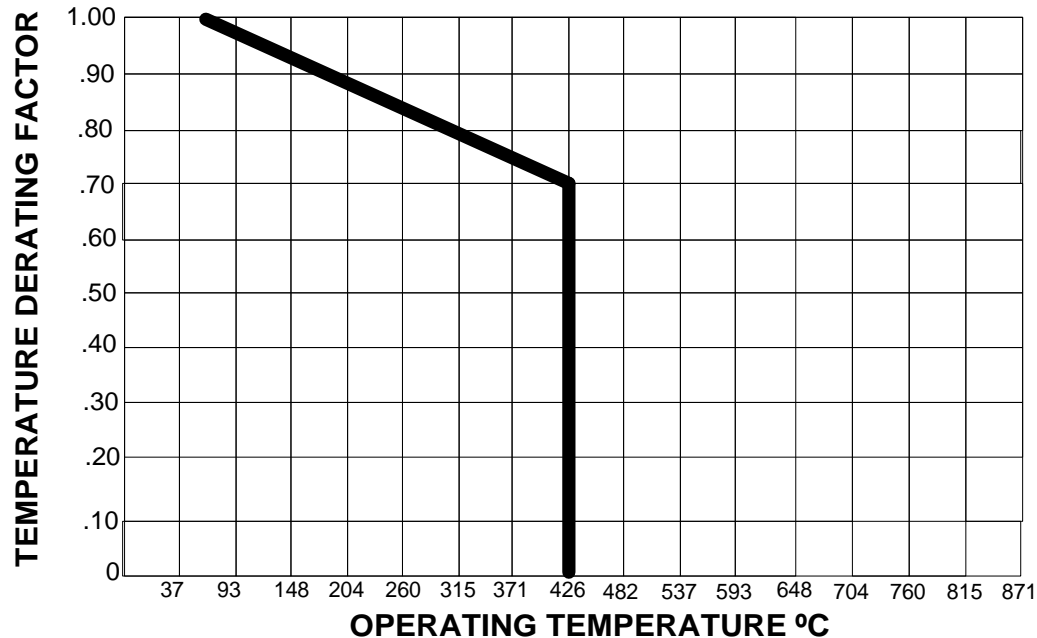
MAXIMUM OPERATING PRESSURES (Process Connection)

Barstock – Screwed Thermowells as per drawing SD 036

Note: the smaller the process connection the higher the pressure. BSPT/ NPT Male Process connection	316 Stainless steel BSPT/ NPT Male Process connection	
	KPa	bar
	1/16"	75,000
1/8"	68,000	690
1/4"	55,000	550
3/8"	53,000	540
1/2"	53,000	530
3/4"	50,000	500
1"	36,000	370
1.1/4"	41,000	410
1.1/2"	34,000	340

Calculations based on ASME B31.3 code for Process Piping.

TEMPERATURE DERATING FACTOR



Pressure rating procedure

1. For applications at elevated temperatures, the pressure rating must be multiplied by an appropriate temperature derating factor obtained from the temperature derating chart above.
2. These working pressures are not necessarily valid for system components. Prudent system design requires that all other system components be evaluated for their specific proper pressure capabilities.

Wake Frequency & Stress Calculation

In Accordance With ASME PTC 19.3 / Design Memo T/115

General Details

Date : 22/01/07
Customer Name : Temperature Controls
Customer Ref : SAMPLE
Supplier Ref :
Tag Number : Sample 07-14 liquid
Calculation Number : Revision :

Thermowell Dimensions

Root Diameter : 22 mm
Tip Diameter : 19 mm
Bore : 6.5 mm
Tip Thickness : 6 mm
Unsupported Length : 200 mm

Thermowell Material

Material Grade : 316 Stainless Steel
Modulus of Elasticity : 1937460.8 kg/cm²
Density : 7940.7 kg/m³
Maximum Allowable Stress : 1217.4498 kg/cm²

Fluid Properties

Phase : Liquid
Velocity : 3 m/s
Operating Temperature : 93 C
Operating Pressure : 17000 kPag
Operating Density : 1000 kg/m³

Calculated Results

Thermowell Natural Frequency : 333.0973 Hz
Vortex Shedding Frequency : 34.7368 Hz
Frequency Ratio : 0.104284
Limiting Velocity : 23.0139 m/s
Maximum Working Pressure : 52607.67 kPag
Maximum Velocity Length : 554.7931 mm
Maximum Stress Length : 1638.106 mm

Summary

Frequency Ratio - ACCEPTABLE
Operating Pressure - ACCEPTABLE
Unsupported Length - ACCEPTABLE
Comments -

Wake Frequency & Stress Calculation

In Accordance With ASME PTC 19.3 / Design Memo T/115

General Details

Date : 22/01/07
Customer Name : Temperature Controls
Customer Ref : SAMPLE
Supplier Ref :
Tag Number : Sample 07-14 gas
Calculation Number : Revision :

Thermowell Dimensions

Root Diameter : 22 mm
Tip Diameter : 19 mm
Bore : 6.5 mm
Tip Thickness : 6 mm
Unsupported Length : 200 mm

Thermowell Material

Material Grade : 316 Stainless Steel
Modulus of Elasticity : 1877149.26 kg/cm²
Density : 7902.858 kg/m³
Maximum Allowable Stress : 1038.8602 kg/cm²

Fluid Properties

Phase : Gas
Velocity : 17 m/s
Operating Temperature : 184.1 C
Operating Pressure : 1000 kPag
Operating Density : 1000 kg/m³

Calculated Results

Thermowell Natural Frequency : 328.6558 Hz
Vortex Shedding Frequency : 196.8421 Hz
Frequency Ratio : 0.598931
Limiting Velocity : 22.7071 m/s
Maximum Working Pressure : 44875.71 kPag
Maximum Velocity Length : 231.2198 mm
Maximum Stress Length : 216.3899 mm

Summary

Frequency Ratio - ACCEPTABLE
Operating Pressure - ACCEPTABLE
Unsupported Length - ACCEPTABLE
Comments -