



TE Connectivity Ltd  
 Energy  
 Stevenson Road  
 Brighton  
 East Sussex UK  
 BN2 0DF  
 Tel ++44 (0)1793 572399 (Main Line)  
 Fax ++44 (0)1273 601741  
 www.te.com

# TYPE TEST REPORT FOR SURGE ARRESTER TYPE PCA

Report no : 161006

## WEATHER AGEING UV TEST

- IEC standard 60099-4: Ed. 3.0 2014, Cl. 10.8.17.3

**Test objects:** Silicone rubber insulation for Surge Arrester type PCA

**Test Standard:** IEC 60099-4 Ed.3 2014 clause 10.8.17.3

**Test Date:** January – July 2016

|         | Name              | Designation         | Signature | Date              |
|---------|-------------------|---------------------|-----------|-------------------|
| Prepare | Nikhil Thakkar    | Test Engineer       |           | 19th October 2016 |
| Approve | Sean Lewington    | Material Manager    |           | 19th October 2016 |
|         | Kwong Tong        | Laboratory Manager  |           | 19th October 2016 |
| Issue   | Bengt Johnnerfelt | Engineering Manager |           | 19th October 2016 |

## PRIMARY ELECTRICAL PERFORMANCE CHARACTERISTIC FOR PCA SURGE ARRESTER DESIGN

|   |                       |                    |
|---|-----------------------|--------------------|
| Reference current ( $I_{ref}$ )         | 5                     | mA <sub>peak</sub> |
| Nominal discharge current ( $I_N$ )     | 10                    | kA                 |
| Rated voltage ( $U_r$ )                 | $0.98 \times U_{ref}$ | kV                 |
| Continuous operating voltage ( $U_c$ )  | $0.80 \times U_r$     | kV                 |
| Charge transfer capability ( $Q_{rs}$ ) | 2.2                   | Coulombs (C)       |
| Energy class                            | SM                    |                    |
| Thermal energy ( $W_{th}$ )             | 7.8                   | kJ/kV- $U_r$       |

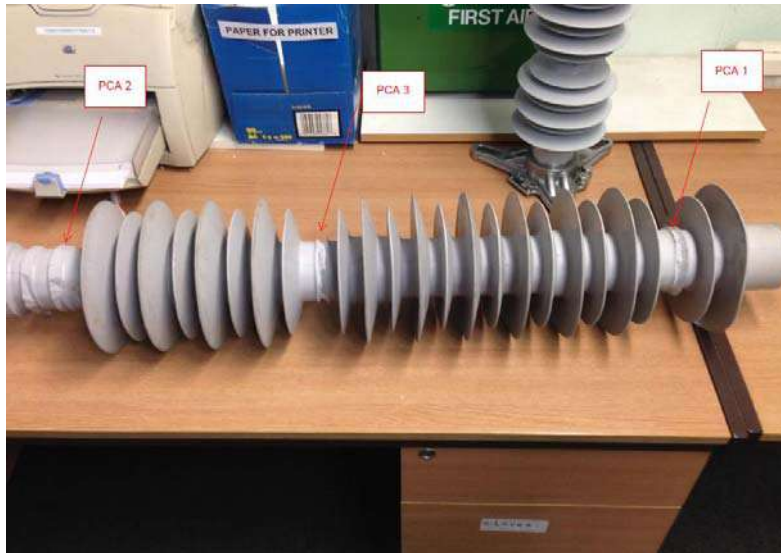
Registered Office: Faraday Road, Dorcan  
 Swindon, Wiltshire, SN3 5HH, UK  
 Registered No. 550926  
 VAT No. GB 681 471 425



Certificate No. LRQ 400659

## SAMPLE SELECTION AND IDENTIFICATION

3 Silicone rubber samples were cut from a standard factory finished PCA-120 surge arrester.



## TEST METHODOLOGY

### UV light source:

Flourescent UV light source according to ASTM G154 and EN ISO 4892-1 & 4892-3

### Lamp type:

QFS-40 (UVB-313 lamps)

### Test cycle:

ASTM G154 - Test cycle 3 / SAE J2020 - Test cycle C

8 hours UV at 70°C (0.48W/m<sup>2</sup>) followed by 4 hours 100% relative humidity at 50°C

### Test duration:

5000 hours with evaluation at 1000<sup>th</sup> hour and 5000<sup>th</sup> hour.

## TEST EVALUATION

The silicone rubber test samples roughness was tested according to IEC 60099-4 using a Mitutuyo SurfTest SJ201P surface roughness tester

- 94 -

IEC 60099-4:2014 © IEC 2014

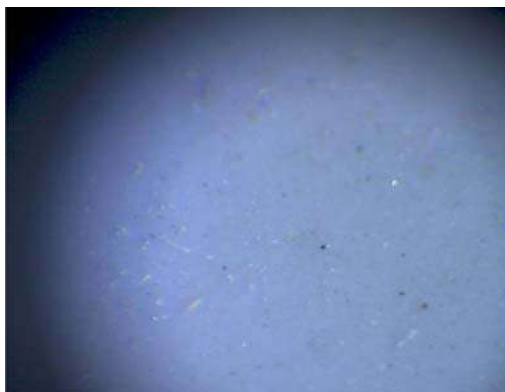
### 10.8.17.3.2 Evaluation of the test

After the test, markings on shed or housing material shall be legible; surface degradations such as cracks and raised areas are not permitted. In case of doubt concerning such degradation, two surface roughness measurements shall be made on each of the three specimens. The roughness,  $R_z$  as defined in ISO 4287, shall be measured along a sampling length of at least 2,5 mm.  $R_z$  shall not exceed 0,1 mm.

NOTE ISO 3274 gives details of surface roughness measurement instruments.

## RESULT AND VISUAL EXAMINATION

| Roughness measurements after UV exposure |                         |                         |                         |
|--|-------------------------|-------------------------|-------------------------|
|  | 0th Hour                | 1000th Hour             | 5000th Hour             |
|  | $R_z$ ( $\mu\text{m}$ ) | $R_z$ ( $\mu\text{m}$ ) | $R_z$ ( $\mu\text{m}$ ) |
| PCA1                                     | 4.03                    | 3.3                     | 3.77                    |
| PCA2                                     | 2.12                    | 4.8                     | 4.15                    |
| PCA3                                     | 2.96                    | N/A                     | 8.49                    |



Control



At 1000<sup>th</sup> hour

## CONCLUSION

No surface cracking or significant chalking/fading present after 5000 hours UV exposure.

All samples passed 1000 and 5000 hours UVB exposure evaluation without significant changes to roughness, colour and without surface cracking irrespective of shed location and source of silicone rubber for PCA surge arrester.