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# STI Coating Finder

English

Surface solutions by STI Group



STI-12-J02-E



STI Group process	Properties	Corrosion protection*				Wear protection*	Hardness	Applications
		Halogenides	Acid exhaust gases	Nitric acid	Cleaning agents			
<b>Galvanic treatment</b>								
Hard chrome plating	Excellent hardness, good wear protection, corrosion protection (particularly against sulph. exhaust gas), erosion protection, excellent layer adhesion, anti-adhesive, low friction coefficient, no distortion of base material, very cost-effective, free from pores, homogeneous layer structure, not toxic or allergenic, layers up to 1 mm, friction coeff. with 100 Cr6 steel 0.06 - 0.12 (aluminium 0.07 - 0.14), max. applic. temp. 800 - 1,300 °C	(x)	x	x	x	x	850 – 1,050 HV 0.1 (höher auf Anfrage)	Cooling, drying, casting, calender, lead rollers, deviating rollers, rods, screen baskets, press, diecast, tools for injection moulding, drawing, stamping, sintering and extrusion, piston crowns of 2- and 4-stroke engines, piston rings, skirts and rods for hydraulics/pneumatics, bridge bearings, turbine shafts, cylinder liners, bearing trunnions, seal seats, ball valves, cooling pump shafts, axle protection, valve bodies, weaponry barrels, aircraft undercarriages, custom-made parts
Dimensional hard chrome plating	Highly cost-effective, layer thickness up to 0.1 mm	(x)	x	x	x	x	850 – 1,050 HV 0.1	Piston crowns (landing surfaces) and rods for hydraulics/pneumatics, piston skirts, weaponry barrels, ball valves
Thick hard chrome plating	High geometric precision, high-gloss surfaces through grinding and polishing, layer thickness up to 1 mm	(x)	x	x	x	x	850 – 1,050 HV 0.1	Ring grooves for piston crowns, bridge bearings, reconditioning layers
Triplex chrome triplex/multilayer	Low-pore layer, high geometric precision, high-gloss surfaces through grinding and polishing	(x)	x	x	x	x	850 – 1,050 HV 0.1	Piston bowls, piston crowns, piston rings, cylinder liners
Matt hard chrome plating	Individually reproducible texture (anti-adhesive in parts), definable degrees of gloss	(x)	x	x	x	x	850 – 1,050 HV 0.1	Cooling rollers, damping rollers, cooling rollers for converting processes
STI AlpineCoat®	Reproducible, definable topographies, surface roughness 0.05 µm < Rz < 100 µm	(x)	x	x	x	x	850 – 1,050 HV 0.1	
Hydrophilic hard chrome surfaces	Optimised surface energy for defined liquid transfer	(x)	x	x	x	x	850 – 1,050 HV 0.1	Application and dosing rollers for the production of speciality paper
Hartchrom Teikuro process**	Extremely smooth, low friction layer, high wear protection, improved demoulding, friction coefficient with 100 Cr6 steel 0.06 - 0.12 (aluminium 0.07 - 0.14), reduced cold-welding effect, max. applic. temp. 400 °C	(x)	x	x	x	x	850 – 1,100 HV 0.1	Cast iron and steel tools for forming thin steel and aluminium sheeting, geometrically complex tools for the automotive industry, plastic injection moulding and press forming tools, metal sheets, forming tools, ball valve plugs
Nanochrome	Anti-adhesive surfaces, surface energy 10 – 20 mJ/m2, max. application temperature up to 300 °C	(x)	x	x	x	x	850 – 1,050 HV 0.1	Lead rollers, nozzles
Diamond chrome	Suitable for high temperatures, extremely good wear protection, good lubrication characteristics	(x)	x	x	x	x	950 – 1,100 HV 0.1	Highly stressed tribological components, drilling rods, heavy duty plain bearings, in particular in lubricated systems
Chrome ceramic	Suitable for high temperatures, good wear protection, good lubrication characteristics	(x)	x	x	x	x	950 – 1,100 HV 0.1	Drilling rods, heavy duty plain bearings, tribological components, in particular in lubricated systems
Electroless nickel high-phos Nitrag®	True to size and contours, x-ray amorphous, non-magnetic, excellent ductility, very good corrosion protection, phosph. content up to 12% by weight, free from pores, suitable for food processing, good brazeability, compliant to EN IS= 4527, RAL-RG 660, Mil-C-26074B and AMS 2404B, max. application temperature 400 °C	x	(x)		x	x	up to 550 HV 0.1 up to 1,000 HV 0.1 ***	Components with complex geometries, nozzles, thread guides, electrical engineering (shielding), valves, print rollers, shafts, moulds, drilling rods, valve housings, fuel pipes, cog wheels, couplings, gears, hydraulic parts, mandrels, anti-diffusion layer (electronics), oil and gas applications, ball valves
Electroless nickel low-phos Nicrodur®	True to size and contours, good hardness, pore-free coating, good wear protection, suitable for food processing, good brazeability, ferromagnetic, phosphor content up to 4% by weight	x	(x)		x	x	750 – 1,000 HV 0.1 ***	Components with complex geometries, cog wheels, couplings, gears, hydraulic parts, pipelines, paddles, housings, worm drives, ball valves
Galvanic nickel (matt nickel)	Good corrosion protection, free from pores, ductile matt nickel layer, excellent mechanical processing, suitable for laser texturing, layer thickness up to > 5 mm, max. application temperature 550 °C	x	(x)		x	(x)	200 – 250 HV 0.1	Reconditioning layer (bearing faces, cones), revision parts, blanket and impression cylinders, coquilles, diverter rollers, rotor shafts, plate heat exchangers, high temperature corrosion protection for heat exchangers (hot gas corrosion protection)
Chromating (Alodine 1200)	Paint priming coating, corrosion protection	x			x			Aluminium components
Cadmium plating	Good corrosion protection, good glide partner, resistant to salt-water	x			x	(x)	80 HB	Axles, shafts, bolts
Silver plating	Good corrosion and temperature resistance, brazeable, good gliding partner, good conductivity	x			x	(x)	80 – 200 HV 0.1	Bolt connections, current transfer
Tin plating	Improved corrosion protection against oleic acids, brazeable, good gliding partner, good conductivity				x	(x)		Bearing metal, plain bearings, bearing bushes, hydraulics, current transfer
Anodising TSA, OAS	Excellent corrosion resistance, good wear protection, very good environmental compatibility	x	(x)		x	x	400 – 500 HV	Aluminium components, aircraft components
Galvanising (white/bichromate)	Cathode corrosion protection with long-range effect	x			x			Bolts, fittings, metal sheeting, aircraft components
<b>Combination layers</b>								
Galvanic nickel/hard chrome	Wear and corrosion protection, very suitable for mechanical processing, for salt-water environments, layer thickness up to 1 mm	x	x	x	x	x	See above	Cylinders/rollers (cast iron, dosing), drilling elements, hydraulic punches, repair/revision, oil pump and diffuser housings, diversion devices, oil and gas applications
Electroless nickel/hard chrome	No thermal after-treatment required, for salt-water environments	x	x	x	x	x	See above	Oil and gas applications, hydraulics
NiComb	Combination layer for high wear and corrosion protection requirements	x	(x)		x	x	750 HV 0.1	Pipeline components, drive shafts, wind turbines, moulds, extruders, oil and gas applications
WC-10Co-4Cr (HVOF, APS)	Very good wear and corrosion protection, excellent erosion, abrasion and fretting protection, good adhesion, low porosity, superfinishing is possible with diamond grinding, maximum application temperature 500°C	(x)	x		x	x	750 – 1,450 HV 0.3	Compressor shafts, pump seals, ball valves, shut-off valves, piston rods, drilling rods, aircraft undercarriages, hydraulic rods, liners, calendar, diverter and lead rollers, drying cylinders
WC-12Co, WC 17Co (HVOF, APS)	Protection against fretting, abrasive particles, particle erosion, glide wear, cavitation and dynamic contact with hard surfaces, good adhesion, good corrosion protection through very dense, almost pore-free layer, application temperature < 500°C	(x)	x		x	x	830 – 1,300 HV 0.3	Aircraft undercarriages, pump seals, extruder tools, exhaust fans, shredding rollers
WC-17Ni (HVOF, APS)	Dense, resilient, less hard layers with better corrosion resistance than tungsten carbide based on pure cobalt, application temperature < 500°C	x	x		x	x	900 – 1,200 HV 0.3	Foil processing, valves
Cr3C2-NiCr (HVOF, APS)	Chrome carbide in a Ni/Cr matrix with very good adhesion, protection against high temperature wear and corrosion at higher temperatures, hardness can be improved through subsequent heat treatment, application temperature < 870°C	x	x	x	x	x	900 – 1,200 HV 0.3	Ring seals, inside nozzle linings, forging tools, hot forming tools, turbine manufacturing, engine manufacturing
Ni20Cr (HVOF, APS)	Adhesion layer for ceramics, anti-diffusion layer, improved corrosion protection through higher density, high temperature resistance up to 1000°C	x	x	x	x		240 – 280 HV 0.3	Layer build-up and reconditioning, adhesion layer, intermediate layer as compensation for different material expansion coefficients, corrosion and high temperature protection layer, engine construction, rollers, piston rods
13% Chrome steel (HVOF, APS)	Resistant to atmospheric corrosion in industrial environments, good strength, appropriate impact resistance, thick layers, suitable for mechanical processing, application temperature < 540°C	x	x	x	x	(x)	270 – 560 HV 0.3	Bearing shells, hydraulic pressure pistons, crank shaft bearings, reciprocating pistons

x x Guaranteed      (x) Guaranteed under certain conditions      \* Guide values under optimal conditions      \*\* See STI DryCoat System      \*\*\* Available with heat treatment

STI Group process	Properties	Corrosion protection*				Wear protection*	Hardness	Applications
		Halogenides	Acid exhaust gases	Nitric acid	Cleaning agents			
<b>Thermal spray coatings</b>								
316L (HVOF)	Suitable protection against corrosion, cavitation and moderate particle erosion, good mechanical machinability, application temperature < 540°C	x	x	x	x		350 – 400 HV 0.3	Corrosion protection for impression cylinders, sealing rings, piston rods and pump pistons, cavitation protection for wear protection rings, engine cylinder linings
Fe-Ni-B-Si (HVOF, APS)	Self-flowing alloy, very hard and with low porosity (fused joint with base material)	x	(x)		x	x	up to 750 HV 0.3	Shafts, bearings
Cr2O3 (APS)	High chemical resistance, suitable for all pH values, high electrical resistance (depending on porosity), very good protection against friction wear, improved ductility/increased shear resistance for ceramic components by adding 25% TiO2					(x)	Depending on porosity	Rollers, bearings, electric insulators
Al2O3 (APS)	High oxidation resistance, high degree of purity, good electric insulation, improved mechanical properties and ductility through the addition of TiO2, high temperature range thermal insulation layer					(x)	Depending on porosity	Electric insulators, shafts
ZrO2 + 8Y2O3 (APS)	High oxidation resistance in hot gas atmospheres, hardness and thermal barrier can be optimised by controlling porosity, ideal thermal insulation layer with excellent thermal shock resistance					(x)	Depending on porosity	Turbine blades, combustion chambers
<b>Thin layers: STI DryCoat System</b>								
STI PlaNit	Meets top requirements in terms of exposure to stress, wear, abrasion; reduced cold welding effect, excellent surface and part quality, layer thickness 10 -30 > 100 µm, friction coefficient against 100 Cr6 steel 0.1 - 0.16 (aluminium 0.1 - 0.2), max. application temp. 400 °C				x	x	750 – 1,100 HV 0.05	Cast-iron tools with small radii for metal forming: steel sheeting < 1.5 mm; components such as strips, shafts etc.; not suitable for non-ferrous metals
STI Glide (various process gases)	Medium hardness, high-gloss surface, good low-friction characteristic, excellent demouldability, very good abrasion resistance, anti-adhesion, precision, layer thickness up to 100 µm, friction coefficient against 100 Cr6 steel 0.08 - 0.14, max. application temp. 400 °C				x	x	900 - 1,600 HV 0.05	Cutting tools and tools for metal forming: steel tools for black plate < 1.8 mm (maximum glide performance); diecasting tools for aluminium and magnesium (improved demoulding, improved wear resistance, anti-adhesive); precision components; pump technology (pistons)
STI Dur(+)/LT**	Very hard, wear and corrosion resistant, good resistance to cold welding, friction coefficient against 100 Cr6 steel 0.3 - 0.4, maximum application temperature 600 °C. Low temperature processes at 200 °C possible	(x)	(x)		x	x	2,000 HV 0.05 +/- 200	Punching and forming tools for metal sheeting thicker and thinner than 2 mm; for thick and high-strength materials combined with STI Perform (+); plastic moulds (good wear protection, improved demoulding); all diecast moulds
STI DurOx(+)**	Additional glide ability, additional reduction in cold welding effect, layer thickness 4 - 6 µm, friction coefficient against 100 Cr6 steel 0.1 - 0.2, aluminium processing, max. application temp. 700 °C				x	x	> 2,000 HV 0.05	Tools with strong cold welding tendency, particularly stainless steel and aluminium sheeting with thickness of < or > 2 mm, available with STI Perform (+) for extra-heavy duties (excellent anti-adhesive effect)
STI DurDLC(+)**	Thin, diamond-hard layer, very low friction coefficient, top resistance to abrasion and cold welding, for applications with little or no lubrication, layer thickness 1 - 2 µm, friction coefficient against 100 Cr6 steel 0.1 - 0.2, excellent tribological properties, max. application temp. 350 °C				x	x	2,500 HV 0.05	Punching and forming tools with high abrasion and extreme cold welding tendencies (steel and non-ferrous metals), for thick material and high stress exposure with STI Perform (+); injection moulding and diecasting moulds (excellent protection for highly abrasive materials), locking and clamping
<b>Various</b>								
Electropolishing	Improved adhesive strength and defined material removal, chemically passive, glossy							Stainless steel components
Polishing/passivat. of stainless steel	Improved corrosion protection through thicker, passive layer; removal of dirt	x	(x)	x	x			Stainless steel components
Decontamination	Cleaning process for minimising particle soiling of oil and fuel circuits							Engine and turbine components
<b>Conversion layers</b>								
Manganese phosphating	Without oil: paint adhesion primer; with oil: temporary corrosion protection, improved glide characteristics	(x)						Drive components, cog wheels, covers
Chemical burnishing	Appearance: oil-coated, temporary corrosion protection							Steel components
<b>Painting</b>								
Anti-static painting	Temperature resistance, improved resistance, corrosion protection							
Anti-static painting	Anti-static, electrostatic discharge, conductivity, wear and corrosion protection, layer thicknesses 20 – 40 µm	x			x			Aircraft nose (Falcon), railway components
High temperature painting (MCAC)	Corrosion protection for high temperature applications, additional waterproof coating possible	x	(x)		x			Aircraft and railway components
Wet painting	Corrosion protection and anti-graffiti protection, good cleaning properties	x			x			Impression cylinders, aircraft and railway components
Polyurethane (Epoxid, Aviox)	Erosion protection		x		x	x		Aircraft and railway components
Rilsan	Corrosion protection, good gliding properties, layer thickness up to 10 mm	x			x	x		Pistons
Various painting	Various	x			x	on request		Various components
<b>Mechanical processing</b>								
Cylindrical grinding	Small components: roughness R max. < 0.1 µm, concentricity < 0.001 mm, cylindricity < 0.002 mm; medium components: roughness R max. < 0.1 µm, concentricity < 0.001 mm, cylindricity < 0.003 mm; large components: roughness R max. < 0.1 µm, concentricity < 0.001 mm, cylindricity < 0.004 mm; cylindrical, concave, convex, defined curves; medium and large components: grinding at operating conditions (temp.) possible							
Flat grinding	Medium components: roughness Rz < 0.8 µm, evenness < 0.002 mm, parallelism < 0.004 mm; deep grinding, profile and flat grinding, CNC-controlled dividing head							
Belt grinding								
Polishing, super-finishing	Rmax < 0.05 µm							
Turning/milling/drilling								
Blasting (corundum, glass beads)	Freely definable curves							

x Guaranteed

(x) Guaranteed under certain conditions

\* Guide values under optimal conditions

\*\* Available with STI Perform (+) support layer for tools exposed to extreme conditions and complying with top quality and service life requirements

STI Group capacities	Process		STI Switzerland	STI China	STI France	STI Germany	STI USA
Galvanic treatments	Hard chrome plating	Large components	ø 4'500, L 12'000 mm, 64 t		2'200 x 1'200 x 2'500 mm		ø 2'000, L 10'000 mm, 30 t
		Medium-sized components	ø 500, L 3'000 mm, 5 t	ø 1'400, L 3,200 mm, 5 t		ø 1'200, L 4'000 mm, 5 t	ø 1'200, L 4'500 mm, 5 t
		Small components	ø 250, L 1'000 mm, 1 t			ø 5 - 250, L 2'500 mm, 1 t	
		Continuous chrome plating	ø 50, L 12'000 mm				
		Piston crowns	ø 1'000, L 1,000 mm, 2 t				
	Hartchrom Teikuro Process					5'000 x 2'700 x 1'500 mm, 20 t	
	Alodine 1200				600 x 400 x 800 mm   2'500 x 1'400 x 800		
	Nanochrome						
	Diamond chrome		ø 1'000, L 1,000 mm, 5 t				
	Chrome ceramic		On request				
	Electroless nickel high-phos					ø 600 - 800, L 2'600 mm, 2 t   1'000 x 1'500 x 2'600 mm, 2 t	
	Electroless nickel low-phos					400 x 600 x 1'150 mm, 0.5 t*   600 x 800 x 2'600 mm, 1 t**	
	Galvanic nickel (matt nickel)		ø 1'000, L 3'500 mm, 3 t***		600 x 400 x 300 mm		
	Cadmium plating				550 x 700 x 800 mm		
	Silver plating				600 x 400 x 300 mm		
	Tin plating				600 x 400 x 300 mm		
	Anodising TSA, OAS				500 x 500 x 1'000 mm		
Galvanising (white, bichromate)				4'000 x 370 x 1'000 mm			
Thermal spraying	Thermal spraying		ø 1'100, L 3,500 mm, 6 t***				
Thin coating	STI Planit/STI Glide					ø 850, L 1'050 mm, 2 t   ø 700 mm, L 1'900 mm, 2 t	
	STI Dur/STI DurOx					ø 1'300, L 1'500 mm, 2 t	
	STI DurDLC						ø 1'300, L 1'500 mm, 300 kg
Etching, pickling, electro-polishing	Electropolishing				550 x 500 x 300 mm	ø 2'000, L 2'500 mm, 3 t	
	Polishing and passivating of stainless steel				1'0000 x 500 x 900 mm		
	Nital				1'300 x 400 x 400 mm		
Conversion layers	Chemical burnishing (on steel and inox)				ø 370 x 1'000 x 1'500 mm		
	Manganese phosphating				1'000 x 450 x 1'500 mm		
	Rilsan				450 x 450 x 400 mm		
Paintings	Anti-static painting				4'000 x 4'000 x 2'500 mm		
	High temperature painting (MCAC)				1'000 x 1000 x 1'500 mm		
	Wet painting		ø 1'000, L 2'000 mm, 3 t		1'000 x 1000 x 1'500 mm		
	Polyurethane, Epoxid, Aviox				1'000 x 1000 x 1'500 mm		
	Various paintings				5'000 x 6'000 x 1'500 mm		
Cleaning	Decontaminating (up to class "A" components)				600 x 600 x 400 mm		
Mechanical processing	Turning/milling/drilling		ø 650, L 3'000 mm, 3.8 t	ø 840, L 3'000 mm, 2.5 t			
	External circular grinding	Large components	ø 30 - 6'500, L 27'000 mm, 64 t				
		Medium-sized components	ø 10 - 1'000, L 10 - 3'000 mm, 1.2 t	ø 650, L 3'000 mm, 2.5 t	ø 500, L 3'000 mm, 2 t	ø 1'200, L 3'500 mm, 5 t   ø 900 mm, L 4'000 mm, 3 t	
		Small components	ø 10 - 520, L 10 - 3'000 mm, 1.2 t			ø 50 - 250, L 2'500 mm, 0.5 t	
	Flat grinding		5 - 2'200 x 5 - 700 x 1 - 890 mm, 4 t	5 - 2'200 x 5 - 700 x 1 - 890 mm, 4 t			
	Belt grinding	Large components	ø 4'500 x L 12'000 mm, 64 t				
		Medium-sized components	ø 1'000 x L 3'000 mm, 5t			ø 1'000, L 3'500 mm, 5 t	
	Polishing/superfinishing	Large components	ø 4'500 x L 12'000 mm, 64 t				5'000 x 2'900 x 1'500 mm, 20 t
		Medium-sized components	ø 1'000 x L 3'000 mm, 5t				ø 1'000, L 3'500 mm, 5 t
	Blasting (corrundum, glass beads, steel)		ø 4'500 x L 12'000 mm, 64 t			1'000 x 1'000 x 1'500 mm	600 - 6'500 x 600 - 3'500 x 500 - 3'000 mm

\* Components made of steel, nonferrous metal and brass

\*\* Components made of aluminium, aluminium alloys, magnesium

\*\*\* Further dimensions on request