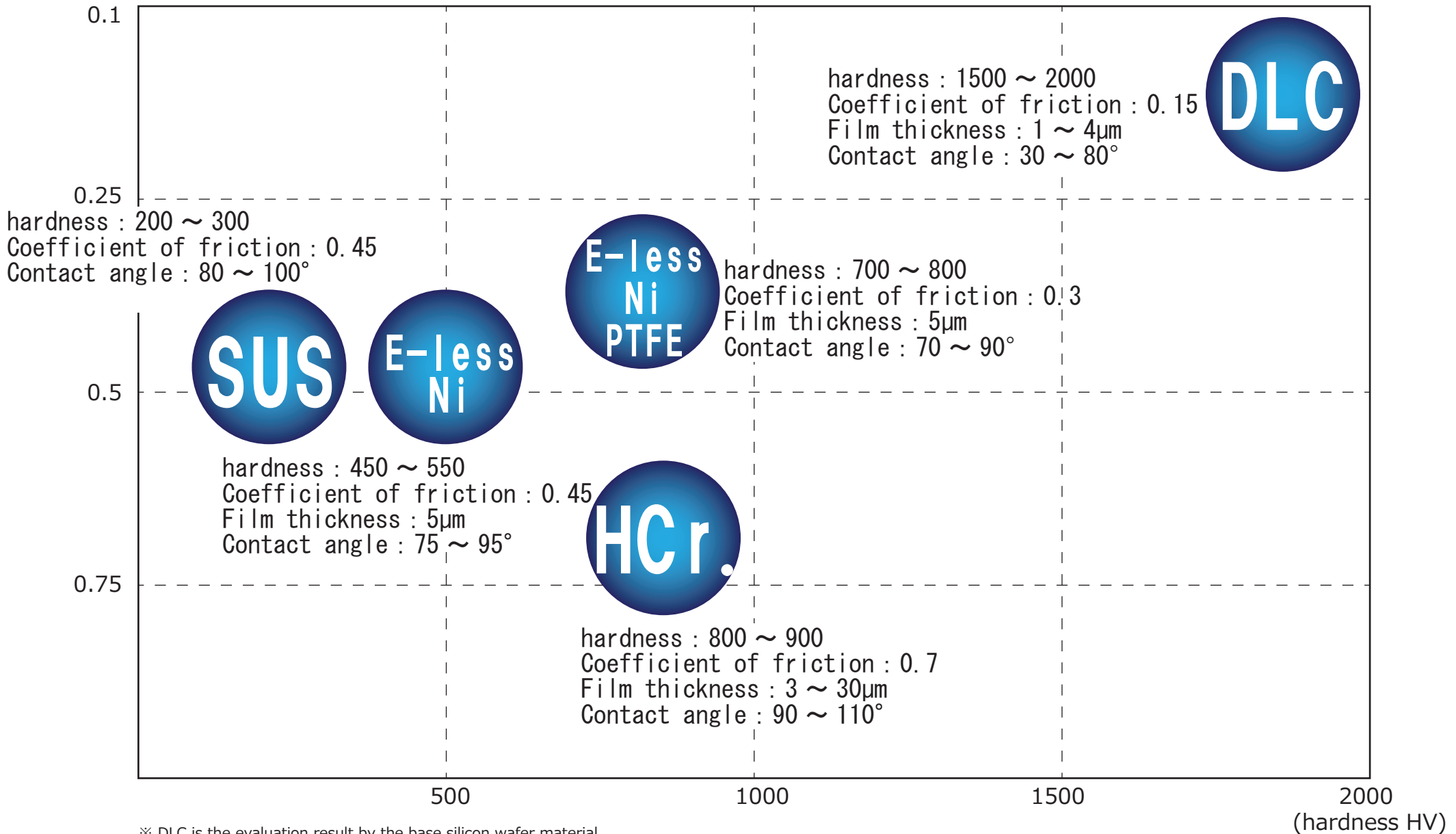


# Characteristics of surface treatment ①

(Coefficient of friction)



※ DLC is the evaluation result by the base silicon wafer material.  
 ※ Other surface treatments are evaluated using SUS304 (surface roughness Ra0.02mm).  
 ※ DLC SUS evaluation results are based on separate document.

# Characteristics of surface treatment ②



Surface treatment type	Surface treated image	Standard film thickness (μm)	Coating hardness (Hv)	Surface roughness (Ra)	Coefficient of friction	Surface energy Pure water Contact angle	Possible processing range	Feature
Hard chrome plating		3~30	800 ~ 900	0.03	0.7	80°~100°	<ul style="list-style-type: none"> <li>● D : φ4~24mm L : ~8000mm</li> <li>● D : φ40~62mm L : ~3000mm</li> </ul>	It has excellent corrosion resistance and resistant to discoloration. It also has relatively high hardness, excellent wear resistance, and corrosion resistance.
Electroless nickel plating		5	450 ~ 550	0.03	0.3	70°~90°	<ul style="list-style-type: none"> <li>● D : φ4~30mm L : ~1800mm</li> </ul>	With few pinholes, it is possible to form a uniform film thickness. Good adhesion and corrosion resistance.
Electroless nickel PTFE plating		5	700 ~ 800	0.02	0.25	75°~95°	<ul style="list-style-type: none"> <li>● D : φ4~30mm L : ~1800mm</li> </ul>	A smooth and hard surface is achieved by coating the electroless nickel plating film with PTFE. It has the lubricity and wear resistance which is a characteristic of lubricity.
DLC coating		1~4	1500 ~ 2000	0.02	0.15	Standard processed product 85°~105°	<ul style="list-style-type: none"> <li>● D : φ4~62mm L : ~3000mm</li> </ul>	DLC is the name of Diamond-Like-Carbon, amorphous carbon with physical properties similar to diamond. Since it has high hardness, it has excellent wear resistance, low coefficient of friction, and excellent lubricity. The standard contact angle is about 80°, and the hydrophilic type can be set from 20° onwards. *Use pure water to evaluate contact angle *Measures the test piece on a silicon wafer.