



November 28, 2011
 Meidensha Corporation
 VC Business Development Department

Notice of Change for Nameplate and Approval Stamp and Rhodium over Silver Coating

1. Changes

1) Nameplate and printing of serial number

- Putting Meiden part number and serial number together to improve cosmetically
- Improving quality of printing character of serial number
- Displaying 2D barcode to realize traceability control

2) Approval stamp

- Displaying in English for non-Japanese customers

3) Coating on the surface of vacuum capacitors

- Rhodium over silver coating to strengthen resistance to discoloration

2. Implementation

- From delivery in April 2012



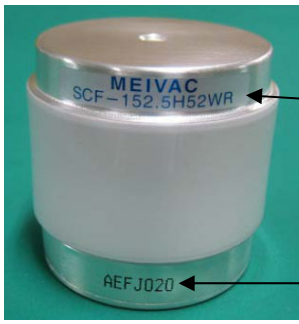
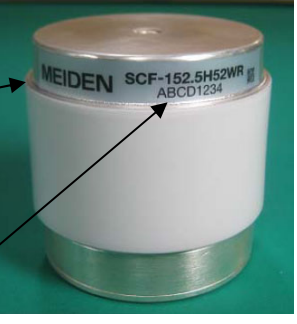



NOTE: Please contact our sales representative for details.

3. Change for nameplate and printing of serial number

1) New nameplate

Type	Series	Size	Design
Large	VM, VH, UW and other VVC	35 mm x 20 mm	<p>Part No. → SCV-155M</p> <p>Serial No. → ABCD123</p> <p>2D barcode (Serial No. info.)</p>
Medium	VM, VH and other VVC FH, FC and other FVC	52 mm x 6 mm	<p>MEIDEN SCF-152.5H52WR ABCD123</p>
Small	FS and other small FVC	37 mm x 4 mm	<p>SCF-152Z ABCD123</p>

2) Comparison

Type	Old	New
Large	 <p>MEIVAC SCV-151H55UW</p> <p>Serial No. A00M001</p>	 <p>MEIDEN SCV-151H55UW</p> <p>Serial No. AAAA001</p>
UW55 type		
Medium	 <p>MEIVAC SCF-152.5H52WR</p> <p>Serial No. AEFJ020</p>	 <p>MEIDEN SCF-152.5H52WR</p> <p>Serial No. ABCD1234</p>
FH52 type		
Small	 <p>MEIVAC SCF-151Z</p>  <p>Serial No. (bottom) ACZA075</p>	 <p>MEIDEN SCV-150.83UZ ABCD1234</p>
FS36 type		

NOTE:
"MEIDEN" will
be displayed in
blue

3) Property of new nameplate

Base material	Material
Printed paper	Aluminum evaporation PET (Polyester)
Adhesive material	Acrylic (Strong stick type: viscosity force 15.1 N / 25 mm ²)
Label ink (black)	RIGIN Ribbon (Heat resistance, alcohol resistance)
Label ink (blue)	UV sclerosing ink

NOTE: UL qualified and RoHS compliant

4) Evaluation on resistance of new nameplate

Item	Test Parameter	Evaluation
Water resistance	24-hour immersion in 20 degrees C tap water	No abnormality
Salt water resistance	24-hour immersion in 20 degrees C saturated saline	No abnormality
Heat resistance	24-hour shelf in 150 degrees C atmosphere	No abnormality
Moisture resistance	24-hour shelf in 40 degrees C 80% atmosphere	No abnormality
Light resistance	3-month photoradiation by florescent (illuminance 5000 lx ambient indoor)	No abnormality
Plasticizer resistance	Glue vinyl chloride plastic wrap with label surface and leave in a 23 degrees C -room for 1 month (2 kg load)	No abnormality
Surface Scratch	100 runs with 200 g / cm ² load (cotton blade #40 cloth)	No abnormality
Alcohol resistance	Immerse ethanol (99.5 %) in cotton and make it 5 runs with 200 g / cm ² load	No abnormality

NOTE: Definition of "No Abnormality"

- (1) Over 60% of background reflectivity
- (2) No deterioration marked
- (3) No exfoliation from adherend
- (4) No deterioration on black and/or blue printing characters
- (5) No glue protrusion and/or no bleed

4. Change for approval stamp



<Old>



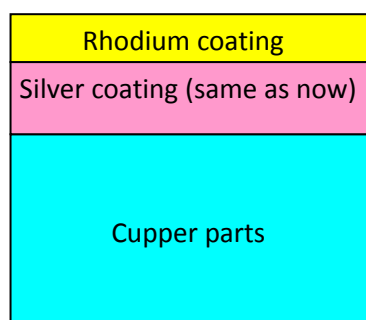
<New>

NOTE: Material (stamp ink (TAT STP-2)) and printing position of approval stamp remain unchanged.

5. Rhodium over silver coating

1) Prevention of discoloration

Silver is easily sulfurized and significantly discolored in a richly sulfurized environment. To prevent discoloration of silver coating, rhodium will be thinly coated over it.



<New surface coating construction>



<Rhodium coating sample>

2) Features of Rhodium

- Generally used to prevent discoloration of silver plating
- Chemically stable and not immersed in aqua regia
- Extremely hard (equal to industrial chrome coating) and highly resistant to abrasion
- Highly resistant to heat and not oxidized at below 500 degrees C
- Highest optical reflectivity in a platinum group
- Lowest electric resistance in a platinum group







3) Cross reference table for characteristics of rhodium, silver and copper





	Rhodium	Silver	Copper
Symbol, number	Rh, 45	Ag, 47	Cu, 29
Density [g/cm ³]	12.41	10.49	8.96
Hardness [Hv]	(800 - 1000)	(100 - 150)	-
Young's modulus [10 ⁹ N/m ²]	359	76	110
Melting point [degrees C]	1970	961	1083
Heat conductivity [W/m/K]	150	427	398
Linear expansion coefficient [10 ⁻⁶ /K]	9.6	19.3	16.2
Resistivity [10 ⁻⁶ Ωcm]	4.51	1.59	1.67
Magnetic susceptibility [10 ⁶ cm ³ /g]	1.08	-0.192	-0.086

4) Effect on performance of vacuum capacitor

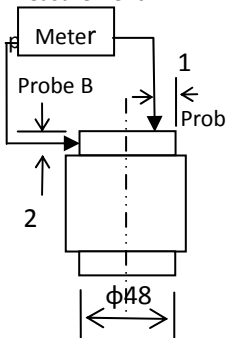
Because Rhodium is extremely thinly coated (0.05 μm), there is no effect in electric resistance on vacuum capacitor. See the following pages for results of evaluation testing.

6. Evaluation results for Rhodium coating

Test	Parameter	Confirmation	Silver coating	Rhodium over silver coating
Atmospheric exposure & discoloration	Leave for 3 months in a richly sulfurized place	-Discoloration degree by color difference meter (no unit) -no remarkable discoloration *color difference meter: Nippon Denshoku ND-300A	-Discoloration degree: 25.0 -Remarkable discoloration	-Discoloration degree: 3.6 -No discoloration
				
			Confirmed superiority of Rhodium over silver coating in a sulfurized place	
Hydrogen sulfide exposure	-Temperature: 30 degrees C -Humidity: 80% -Hydrogen sulfide gas: 3 ppm -Exposure time: 104 hrs.	-Discoloration degree by color difference meter -No remarkable discoloration -Initial value of sulfur and its level change ($\Delta\mu\text{g}/\text{cm}$) after testing *Gas exposure test equipment: Yamazaki Seiki	-Discoloration degree: 36.2 -Remarkable discoloration Increase in sulfur level: $\Delta 2.1 \mu\text{g}/\text{cm}$	-Discoloration degree: 6.5 -Slight discoloration Increase in sulfur level: $\Delta 0.8 \mu\text{g}/\text{cm}$
				
			Superiority of Rhodium over silver coating in a place with hydrogen sulfide gas	
Salt spray	-Temperature: 35 degrees C -saltwater concentration 5% -72 hours	-Discoloration degree by color difference meter -Initial value of oxidation and oxygen level change ($\Delta\mu\text{g}/\text{cm}$) after testing *Salt spray test equipment: Suga test equipment STP-110	-Discoloration degree: 9.9 -No discoloration Increase in oxygen level: $\Delta 0.8 \mu\text{g}/\text{cm}$	-Discoloration degree: 8.1 -No discoloration Increase in oxygen level: $\Delta 2.2 \mu\text{g}/\text{cm}$
				
			Silver and coating and Rhodium over silver coating are almost equal in their discoloration degrees by saltwater.	

Test	Parameter	Confirmation	Silver coating	Rhodium over silver coating
High temperature	Leave for 10 days at 220 degrees C	-Discoloration degree by color difference meter -No remarkable discoloration	-Discoloration degree: 19.3 -Linger	-Discoloration degree: 3.6 -No discoloration
				
			Confirmed superiority of Rhodium over silver coating in a high temperature environment	
Heat run	-FVC (SCF-153.5H52 WR) -Current: 132 A -Frequency: 13.56 MHz -Ambient temperature: 25 degrees C -Time applied: 60 minutes	-Temperature rise < $\Delta 100$ degrees C -No abnormality -No discoloration at electrode contact	$\Delta 91.2$ degrees C, neither abnormality nor discoloration at plate contact	$\Delta 90.5$ degrees C, neither abnormality nor discoloration at plate contact
				
			Results for silver coating and Rhodium over silver coating are equal in heat run and confirm no abnormality	

[NOTE] Discoloration degree: With color difference meter, measure and compare between color states for before testing (initial value) and after to assess the degree of color difference (discoloration). Values get bigger toward black (no unit).

Test	Parameter	Measuring method	Result	
Surface resistance	Surface resistance with Milliohm meter <Milliohm meter> HEWLETT PACARD 4338A <Sample> -FVC (FH52 type) <Parameter> 1. Initial state 2. 10 days later at 125 degrees C 3. 10 days later at 220 degrees C Compare surface resistance for silver coating and Rhodium over silver coating	<Resistance measurement  - Probe A - (Contact area: 258 mm ²) Distance 1: 10 mm - Probe B - (Point contact) Distance 2: 5 mm Measure resistance values by contacting probes at the above positions	Silver coating	Rhodium over silver coating
			1. Initial state <u>Resistance value: 1.4 mΩ</u>	1. Initial state <u>Resistance value: 1.4 mΩ</u>
			2. 10 days later at 125 degrees C <u>Resistance value: 2.3 mΩ</u>	2. 10 days later at 125 degrees C <u>Resistance value: 1.5 mΩ</u>
			3. 10 days later at 220 degrees C <u>Resistance value: 11.2 mΩ</u>	3. 10 days later at 220 degrees C <u>Resistance value: 2.5 mΩ</u>
			-Silver coating and Rhodium over silver coating are equal in their initial resistance values, which confirms no resistance increase of Rhodium coating. -at 220 degrees C, silver coating gets discolored and surface resistance value increased, while such changes do not happen for Rhodium over silver coating.	