We, Hitachi Power Solutions supplys Sialon Rolls for cold rolling on the thin Steel & Copper film owing to Sialon of high value of toughness.

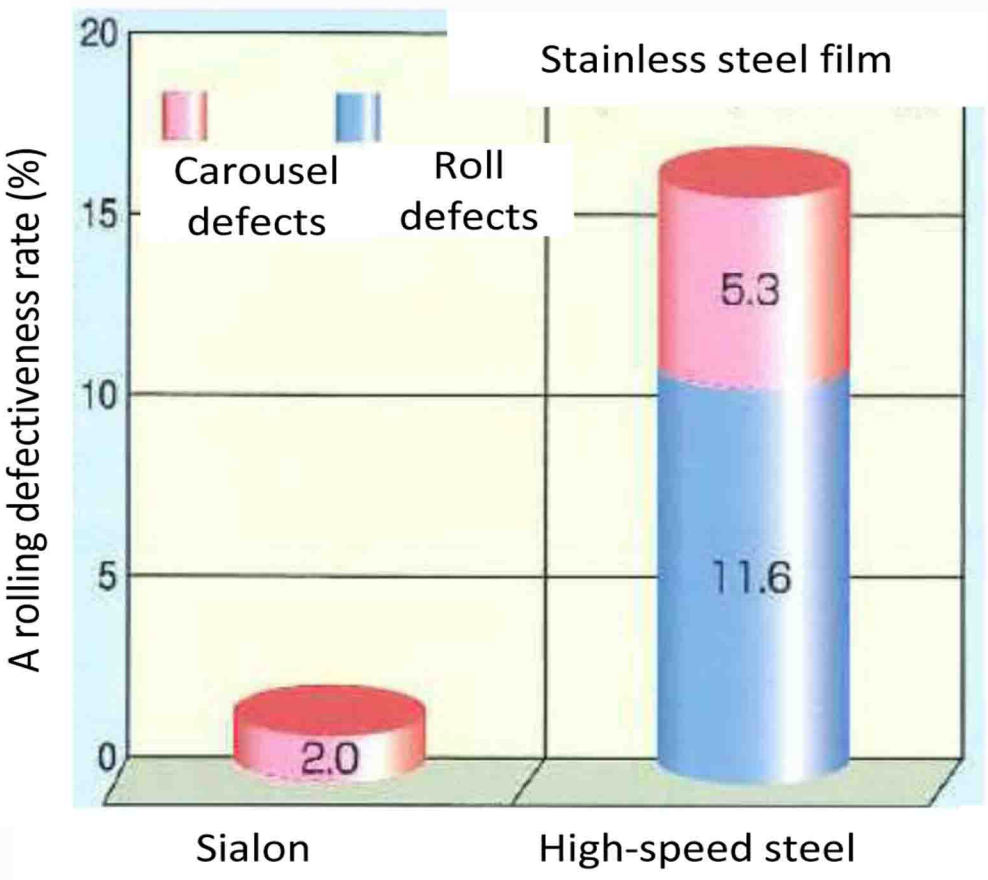
(Sialon is the registered trade mark of Hitachi Ltd.)

・Characteristics of Sialon Roll

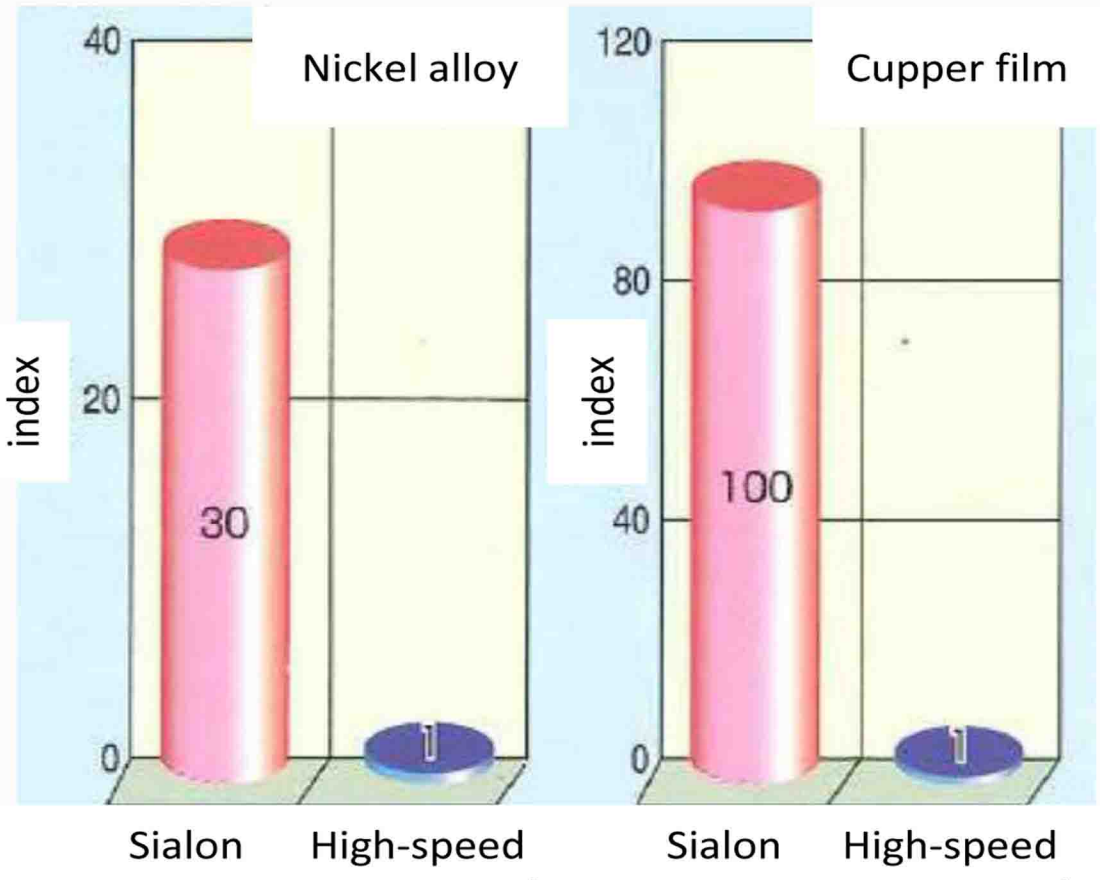
1) Sialon is a ceramics of silicon nitride of aluminum and oxide.
2) Sialon has more than twice higher Vickers hardness than Copper and shows very fine wear resistance.
3) Sialon has higher Young's modulus than High-speed Steel by 1.5 times and enables to roll ultra thin film,which is used to be difficult by Copper rolls.
4) Sialon improves the surface brightness of an object to be rolled owing to no adhesion to the roll surface
5) Sialon can perform for longer continuous operation-run than that of High-speed steels.
6) Sialon enables to minimize the handling time in rotation owing to good reduction of roll weight as its density is less than High-speed Steel by more than 50%.

・Long Life

Roll life shall be grately improved owing to good wear resistance and adhesion resistance.



Comparison of Roll mark Defect Ratio



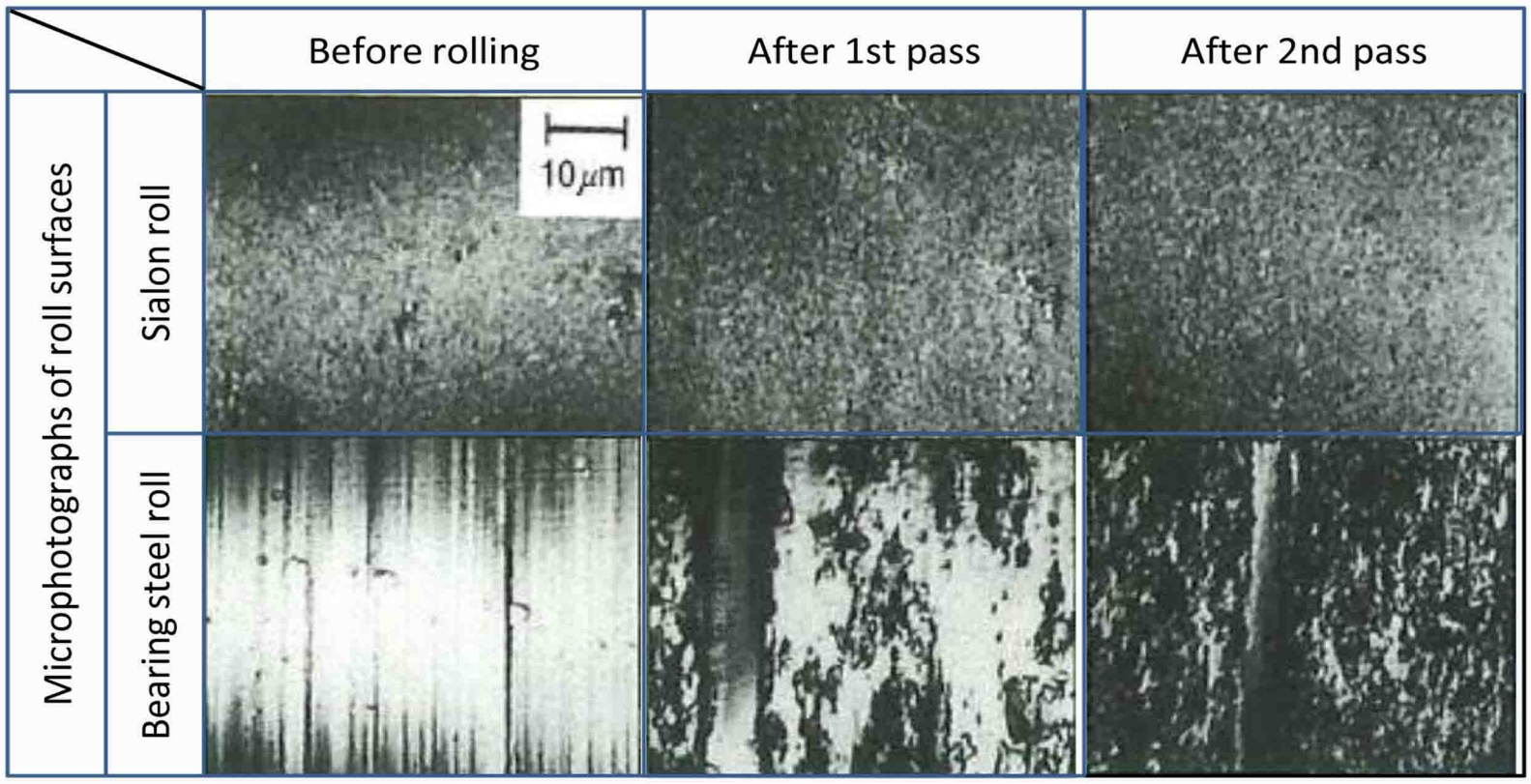
Index of continuous operation

・Comparison of material performance

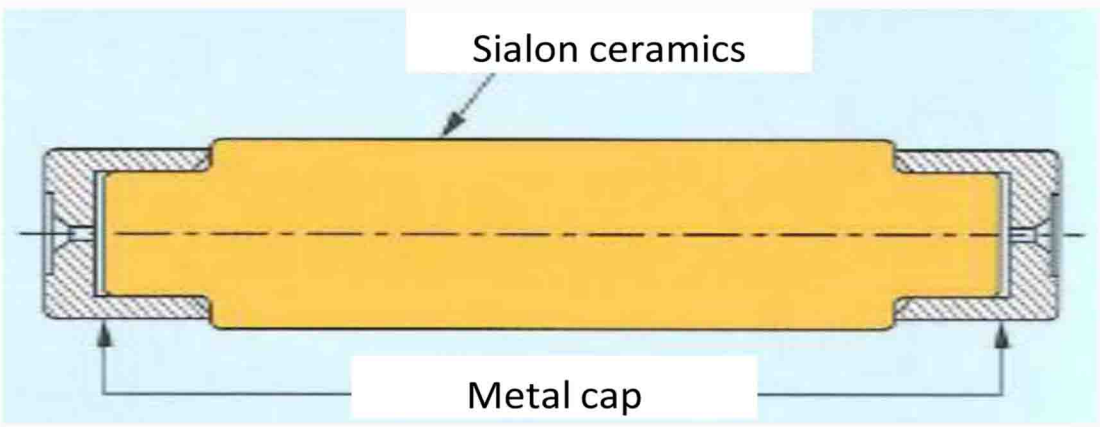
	Sialon	WC	High-speed steel
Vickers Hardness (HV)	1600	1600	900
Density (g/cm^3)	3.3	15.0	8.0
Young's Modulus (GPa)	310	530	230
Coefficient of thermal expansion ($\times 10^{-6}/℃$)	3.2	5.0	12
Specific Heat (cal/g・℃)	0.17	0.05	0.10
Heat Conductivity (cal/cm・s)	0.06	0.18	0.05
Flexural Strength (MPa)	860	2500	3000
Crushing Linear Load (kN/mm)	15	15	20
Fracture Toughness ($MPa\sqrt{m}$)	7.7	11	16

・Surface Brightness

The brightness of the rolled object shall become better owing to the improvement of roll coating.

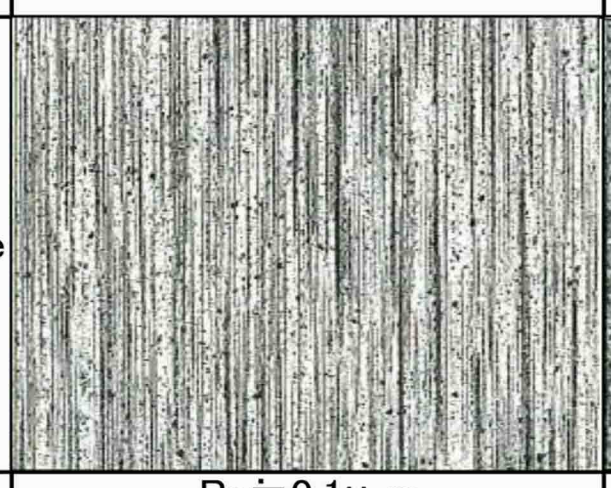
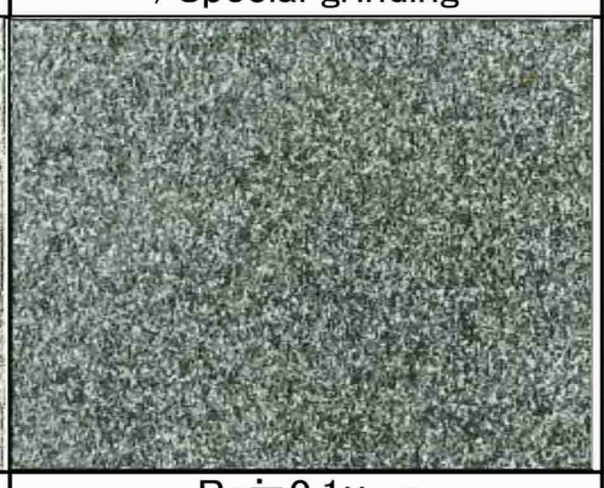
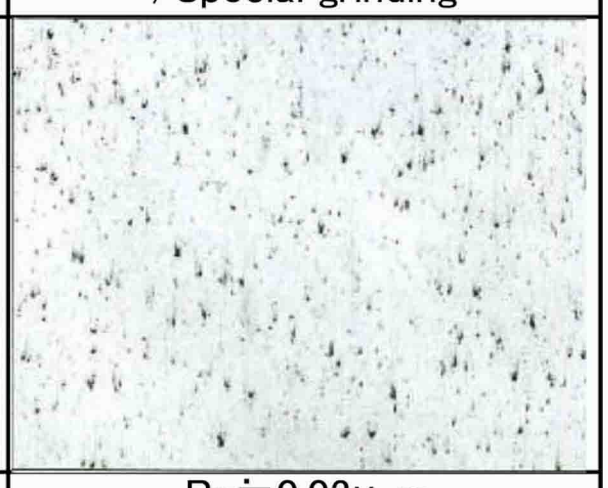


・Structure



・Surface Finish of Roll / Roll Grinding

We can make various kinds of surface finish owing to originally cultivated roll grinding technologies.

Grinding method	Diamond grinding stone surface	Satin finished surface /Special grinding	Lapping surface /Special grinding
Grinding roll surface			
Surface roughness	Ra≒0.1μ m	Ra≒0.1μ m	Ra≒0.03μ m

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