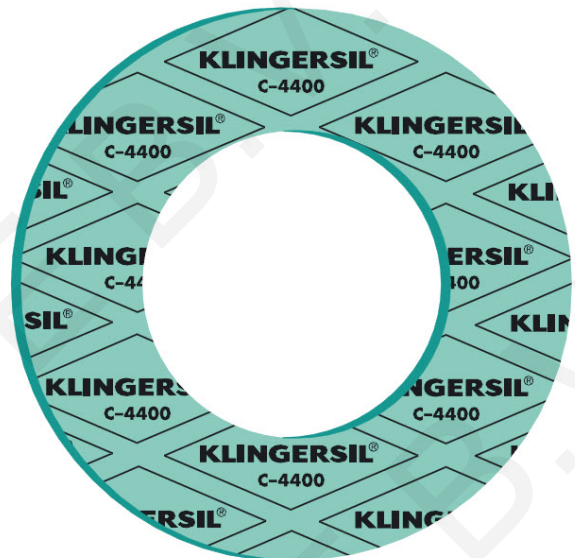


Gasket-Klingersil-C-4400

CHEMICAL RESISTANCE
SHEET MATERIALS TABEL
see page 3-7



High quality non-asbestos grade based on aramid fibre with nitrile rubber binder. A general purpose material for many industrial-sealing applications.

General Properties

- Good resistance to oils, fuels, hydrocarbons
- Good creep resistance
- Low leakage
- Very successful in internal combustion engine applications
- 3xA anti-stick finish on both sides

Tests and Certifications

- BS 7531 Grade Y
- BS F 130 Type A
- Firesafe HTB 90.0223.39.0
- DIN-DVGW
- BAM U W28 for use with oxygen 100°C / 80 Bar
- KTW A 528/88/G
- SVGW 89-053-7
- Germanischer Lloyd 98 952 – 97 HH
- TA-Luft (Clean Air) certificate acc. VDI 2440

Availability

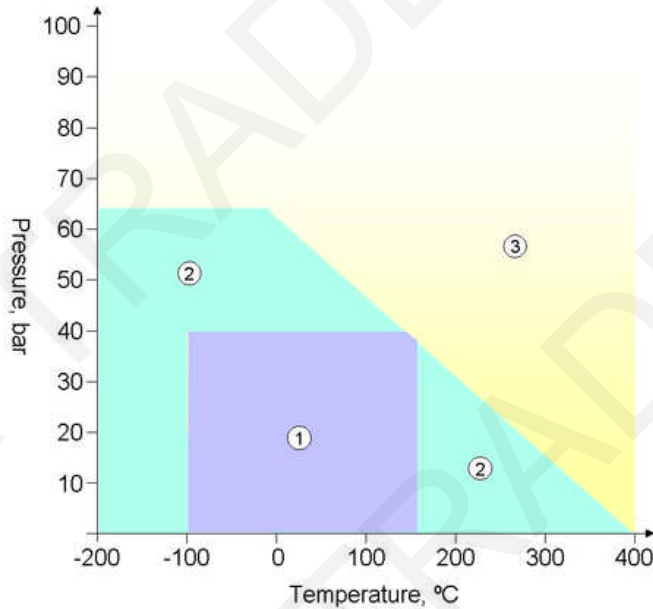
- Thickness (mm): 2



aerospace
sector
certification
scheme

BS EN 9100:2003, ISO 9001:2008
Certificate no: FM 10571

Gasket-Klingersil-C-4400



Application Guidelines

1. Usually satisfactory without reference.
2. Usually satisfactory, but suggest you refer to Klinger for advice
3. Caution: May be suitable but essential that you refer to Klinger for advice.

Chemical compatibility must be considered in all cases.

Typical Specifications

<i>Compressibility ASTM F 36 A</i>		11%
<i>Recovery ASTM F 36 A</i>		55%
<i>Stress relaxation DIN 52913</i>	<i>50MPa, 16h/175°C</i>	<i>32MPa</i>
	<i>50MPa, 16h/300°C</i>	<i>25MPa</i>
<i>Stress relaxation BS 7531</i>		<i>23MPa</i>
<i>Klinger cold/hot compression, 50MPa</i>	<i>Thickness decrease 23°C</i>	10%
	<i>Thickness decrease at 300°C</i>	20%
<i>Gas leakage according to DIN 3535/6</i>		<i>0.02ml/min</i>
<i>Thickness increase after fluid immersion ASTM F 146</i>	<i>Oil no.3:5h/150°C</i>	3%
	<i>Fuel B:5h/23°C</i>	5%
<i>Chlorides (soluble)</i>		<i>150ppm</i>
<i>Density</i>		<i>1.6g/cm³</i>
<i>Average surface resistance</i>	<i>R_{OA}</i>	<i>1.4x10E12 Ω</i>
<i>Average specific volume resistance</i>	<i>ρ_D</i>	<i>1.2x10E12 Ω cm</i>
<i>Average dielectric strength</i>		<i>21.6 kV/mm</i>
<i>Average power factor</i>	<i>1kHz,ca. 2mm thick</i>	<i>0.075 tan δ</i>
<i>Average dielectric constant</i>	<i>1kHz,ca.2mm thick</i>	<i>7.7 ε_r</i>
<i>Thermal conductivity</i>		<i>0.4-0.42W/mK</i>

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A - Suitable

B - Suitability depends on operating conditions

C - Not suitable

CHEMICAL RESISTANCE OF SHEET MATERIALS

Media	Formula	Klinger Quantum / Top-sil-ML1	C-4400	C-4430	C-4500	C-4509	C-8200	C-4324	Top-graph-2000	Graphite	Top-chem-2000/ 2003 Softchem	Top-chem-2005	Top-chem-2006	Milam
A														
Acetaldehyde	CH ₃ CHO	B	B	B	B	B	A	B	B	A	A	A	A	A
Acetamide	CH ₃ COCH ₂	A	A	A	A	A	A	A	A	A	A	A	A	A
Acetic acid	CH ₃ COOH	A	A	A	A	C	A	A	A	A	A	A	A	A
Acetic ether	CH ₃ COOC ₂ H ₅	B	B	B	B	B	B	B	B	A	A	A	A	A
Acetone	CH ₃ COCH ₃	B	B	B	B	B	A	B	B	A	A	A	A	A
Acetylene	C ₂ H ₂	A	A	A	A	A	A	A	A	A	A	A	A	A
Adipic acid	COOH(CH ₂) ₄ COOH	A	A	A	A	A	A	A	A	A	A	A	A	A
Alum	KAl(SO ₄) ₂	A	A	A	A	B	A	A	A	A	A	A	A	A
Aluminium acetate	(CH ₃ COO) ₃ Al	A	A	A	A	B	A	A	A	A	A	A	A	A
Aluminium chlorate	Al(ClO ₃) ₃	A	A	A	A	C	A	A	B	A	A	A	A	A
Aluminium chloride	AlCl ₃	A	A	A	A	B	A	A	A	A	A	A	A	A
Ammonia	NH ₃	A	A	A	A	A	A	A	A	A	A	B	A	A
Ammonium bicarbonate	NH ₄ HCO ₃	A	A	A	A	A	A	A	B	A	A	A	A	A
Ammonium chloride	NH ₄ Cl	A	A	A	A	C	A	A	A	A	A	A	A	A
Ammonium diphosphate	(NH ₄) ₂ HPO ₄	A	A	A	A	B	A	A	A	A	A	A	A	A
Ammonium hydroxide	NH ₄ OH	A	A	A	A	B	A	A	C	A	A	A	A	A
Amyl acetate	CHCOOC ₄ H ₁₁	B	B	B	B	B	B	B	A	A	A	A	A	A
Aniline	C ₆ H ₅ NH ₂	C	C	C	C	C	C	C	C	A	A	A	A	A
Asphalt (tar)		A	A	A	A	A	A	A	C	A	A	A	A	A
ASTM oil 1		A	A	A	A	A	A	A	A	A	A	A	A	A
ASTM oil 3		A	A	A	A	A	A	A	A	A	A	A	A	A
B														
Barium chloride	BaCl ₂	A	A	A	A	A	A	A	A	A	A	A	A	A
Benzene	C ₆ H ₆	A	A	A	A	A	A	A	A	A	A	A	A	A
Benzine		A	A	A	A	A	A	A	A	A	A	A	A	A
Benzoic acid	C ₆ H ₅ COOH	B	B	B	A	B	A	B	B	A	A	A	A	A
Bleach	Ca(OCl) ₂	A	A	A	A	C	A	A	A	A	A	A	A	A
Borax	Na ₂ B ₄ O ₇ ·10H ₂ O	A	A	A	A	A	A	A	A	A	A	A	A	A
Butane	C ₄ H ₁₀	A	A	A	A	A	A	A	A	A	A	A	A	A
Butanone		B	B	B	B	B	B	B	B	A	A	A	A	A
Butyl acetate	CHCOOC ₄ H ₉	B	B	B	B	B	B	B	A	A	A	A	A	A
Butyl alcohol (butanol)	C ₄ H ₉ OH	A	A	A	A	A	A	A	A	A	A	A	A	A
C														
Calcium chloride	CaCl ₂	A	A	A	A	B	A	A	A	A	A	A	A	A
Calcium hydroxide	Ca(OH) ₂	A	A	A	A	B	A	A	B	A	A	B	A	A
Calcium sulphate	CaSO ₄	A	A	A	A	A	A	A	A	A	A	A	A	A
Carbon dioxide	CO ₂	A	A	A	A	A	A	A	A	A	A	A	A	A
Carbon disulphide	CS ₂	C	C	C	B	C	C	C	A	A	A	A	A	A

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Carbon tetrachloride	CCl ₄	B	B	B	B	B	C	B	B	A	A	A	A	A
Castor oil		A	A	A	A	A	A	A	A	A	A	A	A	A
Chlorine (dry)	Cl ₂	B	B	B	B	B	B	B	B	B	A	A	A	A
Chlorine water (0.5%)		A	A	A	A	C	A	A	A	B	A	A	A	A
Chlorine (wet)	Cl ₂	C	C	C	C	C	C	C	C	B	A	A	A	A
Chloroform	CHCl ₃	B	B	B	B	B	B	B	B	A	A	A	A	A
Chloromethane	CH ₃ Cl	B	B	B	B	B	B	B	B	A	A	A	A	A
Chromic acid	H ₂ CrO ₄	B	B	B	B	C	B	C	B	C	A	A	A	A
Citric acid	(CH ₂ COOH) ₂ C(OH)COOH	A	A	A	A	A	A	A	A	A	A	A	A	A
Clophen	T64	B	B	B	B	B	B	B	B	A	A	A	A	A
Copper acetate	(CH ₃ COO) ₂ Cu	A	A	A	A	A	A	A	A	A	A	A	A	A
Copper sulphate	CuS ₄	A	A	A	A	A	A	A	A	A	A	A	A	A
Creosote		C	C	C	C	C	C	C	C	A	A	A	A	A
Cresol	C ₆ H ₄ (OH)CH ₃	B	B	B	B	B	B	B	C	A	A	A	A	A
Cyclohexanol	C ₆ H ₁₁ OH	A	A	A	A	A	A	A	A	A	A	A	A	A
Cyclohexanone	C ₆ H ₁₀ O	C	C	C	C	C	C	C	C	A	A	A	A	A
D														
Decalin	C ₁₀ H ₁₈	A	A	A	A	A	A	A	A	A	A	A	A	A
Di-benzylether	(C ₆ H ₅ CH ₂) ₂ O	C	C	C	C	C	C	C	B	A	A	A	A	A
Di-butylphthalate	C ₆ H ₄ (COOC ₄ H ₉) ₂	A	A	A	A	A	A	A	A	A	A	A	A	A
Dimethylformamide	HCON(CH ₃) ₂	C	C	C	C	C	C	C	C	A	A	A	A	A
Diphyl (Dowtherm A)		A	A	A	A	A	A	A	A	A	A	A	A	A
E														
Ethane	C ₂ H ₆	A	A	A	A	A	A	A	A	A	A	A	A	A
Ethyl acetate	CH ₃ COOC ₂ H ₅	B	B	B	B	B	B	B	A	A	A	A	A	A
Ethyl alcohol (Ethanol)	C ₂ H ₅ OH	A	A	A	A	A	A	A	A	A	A	A	A	A
Ethyl chloride	C ₂ H ₅ Cl	B	B	B	B	B	B	B	B	A	A	A	A	A
Ethyl ether	C ₂ H ₅ OC ₂ H ₅	A	A	A	A	A	A	A	A	A	A	A	A	A
Ethylene chloride	(CH ₂ Cl) ₂	C	C	C	C	C	A	C	C	A	A	A	A	A
Ethylene glycol	(CH ₂ OH) ₂	A	A	A	A	A	A	A	A	A	A	A	A	A
F														
Formaldehyde	CH ₂ O	A	A	A	A	A	A	A	B	A	A	A	A	A
Formamide	HCONH ₂	B	B	B	A	B	B	B	B	A	A	A	A	A
Freon 12		A	A	A	A	A	A	A	A	A	A	A	A	A
Freon 22		B	B	B	B	B	A	B	A	A	A	A	A	A
G														
Glucose	C ₆ H ₁₂ O ₆	A	A	A	A	A	A	A	A	A	A	A	A	A

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Glycerine	(CH ₂ OH) ₂ CHOH	A	A	A	A	A	A	A	A	A	A	A	A	A
H														
Heptane	C ₇ H ₁₆	A	A	A	A	A	A	A	A	A	A	A	A	A
Hydraulic oil (mineral/Glycol)		A	A	A	A	B	A	A	A	A	A	A	A	A
Hydraulic oil (phosphate ester)		B	B	B	B	B	B	B	B	A	A	A	A	A
Hydrazine hydrate	(NH ₂) ₂ H ₂ O	A	A	A	A	A	A	A	A	A	A	A	A	A
Hydrochloric acid (20%)	HCl	B	B	B	B	C	A	B	B	A	A	A	C	A
Hydrochloric acid (30%)	HCl	C	C	C	C	C	A	C	C	A	A	A	C	A
Hydrofluoric acid (10%)	HF	C	C	C	C	C	A	C	C	A	A	C	C	A
Hydrogen	H ₂	A	A	A	A	B	A	A	A	A	A	A	A	A
Hydrogen peroxide (<6%ww)	H ₂ O ₂	A	A	A	A	C	A	A	C	A	A	A	A	A
I														
Iso-octane	(CH ₃) ₂ CCH ₂ (CH ₃) ₂	A	A	A	A	A	A	A	A	A	A	A	A	A
Iso-propyl alcohol	(CH ₃) ₂ CHOH	A	A	A	A	A	A	A	A	A	A	A	A	A
K														
Kerosene (petroleum)		A	A	A	A	A	A	A	A	A	A	A	A	A
L														
Lead acetate	(CH ₃ COO) ₂ Pb	A	A	A	A	A	A	A	A	A	A	A	A	A
Lead arsenate	Pb ₃ (AsO ₄) ₂	A	A	A	A	A	A	A	A	A	A	A	A	A
M														
Magnesium sulphate	MgSO ₄	A	A	A	A	A	A	A	A	A	A	A	A	A
Methane	CH ₄	A	A	A	A	A	A	A	A	A	A	A	A	A
Methyl alcohol	CH ₃ OH	A	A	A	A	A	A	A	A	A	A	A	A	A
Methyl chloride	CH ₃ Cl	B	B	B	B	B	B	B	B	A	A	A	A	A
Methyl ethyl ketone	CH ₃ COO ₂ H ₅	B	B	B	B	B	B	B	B	A	A	A	A	A
Methylene chloride	CH ₂ Cl ₂	C	C	C	C	C	B	C	B	A	A	A	A	A
N														
Naphtha		A	A	A	A	A	A	A	A	A	A	A	A	A
Nitrobenzene	C ₆ H ₅ NO ₂	C	C	C	C	C	C	C	C	A	A	A	A	A
Nitrogen	N ₂	A	A	A	A	A	A	A	A	A	A	A	A	A
Nitric Acid	HNO ₃	C	C	C	C	C	B	C	C	C	A	A	B	A
O														
Octane	C ₈ H ₁₈	A	A	A	A	A	A	A	A	A	A	A	A	A
Oleum (fuming sulphuric acid)		C	C	C	C	C	C	C	C	C	A	A	C	A

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Oxalic acid	$\text{HO}_2\text{CCO}_2\text{H}$	B	B	B	B	B	A	B	B	A	A	A	A	A
Oxygen	O_2	A	A	A	A	B	A	A	B	A	A	A	A	A
P														
Pentane	C_5H_{12}	A	A	A	A	A	A	A	A	A	A	A	A	A
Perchloroethylene	C_2Cl_4	B	B	B	B	B	B	B	B	A	A	A	A	A
Petroleum ether		A	A	A	A	A	A	A	A	A	A	A	A	A
Phenol	$\text{C}_6\text{H}_5\text{OH}$	C	C	C	C	C	B	C	C	A	A	A	A	A
Phosphoric acid	H_3PO_4	A	A	A	A	C	A	C	A	A	A	A	A	A
Phthalic acid	$(\text{C}_6\text{H}_4\text{COOH})_2$	A	A	A	A	A	A	A	A	A	A	A	A	A
Potassium acetate	CH_3COOK	A	A	A	A	A	A	A	A	A	A	A	A	A
Potassium carbonate	K_2CO_3	A	A	A	A	A	A	A	B	A	A	A	A	A
Potassium chlorate	KClO_3	A	A	A	A	C	A	A	A	B	A	A	A	A
Potassium chloride	KCl	A	A	A	A	A	A	A	A	A	A	A	A	A
Potassium cyanide	KCN	A	A	A	A	A	A	A	A	A	A	A	A	A
Potassium dichromate	$\text{K}_2\text{Cr}_2\text{O}_7$	A	A	A	A	B	A	A	A	B	A	A	A	A
Potassium hydroxide	KOH	B	B	B	A	B	A	B	B	A	A	C	A	A
Potassium hypochlorite	KClO	A	A	A	A	C	A	B	A	B	A	A	A	A
Potassium nitrate	KNO_3	A	A	A	A	A	A	A	A	A	A	A	A	A
Potassium permanganate	KMnO_4	A	A	A	A	A	A	A	A	B	A	A	A	A
Propane	C_3H_8	A	A	A	A	A	A	A	A	A	A	A	A	A
Pyridine	$\text{C}_5\text{H}_5\text{N}$	C	C	C	C	C	C	C	C	A	A	A	A	A
S														
Salt	NaCl	A	A	A	A	A	A	A	A	A	A	A	A	A
Silicone oil		A	A	A	A	A	A	A	A	A	A	A	A	A
Soda	Na_2CO_3	A	A	A	A	A	A	A	A	A	A	C	A	A
Sodium aluminate	Na_2AlO_3	A	A	A	A	A	A	A	A	A	A	A	A	A
Sodium bisulphite	NaHSO_3	A	A	A	A	B	A	A	A	A	A	A	A	A
Sodium carbonate	NaHCO_3	A	A	A	A	A	A	A	A	A	A	A	A	A
Sodium chloride	NaCl	A	A	A	A	A	A	A	A	A	A	A	A	A
Sodium cyanide	NaCN	A	A	A	A	A	A	A	A	A	A	A	A	A
Sodium hydroxide	NaOH	B	B	B	A	B	A	B	B	A	A	C	A	A
Sodium silicate (water glass)		A	A	A	A	A	A	A	A	A	A	A	A	A
Sodium sulphate	Na_2SO_4	A	A	A	A	A	A	A	A	A	A	A	A	A
Sodium sulphide	Na_2S	A	A	A	A	A	A	A	A	A	A	A	A	A
Steam	H_2O	B	B	B	B	B	B	B	A	A	B	B	B	A
Stearic acid	$\text{C}_{17}\text{H}_{33}\text{COOH}$	A	A	A	A	A	A	A	A	A	A	A	A	A
Sulphur dioxide	SO_2	C	C	C	B	C	A	C	B	A	A	A	A	A
Sulphuric acid	H_2SO_4	C	C	C	C	C	A	C	C	B	A	A	C	A
T														

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Tetrachloroethane	$C_2H_2Cl_4$	B	B	B	B	B	B	B	B	A	A	A	A	A
Tetraline	$C_{10}H_{12}$	A	A	A	A	A	A	A	A	A	A	A	A	A
Toluene	$C_6H_5CH_3$	A	A	A	A	A	A	A	A	A	A	A	A	A
Transformer oil		A	A	A	A	A	B	A	A	A	A	A	A	A
Trichloroethylene	C_2HCl_3	B	B	B	B	B	B	B	B	A	A	A	A	A
Triethanolamine	$N(CH_2CH_2OHO)_3$	A	A	A	A	A	A	A	A	A	A	A	A	A
U														
Urea	$(NH_2)_2CO$	A	A	A	A	A	A	A	A	A	A	A	A	A
V														
Vinyl acetate	$CH_3COOC_2H_3$	A	A	A	A	A	A	A	A	A	A	A	A	A
W														
Water	H_2O	A	A	A	A	A	A	A	A	A	A	A	A	A
Water glass	Na_2SiO_3	A	A	A	A	A	A	A	A	A	A	A	A	A
X														
Xylo	$C_6H_4(CH_3)_2$	A	A	A	A	A	A	A	A	A	A	A	A	A

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