



# Chemical resistance table

The chemical resistance table serves as a guide for the resistance to media of all asbestos-free gaskets. All information is provided in accordance with the current state of knowledge and subject to alteration.

If in doubt, please use our free technical fax service. Details are given inside.



# Chemical resistance table

Medium	Chemical formula		99								Ga	sket	mate	erial
		Top-sil-ML 1	Top-graph 2000		C-4243/4300	C-4304/4324		C-4430/4433		C-6307/6327		C-4408/4438	4439	
		I-lis-	-grap	C-4106	243/4	304/4	C-4400	430/	C-4500	307/	C-8200	408/	409/	209
		Top	Top-	C-4	C-4	C-4	C-4	C-4	C-4;	9-0	C-8	C-4	C-4	C-4
Acetaldehyde	СН₃СНО													
Acetamide	CH <sub>3</sub> CONH <sub>2</sub>		•	•								•		•
Acetic acid 10%	CH₃COOH													
Acetic acid 100% (glacial acetic acid)	CH₃COOH													
Acetic acid ester	$CH_3COOC_2H_5$													
Acetone	CH₃COCH₃													
Acetylene	$C_2H_2$													
Adipic acid	H00C(CH <sub>2</sub> ) <sub>4</sub> C00H													
Air														
Aliphatic hydrocarbons (see under specific name)														
Alcohol (see under specific name)														
Alum	$KAI(SO_4)_2$													
Aluminum acetate	(CH <sub>3</sub> COO) <sub>2</sub> AI OH													
Aluminum chlorate	AI(CIO <sub>3</sub> ) <sub>3</sub>													
Aluminum chloride	$AICI_3$													
Ammonia	$NH_3$													
Ammonium carbonate	$(NH_4)_2CO_3$													
Ammonium chloride	NH <sub>4</sub> CI													
Ammonium hydrogenphosphate (diammonium phosph	nate) (NH <sub>4</sub> ) <sub>2</sub> HPO <sub>4</sub>													
Ammonium hydroxide	NH <sub>4</sub> OH													
Amyl acetate	CH <sub>3</sub> COOC <sub>5</sub> H <sub>11</sub>													
Aniline	$C_6H_5NH_2$													
Anon (Cyclohexanone)	$C_6H_{10}O$													
Arcton 12 (Frigen or Freon 12)	C CI <sub>2</sub> F <sub>2</sub>													
Arcton 22 (Frigen or Freon 22)	CHF <sub>2</sub> CI													
Aromatic hydrocarbons (see under specific name)														
Asphalt (tar)		•												
<b>B</b> arium chloride	BaCl <sub>2</sub>													
Benzene	$C_6H_6$													
Benzoic acid	$C_6H_5COOH$													
Blast furnace gas														
Bleaching liquor (chloride of lime)														
Boiler feed water and boiler water (alkaline)														
Borax	Na <sub>2</sub> B <sub>4</sub> O <sub>7</sub> · 10H <sub>2</sub> O													
Boric acid	B (OH) <sub>3</sub>													
Brine	NaCl													
Butane	C <sub>4</sub> H <sub>10</sub>													
Butanol (butyl alcohol)	C <sub>4</sub> H <sub>9</sub> OH									•				
Butanone (2) (M.E.K.)	$CH_3COC_2H_5$													
Butyl acetates	$CH_3COOC_4H_9$								•					
Butyl alcohol	C <sub>4</sub> H <sub>9</sub> OH		•	•			•		•	•	•		•	
Butylamine	$C_4H_9NH_2$													
Butyric acid	$C_3H_7COOH$		•	•	•	•	•		•	•	•	•	•	•
	J /	_												_

■ Resistant\* Condit. recommended Not recommended

\* Resistant means: Suitable for the appropriate use as a compressed gasket between flange surfaces.

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For your choice of the right gasket we offer you a proven communication concept which leads you step by step to the right decision.

## 1. Application survey

A comparison of the sealing material characteristics with the criteria for typical fields of application gives you a first general survey.

# 2. Documentation of the product:

A technical data sheet is available for every material including the

pT diagram, which demonstrates different material behaviour to further facilitate your choice.

### 3. Resistance to media:

Here you find statements on the resistance of every Klinger gasket material.

	for every material includir	ig the	9											
Medium	Chemical formula				_	_		~			Ga	sket		ri
		ML 1	ИC	4106	4300	4324		4433		632		4438	4436	
		Top-sil-ML	Top-graph	2000 C-4106	C-4243/4300	C-4304/4324	C-4400	C-4430/4433	C-4500	C-6307/6327	C-8200	C-4408/4438	C-4409/4439	
		Тор	Тор	200	C-4	C-4	C-4	C-4	C-4	9-9	6-8	C-4	C-4	,
<b>C</b> alcium chloride	CaCl <sub>2</sub>													(
Calcium hydroxide	Ca(OH) <sub>2</sub>													(
Calcium hypochlorite	Ca(OCI) <sub>2</sub>													(
Calcium sulfate	CaSO <sub>4</sub>													-
Carbolic acid 100% (phenol)	$C_6H_5OH$													
Carbon dioxide	$CO_2$													
Carbon disulfide	$CS_2$													
Carbon tetrachloride	CCI <sub>4</sub>													
Castor oil	<u> </u>	•												
Chlorine (dry)	$CI_2$													
Chlorine (wet)	$CI_2$													ļ
Chlorine water (circa 0,5%)		•												
Chloroform	CHCI <sub>3</sub>													
Chromic acid	$H_2CrO_4$													
Citric acid	(CH <sub>2</sub> COOH) <sub>2</sub> C(OH)COOH	•	•	•	•	•	•	•	•	•	•	•	•	
Clophen T 64	(611/26/611/1/26/611/1/26/611	•	•		•	•	•	•	•			•	•	
Coagulating baths (up to 10%)	H <sub>2</sub> SO <sub>4</sub>	Ť		_						_	_			
Condensation water	H <sub>2</sub> O	_	_		_	_	_	_				_	_	
Copper acetate	(CH <sub>3</sub> COO) <sub>2</sub> Cu				•	•		•		•		•	•	
Copper sulfate	CuSO <sub>4</sub>	•	•		•	•		•		•	•	•		
Cresol	$C_6H_4(OH)CH_3$													
Cyclohexanol	$C_6H_{11}OH$	_	_	_	_	_	_	_		_	_	_	_	
Cyclohexanone (see anon)	<u> </u>													
<b>D</b> ecaline	$C_{10}H_{18}$													
Dibenzyl ether	$(C_6H_5CH_2)_2O$		_			_	_	_	_	_	_	_		
Dibutyl phthalate	$C_6H_4(COOC_4H_9)_2$	_	_	_	_	_	_	_	_	_	_	_	_	
Diesel oil	06114(00004119)2	-	-	-	-	-	-	-	-		-	-	-	
Diethyl ether	$C_2H_5OC_2H_5$	_						-	-	_	-			
Dimethyl formamide	HCON(CH <sub>3</sub> ) <sub>2</sub>	_	_		_	_				_	_	_	_	
Diphyl (Dowtherm A)	110011(0113/2			-										
· · · · · · · · · · · · · · · · · · ·		-	-	_	-	-	-	-	-	-	-	-	-	
Dye baths (alkaline, neutral, acidic)	СП	_	-	_	-	-	_	_	_	_	_	-	-	_
Ethane  Sthane (athyl alashal)	$C_2H_6$	-	-	-	-	-	-	-	-	_	-	-	•	
Ethanol (ethyl alcohol)	<i>C</i> <sub>2</sub> <i>H</i> <sub>5</sub> <i>OH</i>	_	_	_	_	_	_	_	_	_	_	_	_	
Ethyl acetate (acetic ethylester)	CH <sub>3</sub> C00C <sub>2</sub> H <sub>5</sub>													
Ethyl alcohol	C <sub>2</sub> H <sub>5</sub> OH	_	_		_	_	_	_	_	<u> </u>	_	_		
Ethyl chloride	C <sub>2</sub> H <sub>5</sub> CI	_												
Ethylene	$C_2H_4$		<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	A	<u> </u>		<u> </u>	<u> </u>	
Ethylene chloride	(CH <sub>2</sub> CI) <sub>2</sub>		<u> </u>	<u> </u>		<u> </u>	<u> </u>	_						
Ethylenediamine	(CH <sub>2</sub> NH <sub>2</sub> ) <sub>2</sub>		_	_	_	_	_		_		_	_	_	
Ethylene glycol	(CH <sub>2</sub> OH) <sub>2</sub>													
<b>F</b> atty acids from C <sub>6</sub> upwards (see palmitic, ste														
Fluorosilicic acid	$H_2SiF_6$													
Formaldehyde	НСНО													
Subject to technical alternations. 01.2005				•	Resisi	tant*	■ Con	dit. re	comm	ended	/ ▲ No	ot reco	mn	1e

\* Resistant means: Suitable for the appropriate use as a compressed gasket between flange surfaces.



# 3 4. Technical fax service:

Provide us with the data for your sealing situation and you will receive a reliable response from Klinger, often within 24 hours.

# 5. Sealing calculation with the help of your PC:

The efficient computer program

KLINGERexpert® for the experienced specialist. It helps to answer all questions on construction, design and maintenance. Software and on-linehelp on CD-ROM.

# 6. The best way: to test

We will deliver original material for a test under your service conditions.

# 7. On-the-spot advice

With very difficult tasks we will advise you on the spot. We offer adapted designs you on the basis of our standard qualities and special designs for your needs.

The efficient computer program	test under your service co	nditi	ons											
Medium	Chemical formula		000		_			~		_	Ga	sket		rial
		Top-sil-ML 1	Top-graph 2000		C-4243/4300	C-4304/4324		C-4430/4433		C-6307/6327		C-4408/4438	C-4409/4439	
		- <i>Sil-</i>	-gra	C-4106	243/	304/	C-4400	430/	C-4500	307/	C-8200	408/	409/	C-4509
		Тор	Тор	C-4	C-4	C-4	C-4	C-4	C-4	9-9	6-8	C-4	C-4	J7
<b>F</b> ormamide	HCONH <sub>2</sub>													
Formic acid 10%	НСООН													•
Formic acid 85%	НСООН													
Freon 12, Frigen 12, Arcton 12	$CCI_2F_2$													
Freon 22, Frigen 22, Arcton 22	CHF <sub>2</sub> CI													
Fuel oil														•
<b>G</b> enerator gas														•
Glacial acetic acid	CH₃COOH													•
Glycerol	(CH <sub>2</sub> OH) <sub>2</sub> CHOH													•
<b>H</b> eating oil														•
Heptane	$C_7H_{16}$													
Hydraulic oil (mineral)														
Hydraulic oil (phosphate ester type)														
Hydraulic oil (glycol based)												•		•
Hydrazine hydrate	(NH <sub>2</sub> ) <sub>2</sub> H <sub>2</sub> O													•
Hydrochloric acid 20%	HCI													
Hydrochloric acid 37%	HCI													A
Hydrofluoric acid 10%	HF													
Hydrofluoric acid 40%	HF													
Hydrogen	$H_2$													•
Hydrogen chloride (dry)	НСІ													
Hydrogen peroxide (up to 6% by weight)	H <sub>2</sub> O <sub>2</sub>													•
Isooctane (2, 2, 4 -trimethylpentan)	(CH <sub>3</sub> ) <sub>3</sub> CCH <sub>2</sub> CH(CH <sub>3</sub> ) <sub>2</sub>													•
Isopropyl alcohol	(CH <sub>3</sub> ) <sub>2</sub> CH0H													•
Kerosene														•
Lactic acid 50%	СН₃СНОН СООН													•
Lead acetate (sugar of lead)	(CH <sub>3</sub> COO) <sub>2</sub> PB													•
Lead arsenate	$Pb_3(AsO_4)_2$													•
Lime water	Ca(OH) <sub>2</sub>													
Linseed oil														•
Lubricating oil (see mineral oils)														
<b>M</b> agnesium sulfate	$MgSO_4$													•
Malic acid	H00C-CH0H-CH <sub>2</sub> -C00H													•
M.E.K. (2-butanone)	CH <sub>3</sub> COC <sub>2</sub> H <sub>5</sub>													
Methane	CH <sub>4</sub>													•
Methyl alcohol (methanol)	CH₃OH	•		•	•	•	•	•	•	•	•		•	•
Methyl chloride	CH <sub>3</sub> CI													
Methylene chloride	CH <sub>2</sub> CI <sub>2</sub>													A
Mineral oil - ASTM Oil No. 1														
Mineral oil - ASTM Oil No. 3									•				•	•
Monochlormethane	CH <sub>3</sub> CI													



The recommendations given here are intended to be an aid in the selection of the suitable gasket quality. It is not possible to provide a warranty because the function and durability of the products depend largely a number of factors over which the manufacturer has no influence. Should there be special approval regulations, these have to be complied with.

The nomenclature of the media corresponds to the IUPAC (German nomenclature commission): e.g. chemical compounds which are written with Ae are changed to E and can be found under this letter in the alphabet.

Medium	Chemical formula		00					_			Ga	sket		rial
		/L 1	Top-graph 2000		C-4243/4300	1324		C-4430/4433		C-6307/6327		C-4408/4438	1439	
		Top-sil-ML 1	grap	90	43/4	04/4	00	130/1	00	3//0	90	108/4	109/4	60
		Тор-	Тор-	C-4106	C-42	C-4304/4324	C-4400	C-44	C-4500	£9-J	C-8200	C-44	C-4409/4439	C-4509
<b>N</b> aphtha													•	•
Natural gas														
Nitric acid 20%	HNO <sub>3</sub>													
Nitric acid 40%	HNO <sub>3</sub>													
Nitric acid 96%	HNO <sub>3</sub>													
Nitrobenzene	$C_6H_5NO_2$													
Nitrogen	$N_2$													
<b>O</b> ctane														
Oleic acid	C <sub>17</sub> H <sub>33</sub> C00H													
Oleum (fuming sulfuric acid))	$H_2SO_4$ with free $SO_3$													
Oxalic acid	(COOH) <sub>2</sub>													
Oxygen (check local regulations for use)	$O_2$													
Palmitic acid	C <sub>15</sub> H <sub>31</sub> C00H													
Paraffin (kerosene)														
Pentane	$C_5H_{12}$													
Perchlorethylene	$C_2CI_4$													
Petrol (fuel)														
Petroleum														
Petroleum ether														
Phenol	<i>C<sub>6</sub>H<sub>5</sub>OH</i>													
Phosphoric acid (all concentrations)	H <sub>3</sub> PO <sub>4</sub>													
Phthalic acid	$C_6H_4(COOH)_2$													
Potassium acetate	CH₃COOK													
Potassium carbonate	K <sub>2</sub> CO <sub>3</sub>													
Potassium chlorate	KCIO <sub>3</sub>													
Potassium chloride	KCI													
Potassium chromium sulfate	KCr(SO <sub>4</sub> ) <sub>2</sub> · 12H <sub>2</sub> O													
Potassium cyanide	KCN													
Potassium dichromate	K <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub>													
Potassium hydroxide	КОН													
Potassium hypochlorite (eau de Javelle)	KOCI													
Potassium iodide	KJ													
Potassium nitrate (salpetre)	KNO <sub>3</sub>													
Potassium permanganate	KMnO <sub>4</sub>													
Propane	$C_3H_8$													
Pyridine	$C_5H_5N$													
Rapeseed oil														
R134a	CH <sub>2</sub> FCF <sub>3</sub>		•											
<b>S</b> alicylic acid	C <sub>6</sub> H <sub>4</sub> (OH)COOH		•		•	•	•	•	•	•	•	•		
Salt (rock salt)	NaCl				•	•	•	•	•	•	•	•		
Sea water					•	•	•	•	•	•	•	•		
Silicone oil					•	•	•	•	•	•	•			
Skydrol 500														
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\* Resistant means: Suitable for the appropriate use as a compressed gasket between flange surfaces.

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Resistant\* ■ Condit. recommended ▲ Not recommended



# Certified according to DIN EN ISO 9001:2000

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		http://www.klinger.co.at  Gasket material												
Medium	Chemical formula	1	000:		00	4		33		75	Ga			rial
		-ML	ph 2		/430	/432		/443		/632		/443	/443	
		Top-sil-ML 1	Top-graph 2000	C-4106	C-4243/4300	C-4304/4324	C-4400	C-4430/4433	C-4500	C-6307/6327	C-8200	C-4408/4438	C-4409/4439	C-4509
Coop		To	70	Ċ	Ċ	Ċ	Ċ	Ċ	Ċ	C	<u>C</u>	Ċ	C	<u>\( \)</u>
Soap  Sodo (codium corbonato)	No. 00	_	-	-	-	-	-	-	-	•	-	-	_	_
Soda (sodium carbonate)	Na <sub>2</sub> CO <sub>3</sub>	_	•	-	•	•	•	-	-	•	•	•	_	_
Sodium aluminate	Na <sub>3</sub> AIO <sub>3</sub>						-		_			-	_	_
Sodium hydrogencarbonate	NaHCO <sub>3</sub>	_	-	-		•		-		-	-	-	_	_
Sodium hydrogensulfite	NaHSO <sub>3</sub>	_	•	•	•	•	•	•	•	•	•	•	_	_
Sodium chloride (Salt)	NaCl		•	•	•	•	•		•		•	•	_	_
Sodium cyanide	NaCN	_	_	_	_	_	_	_	•	_	•	_	_	_
Sodium hydroxide	NaOH	_	_	_		_	_	_	•	_	•	_	_	_
Sodium silicate (water-glass)	$Na_2SiO_3K_2SiO_3$	_	•	•	•	•	•	•	•	•	•	•	_	_
Sodium sulfate	Na <sub>2</sub> SO <sub>4</sub>	_	•	_	•	•	•	•	•	•	•	•	_	_
Sodium sulfide	Na <sub>2</sub> S	_	•		•	•	•	•	•	•	•	•	_	_
Spirit			•		•	•	•				•	•		
Starch	$(C_6H_{10}O_5)_n$													
Steam (temperature limit see pT-diagram)	$H_2O$													
Stearic acid	C <sub>17</sub> H <sub>35</sub> COOH													
Sugar														
Sulfur dioxide	SO <sub>2</sub>													
Sulfuric acid 20 %	H <sub>2</sub> SO <sub>4</sub>													
Sulfuric acid 50 %	H <sub>2</sub> SO <sub>4</sub>													
Sulfuric acid 96 %	H <sub>2</sub> SO <sub>4</sub>													
Sulfurous acid	H <sub>2</sub> SO <sub>3</sub>													
<b>T</b> annic acid	$C_{76}H_{52}O_{46}$													
Tar (asphalt)														
Tartaric acid	(CH0HC00H) <sub>2</sub>													
Tetrachlorethane	$C_2H_2CI_4$													
Tetralin (1, 2, 3, 4 -tetrahydronaphtalene)	$C_{10}H_{12}$													
Toluene	$C_6H_5CH_3$													
Town gas														
Transformer oil														
Trichlorethylene	$C_2HCI_3$													
Triethanolamine	$N(CH_2CH_2OH)_3$													
Turpentine														
<b>U</b> rea	(NH <sub>2</sub> ) <sub>2</sub> CO		•	•	•		•		•		•	•		
Vinyl acetate	$CH_3COOC_2H_3$				•							•		•
<b>W</b> ater	H <sub>2</sub> 0		•	•					•		•	•		
Water-glass	$Na_2SiO_3K_2SiO_3$			•					•					•
White Spirit				•										
<b>X</b> ylene	C <sub>6</sub> H <sub>4</sub> (CH <sub>3</sub> ) <sub>2</sub>		•			•	•							

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