



# PTFE Gasket Materials

KLINGER<sup>®</sup>top-chem<sup>®</sup> Top Quality Reinforced  
Thermoseal<sup>®</sup> soft-chem<sup>®</sup> Expanded  
Sealex<sup>®</sup> Joint Sealant

Sealing Solutions for the  
Chemical Process Industry.



ISO 9001:2000



## A Long-standing Tradition of Excellence and Innovation

Since its inception in 1886 by Austrian engineer Richard Klinger, the Klinger Group of independent companies has become a world leader in the development, manufacture and distribution of quality fluid sealing and control products. A commitment to excellence and product innovation has always been the cornerstone of Klinger's operating policy.

Today, Thermoseal, the exclusive Klinger licensee in North America, continues the tradition by providing a wide variety of fluid sealing materials and standing behind its products with thousands of hours of scientific development, testing and evaluation.

## Taking PTFE Gasket Materials to a Higher Level of Performance

Thermoseal offers a complete line of PTFE materials to meet any application need – KLINGER<sup>®</sup>top-chem<sup>®</sup>, Thermoseal<sup>®</sup> soft-chem<sup>®</sup> and Sealex<sup>®</sup> Joint Sealant. Each FDA compliant line provides longer gasket life and trouble-free sealing to help cut costs and enhance plant and personnel safety.

## KLINGER<sup>®</sup>-tested for Pressure Resistance

The Klinger Hot Compression Test was developed by the Klinger Group as a method to test the load bearing capabilities of gasket materials under hot and cold conditions. In contrast to BS 7531 and DIN 52913 tests, the Klinger Hot Compression Test keeps the gasket stress constant throughout the entire test. This subjects the gasket to more severe conditions. Thickness decrease is measured at 73°F and after heating to 572°F.

## The Many, Varied Demands Placed on Gaskets

A common perception is that the suitability of a gasket for any given application depends on the maximum temperature and pressure conditions. This is not the case. Maximum temperature and pressure values alone cannot define a material's suitability for an application. These limits are dependent upon a multiplicity of factors (gasket material, media, pressure, temperature, bolts, flange surface). It is always suggested to consider these factors when selecting a material for a given application.

## KLINGER<sup>®</sup> Expert Is the Reliable Route to Successful Gasketing

With the increasing concern for safety and environmental issues, reducing leaks from flanged assemblies has become a high priority. Never has it been more important for companies that use gaskets to choose the correct gasketing material, and install and maintain it to ensure optimum performance. The development of the KLINGER<sup>®</sup> expert gasket design software program, the most comprehensive engineering program available today, is one more way Thermoseal helps customers choose the right gasket material for a reliable and safe flange connection.

It is the aim of KLINGER<sup>®</sup> expert to provide solutions to your gasketing problems based on experience and technical information.

This innovative software takes your specifications and suggests the right KLINGERSIL<sup>®</sup> compressed gasket grades, graphite laminates, and KLINGER<sup>®</sup>top-chem<sup>®</sup> PTFE products for the application.

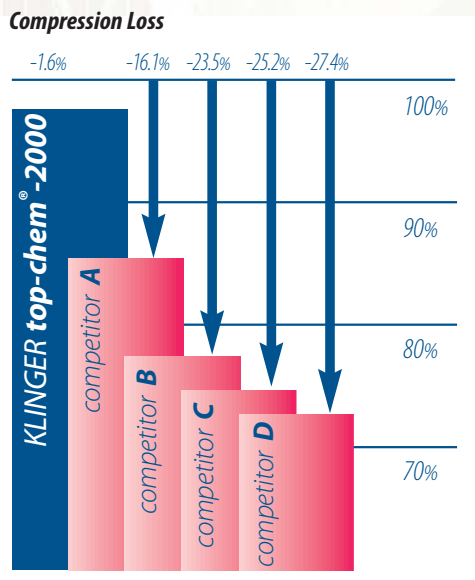
For more information, call 1-800-990-SEAL (7325), or find the technical service form on our website to see just how easy choosing a reliable gasket can be!



# KLINGER<sup>top-chem</sup><sup>®</sup>

## Four Top Quality PTFE Based Materials That Meet All Your Needs

KLINGER<sup>top-chem</sup><sup>®</sup> Top Four offer you a choice of heavy-duty PTFE gasket materials – for severe to more routine chemical process applications. These superior performing materials provide outstanding creep resistance to prolong time between service periods, while reducing maintenance and the cost of replacement parts.



Test conditions: 7250 psi at 392°F  
For complete technical/testing data, contact your Thermoseal representative.

Laboratory tests clearly demonstrate the compression loss of competitors' materials compared with KLINGER<sup>top-chem</sup><sup>®</sup>-2000, which had a relaxation of only 1.6% and virtually no effect on bolt forces. This ensures that bolt forces are maintained even under severe conditions.

## Maximum Sealing with Minimum Creep

Although recognized industry wide for its excellent corrosion resistance and good economy, PTFE's usage as a sealing material has been historically hampered by its poor creep characteristics. This is no longer true, thanks to KLINGER<sup>®</sup>'s development of a revolutionary processing system that enhances PTFE performance, while virtually eliminating leakage and failure problems commonly associated with creep and embrittlement.

### KLINGER<sup>top-chem</sup><sup>®</sup>-2000

- Universal application use in the chemical and petrochemical industries
- Excellent chemical resistance to acidic and alkaline attack
- Superior mechanical properties at high temperatures and surface loads
- FDA compliant
- Only PTFE gasket with a Fire Test Certificate (tested according to the criteria of API 6FA to ANSI Class 300 pressure rating)

### KLINGER<sup>top-chem</sup><sup>®</sup>-2003

- Excellent chemical resistance to acidic and alkaline attack
- Superior mechanical properties at medium and low temperatures and surface loads
- Greater gas containment even at 1000 psi surface loads
- Good flange adaptation
- FDA compliant

### KLINGER<sup>top-chem</sup><sup>®</sup>-2005

- Economical alternative where service conditions are moderate
- Excellent chemical resistance in acidic applications
- Good mechanical properties at medium and low temperatures and surface loads
- FDA compliant

### KLINGER<sup>top-chem</sup><sup>®</sup>-2006

- Known as the "lye-proof gasket"
- Good resistance in strong alkaline applications
- Good choice for a broad range of chemical process applications
- Good mechanical properties at medium and low temperatures and surface loads
- Free of pigments, well suited for food processing and pharmaceutical industries
- FDA compliant

	KLINGER <sup>top-chem</sup> <sup>®</sup>			
	2000	2003	2005	2006
Strong acids	++	++	++	+
Strong alkali	++	++	+	++
Mechanical resistance to high temperature	++	○	+	+
Tightness	+	++	+	+
Adaptability	○	++	+	+

KEY: ++ BEST    + BETTER    ○ GOOD

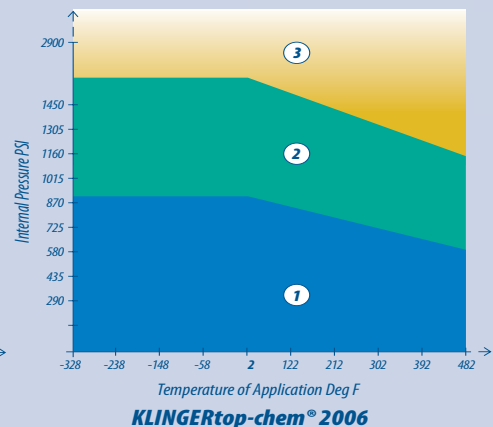
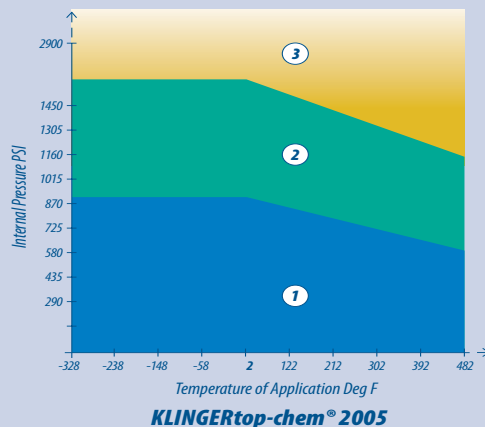
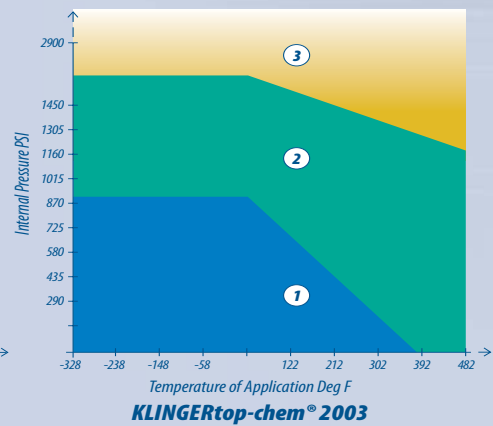
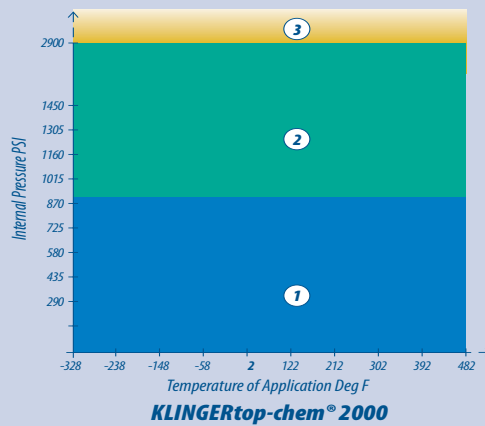
# KLINGER<sup>top-chem</sup><sup>®</sup>

## The Right Gasket for the Right Application

To help you easily decide which KLINGER<sup>top-chem</sup><sup>®</sup> material is needed, Thermoseal pressure and temperature graphs have been included to help in your gasket material selection process. If there is still an uncertainty about which KLINGER<sup>top-chem</sup><sup>®</sup> material is right for a particular application, Thermoseal offers technical support to help you make the right decision the first time. Simply fax a completed technical service questionnaire, **found on the inside back cover of this brochure** or on our website at [www.thermosealinc.com](http://www.thermosealinc.com), and we will provide an immediate recommendation.

- ① In area one, the gasket material is suitable using common installation practices subject to chemical compatibility.
- ② In area two, appropriate measures are necessary for the installation of the gasket to ensure maximum performance. Please call or refer to the KLINGER<sup>®</sup> expert software system for assistance.
- ③ In area three, do not install gaskets in these applications without first referring to the KLINGER<sup>®</sup> expert software system or contacting Thermoseal's technical support service.

Data shown apply to continuous operation. Pressure and temperature fluctuations must be considered separately. All data refer to standard flange connections and dimensions according to ASME B16.10.



# KLINGER<sup>top-chem</sup><sup>®</sup>

	<b>KLINGER<sup>top-chem</sup><sup>®</sup> 2000</b>	<b>KLINGER<sup>top-chem</sup><sup>®</sup> 2003</b>	<b>KLINGER<sup>top-chem</sup><sup>®</sup> 2005</b>	<b>KLINGER<sup>top-chem</sup><sup>®</sup> 2006</b>
<i>Thickness</i>	1.5 mm	2 mm	1.5 mm	1.5 mm
<i>Density</i>	2.5 g/cm <sup>3</sup>	1.7 g/cm <sup>3</sup>	2 g/cm <sup>3</sup>	2.9 g/cm <sup>3</sup>
<i>Compressibility ASTM F36</i>	2 %	18 %	7 %	4 %
<i>Recovery ASTM F36</i>	55 %	40 %	35 %	40 %
<b>Stress Relaxation</b>				
<i>DIN 52913, 16h, 7250 psi, 570°F</i>	35 MPa	n/a	n/a	n/a
<i>DIN 52913, 16h, 4350 psi, 300°F</i>	30 MPa	13 MPa	25 MPa	18 MPa
<b>Klinger Cold/Hot Compression</b>				
<i>75°F / 7250 psi</i>	2 %	n/a	10 %	10 %
<i>480°F / 7250 psi</i>	5 %	n/a	30 %	40 %
<i>75°F / 3625 psi</i>	n/a	9 %	n/a	n/a
<i>480°F / 3625 psi</i>	n/a	38 %	n/a	n/a
<b>Sealability</b>				
<i>DIN 3535 / 6</i>	0.5 ml/min	0.1 ml/min	0.2 ml/min	0.1 ml/min
<i>DIN 28090-2</i>	0.05 mg/s m	0.01 mg/s m	0.02 mg/s m	0.01 mg/s m
<b>Thickness/Weight Increase</b>				
<i>H<sub>2</sub>SO<sub>4</sub>, 100%: 18h/75°F</i>	0.5 - 1 %	n/a - 1 %	2 - 2 %	n/a
<i>HNO<sub>3</sub>, 100%: 18h/75°F</i>	1 - 2 %	n/a - 5 %	2 - 7 %	2 - 7 %
<i>NaOH, 33%: 72h/230°F</i>	5 - 5 %	n/a - 2 %	n/a	12 - 24 %
<b>Permits/Certifications</b>				
<i>BAM certification</i>	yes	in process	n/a	yes
<i>KTW proposal</i>	yes	yes	yes	yes
<i>DIN-DVGW permit</i>	yes	yes	yes	yes
<i>Fire tested API 6FA</i>	yes	n/a	n/a	n/a
<i>FDA conformity</i>	yes	yes	yes	yes
<i>TA-Luft certification</i>	yes	yes	yes	yes
<i>Germanischer Lloyd</i>	yes	yes	yes	yes
<i>United States Coast Guard</i>	yes	n/a	n/a	n/a
<i>Registro Italiano Navale</i>	yes	n/a	n/a	n/a
<i>Det Norske Veritas AS</i>	yes	n/a	n/a	n/a

# Chemical Compatibility of KLINGER<sup>top-chem</sup>® Gasket Materials

● generally suitable

■ generally suitable with sufficient surface stress

▲ critical application; do not use without contacting manufacturer

Temperatures are maximum values

Medium	KLINGER <sup>top-chem</sup> ®			
	2000	2003	2005	2006
Acetaldehyde	●500°F	●500°F	●500°F	●500°F
Acetamide	●500°F	●500°F	●500°F	●500°F
Acetic acid	●500°F	●500°F	●500°F	●500°F
Acetic acid ester	●500°F	●500°F	●500°F	●500°F
Acetone	●500°F	●500°F	●500°F	●500°F
Acetylene	●500°F	●500°F	●500°F	●500°F
Adipic acid	●500°F	●500°F	●500°F	●500°F
Air	●500°F	●500°F	●500°F	●500°F
Alum	●500°F	●500°F	●500°F	●500°F
Aluminum acetate	●500°F	●500°F	●500°F	●500°F
Aluminum chlorate	●500°F	●500°F	●500°F	●500°F
Aluminum chloride	●500°F	●500°F	●500°F	●500°F
Ammonia	●500°F	●500°F	■212°F	●500°F
Ammonium carbonate	●500°F	●500°F	●500°F	●500°F
Ammonium chloride	●500°F	●500°F	●500°F	●500°F
Ammonium disphosphate	●500°F	●500°F	●500°F	●500°F
Ammonium hydroxide	●500°F	●500°F	●500°F	●500°F
Amyl acetate	●500°F	●500°F	●500°F	●500°F
Aniline	●500°F	●500°F	●500°F	●500°F
Anon cyclohexanone	●500°F	●500°F	●500°F	●500°F
Arcton 12	●500°F	●500°F	●500°F	●500°F
Arcton 22	●500°F	●500°F	●500°F	●500°F
Asphalt	●500°F	●500°F	●500°F	●500°F
Aviation fuel	●500°F	●500°F	●500°F	●500°F
Barium chloride	●500°F	●500°F	●500°F	●500°F
Benzene	●500°F	●500°F	●500°F	●500°F
Benzoic acid	●500°F	●500°F	●500°F	●500°F
Blast furnace gas	●500°F	●500°F	●500°F	●500°F
Bleaching solution	●500°F	●500°F	●500°F	●500°F
Boiler feed water	●500°F	●500°F	●500°F	●500°F
Borax	●500°F	●500°F	●500°F	●500°F
Boric acid	●500°F	●500°F	●500°F	●500°F
Brine	●500°F	●500°F	●500°F	●500°F
Butane	●500°F	●500°F	●500°F	●500°F
Butanol	●500°F	●500°F	●500°F	●500°F
Butanone	●500°F	●500°F	●500°F	●500°F
Butyl acetate	●500°F	●500°F	●500°F	●500°F
Butylamine	●500°F	●500°F	●500°F	●500°F
Butyle alcohol	●500°F	●500°F	●500°F	●500°F
Butyric acid	●500°F	●500°F	●500°F	●500°F
Caesium melt	▲	▲	▲	▲
Calcium chloride	●500°F	●500°F	●500°F	●500°F
Calcium hydroxide	●500°F	●500°F	●500°F	●500°F
Calcium hypochlorite	●500°F	●500°F	●500°F	●500°F
Calcium sulphate	●500°F	●500°F	●500°F	●500°F
Carbolic acid	●500°F	●500°F	●500°F	●500°F
Carbon dioxide	●500°F	●500°F	●500°F	●500°F
Carbon disulphide	●500°F	●500°F	●500°F	●500°F
Carbon tetrachloride	●500°F	●500°F	●500°F	●500°F
Castor oil	●500°F	●500°F	●500°F	●500°F
Chlorine water	●500°F	●500°F	●500°F	●500°F
Chlorine, dry	●500°F	●500°F	●500°F	●500°F
Chlorine, moist	●500°F	●500°F	●500°F	●500°F

Medium	KLINGER <sup>top-chem</sup> ®			
	2000	2003	2005	2006
Chloroform	●500°F	●500°F	●500°F	●500°F
Chromic acid	●500°F	●500°F	●500°F	●500°F
Citric acid	●500°F	●500°F	●500°F	●500°F
Clorotrifluoride	▲	▲	▲	▲
Condensation water	●500°F	●500°F	●500°F	●500°F
Copper acetate	●500°F	●500°F	●500°F	●500°F
Copper sulphate	●500°F	●500°F	●500°F	●500°F
Creosote	●500°F	●500°F	●500°F	●500°F
Cresol	●500°F	●500°F	●500°F	●500°F
Crude oil	●500°F	●500°F	●500°F	●500°F
Cyclohexanol	●500°F	●500°F	●500°F	●500°F
Decahydronaphthalene	●500°F	●500°F	●500°F	●500°F
Dibenzyl ether	●500°F	●500°F	●500°F	●500°F
Dibutyl phthalate	●500°F	●500°F	●500°F	●500°F
Diesel oil	●500°F	●500°F	●500°F	●500°F
Dimethyl formamide	●500°F	●500°F	●500°F	●500°F
Diphyl	●500°F	●500°F	●500°F	●500°F
Dye bath	●500°F	●500°F	●500°F	●500°F
Ethane	●500°F	●500°F	●500°F	●500°F
Ethanol	●500°F	●500°F	●500°F	●500°F
Ethyl acetate	●500°F	●500°F	●500°F	●500°F
Ethyl alcohol	●500°F	●500°F	●500°F	●500°F
Ethyl chloride	●500°F	●500°F	●500°F	●500°F
Ethyl ether	●500°F	●500°F	●500°F	●500°F
Ethylendiamine	●500°F	●500°F	●500°F	●500°F
Ethylene	●500°F	●500°F	●500°F	●500°F
Ethylene chloride	●500°F	●500°F	●500°F	●500°F
Ethylene glycol	●500°F	●500°F	●500°F	●500°F
Fluorine dioxide	▲	▲	▲	▲
Fluorine gaseous	▲	▲	▲	▲
Fluorine liquid	▲	▲	▲	▲
Fluorosilicic acid	▲	▲	▲	▲
Formaldehyde	●500°F	●500°F	●500°F	●500°F
Formamide	●500°F	●500°F	●500°F	●500°F
Formic acid	●500°F	●500°F	●500°F	●500°F
Freon 12	●500°F	●500°F	●500°F	●500°F
Freon 22	●500°F	●500°F	●500°F	●500°F
Generator gas	●500°F	●500°F	●500°F	●500°F
Glacial acetic acid	●500°F	●500°F	●500°F	●500°F
Glycerine	●500°F	●500°F	●500°F	●500°F
Heating oil	●500°F	●500°F	●500°F	●500°F
Heptane	●500°F	●500°F	●500°F	●500°F
Hydraulic oil	●500°F	●500°F	●500°F	●500°F
Hydraulic oil 2	●500°F	●500°F	●500°F	●500°F
Hydraulic oil 3	●500°F	●500°F	●500°F	●500°F
Hydrazine hydrate	●500°F	●500°F	●500°F	●500°F
Hydrochloric acid	●500°F	●500°F	●500°F	●500°F
Hydrofluoric acid	■212°F	■212°F	▲	●212°F
Hydrofluosilic acid	▲	▲	▲	▲
Hydrogen	●500°F	●500°F	●500°F	●500°F
Hydrogen chloride	●500°F	●500°F	●500°F	●500°F
Hydrogen peroxide	●500°F	●500°F	●500°F	●500°F
Isooctane	●500°F	●500°F	●500°F	●500°F

# Chemical Compatibility of KLINGER<sup>top-chem</sup>® Gasket Materials

Medium	KLINGER <sup>top-chem</sup> ®			
	2000	2003	2005	2006
Isopropyl alcohol	●500°F	●500°F	●500°F	●500°F
Kerosene	●500°F	●500°F	●500°F	●500°F
Lactic acid	●500°F	●500°F	●500°F	●500°F
Lead acetate	●500°F	●500°F	●500°F	●500°F
Lead arsenate	●500°F	●500°F	●500°F	●500°F
Linseed oil	●500°F	●500°F	●500°F	●500°F
Lithium melt	▲	▲	▲	▲
Magnesium sulphate	●500°F	●500°F	●500°F	●500°F
Malic acid	●500°F	●500°F	●500°F	●500°F
MEK butanone	●500°F	●500°F	●500°F	●500°F
Methane	●500°F	●500°F	●500°F	●500°F
Methyl alcohol	●500°F	●500°F	●500°F	●500°F
Methyl chloride	●500°F	●500°F	●500°F	●500°F
Methylene chloride	●500°F	●500°F	●500°F	●500°F
Mineral oil no. 1	●500°F	●500°F	●500°F	●500°F
Mineral oil no. 2	●500°F	●500°F	●500°F	●500°F
Monochlorethane	●500°F	●500°F	●500°F	●500°F
Naphtha	●500°F	●500°F	●500°F	●500°F
Natural gas	●500°F	●500°F	●500°F	●500°F
Nitric acid	●500°F	●500°F	●500°F	●500°F
Nitrobenzene	●500°F	●500°F	●500°F	●500°F
Nitrogen	●500°F	●500°F	●500°F	●500°F
Octane	●500°F	●500°F	●500°F	●500°F
Oil	●500°F	●500°F	●500°F	●500°F
Oleanolic acid	●500°F	●500°F	●500°F	▲
Oleic acid	●500°F	●500°F	●500°F	●500°F
Oxalic acid	●500°F	●500°F	●500°F	●500°F
Oxygen	●500°F	●500°F	●500°F	●500°F
Palmitic acid	●500°F	●500°F	●500°F	●500°F
Pentane	●500°F	●500°F	●500°F	●500°F
Perchlorethylene	●500°F	●500°F	●500°F	●500°F
Petroleum	●500°F	●500°F	●500°F	●500°F
Petroleum benzin	●500°F	●500°F	●500°F	●500°F
Petroleum ether	●500°F	●500°F	●500°F	●500°F
Phenol	●500°F	●500°F	●500°F	●500°F
Phosphoric acid	●500°F	●500°F	●500°F	●500°F
Phthalic acid	●500°F	●500°F	●500°F	●500°F
Polychl. biphenyls.	●500°F	●500°F	●500°F	●500°F
Potassium acetate	●500°F	●500°F	●500°F	●500°F
Potassium carbonate	●500°F	●500°F	■500°F	●500°F
Potassium chlorate	●500°F	●500°F	●500°F	●500°F
Potassium chloride	●500°F	●500°F	●500°F	●500°F
Potass. chrom. sulph.	●500°F	●500°F	●500°F	●500°F
Potassium cyanide	●500°F	●500°F	●500°F	●500°F
Potassium dichrom.	●500°F	●500°F	●500°F	●500°F
Potassium hydroxide	●500°F	●500°F	▲	●500°F
Potassium hypochl.	●500°F	●500°F	●500°F	●500°F
Potassium iodide	●500°F	●500°F	●500°F	●500°F
Potassium melt	▲	▲	▲	▲
Potassium nitrate	●500°F	●500°F	●500°F	●500°F
Potassium nitrite	●500°F	●500°F	●500°F	●500°F
Potassium permang.	●500°F	●500°F	●500°F	●500°F
Propane	●500°F	●500°F	●500°F	●500°F

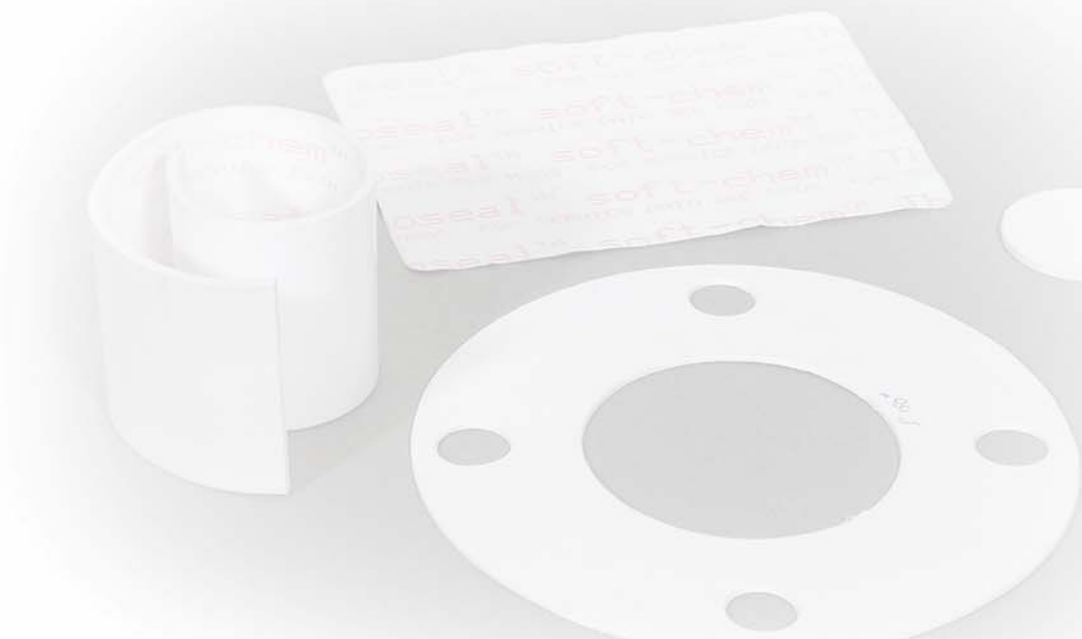
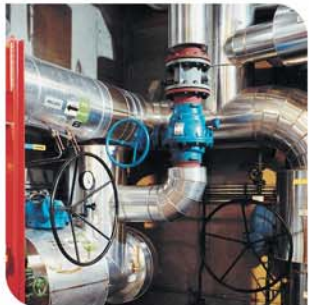
Medium	KLINGER <sup>top-chem</sup> ®			
	2000	2003	2005	2006
Pydraul	●500°F	●500°F	●500°F	●500°F
Pyridine	●500°F	●500°F	●500°F	●500°F
Rape seed oil	●500°F	●500°F	●500°F	●500°F
Rubidium melt	▲	▲	▲	▲
Salicylic acid	●500°F	●500°F	●500°F	●500°F
Sea water	●500°F	●500°F	●500°F	●500°F
Silicon oil	●500°F	●500°F	●500°F	●500°F
Skydrol 500	●500°F	●500°F	●500°F	●500°F
Soap	●500°F	●500°F	●500°F	●500°F
Soda	●500°F	●500°F	▲	●500°F
Sodium aluminate	●500°F	●500°F	●500°F	●500°F
Sodium bicarbonate	●500°F	●500°F	●500°F	●500°F
Sodium bisulphite	●500°F	●500°F	●500°F	●500°F
Sodium chloride	●500°F	●500°F	●500°F	●500°F
Sodium cyanide	●500°F	●500°F	●500°F	●500°F
Sodium hydroxide	●500°F	●500°F	▲	●500°F
Sodium melt	▲	▲	▲	▲
Sodium silicate	●500°F	●500°F	●500°F	●500°F
Sodium sulfide	●500°F	●500°F	●500°F	●500°F
Sodium sulphate	●500°F	●500°F	●500°F	●500°F
Spinning baths	●500°F	●500°F	●500°F	●500°F
Spirit	●500°F	●500°F	●500°F	●500°F
Starch	●500°F	●500°F	●500°F	●500°F
Steam	●500°F	●500°F	●500°F	●500°F
Stearic acid	●500°F	●500°F	●500°F	●500°F
Sugar	●500°F	●500°F	●500°F	●500°F
Sulphur dioxide	●500°F	●500°F	●500°F	●500°F
Sulphuric acid	●500°F	●500°F	●500°F	▲
Sulphurous acid	●500°F	●500°F	●500°F	●500°F
Table salt	●500°F	●500°F	●500°F	●500°F
Tannic acid	●500°F	●500°F	●500°F	●500°F
Tannin	●500°F	●500°F	●500°F	●500°F
Tar	●500°F	●500°F	●500°F	●500°F
Tartaric acid	●500°F	●500°F	●500°F	●500°F
Tetrachloroethane	●500°F	●500°F	●500°F	●500°F
Tetrahydronaphthale	●500°F	●500°F	●500°F	●500°F
Toluene	●500°F	●500°F	●500°F	●500°F
Town gas	●500°F	●500°F	●500°F	●500°F
Transformer oil	●500°F	●500°F	●500°F	●500°F
Trichloroethylene	●500°F	●500°F	●500°F	●500°F
Triethanolamine	●500°F	●500°F	●500°F	●500°F
Turpentine	●500°F	●500°F	●500°F	●500°F
Urea	●500°F	●500°F	●500°F	●500°F
Vinyl acetate	●500°F	●500°F	●500°F	●500°F
Water	●500°F	●500°F	●500°F	●500°F
Water flask	●500°F	●500°F	●500°F	●500°F
Water vapour	●500°F	●500°F	●500°F	●500°F
White spirit	●500°F	●500°F	●500°F	●500°F
Xylene	●500°F	●500°F	●500°F	●500°F

# Thermoseal® soft-chem®

## Unmatched Expanded PTFE Gasketing Technology

Thermoseal® soft-chem® expanded PTFE material provides excellent corrosion resistance and impermeability, along with superior creep resistance and sealability for use in all types of applications. The material's high compressibility enables it to deform under load and conform to irregularities in flange faces for a tight seal with low, minimum sealing stress. In fact, it actually compensates for worn or damaged flange surfaces. And its superior memory characteristics ensure that bolts remain tight, so retorquing is not necessary and leaks do not occur. Standardizing with it also helps to reduce maintenance, simplify inventory and save money.

- Best choice for economical plant-wide use on services to 500°F (260°C) and pressures to 3,000 psi (200 bar)
- Excellent resistance to chemical attack
- Virtually eliminates corrosive effects of gas and liquid permeation
- Ideal for boiler applications because it is largely unaffected by steam or condensate
- Tightly bound, fibrous structure makes it highly creep resistant
- Overcompression is virtually impossible
- Flexibility makes it easy to hand or die cut
- Simple installation regardless of flange type
- Indefinite shelf life
- FDA compliant
- BAM approval for gaseous oxygen





# Thermoseal® soft-chem®

## Tests and Certifications

The composition of Thermoseal® soft-chem® is fully compatible with FDA requirements.

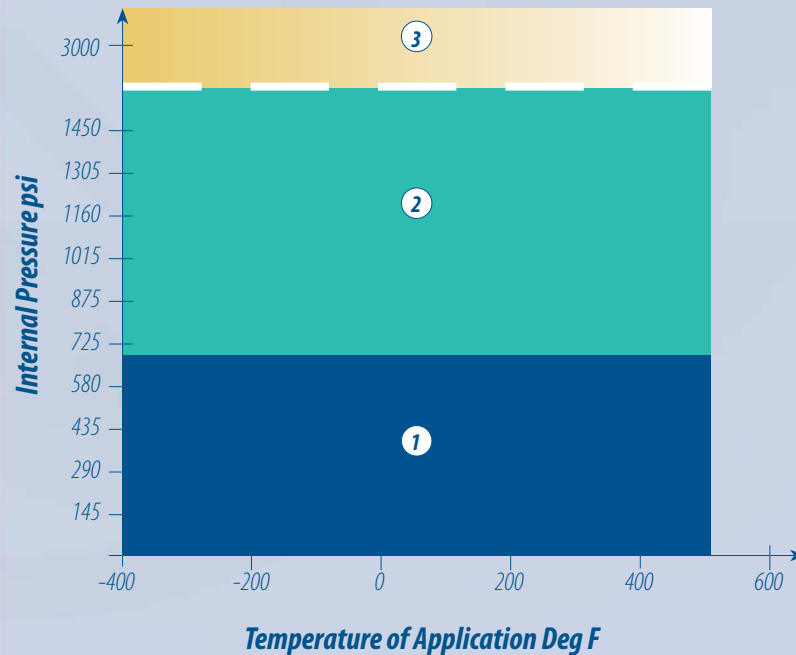
Tested at 1/16" unless noted.

<b>Creep</b> ASTM F 38 B, 212°F, (1/32")	35 %
<b>Sealability</b> ASTM F 37 B, Fuel A	.002 ml/min
<b>Gas leakage</b> DIN 3535/6	.12 ml/hr
<b>Klinger Hot Compression</b>	
Thickness decrease ambient, 3625 psi	37 %
Thickness decrease hot 572°F	28.6 %
<b>Compressibility</b> ASTM F36	60 %
<b>Recovery</b> ASTM F36	12 %
<b>Tensile</b> ASTM 152	1500 psi
<b>Vacuum to full pressure</b>	3000 psi
<b>Chemical resistance</b>	0-14 pH
<b>Density</b>	.85 g/cm <sup>3</sup>
<b>Gasket constants as tested by Ecole Polytechnic</b>	
<b>G<sub>b</sub></b>	1260 psi
<b>a</b>	.20 psi
<b>G<sub>s</sub></b>	3.5 psi

## Pressure and Temperature Graphs

To help you easily decide which material is needed, Thermoseal pressure and temperature graphs have been included to help in your gasket material selection process. If there is still an uncertainty about which material is right for a particular application, Thermoseal offers technical support to help you make the right decision the first time. Simply fax a completed technical service questionnaire **found on the inside back cover of this brochure** or on our website at [www.thermosealinc.com](http://www.thermosealinc.com), and we will provide an immediate recommendation.

- ① In area one, the gasket material is suitable using common installation practices subject to chemical compatibility.
- ② In area two, appropriate measures are necessary for the installation of the gasket to ensure maximum performance. Please call for assistance.
- ③ In area three, do not install gaskets in these applications without first contacting Thermoseal's technical support service.



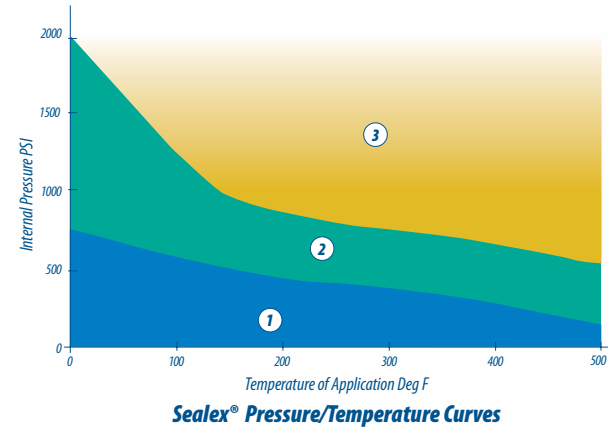
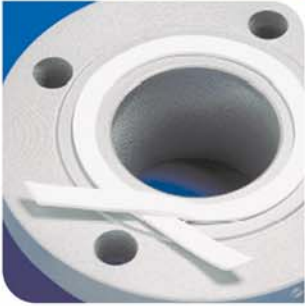
# Sealex® Joint Sealant

## Reliability and Flexibility on a Roll

Sealex® Joint Sealant, specially processed, 100% pure PTFE on a roll, provides soft, highly compressible gasketing for longer life and trouble-free sealing. It also cuts maintenance and storage costs. The high compressibility of Sealex® enables it to effectively fill flange imperfections for a tight, leak-free seal. Under pressure, it provides a very wide, thin ribbon-like joint sealant so that the smallest possible gasket surface area is exposed to the harmful effects of corrosive media. Unlike conventional PTFE, which is prone to cold flow, Sealex® has good creep resistance and bolt torque retention properties.

- Excellent resistance to chemical attack
- Does not support bacterial growth or cause product contamination
- Ideal for most chemical services at temperatures to 500°F (260°C) and pressures to 2,000 psi (138 bar)
- Free-parting sealing surfaces save expensive maintenance downtime
- Suitable for cryogenic use to -321°F (-196°C)
- Pressure-sensitive adhesive strip ensures easy installation
- Available in roll form to reduce storage space
- FDA compliant
- No shelf-life concerns because it is unaffected by normal environmental conditions

Sealex® Joint Sealant can be used wherever reliable gasketing is required.



- ① Suitable for gas and liquid
- ② Suitable for liquid only
- ③ Refer to Thermoseal's technical support service

### Selection of Sealex® Size

Use a size with nominal width of between 1/3 and 1/2 of the effective flange sealing width.

### Easy to Use Sealex®

Just follow the simple installation instructions.

1. Make sure that the sealing flanges are clean.
2. Cut off a length of Sealex® just a little longer than the actual circumference of the perimeter of the seal.
3. Peel off the adhesive protection strip and press the Sealex® into position. Cross the free ends of the Sealex® adjacent to the bolt hole.
4. Bolt up the mating surfaces using the recommended clamping force and bolt tightening patterns.

### Size Selection/Torques Required to Seal ANSI 150lb Flanges

Nominal Flange	Number Bolts	Bolt Size	*Approx. Sealex	Recommended Sealex Size	Sealing Stress	Torque
1/2 in	4	0.5 in	4.3 in	3/16 in	1570 (lbs/in)	30 (lb/ft)
3/4 in	4	0.5 in	5.2 in	3/16 in	1570 (lbs/in)	30 (lb/ft)
1 in	4	0.5 in	6.2 in	3/16 in	1570 (lbs/in)	30 (lb/ft)
1-1/4 in	4	0.5 in	7.4 in	3/16 in	1570 (lbs/in)	30 (lb/ft)
1-1/2 in	4	0.5 in	8.3 in	1/4 in	2140 (lbs/in)	30 (lb/ft)
2 in	4	0.625 in	10.2 in	1/4 in	2140 (lbs/in)	60 (lb/ft)
2-1/2 in	4	0.625 in	12.2 in	1/4 in	2140 (lbs/in)	60 (lb/ft)
3 in	4	0.625 in	13.9 in	1/4 in	2140 (lbs/in)	60 (lb/ft)
4 in	8	0.625 in	17.9 in	3/8 in	2620 (lbs/in)	60 (lb/ft)
5 in	8	0.75 in	20.9 in	3/8 in	2760 (lbs/in)	100 (lb/ft)
6 in	8	0.75 in	24.1 in	3/8 in	2625 (lbs/in)	100 (lb/ft)
8 in	8	0.75 in	30.9 in	3/8 in	2625 (lbs/in)	100 (lb/ft)
10 in	12	0.875 in	37.9 in	3/8 in	2750 (lbs/in)	160 (lb/ft)
12 in	12	0.875 in	45.4 in	1/2 in	3000 (lbs/in)	160 (lb/ft)

\* Based on mean sealing diameter

$$\text{Torque (lb/ft)} = \frac{\mu \times S \times \text{Bolt } \varnothing}{12 \times N}$$

Where  $\mu = 0.2$  (Bolt friction coefficient)  
 $S = \text{Total clamping force (lbs force)}$   
 $N = \text{Number of bolts}$   
 $\varnothing = \text{Bolt diameter (in)}$

# Thermoseal Sealing Technical Service

If you would like us to advise you on your gasket application, please provide the details requested below and fax the form to Thermoseal Inc.: (937) 498-4911. This form is also available on our website at [www.thermosealinc.com](http://www.thermosealinc.com).

I would like a visit from a Thermoseal Inc. sales representative. Yes  No

## DUTY

Medium \_\_\_\_\_

Concentration \_\_\_\_\_

Max. Pressure \_\_\_\_\_

Max. Temperature \_\_\_\_\_

Liquid or Gas \_\_\_\_\_

Any other comments (cycling, vibrations, food, hazardous)

\_\_\_\_\_  
\_\_\_\_\_

## FLANGES

Pressure Rating \_\_\_\_\_

Nominal Size \_\_\_\_\_

Flange Material \_\_\_\_\_

Surface Finish \_\_\_\_\_

Type \_\_\_\_\_

If non-standard, please give dimensions

\_\_\_\_\_  
\_\_\_\_\_

## BOLTS

Quality/Grade \_\_\_\_\_ Number \_\_\_\_\_

Diameter/Length \_\_\_\_\_

Lubrication/Type \_\_\_\_\_

Contact \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

Phone \_\_\_\_\_

Fax \_\_\_\_\_

Email \_\_\_\_\_

## GASKET DETAILS (Dimensions)

### 1. Full Face

Outside Diameter \_\_\_\_\_

Inside Diameter \_\_\_\_\_

Number of Holes \_\_\_\_\_

Hole Diameter \_\_\_\_\_

– OR –

### 2. Ring

Outside Diameter \_\_\_\_\_

Inside Diameter \_\_\_\_\_

– OR –

### 3. Special Design

Please provide drawing, and/or stressed gasket area.

## Current application material and thickness

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## Reason for material change (e.g. leaks, blow out)

\_\_\_\_\_  
\_\_\_\_\_

**Thermoseal Inc.**  
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Sidney, OH 45365

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Fx: (937) 498.4911  
Toll Free: (800) 990.SEAL (7325)  
[www.thermosealinc.com](http://www.thermosealinc.com)



## Call or Visit Our Website for Information on More of Thermoseal's Products

### **KLINGERSIL®**

*Compressed non-asbestos gasket materials*

### **KLINGERSIL®**

*Beater addition composite gasket materials*

### **KLINGER® Flexible Graphite HL, SLS, and PSM**

### **KLINGER® Milam**

### **KLINGER® Maxiprofile semi-metallic composite gaskets**

## Limited Warranty

All goods are sold according to Thermoseal Inc. terms and conditions which included a 30-day limited warranty. For product safety information, refer to the Material Safety Data Sheet (MSDS). A copy of the MSDS information and Thermoseal Inc.'s terms and conditions of sale are available upon request and are subject to change without notice.

The information in this brochure supersedes all previous issues.



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