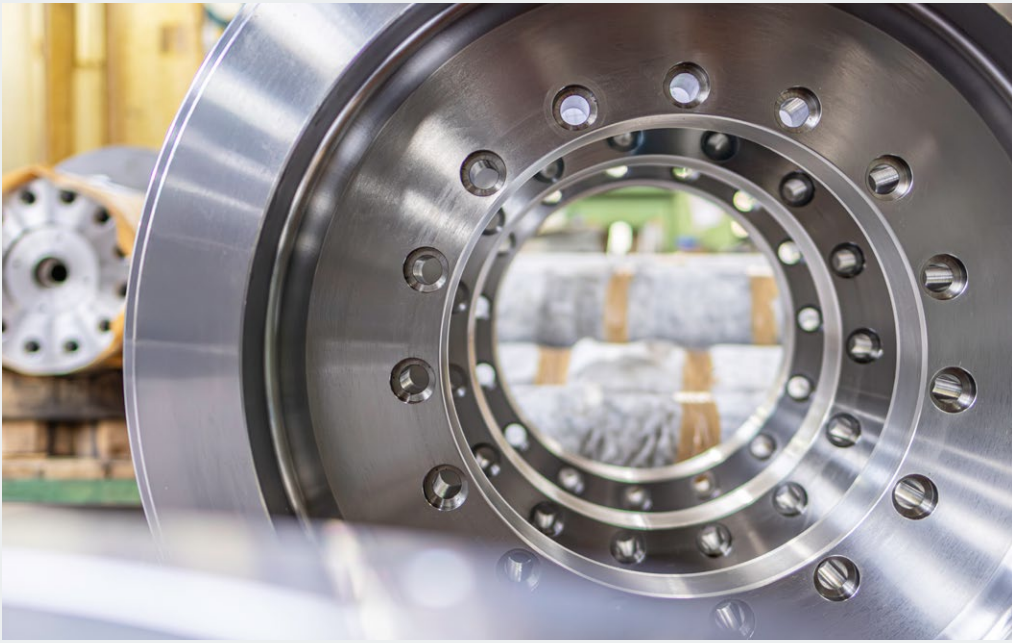
Schnarr
OBERFLÄCHENTECHNIK

TECHNICAL DETAILS

KANIGEN®
KANISIL®/KANISIL®PLUS
KANIFLON®
HARD CHROME/KANICHROM®
PRECISION CYLINDRICAL GRINDING



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KANIGEN® is the German abbreviation of "**ca**talytic **ni**ckel **gen**eration". The brand name KANIGEN® is internationally renowned as the most tested and proven method of electroless nickel plating. From the basic KANIGEN® process two methods were developed with great effort and money: KANISIL® and KANIFLON®. The combination processes KANICHROM® und KANISIL®PLUS developed in combination with hard chrome.

The KANIGEN® group guarantees uniform layer thicknesses and offers an ideal solution for wear and corrosion problems in always reproducible quality of the highest level.

With its aid, increases in service life can be achieved with simultaneous cost reduction by the use of low-quality base material. Almost all materials can be finished. In addition to the KANIGEN® coatings, SCHNARR also executes hard chrome plating and all upstream and downstream processing such as grinding, polishing, finishing, as well as corund or glass-ball blasting.

Processing of large-dimensioned workpieces and repairs with accurate-to-dimension coat application are our specialities.

CONTENTS:

Chemical composition and suitability

Coat	Composition	Recommended against
KANIGEN®	Electroless nickel, a nickel-phosphorus alloy (about. 90 % Ni, 10 % P)	Corrosion, wear
KANISIL®	KANIGEN® with 20-25 Vol. % SiCIncorporation	Wear, corrosion
KANISIL®PLUS	Combination coat KANIGEN®, KANISIL® and/or hard chrome	Wear, corrosion, adhesion
KANICHROM®	Combination coat KANIGEN® and hard chrome	Corrosion, wear
KANIFLON®	KANIGEN® with 20 Vol.-% PTFE incorporation	Adhesion, seizing, corrosion
Hard chrome	Hard chrome plating – proven since 80 years – in different versions such as for e.g. double chrome and multi chrome	Wear, corrosion, adhesion

Typical applications

Sector	Applications
Automotive industry	Parts for brakes, cylinder liners, core moulds for foundries, foam moulds
Chemical industry	Filter parts, diverse milling, screw conveyor, compressors
Printing and paper industry	Gravure, plate and impression cylinders, calendar roll, thrust bearing, glue application roller, brush roller and embossing roller, wiper, paper cutting table
Petroleum industry	Plug valves for oil and gas pipes, components for meters, pipelines
Foundry and model making	Core boxes, sand casting moulds, models
Food industry	Blenders, kneaders, measuring devices, separators, presses, transporting devices
Plastic industry	Smoothing rolls, perforated sheets, moulded tools, extruder nozzles, spirals and housings, calibrations
Mechanical engineering industry	Pump shafts, piston rods, components for hydraulic engineering, ball-bearing components, springs, valves, frames, plates, oil troughs
Nuclear industry	Pipelines, stop valves, compensator parts
Aerospace/ Aircraft construction	Parts for hydraulic engineering, control elements, valves, modules, aluminium structures
Shipbuilding	Shafts, rollers
Textile industry	Bobbins, eyelets, thread castors, rollers, godets, extension tracks
Vacuum technology	Dry pumps, diffusion pumps

Coefficients of friction

Materials	Without lubrication	With lubrication
KANIGEN® against nickel plating	Seizing	0.26
KANIGEN® against KANIGEN®	0.45	0.25
KANIGEN® against steel	0.38	0.21
KANIGEN® against cast iron	0.16	0.08
KANIGEN® against chrome	0.43	0.30
KANIGEN® against KANIFLON®	0.10	0.10 – 0.05

NOTE:
Please note that the finishing result is also essentially influenced by the quality and type of base material. Moreover, our process is continuously advanced so that it is subject to changes.

You can receive exact, reproducible results via sample machining on original workpieces.

Coat properties

Coat	Recommended layer thickness[1] µm with corrosion exposure			
	Mild	Moderate	Strong	Very strong
KANIGEN®	< 10	25	50	≥ 50
KANIGEN® Heat treated 290°C	< 10	25	50	≥ 50
KANISIL® Heat treated 290°C	10	25	40	≥ 50
KANISIL®PLUS	20	30	40	≥ 50
KANICHROM®	20	30	50	≥ 60
KANIFLON®	< 10	15	25	≥ 40
Hard chrome[3]	< 20	20 – 30	> 50	ca. 100

Coat	**Salt spray test** Attainable no. of hours according to SS DIN 50021	**Kesternich test** SFW 2.S DIN 50018 attainable no. of cycles	**Abrasion resistance** Taber 1,000 g/ 1,000 U	**Surface hardness** HV 0.05
KANIGEN®	[2]1.000	8	9.6	560 – 580
KANIGEN® Heat treated 290 °C	700	6	4.5	ca. 1,000
KANISIL® Heat treated 290 °C	700	6	0.6 – 0.8	bis 1,200
KANISIL®PLUS	2.000	10	0.8 – 1.2	bis 1,200
KANICHROM®	[2]2.000	10	1 - 2	ca. 1,000
KANIFLON®	800	8	-	350 – 450
Hard chrome[3]	120	10	1 – 2	ca 1,000

Workpiece dimensions

Area	Processable material sizes [mm]	Max. weight Per workpiece
KANIGEN®	4,000 x 2,600 x 2,100 10,000 x 1,000 x 850	> 12.6 t
KANISIL® KANISIL®PLUS	3,900 x 1,400 x 800	> 12.6 t
KANICHROM®	10,000 x 1,000 x 850	> 12.6 t
KANIFLON®	3,250 x 1,000 x 800	> 12.6 t
Hard chrome	~ 13,000 x 1,100 x 1,100 ~ Ø 1,400 x 7,600	> 20.0 t
Grinding	~ Ø 1,400 x 13,000	> 20.0 t
Polishing, finishing	~ Ø 1,400 x 13,000	> 20.0 t
Belt grinding	~ Ø 1,400 x 12,000	> 8.5 t

The values listed here are in accordance with the general state of technology and the specifications of the DIN EN ISO 4527. However, generally, we are in a position to produce qualities that go far beyond the above-mentioned parameters.

NOTE: The specifications in mm are approximate sizes. Oversize workpieces can be processed in individual cases and after consultation. Interior finishings are possible till 120,000 l.

1) We precipitate the layers of the KANIGEN® group with a tolerance of up to ±2 %.
2) The coats have been tested for a number of years in seawater.
3) According to the tolerance range, the precision is achieved by additional mechanical processing.

KANIGEN®-Corrosion table

2 Ethyl hexoid acid + water	–	Citric acid 5%	–	Phosphoric acid 85%	–
2.4–Dichlorophenol	–	Cobalt	+	Photo developer	+
Acetaldehyde	+	Coconut oil fatty acids	+	Photo–fixing sodium bicarbonate	+
Acetic acid 5 – 50%	–	Cresy compounds	+	Polyvinyl acetate	+
Acetone	+	Cyanogen compounds liquid	–	Polyvinyl acetate 90°C	–
Acetylene bromide	+	Dibutylphthalate	+	Pure acetic acid	–
Acrylonitrile	+	Dimethyldithiocarbamate	–	Refined salt solution	+
Alkyl chloride	+	Ethyl alcohol	+	Resin (alkyd)	+
Alum	–	Ethylene dibromide	+	Resin (amine)	+
Aluminium sulphate	–	Ethylene glycol	+	Resin (paste)	+
Ammonium chloride	–	Fatty acids	+	Resin (polyester)	+
Ammonium hydroxide	–	Fatty acids 150°C	–	Schwefelamon	+
Ammonium nitrate	–	Fluorine phosphoric acid	–	Sodium carbonate	+
Ammonium nitrite	–	Formaldehyde 37%	+	Sodium chloride	–
Ammonium phosphate	–	Formic acid sodium	–	Sodium cyanide	–
Ammonium sulphate	–	Gasoline	+	Sodium dithionite	+
Ammonium thiocyanate	+	Hydrochloric acid pH 1.5 – 4	–	Sodium dithionite 120°C	–
Amyl acetate	+	Insektiol	+	Sodium hydroxide	+
Amyl alcohol	+	Lemon juice	–	Sodium hypochlorite	–
Amyl chloride	+	Isoamyl–8–orthophosphate	+	Sodium sulphite	+
Aniline (chlorinated)	–	Methyl alcohol	+	Sorbitol	+
Barium chloride	–	Milk acids 45%	–	Stearic acid	+
Benzene	+	Milk acids 80%	+	Sugar	+
Benzyl acetate	+	Monochloro acetic acid	–	Sulphuric acid 1% – conc.	–
Benzyl chloride	–	Monochlorobenzene + 5% water	–	Tallow oil	+
Bleach	–	Naphtaline	+	Tallow oil acetate	+
Borax solution	+	Nitric acid 1% – conc.	–	Tallow oil fatty acids	+
Boric acid solution	–	Nitrofertiliser	–	Tallow oil fatty acids 170 °C	–
Bromine (dry gas)	+	Nitrotoluol	–	Tallow oil resin	+
Bromine water	–	o–Dichlorobenzene	+	Trichloroethylene	+
Caprolactam	+	o–Dichlorobenzene + 5% water	–	Trimethyl–phosphoric acid salt	+
Carbon disulphide	+	Oleic acid	+	Trimethyl–phosphoric acid salt 5% water	–
Chloral	+	Orange juice	+	Urea	+
Chloral 90%	–	p–Dichlorobenzene	+	Water deionised	+
Chlorine calcium solution 40 – 1%	–	p–Dichlorobenzene + 5% water	–	Water distilled	+
Chlorine calcium solution 48.5%	+	Perchloroethylene	+	Wine	–
Chlorine carbon	+	Petrol	+	Zinc–chloride ammonium	–
Chromic acid	–	Petroleum	+		

+ suitable **–** unsuitable

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