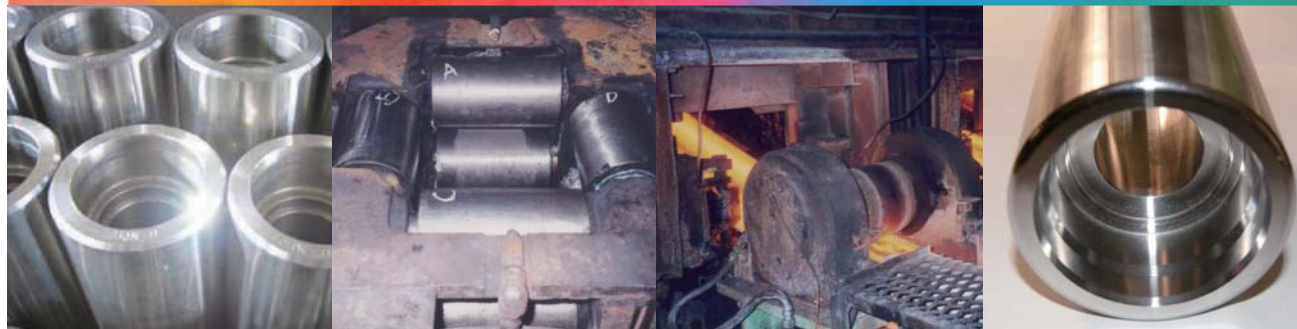


Silicolloy A2 Continuous Casting Roller

Silicolloy is precipitation hardened stainless steel having composite property such as heat resistance, corrosion resistance, wear resistance and high-temperature oxidation resistance.

Continuous Casting Roller made from Silicolloy can save cost for maintenance by reducing number of the times of replacements of rollers.



- Silicolloy A2 which is used for rollers is all-round stainless steel that contains high Si by around 3.5%. Silicon contributes to many characteristics such as heat resistance, oxidation resistance, hardness, strength and corrosion resistance. (Principal component) : 0.02C - 3.5Si - 11Cr - 7Ni - 1Mn - 1Cu - the rest Fe
- There are a lot of actual achievements in Silicolloy A2 roller for top rollers (foot roller) to produce billets.

1.Heat resistance

- High-temperature oxidation resistance : Silicolloy A2 roller is comparatively strong against oxidation resistance in high temperature because of containing Si by around 3.5%.
- High temperature hardness•Wear resistance : Silicolloy A2 roller is superior in wear resistance because of relatively high hardness. (ex. Hardness = normal temperature : HV320 / 600°C : HV200)
- Hot strength : Silicolloy A2 roller is hard to deform and bend because tensile strength is high compared to existing material. (ex. Tensile strength = normal temperature : 1100N/mm² / 500°C : 600N/mm²)

2.Corrosion resistance

Silicolloy A2 roller is excellent in corrosion resistance against and strongly acidic powder.

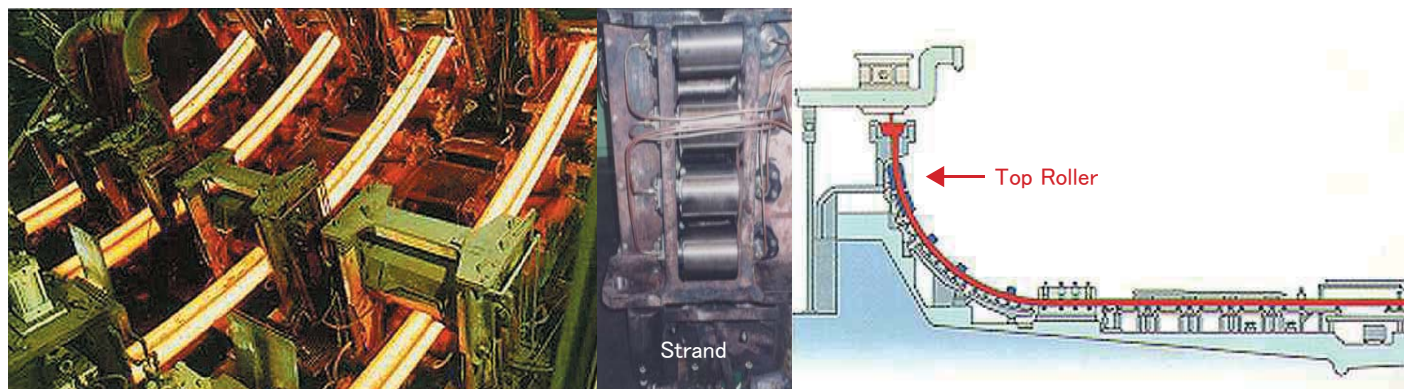
3.Fracture toughness (heat check resistance)

Silicolloy A2 roller is superior in fatigue propagation resistance.

Thus, it is hard to occur crack even though high temperature heating rapidly cooling are repeated.

4.High-temperature corrosion resistance / High-temperature wear resistance

Silicolloy which has all-round stainless steel can realize longlife improvement of roller.



< Usage examples of Silicolloy A2 Roller >

No	Machine Type	A Usage Place	A conventional material			The number of iron and steel melting		
			AISI	DIN	JIS	Conventional life	Life of Silicolloy	
①	Curved Type	A Foot Roll	321	X6CrNiTi18 10	SUS321	1500	5000	3.3 Times
②	Curved Type	Apron Roll	(Heat-resistant steel)	(Heat-resistant steel)	SUH660	1000	6000	6.0 Times
③	Curved Type	A Foot Roll			Overlay welding (13%Cr-4%Ni)	1000	4800	4.8 Times
④	Curved Type	A Foot Roll	321	X6CrNiTi18 10	SUS321	1500	9000	6.0 Times
⑤	Curved Type	A Top Roll	4137	34CrMo4	SCM435	800	8000	10.0 Times
⑥	Curved Type	A Foot Roll	321	X6CrNiTi18 10	SUS321	1000	6000	6.0 Times

※Please be understanding in advance that the same effect may not be expected depending on operating circumstances.

There are a lot of actual achievement of Silicolloy A2 roller which are used in iron mill, especially it is used in a facility to make steel billet. Silicolloy A2 roller is commonly installed in continuous casting machine, especially as top roller which is a severe condition. Sizes of roller which is commonly used are from $\phi 70 \sim \phi 100$ in dia. x 110mm ~ 330mm in length. Around 15 companies have adopted Silicolloy A2 roller so far and total 2,000 pc. in around 5 years have been supplied to those companies.

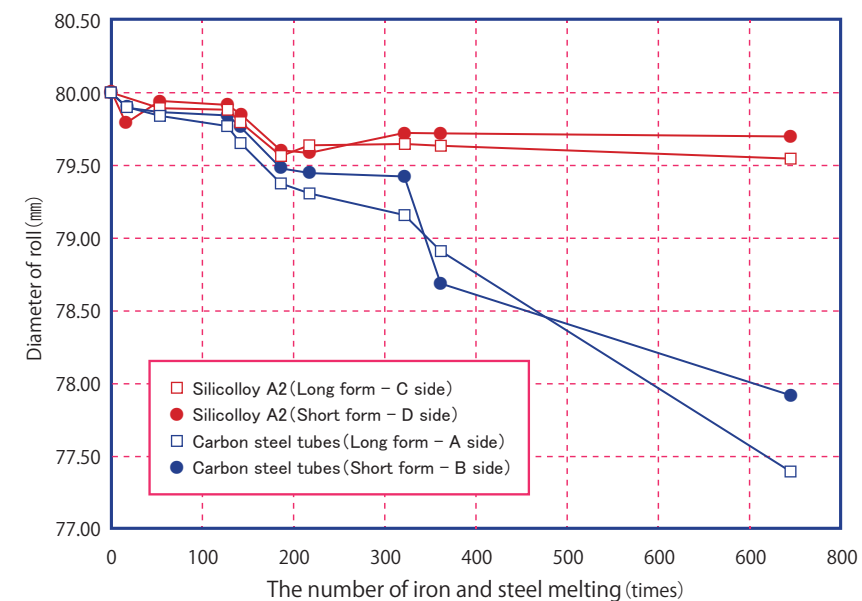
<Examination example of SilicolloyA2 Roll ①>

No	Item	Details of contents
①	Continuous casting equipment	Manufacture of slab
②	Type of material	Ordinary steel
③	Size of slab	Width : 1000~1500mm, Thickness:200mm
④	A Usage Place	A Foot Roll (Division type)
⑤	Size of roll	$\phi 90 \sim \phi 100$ in dia. x 260mm , 6 Lines
⑥	A conventional material	321 / X6CrNiTi18 10 / SUS321
⑦	Usable years	3 months
⑧	The number of iron and steel melting	1500,150,000 tons (At the time of an investigation)



- Life time of Silicolloy A2 roller is about three time as long as that of 321(X6CrNiTi18 10).
- Surface of Silicolloy A2 roller after use is better compared to that of 321(X6CrNiTi18 10).
- While 321(X6CrNiTi18 10) roller was disposed in 1000 charges due to cause of crack, Silicolloy A2 roller can be used up to 3000 charges.
- Abrasion loss : It is 2 millimeters at a diameter.

<Examination example of SilicolloyA2 Roll ②>



- Life time of Silicolloy A2 roller is about six time as long as that of Carbon steel tubes (STK).
- Abrasion loss (747charges, The mean value)
Silicolloy A2 : 0.38mm
Carbon steel tubes : 2.35mm