GASKET
Asbestos Sheet

KLINGER

ALPHA GROUP

Compressed Gasket Materials

Klingerit ® 3 x A

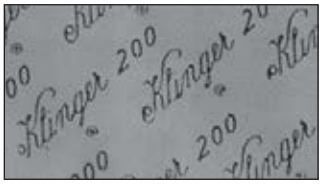
Klingerit Universal ® 3 x A

Klingerit 1000 ®

Klinger Oilit ® 3 x A

Klinger Acidit ®

Klingerit 100 ®



Klinger 200 ®

Klinger 80 ®

Type	Material Description	Operating Guidelines	(see note below*)
Klingerit ® 3xA	Top quality for general purpose use and especially suitable for all steam conditions, compressed air and other gases, chemicals and organic compounds. Composed of SBR binder with long grade chrysotile asbestos fibre. Colour : Red/Brown.	**Max. Temperature** **Max. Pressure**	550°C 130 bar
Klingerit Universal ® 3xA	Oil resistant material of the highest quality composed of long grade chrysotile asbestos fibre with NBR binder. Particularly suitable for use in the aviation industry and with hot oil and thermal fluids. Colour : Blue, (does not contain"blue" asbestos fibre) *Do not retorque fasteners at cryogenic temperatures*	**Max. Temperature** **Max. Pressure** **Min. Temperature**	550°C 140 bar -200°C
Klingerit 1000 ®	Top grade wire reinforced material for extreme service. Recommended for conditions of fluctuating pressure and temperature. Composed of chrysotile asbestos fibre bonded with SBR and reinforced with close mash steel wire. Colour : Black graphite finish.	**Max. Temperature** **Max. Pressure**	550°C 200 bar
Klinger Oilit ® 3xA	Top quality oil and petrol resistant material especially suitable for use with refrigerants. Composed of chrysotile asbestos fibre bonded with NBR. Approved by Water Research Council for use with portable water. Colour : Black *Do not retorque fasteners at cryogenic temperatures*	**Max. Temperature** **Max. Pressure** **Min. Temperature**	550°C 130 bar -200°C
Klinger Acidit ®	High quality acid resistant material with a special binder. Widely used in the chemical industry. Suitable for ceramic and glass flanges. Colour : White	**Max. Temperature** **Max. Pressure**	150°C 20 bar
Klinger 100 ®	High quality material for the oil and petrochemical industries. Composed of chrysotile asbestos fibre with SBR. Colour : Grey *Do not retorque fasteners at cryogenic temperatures*	**Max. Temperature** **Max. Pressure** **Min. Temperature**	510°C 100 bar -200°C
Klinger 200 ®	Medium quality for general purpose use. Composed of chrysotile asbestos fibre bonded with SBR. Colour : Red/Brown	**Max. Temperature** **Max. Pressure**	400°C 40 bar
Klinger 80 ®	Medium quality for general purpose use. Contains chrysotile asbestos fibre bonded with SBR. Colour : Red/Black	**Max. Temperature** **Max. Pressure**	350°C 25 bar

* Note: Maximum temperature and pressure capabilities do not necessarily operate together for all gasket thicknesses and service conditions.

Thickness (mm)	**0.4**	**0.5**	**0.8**	**1**	**1.5**	**2**	**2.5**	**3**	**4**
Tolerances	**size (m)**			**width (mm)**			**Length (mm)**		
Nominal Sheet	1.5 x 2.0			1500			2000		
	1.5 x 1.0			1500			1000		

ALPHA GROUP

GASKET
KLR - 232

KLINGER

A New Grade Medium Range
General Purpose Gasket Jointing

For Steam, Water and Gas Application
Colour : Red / Black

Technical Data

All data are typical values
* for sheet thickness
1.5 mm, 2 mm, 3 mm, 5 mm

Standards : B.S. 1832 B.
IS 2712 1998 Grade W - 3
ASTM F 104 - 71 = SAE J 90 B . F 112 700
Please inquire for other standards

For temperature and pressure limitations please see pT graph. Max. Pressure (BAR)				25
		Max. Temperature Degree C		270
Maximum Permissible Gasket Loading		0.50 mm		70 N/mm²
At 23 Degree C		1.50 mm		50 N/mm²
		3.00 mm		25 N/mm²
Compressibility				
ASTM F / 36 A / BS 2815		%		8
Recovery ASTM / 36 A		%		40
Stress Relaxation				
DIN 52913 , 50 N/mm2 16 H / 300 degree C		N/mm²		17
BS 1832 , 40 N/mm2 16 H / 300 degree C		N/mm²		14
Hot Compression Test , 25 N/mm2				
(Klinger Apparatus)				
Decrease in thickness	23 degree C	%		6
	300 degree C	%		9
Tensile Strength				
DIN 52910, CROSS GRAIN		N/mm²		4
ASTM F 146, CROSS GRAIN		N/mm²		8
Change in Tensile Strength				
ASTM F 146 After Immersion in				
Oil No. 3, 5 H/ 150 degree C		%		-50
Weight Increase				
ASTM F 146 After Immersion in				
FUEL B, 5 H/ 23 degree C		%		20
Increase in Thickness				
ASTM F 146 After Immersion in				
Oil No. 3 , 5 H/ 150 degree C		%		45
FUEL B , 5 H/ 23 degree C		%		30
Ignition Loss DIN 52911		%		24
Specific Gravity				
(Density) approx		gm/cm³		2.15
Gas leakage DIN 3535/4		ml/min		3.00

* Note : Standard Stock

CHEMICAL RESISTANCE CHART

KLINGER

ALPHA GROUP

The information in this chart should only be used as a general guide to the selection of a suitable material. Solid materials shown are to be understood asaqueous solutions or suspensions.

Klingerit 1000, Klinger WB1, Klinger 80
Due to their special formulation it is only possible to predict performance for these materials when all operating conditions are known. They have therefore been omitted from this chart. Please refer to the technical data pages on these products or consult our Technical Services who will be pleased to advise on the most suitable grade for media not included in this chart.

Medium

Medium	Klingerit	Klingerit universal	Klinger 100	Klinger acidit	Klinger oilit	Klinger 200
A						
Acetaldehyde CH_3CHO	A	B	A	A	C	A
Acetamide CH_3CONH_2	A	A	A	A	A	A
Acetic acid 10% CH_3COOH	A	A	A	A	A	A
Acetic acid 100% CH_2COOH	A	A	A	A	A	A
Acetic Ether $CH_3COOC_2H_5$	A	A	A	B	A	B
Acetone CH_3COCH_3	A	B	A	C	B	A
Acetylene C_2H_2	A	A	A	B	A	A
Adipic acid $COOH(CH_2)_4COOH$	A	A	A	A	A	A
Air	A	A	A	A	A	A
Alum KAl $(SO_4)_2$	A	A	A	A	A	A
Aluminium acetate Al $(CH_3COO)_3$	A	A	A	A	A	A
Aluminium chlorate Al $(ClO_3)_3$	A	A	A	A	A	A
Aluminium chloride $AlCl_3$	A	A	A	A	A	A
Ammonia NH_3	A	A	A	A	A	A
Ammoniumbicarbonate NH_4HCO_3	A	A	A	A	A	A
Ammonium chloride NH_4Cl	A	A	A	A	A	A
Ammonium hydroxide NH_4OH	A	A	A	A	A	A
Amyl acetate $CH_3COOC_5H_{11}$	A	A	A	B	B	B
Aniline $C_6H_5NH_2$	A	C	A	B	C	A
Arcton 12 (Freon 12, Frigen 12)	B	A	C	C	A	C
Arcton 22 (Freon 22, Frigen 22)	C	B	C	C	B	C
Asphalt (Tar)	A	A	A	A	A	A
ASTM Oil No. 1	A	A	A	A	A	A
ASTM Oil No. 3	B	A	B	A	A	C
Aviation fuel (Kerosene)	B	A	B	B	A	C
B						
Barium chloride $BaCl_2$	A	A	A	A	A	A
Benzene (Benzol) C_6H_6	B	A	B	B	A	C
Benzoic acid C_6H_5COOH	A	A	A	A	A	A
Blast furnace gas	A	A	A	A	A	A
Bleach liquor Ca $(OCl)_2$	A	A	A	A	A	A
Boiler feed water (alkaline)	A	A	A	B	A	B
Borax $Na_2B_4O_7(H_2O)_{10}$	A	A	A	A	A	A
Boric acid H_3BO_3	A	A	A	A	A	A
Brine NaCl	A	A	A	A	A	A
Butane C_4H_{10}	B	A	B	A	A	B
Butanone (M.E.K)	A	B	A	C	B	B
Butyl acetate $CH_3COOC_4H_9$	A	A	A	B	B	B
Butyl alcohol (butanol) C_4H_9OH	A	A	A	A	A	A
Butyric acid C_3H_7COOH	A	A	A	A	A	A
C						
Calcium chloride $CaCl_2$	A	A	A	A	A	A
Calcium hydroxide (lime water)$Ca(OH)_2$	A	A	A	A	A	A
Calcium hypochlorite $Ca(OCl)_2$	A	A	A	A	A	A
Calcium sulphate $CaSO_4$	A	A	A	A	A	A
Carbolic acid 100% (Phenol)C_6H_5OH	A	B	B	A	B	B
Carbon dioxide CO_2	A	A	A	A	A	A
Carbon disulfide CS_2	C	A	C	C	A	C
Carbon tetrachloride CCl_4	B	A	B	B	B	C
Castor oil	A	A	A	A	A	B
Chlorine (dry) Cl_2	A	A	A	A	A	B
Chlorine (wet)Cl_2	B	B	B	B	B	C
Chlorine water (ca, 0.5%)	A	A	A	A	A	A
Chloroform $CHCl_3$	B	B	B	B	B	C
Chloromethane (Methylchloride)CH_3Cl	C	B	C	C	B	C
Chromic acid, H_2CrO_4	C	B	C	A	B	C
Citric acid $(CH_2COOH)_2C(OH)COOH$	A	A	A	A	A	A
Clophen T 64	C	A	C	B	A	C
Copper acetate Cu $(CH_3COO)_2$	A	A	A	A	A	A
Copper Sulphate $CuSO_4$	A	A	A	A	A	A
Creosote	B	B	B	C	C	B
Cresol $C_6H_4(OH)CH_3$	A	B	A	A	B	B
Cyclohexanol $C_6H_{11}OH$	A	A	A	C	A	B
Cyclohexanone $C_5H_{10}O$	C	C	C	C	C	B
D						
Decalin $C_{10}H_{18}$	B	A	B	B	A	C
Di-ammonium phosphate $(NH_4)_2HPO_4$	A	A	A	A	A	A
Di-benzyl ether $(C_6H_5CH_2)_2O$	A	B	A	B	C	C
Di-butyl phthalate $C_6H_4(COOC_4H_9)_2$	A	A	A	B	A	C
Diesel oil	B	A	B	B	A	C
Dimethyl formamide $HCON(CH_3)_2$	A	C	A	C	C	B
Diphyl (Dowtherm A)	C	A	C	C	A	C
Dye loquor (alkaline, neutral, acidic)	A	A	A	A	A	A
E						
Ethane C_2H_6	A	A	A	A	A	A
Ethyl acetate $CH_3COOC_2H_5$	A	A	A	B	B	B
Ethyl alcohol (ethanol) C_2H_5OH	A	A	A	A	A	A
Ethyl chloride C_2H_5Cl	C	B	C	C	B	C
Ethylene chloride $(CH_2Cl)_2$	A	B	A	C	C	B
Ethylene glycol $(CH_2OH)_2$	A	A	A	A	A	A
Ethyl ether $C_2H_5OC_2H_5$	A	A	A	A	A	A
F						
Fluosilicic acid H_2SiF_6	A	A	A	A	A	A
Formaldehyde HCHO	A	A	A	A	A	A
Formamide H CO NH_2	A	A	A	A	A	B
Formic acid 10% HCOOH	A	A	A	A	A	A
Formic acid 85% HCOOH	A	A	A	A	B	B
Freon 12 Frigen 12 CCl_2F_2	B	A	B	C	A	C
Freon 22 Frigen 22	C	B	C	C	B	C
G						
Glacial acetic acid CH_3COOH	A	A	A	A	A	A
Glycerine $(CH_2OH_2)CHOH$	A	A	A	A	A	A
H						
Heating oil	B	A	B	B	A	C
Heptane C_7H_{16}	B	A	B	A	A	C
Hydraulic oil (Glycol based)	A	A	A	A	A	A
Hydraulic oil (mineral)	B	A	B	B	A	C
Hydraulic oil (phosphate ester)	A	B	A	C	B	B
Hydrazine hydrate $(NH_2)_2H_2O$	A	A	A	A	A	B
Hydrochloric acid 20% HCl	B	B	B	A	B	C
Hydrochloric acid 37% HCl	B	B	B	A	C	C
Hydrofluoric acid 10% HFI	C	C	C	B	C	C
Hydrogen H_2	A	A	A	A	A	A
Hydrogen chloride (dry) HCl	A	A	A	A	A	A
Hydrogen peroxide (up to 6% W.W.)	A	A	A	A	A	A
I						
Iso-octane $(CH_3)_3C\,CH_2\,(CH_3)_2$	A	A	A	A	A	A
Iso-propyl alcohol $(CH_3)_2CHOH$	A	A	A	A	A	A
K						
Kerosene	B	A	B	A	A	C
L						
Lactic acid 50% $CH_3CHOHCOOH$	A	A	A	A	A	A
Lead acetate Pb $(CH_3COO)_2$	A	A	A	A	A	A
Lead arsenate $Pb_3(AsO_4)_2$	A	A	A	A	A	A
Lime water $Ca(OH)_2$	A	A	A	A	A	A
Linseed oil	A	A	A	A	A	B
M						
Magnesium sulphate $MgSO_4$	A	A	A	A	A	A
Malic acid $HOOCCH_2CHOHCOOH$	A	A	A	A	A	A
Methane CH_4	A	A	A	A	A	A
Methyl alcohol CH_3OH	A	A	A	A	A	A
Methylated spirits	A	A	A	A	A	A
Methyl chloride CH_3Cl	C	B	C	C	B	C
Methylene chloride CH_2Cl_2	B	B	B	C	C	C
Methyl ethyl ketone (M.E.K.)$CH_3COC_2H_5$	A	B	A	C	B	B
Mineral oil-ASTM No. 1	A	A	A	A	A	A
Mineral oil-ASTM No. 3	B	A	B	A	A	C
N						
Naptha	B	A	B	B	A	C
Natural gas (Methane) CH_4	A	A	A	A	A	C
Nitric acid 20% HNO_3	B	B	B	A	C	C
Nitric acid 40% HNO_3	C	B	C	A	C	C
Nitric acid 96% HNO_3	C	C	C	A	C	C
Nitrobenzene $C_6H_5NO_2$	C	C	C	C	C	C
Nitrogen N_2	A	A	A	A	A	A
O						
Octane C_8H_{18}	B	A	B	A	A	C
Oleic acid $C_{17}H_{33}COOH$	A	A	A	A	A	B
Oleum (Fuming Sulphuric Acid)	C	C	C	B	C	C
Oxalic acid $(COOH)_2$	B	B	B	A	B	C
Oxygen O_2(check local regulations for use)	A	A	A	A	A	A
P						
Palmitic acid $C_{15}H_{31}COOH$	A	A	A	A	A	B
Paraffin (Kerosene)	B	A	B	A	A	C
Pentane C_5H_{12}	B	A	B	A	A	C
Perchoroethylene C_2Cl_{14}	B	B	B	B	B	C
Petrol	B	A	B	A	A	C
Petroleum ether	A	A	A	A	A	B
Phenol C_6H_5OH	A	B	A	A	B	B
Phosphoric acid (all concs)H_3PO_4	A	A	A	A	A	A
Phthalic acid $(C_6H_4(COOH)_2$	A	A	A	B	A	A
Potassium acetate CH_3COOK	A	A	A	A	A	A
Potassium carbonate K_2CO_3	A	A	A	A	A	A
Potassium chlorate $KClO_3$	A	A	A	A	A	A
Potassium chloride KCl	A	A	A	A	A	A
Potassium chromium sulphate$(K\,Cr(SO_4)_2 12H_2O)$	A	A	A	A	A	A
Potassium cyanide KCN	A	A	A	A	A	A
Potassium dichromate $K_2Cr_2O_7$	A	A	A	A	A	A
Potassium hydroxide KOH	A	A	A	A	A	B
Potassium hypochlorite KClO	A	A	A	A	A	A
Potassium iodide KI	A	A	A	A	A	A
Potassium nitrate (saltpetre) KNO_3	A	A	A	A	A	A
Potassium permanganate $KMnO_4$	A	A	A	A	A	A
Producer gas (generator gas)	A	A	A	A	A	A
Propane C_3H_8	A	A	A	A	A	B
Pydrol	C	A	C	C	A	B
Pyridine C_5H_5N	A	C	A	B	C	B
R						
Rapeseed oil	A	A	A	A	A	B
S						
Salicylic acid $C_6H_4(OH)COOH$	A	A	A	A	A	A
Sea Water	A	A	A	A	A	A
Silicone oil	A	A	A	A	A	A
Skydrol 500	C	C	C	C	C	C
Soap	A	A	A	A	A	A
Soda (sodium carbonate) Na_2CO_3	A	A	A	A	A	A
Sodium aluminate Na_3AlO_3	A	A	A	A	A	A
Sodium bicarbonate $NaHCO_3$	A	A	A	A	A	A
Sodium bisulphite $NaHSO_3$	A	A	A	A	A	A
Sodium chloride (Salt) NaCl	A	A	A	A	A	A
Sodium cyanide NaCN	A	A	A	A	A	A
Sodium hydroxide NaOH	A	A	A	A	A	B
Sodium silicate (water glass)	A	A	A	A	A	A
Sodium sulphate Na_2SO_4	A	A	A	A	A	A
Sodium sulphide Na_2S	A	A	A	A	A	A
Spinning baths (up to 10%) H_2SO_4	B	B	B	A	B	B
Starch $(C_6H_{10}O_5)X$	A	A	A	A	A	A
Steam H_2O	A	A	A	B	A	A
Steam condensate H_2O	A	A	A	B	A	B
Stearic acid $C_{17}H_{35}COOH$	A	A	A	A	A	B
Sugar	A	A	A	A	A	A
Sulphur dioxide SO_2	B	B	B	A	B	C
Sulphuric acid 30% H_2SO_4	B	B	B	A	C	C
Sulphuric acid 50% H_2SO_4	B	B	B	A	C	C
Sulphuric acid 96% H_2SO_4	B	B	B	A	C	C
Sulphurous acid H_2SO_3	B	B	B	A	B	C
T						
Tannic acid $C_{76}H_{52}O_{46}$	A	A	A	A	A	A
Tar (asphalt)	A	A	A	A	A	A
Tartaric acid $(CHOHCOOH)_2$	A	A	A	A	A	A
Tetrachloroethane $C_2H_2Cl_4$	B	B	B	C	B	C
Tetralin $C_{10}H_{12}$	B	A	B	A	A	C
Toluene $C_6H_5CH_3$	B	A	B	B	A	A
Town's gas	A	A	A	A	A	C
Transformer oil	A	A	A	A	A	B
Trichloroethylene C_2HCl_3	B	B	B	B	B	B
Triethanolamine $N(CH_2CH_2OH)_3$	A	A	A	A	A	A
Turpentine	B	A	B	A	A	C
U						
Urea $(NH_2)_2CO$	A	A	A	A	A	A
V						
Vinyl acetate $CH_3COOC_2H_3$	B	A	B	C	A	C
W						
Water H_2O	A	A	A	A	A	A
Water glass $Na_2SiO_3K_2SiO_3$	A	A	A	A	A	A
White Spirit	B	A	B	A	A	C
X						
Xylol $C_6H_4(CH_3)_2$	B	A	B	B	A	C

Note : The symbols used as follows : A: Suitable for application, B: Suitability depends on operating conditions, C: Not suitable