

Leader of CHQ company with best quality

A trust company with clean management

Comparison **Smart Coating** and Phosphate Coating

Sep-27st , 2019

WOOSIN WOOSIN STEEL Co., Ltd.

Objective of Smart coating

The objective of Smart coating is “increasing customers benefit by saving manufacturing expense and helping high quality cold forming products.”

Customer satisfaction by high quality

Cost reduction

- Increasing lifetime (tools, dies etc.)
- Longer forming oil exchange cycle
- Energy saving
- Unnecessary Drawing powder

Increase productive rate

- Increasing operating rate (decreasing idle time)
- Increasing productive rate (less seizure)
- Eco-friendly (No dust)

Increase technology

- Available highly forming product (possible extreme reduction in area)
- Available higher forming temp. (possible with lower pressure)

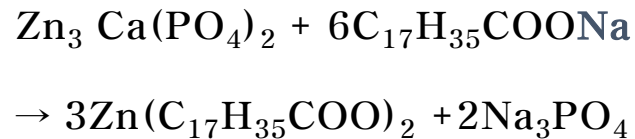
Lower frictional resistance by thin and even coating and better lubrication function

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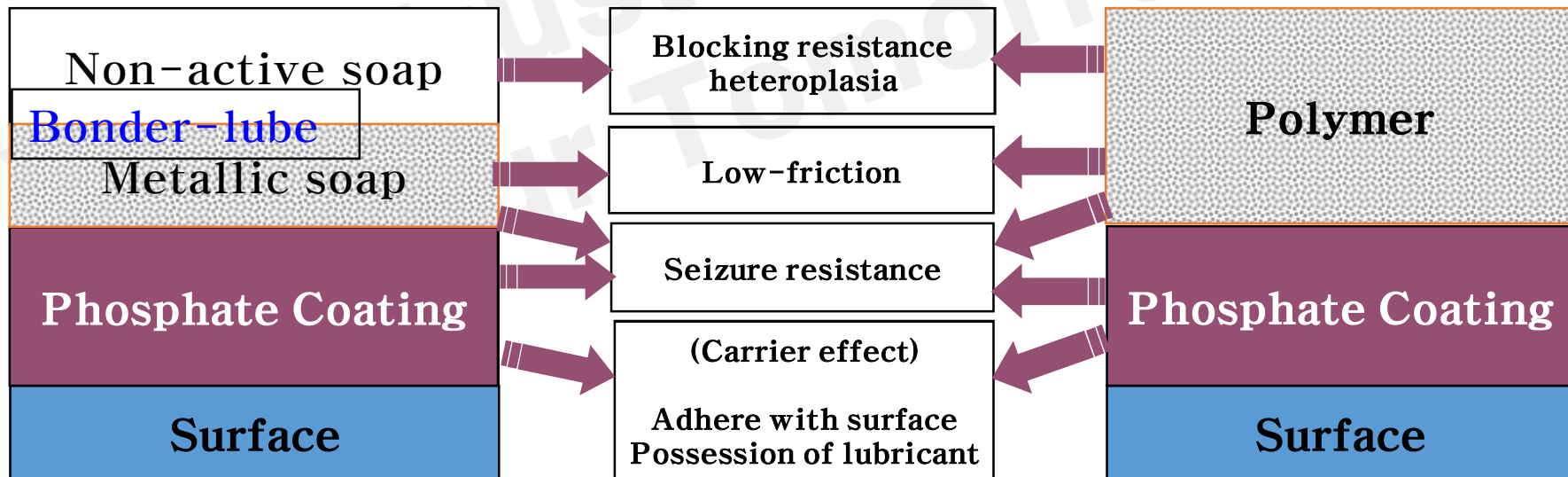
1. Role and structure of **Smart** and Phosphate Coating

Phosphate / Soap



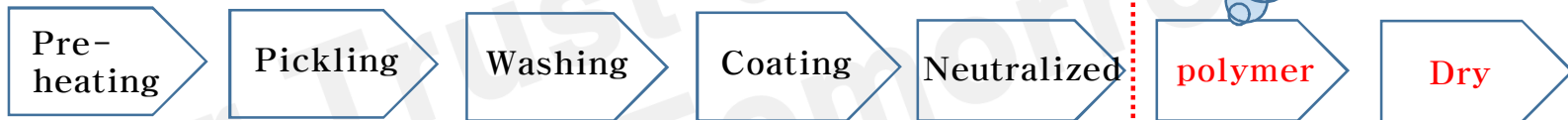
Role of Layer

Phosphate / Polymer

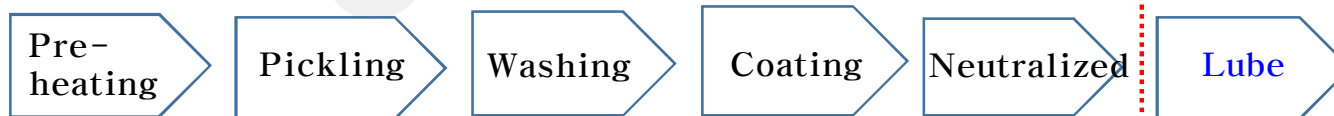


2. Process of **Smart** and Phosphate Coating

• Smart coating Process



• Phosphate Coating Process



3. Compared **Smart Coating** with Phosphate Coating

Classification		Smart Coating	Phosphate Coating
Base coating		$Zn_3 Ca(PO_4)_2$	$Zn_3 Ca(PO_4)_2$
Lubricant		High polymer	Soap
Lube weight		$1.5g/m^2 \sim 2g/m^2$	$3g/m^2 \sim 5g/m^2$
Apply type		Inactive (Applied)	Active
Coating weight	Carbon steel	$9g/m^2 \pm 2g$	$11g/m^2 \pm 2g$
	Alloy steel	$12g/m^2 \pm 2g$	$14g/m^2 \pm 2g$
Characteristics		<ul style="list-style-type: none"> ① Prevented burning ② High forging precision by even coating thickness ③ Expected longer tool lifetime and oil exchange cycle (less pollution by soap) ④ Eco-friendly and clean (no dust) ⑤ No need drawing lubricant 	<ul style="list-style-type: none"> ① Shorter tool lifetime and oil exchange cycle ② Not eco-friendly and many dust (soap) ③ must need drawing lubricant

4. Dies' lifetime between **Smart** with Phosphate Coating

▣ Test Item : HEX NUT M20 2.5P

▣ Grade & Size & Process : SCR420B, ϕ 30mm, 70TON, SAF

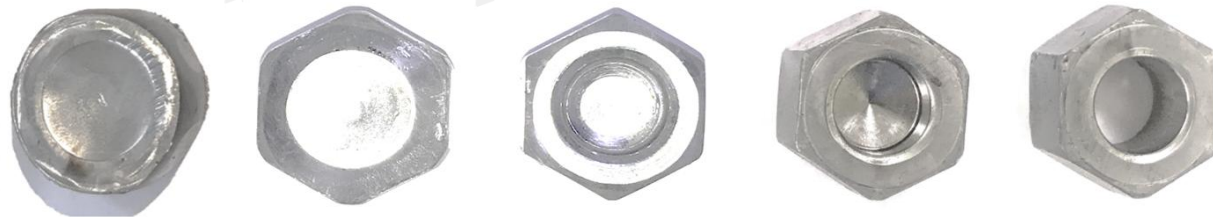
▣ Test Facility

Facility	Standard	M/MOTOR	OUT-PUT	Manufactured
NUT FORMER	JNF-32B5S	100Hp	110EA/Min	China

▣ Test Process

#10	#20	#30	#40	#50	#60
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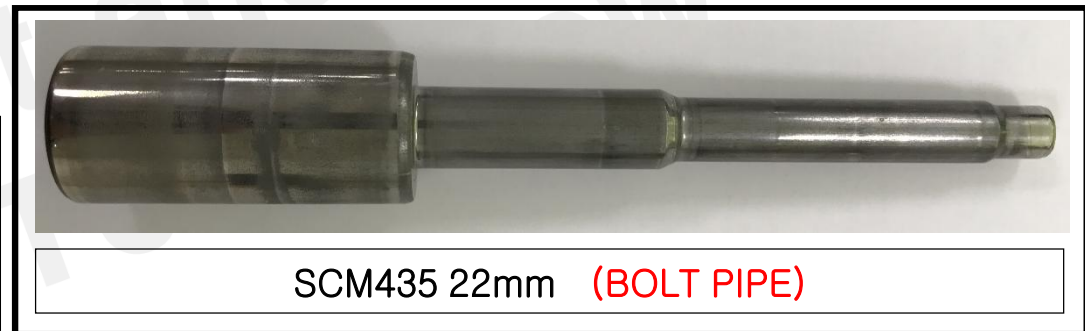
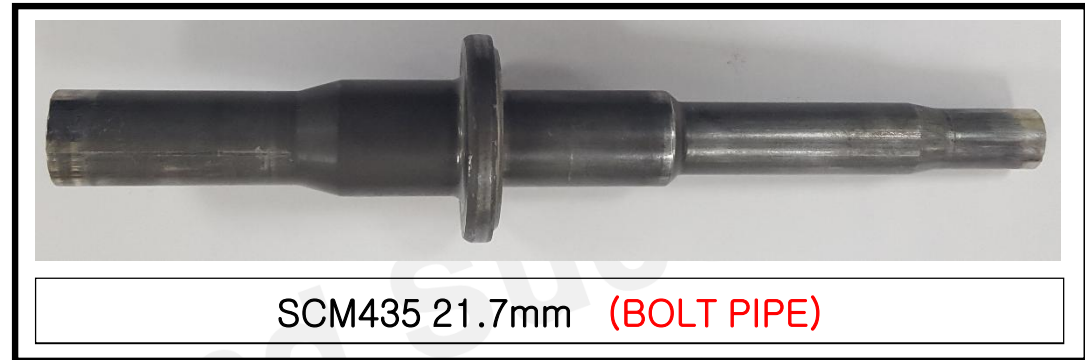
Wire Cutting



▣ Test Result

Classification		counting		other
		Smart coating	Phosphate coating	
Tool lifetime	Dies change	700,000EA	550,000EA	No fix dies

5. Applied product to Smart coating



5. Applied product to Smart coating



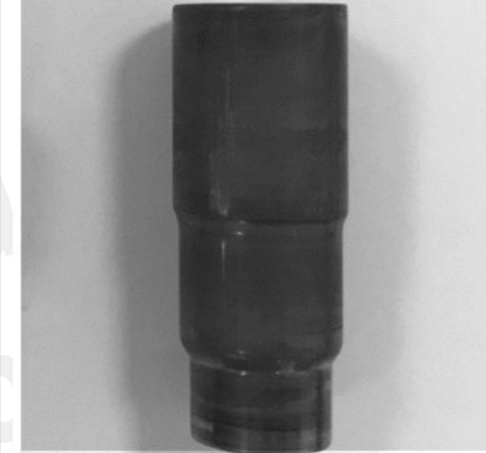
POSA1021B
5.23mm
(Welding Bolt)



SCM435
14.00mm
(Ball Stud)



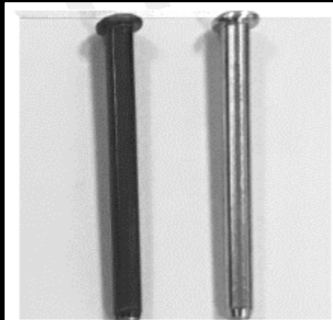
SCR420HB
38.00mm
(Gear Ass'y-Sun, MID)



SWCH45F
40.00mm
(Tube)



SWCH18A
26.50mm
(Ball Case)



SWCH10A
6.04mm
(Pin : Galvanizing)



SWCH45F
11.42mm (Gear shaft)

5. Applied product to Smart coating



SWCH45F 34.20mm
(Output shaft)



SCM420H 37.00mm
(Inner race)



SWCH18A 27.00mm
(Pinch yoke)



SCM435 7.85mm
(Stud Bolt)



SWCHXXX17.85mm with other (Ball Pin)



SWCH45F11.42mm (Gear shaft)

5. Applied product to Smart coating

