



CarSIK Seal Faces and Bearings – Figures, Technical Data and Facts

Corrosion Behavior of CarSIK

Agent	Chem. formula	Concentration %	CarSIK-NT		CarSIK-CT		CarSIK-SD	
			RT	50°C	RT	50°C	RT	50°C
Acetone	CH ₃ COCH ₃	conc.	++	++	++	++	++	++
Acetyl chloride	CH ₃ COCl	conc.	++	++	++	++	++	++
Aluminum chloride	AlCl ₃	10	++	++	++	++	++	++
Ammonia, aqueous solution	NH ₃	conc. (25%)	++	+	++	++	++	++
Ammonium chloride	NH ₄ Cl	25	++	++	++	++	++	++
Ammonium fluoride	NH ₄ F	20	+	-	+	-	++	++
Ammonium nitrate	NH ₄ NO ₃	50	++	++	++	++	++	++
Aniline	C ₆ H ₅ NH ₂	conc.	++	++	++	++	++	++
Aqua regia	HCl/HNO ₃	conc., 3:1	++	++	++	++	++	++
Benzoic acid	C ₆ H ₅ COOH	alcoholic sol.	++	++	++	++	++	++
Benzene	C ₆ H ₆	conc.	++	++	++	++	++	++
Boric acid	H ₃ BO ₃	cold sat. sol.	++	++	++	++	++	++
Bromine, aqueous solution	Br ₂	cold sat. sol.	++	++	++	++	++	++
Calcium oxide	CaO	cold sat. sol.	++	++	++	++	++	++
Carbon tetrachloride	CCl ₄	conc.	++	++	++	++	++	++
Citric acid	C ₆ H ₈ O ₇	50	++	++	++	++	++	++
4-chlorotoluene	CH ₃ C ₆ H ₄ F	conc.	++	++	++	++	++	++
Chromosulphuric acid	CrO ₃ /H ₂ SO ₄	conc.	++	++	++	++	++	++
Copper(II)-chloride	CuCl ₂	40	++	++	++	++	++	++
Copper(II)-sulfate	CuSO ₄	25	++	++	++	++	++	++
1,4-dioxane	C ₄ H ₈ O ₂	conc.	++	++	++	++	++	++
Ethanol	C ₂ H ₅ OH	conc.	++	++	++	++	++	++
Ethyl acetate	CH ₃ COOC ₂ H ₅	conc.	++	++	++	++	++	++
Fluorosilicic acid	H ₂ SiF ₆	conc.	++	++	++	++	++	++
Formic acid	HCOOH	conc.	++	++	++	++	++	++
Glycerol	C ₃ H ₈ O ₃	conc.	++	++	++	++	++	++
Hydrofluoric acid	HF	conc., 40	+	-	+	-	++	++
Hydrochloric acid	HCl	conc., 36	++	++	++	++	++	++
Hydrofluoric acid - nitric acid	HF/HNO ₃	conc., 3:1	-	-	-	-	++	+
Hydrogen peroxide	H ₂ O ₂	30	++	++	++	++	++	++
Iron(III)-chloride	FeCl ₃	45	++	++	++	++	++	++
Iron(II)-sulfate	FeSO ₄	25	++	++	++	++	++	++
Lithium hydroxide	LiOH	10	++	+	++	+	++	++
Magnesium sulfate	MgSO ₄	4	++	++	++	++	++	++
Mercury(II)-nitrate	Hg(NO ₃) ₂	10	++	++	++	++	++	++
Methanol	CH ₃ OH	conc.	++	++	++	++	++	++

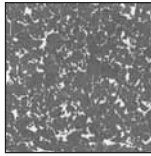
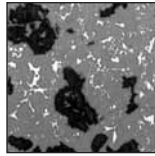
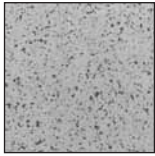
++ resistant · + partially resistant · - not resistant · -¹ solution boiling

Agent	Chem. formula	Concentration %	CarSIK-NT		CarSIK-CT		CarSIK-SD	
			RT	50°C	RT	50°C	RT	50°C
Mixed acid	H ₂ SO ₄ +H ₃ PO ₄	conc., 1:1	++	++	++	++	++	++
Nitric acid	HNO ₃	conc., 65	++	++	++	++	++	++
Oleic acid	C ₁₇ H ₃₃ COOH	conc.	++	++	++	++	++	++
Oxalic acid	(COOH) ₂	cold sat. sol.	++	++	++	++	++	++
Phosphoric acid	H ₃ PO ₄	conc., 85	++	++	++	++	++	++
Phthalic acid	C ₆ H ₄ (COOH) ₂	alcoholic sol.	++	++	++	++	++	++
Potash lye	KOH/H ₂ O	30	-	-	-	-	++	+
Potash lye	KOH/H ₂ O	20	+	-1	+	-1	++	-1
Potassium chloride	KCl	cold sat. sol.	++	++	++	++	++	++
Potassium chromate	K ₂ CrO ₄	35	++	++	++	++	++	++
Potassium nitrate	KNO ₃	20	++	++	++	++	++	++
Potassium permanganate	KMnO ₄	5	++	++	++	++	++	++
Propionic acid	CH ₃ CH ₂ COOH	conc.	++	++	++	++	++	++
Pure acetic acid	CH ₃ COOH	conc.	++	++	++	++	++	++
Salicylaldehyde	C ₇ H ₆ O ₂	conc.	++	++	++	++	++	++
Silver nitrate	AgNO ₃	10	++	++	++	++	++	++
Sodium carbonate	Na ₂ CO ₃	15	++	++	++	++	++	++
Sodium chloride	NaCl	cold sat. sol.	++	++	++	++	++	++
Sodium fluoride	NaF	4	++	+	++	+	++	++
Sodium hydroxide	NaOH	10	+	-	+	-	++	+
Sodium hydroxide	NaOH	30	-	-1	-	-1	++	-1
Sodium hypochlorite	NaOCl	12,5 % free Cl	++	++	++	++	++	++
Sodium metaborate	NaBO ₂	20	++	++	++	++	++	++
Sodium peroxide	Na ₂ O ₂	10	++	++	++	++	++	++
Sodium sulfide	Na ₂ S	50	++	++	++	++	++	++
Sodium thiosulphate	Na ₂ S ₂ O ₃	40	++	++	++	++	++	++
Sulphuric acid, oleum	H ₂ SO ₄ +SO ₃	30 % free SO ₃	++	++	++	++	++	++
Sulphuric acid	H ₂ SO ₄	conc., 98	++	++	++	++	++	++
Sulphuric acid	H ₂ SO ₄	50	++	++	++	++	++	++
Sulphurous acid	H ₂ SO ₃	5-6 % SO ₂	++	++	++	++	++	++
Tartaric acid	C ₄ H ₆ O ₆	10	++	++	++	++	++	++
Tetrachloroethylene	C ₂ Cl ₄	conc.	++	++	++	++	++	++
Tetrafluoroboric acid	BF ₄	conc.	+	+	+	+	++	++
Trisodium phosphate	Na ₃ PO ₄	10	++	++	++	++	++	++
Urea	H ₂ N-CO-NH ₂	cold sat. sol.	++	++	++	++	++	++
Zinc chloride	ZnCl ₂	60	++	++	++	++	++	++

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Seal Rings and Bearings

Material Data Sheet CarSIK

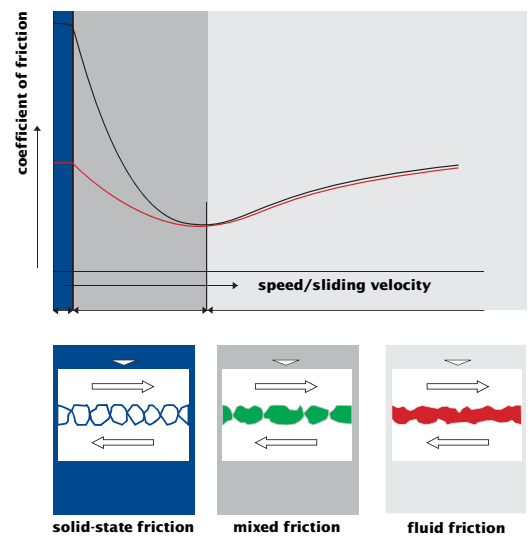
		CarSIK-NT	CarSIK-CT	CarSIK-SD
Optical Micrographs:				
Open Porosity	vol.%	0	0	0
Density	g/cm ³	3.09	2.90	3.10
Flexural Strength (4-point)	MPa	280	120	390
Compressive Strength	MPa	3000	650	3800
Young's Modulus	GPa	360	260	400
Vickers Hardness		2800	2800	2800
Coefficient of Thermal Expansion (RT -400 °C)	10 ⁻⁶ /K	3.9	3.9	4.0
Thermal Conductivity (RT)	W/mK	120	120	110
SiC Content	weight %	88	75	99
free carbon	weight %	0	15	0
free silicon	weight %	12	10	0

The Stribeck curve:

By means of the Stribeck curve, the curve of the coefficient of friction of a bearing, which is lubricated with oil or grease, can be illustrated during the different friction and lubrication phases. During the starting phase, the static friction is followed by the solid-state friction (high coefficient of friction/high wear).

With increasing velocity, the sliding surfaces are partially separated by the lubricating film during the mixed friction phase (medium coefficient of friction/medium wear). Exactly at this spot, the emergency running film, which is formed by solid lubricants, then serves as protection (see red curve).

With higher velocities, a hydrodynamic liquid film separates the sliding faces (comparable with aquaplaning) from each other. In this phase of fluid friction the lowest wear is obtained.



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