

## UNDERWRITERS LABORATORIES INC. CERTIFICATION REQUIREMENT DECISION

This Certification Requirement Decision is prepared by UL LLC. It is normative for the applicable UL Product Certification Program(s); however, it is currently not part of the UL Standard(s) referenced below.

**Product Category (CCN):** ZLGR

**Standard Number:** UL 44

**Standard Title:** Standard for Thermoset-Insulated Wires and Cables

**Edition Date:** March 28, 2014

**Edition Number:** 18

**Section / Paragraph Reference:** 4.6A (new); 5.27, 5.27.1, 5.27.2, 5.27.3, 5.27.4 (new);  
Table B.1

**Subject:** Color coating

### DECISION:

#### 4.6 Color coding

4.6A When ink or paint is used as a means of identifying conductors, the coating shall be a thin colored coating of suitable material applied to the surface of the insulation. The coating material shall not have an adverse effect on the properties of the insulation. The required surface printing shall remain legible after the application of the colored coating. If the coating is of an extruded type, it shall be considered as part of the insulation and shall comply with all requirements.

#### 5.27 Color coating

5.27.1 Surface (ink or paint) coated thermoset-insulated wire shall comply with the requirements in Clauses 5.27.2 – 5.27.4 when tested in accordance with the test, Color coating, in UL 2556, CSA C22.2 No. 2556, or NMX-J-556-ANCE.

5.27.2 The surface-coated thermoset-insulated conductor shall comply with the tensile strength and ultimate elongation requirements before and after the air-oven aging applicable to the insulation.

5.27.3 The coating shall not flake off of the surface of the insulation when samples of the wire are flexed at room temperature in the manner described in the test, Color coating, in UL 2556, CSA C22.2 No. 2556, or NMX-J-556-ANCE both before and after the air-oven aging applicable to the insulation.

5.27.4 The surface coating shall not migrate when tested in accordance with the test, Color coating, in UL 2556, CSA C22.2 No. 2556, or NMX-J-556-ANCE.

### Annex B (informative) - Summary of requirements

(See Clause 1.1)

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Table B.1

| Requirement                                                      | Wire type designation |                 |               |               |        |     |                                      |                    |                 |
|------------------------------------------------------------------|-----------------------|-----------------|---------------|---------------|--------|-----|--------------------------------------|--------------------|-----------------|
|                                                                  | XHH                   | XHHW,<br>XHHW-2 | RHW,<br>RHW-2 | RHH           | SA, SF | SIS | R90                                  | RW75,<br>RW90      | RWU75,<br>RWU90 |
| Voltage rating                                                   | 600 V                 |                 | 600V and 2kV  |               | 600V   |     | 600v, 1kV, 2kV, and 5kV <sup>a</sup> |                    | 1kV             |
| Temperature rating                                               | 1.2, Table 1          |                 |               |               |        |     |                                      |                    |                 |
| Conductors                                                       | 4.1.5.1, Table 2      |                 |               |               |        |     |                                      |                    |                 |
| Number of conductors                                             | Table 1               |                 |               |               |        |     |                                      |                    |                 |
| Conductor stranding                                              | 4.1.5.2, Table 3      |                 |               |               |        |     |                                      |                    |                 |
| Conductor diameter                                               | 4.1.6, Tables 5 – 10  |                 |               |               |        |     |                                      |                    |                 |
| Conductor separator                                              | 4.1.8                 |                 |               |               |        |     |                                      |                    |                 |
| Insulation – General                                             | 4.2.1, Table 19       |                 |               |               |        |     |                                      |                    |                 |
| Insulation – Physical properties                                 | 4.2.1, Table 11       |                 |               |               |        |     |                                      |                    |                 |
| Insulation – Thickness                                           | 4.2.3, Tables 12 – 18 |                 |               |               |        |     |                                      |                    |                 |
| Jackets and coverings                                            | 4.3, Tables 21 – 23   |                 |               |               |        |     |                                      |                    |                 |
| Jacket physical properties                                       | Table 20              |                 |               |               |        |     |                                      |                    |                 |
| Shielding                                                        | 4.4                   |                 |               |               |        |     |                                      |                    |                 |
| Multiple-conductor cables                                        | 4.5                   |                 |               |               |        |     |                                      |                    |                 |
| Color coding                                                     | 4.6                   |                 |               |               |        |     |                                      |                    |                 |
| Fillers                                                          | 4.7                   |                 |               |               |        |     |                                      |                    |                 |
| Jacket separators                                                | 4.8                   |                 |               |               |        |     |                                      |                    |                 |
| Overall jackets                                                  | 4.9, Tables 19 and 26 |                 |               |               |        |     |                                      |                    |                 |
| Evaluation of new materials                                      | 4.10                  |                 |               |               |        |     |                                      |                    |                 |
| Assemblies of conductors                                         | 4.11                  |                 |               |               |        |     |                                      |                    |                 |
| Conductor resistance                                             | 5.2, Tables 27 – 32   |                 |               |               |        |     |                                      |                    |                 |
| Tests on aluminum conductors                                     | 5.3                   |                 |               |               |        |     |                                      |                    |                 |
| Long-term insulation resistance in water                         |                       | 5.4, Table 35   |               |               |        |     |                                      | 5.4, Table 33 – 34 |                 |
| Long-term insulation resistance in air for 90°C rated conductors | 5.5, Table 36         |                 |               | 5.5, Table 36 |        |     | 5.5, Tables 36 – 37                  |                    |                 |
| Capacitance and relative permittivity                            |                       | 5.6             |               |               |        |     |                                      | 5.6                |                 |
| Conductor corrosion                                              | 5.7                   |                 |               |               |        |     |                                      |                    |                 |
| Insulation fall-In                                               | 5.8                   |                 |               |               |        |     |                                      |                    |                 |
| Heat shock of thermoplastic jacket                               | 5.9                   |                 |               |               |        |     |                                      |                    |                 |
| Flexibility of separator under thermoplastic jacket              | 5.10                  |                 |               |               |        |     |                                      |                    |                 |
| Cold bend                                                        | 5.11.1                |                 |               |               |        |     |                                      |                    |                 |
| Cold impact (optional)                                           | 5.11.2                |                 |               |               |        |     |                                      |                    |                 |
| Deformation                                                      | 5.12                  |                 |               |               |        |     |                                      |                    |                 |
| Hot creep                                                        | 5.13                  |                 |               |               |        |     |                                      |                    |                 |
| Horizontal- specimen flame test                                  | 5.14.1                |                 |               |               |        |     |                                      |                    |                 |
| Burning particles test                                           |                       |                 |               |               |        |     | 5.14.2                               |                    |                 |
| FT1 flame test (optional)                                        | 5.14.3                |                 |               |               |        |     |                                      |                    |                 |
| VW-1 flame test (optional)                                       | 5.14.4                |                 |               |               |        |     |                                      |                    |                 |
| Vertical tray flame (optional)                                   | 5.14.5                |                 |               |               |        |     |                                      |                    |                 |

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