

Coating Properties Quick Reference Guide

				Coating			
Coating Property	Silcolloy	SilcoNert 2000	SilcoGuard	Silcoklean	Dursan	Dursox	Notak
Coating Property	Hydrogenated amorphous silicon (a-	Functionalized hydrogenated	Hydrogenated amorphous	Functionalized hydrogenated	Functionalized silica-like coating	Duisox	Direct molecular fluorination of
Coating Structure	Si:H)	amorphous silicon	silicon (a-Si:H)	amorphous silicon	(a-SiOX:CHY)	Silica-like coating (a-SiOX)	base substrate
		, , , , , , , , , , , , , , , , , , , ,	Thermal chemical vapor		Thermal chemical vapor	Thermal chemical vapor	Thermal chemical vapor
	Thermal chemical vapor deposition	Thermal chemical vapor deposition	deposition (not plasma-	Thermal chemical vapor deposition	deposition (not plasma-	deposition (not plasma-	deposition (not plasma-
Deposition Process	(not plasma-enhanced)	(not plasma-enhanced)	enhanced)	(not plasma-enhanced)	enhanced)	enhanced)	enhanced)
Physical Properties							
	44408 6 (6-24-24) 11-5-24	450% C (!	4.4408 C (Company) 5 - 1 4 - 1	450° C (maximum for	500° C ('a a st a tra a su h a sa) 450° C	43508 6 (6	
Maximum Working Temperature	1410° C (Contact Us for More Information)	450° C (inert atmosphere) 400° C (oxidative)	1410° C (Contact Us for More Information)	functionalization) - 1410° C (Contact us)	500° C (inert atmosphere) 450° C (oxidative)	1250° C (Contact Us for More Information)	300° C
Minimum Working Temperature	-210°C	-210°C	-210°C	-210°C	-210°C	-210°C	N/A
Melting Point (°C)	1410	1410	1410	1410	1410	1410	N/A
• ,			Stainless steel, exotic alloys,	Stainless steel, exotic alloys,	ceramics, aluminum, glass. Any	Stainless steel, exotic alloys,	Stainless steel, Aluminum,
	Stainless steel, exotic alloys, ceramics,	Stainless steel, exotic alloys, ceramics,	ceramics, aluminum, glass. Any	ceramics, aluminum, glass. Any	shape, including complex	ceramics, aluminum, glass. Any	Brass, Glass, Ceramics. Contact
	aluminum, glass. Any shape, including	aluminum, glass. Any shape, including	shape, including complex	shape, including complex	geometries, limited tubing ID	shape, including complex	us for geometry and size
Allowable Substrates	complex geometries.	complex geometries.	geometries.	geometries.	sizes.	geometries.	information
							No measurable thickness - Up
Typical Coating Thickness	180 - 800 nm	100 - 500 nm	180 - 600 nm	100 - 500 nm	400 - 1600 nm	400 - 1600 nm	to 30 Angstroms Water: ≥118°, Hexadecane:
Hydrophobicity	≥40°	≥65°	≥20°	≥65°	≥81°	≤60°	water: ≥116 , nexadecane: ≥65°
ya. op.iobicity	_40	503	220	503	=01	300	Dependent on chemical
							exposure and substrate
Recommended acid/base range (pH)	0-8	0 - 8	0 - 8	0 - 8	0 - 14	0 - 14	material. Contact us.
Adhesion Pull Strength (PSI)	350-450	350-450	350-450	350-450	350-450	350-450	N/A
Coating Hardness (Gpa)	12-13	12-13	12-13	12-13	4.3-4.4	4.3-4.4	N/A
Wear Resistance (x10-5 mm ³ /Nm) (stainless steel = 13.810)	N/A	N/A	N/A	N/A	6.129	N/A	N/A
Lubricity, relative to stainless steel (stainless steel = 1.0)	N/A	0.84	N/A	N/A	1.56	N/A	N/A
Impact Resistance (Ft/lbs)	N/A	N/A	N/A	N/A	264	N/A	N/A
David (Court Davidson	Good, bending allowed within	Good, bending allowed within	Good, bending allowed within	Good, bending allowed within	Good, bending allowed within	Good, bending allowed within	Good, bending allowed within
Bend / Crush Resistance	specification. Welding will damage coating. Able to	specification. Welding will damage coating. Able to	specification. Welding will damage coating.	specification. Welding will damage coating. Able	specification. Welding will damage coating.	specification. Welding will damage coating.	specification. Welding will damage coating.
Weld Resistance	coat over weld.	coat over weld.	Able to coat over weld.	to coat over weld.	Able to coat over weld.	Able to coat over weld.	Able to coat over weld.
Total Resistance	coat over were.	course, weig.	Able to cour over werd.	to tout over weig.	Able to code over weigh	Braze will damage coating.	Braze will damage coating.
	Braze will damage coating. Able to	Braze will damage coating. Able to	Braze will damage coating. Able	Braze will damage coating. Able to	Braze will damage coating. Able	Able to coat over vacuum	Able to coat over vacuum
Braze Compatibility	coat over vacuum braze.	coat over vacuum braze.	to coat over vacuum braze.	coat over vacuum braze.	to coat over vacuum braze.	braze.	braze.
Solder Compatibility	Not compatible	Not compatible	Not compatible	Not compatible	Not compatible	Not compatible	N/A
Electrical Properties							
Electrical Bulk Resistivity (Ω.cm)	108	N/A	N/A	N/A	10 ¹²	N/A	N/A
Relative Permittivity (error)	18.9 (2.3)	N/A	N/A	N/A	6.9 (1.2)	N/A	N/A
Dielectric Loss (tan δ) (error)	0.4 (0.04)	N/A	N/A	N/A	0.6 (0.6)	N/A	N/A
Breakdown Field 1 (MV/cm) Breakdown Field 2 (MV/cm)	0.09-0.1 0.15-0.2	N/A N/A	N/A N/A	N/A N/A	N/A 5.9-9.6	N/A N/A	N/A N/A
Weibull Modulus	4.3	N/A	N/A	N/A	4.6	N/A	N/A
Thermal Properties	41.5	1977	13/73	1973	-1.0	1971	13/73
Bulk Modulus (dyn/cm2)	9.8·10 ¹¹	9.8·10 ¹¹	9.8·10 ¹¹	9.8·10 ¹¹	N/A	N/A	N/A
Melting Point (°C)	1410	1410	1410	1410	N/A	N/A	N/A
Specific Heat (J g-1°C-1)	0.7	0.7	0.7	0.7	N/A	N/A	N/A
Thermal Conductivity (W cm-1°C-1)	1.3	1.3	1.3	1.3	N/A	N/A	N/A
Thermal Diffusivity (cm2/s)	0.8	0.8	0.8	0.8	N/A	N/A	N/A
Thermal Expansion, Linear (10-6°C -1)	2.6	2.6	2.6	2.6	N/A	N/A	N/A
Steam Resistance Optical Properties	Fair - Good	Good	Good	Good	Good	Good	Excellent
Light Transmission (loss, dB) 1500nm wavelength	Approx 0.00104	0.00004-0.00065	N/A	N/A	N/A	N/A	N/A
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		- Annual March 1988		Marine	1.3	I.I	. 1
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FTIR Reflectance			The second secon	The second secon	- 10 M	NO NO NAME OF THE PARTY OF	= (400 ms 200 ms com 200 ms com 201
IR Emittance Values							
Solar Absorptance (αs) on elgiloy substrate	0.6712	0.4983 (SN 1000)	N/A	N/A	0.6265	N/A	N/A
Solar Reflectance (ρs) on elgiloy substrate	0.2811	0.5017 (SN 1000)	N/A	N/A	0.3735	N/A	N/A
Hemispherical infrared emittance (ε) on eligloy substraate	0.71	0.159 (SN 1000)	N/A	N/A	0.339	N/A	N/A
Ratio of solar absorptance to emittance on elgiloy substrate	0.945	3.134 (SN 1000)	N/A	N/A	1.848	N/A	N/A
Water Repelling Properties							
Average Water Droplet Contact Angle, Rough Surface (Degrees)	53.5	99.4	Approx 53	N/A	119.3	N/A	146.7
Average Water Droplet Contact Angle, Smooth Surface (Degrees)	29.5	74.1	Approx 29	N/A	86	N/A	112.1
Average Hexadecane Contact Angle, Rough Surface (Degrees)	0	0	0	0	0	0	79
Average Hexadecane Contact Angle, Smooth Surface (Degrees)	0	0	0	0	0	0	53
Icephobicity Relative Effort to Remove Ice (emperical removal effort 1=low force, 10=high force) Uncoated stainless steel coupon = 8	7	N/A	N/A	N/A	6	8	2
Oleophobicity Properties	,	17/5	1975	13/15	, i	<u> </u>	
10W40 Motor Oil Contact Angle, Rough Surface (Degrees)	0	0	0	0	0	0	82
10W40 Motor Oil Contact Angle, Smooth Surface (Degrees)	0	0	0	0	0	0	63
Chemical and Material Compatibility							
Chemical Compatibility	See Guide	<u>See Guide</u>	<u>See Guide</u>	<u>See Guide</u>	See Guide	See Guide	N/A
	<u>See Guide</u> <u>See Guide</u>	<u>See Guide</u> <u>See Guide</u>	<u>See Guide</u> <u>See Guide</u>	<u>See Guide</u> <u>See Guide</u>	<u>See Guide</u> <u>See Guide</u>	<u>See Guide</u> <u>See Guide</u>	N/A N/A