

### JP4EEE Attachment 3: Non-exhaustive list of EEE safety standards relating to the flame retardancy

This is a non-exhaustive list as of 27 March 2026.

| Standard No. | Scope of the standards<br>on products/parts                                                                                                                                                                                                                                                                            | Whether it directly mentions on flame<br>retardant criteria or not                                                                                                                                                                                                                                                                                                                      | Applications<br>e.g. Power supply, cable                                                                                                                                         |
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| UL 62368-1   | Audio/Video, Information and Communication Technology Equipment – Safety Requirements                                                                                                                                                                                                                                  | Including test and evaluation standards of flame retardant performance.<br><br>6. Electrically-caused fire<br><br>6.4.5. Control of fire spread in PS2 circuits<br><br>6.4.6. Control of fire spread in a PS3 circuit<br><br>Annex B.4.8. Compliance criteria during and after single fault conditions<br><br>Annex G. Components<br><br>Annex S. Tests for resistance to heat and fire | Exterior parts (housing, etc.), internal parts (Tube, thermistor, varistor, etc.), cables (coating), connectors, switches, sensors, printed circuit boards, and other substrates |
| UL 60204-1   | Safety of machinery. Electrical equipment of machines.<br><br>General requirements<br><br>Applies to electrical equipment of machines<br><br>•Products covered by LVD: Equipment operating at 50 VAC -1000 V, 75 VDC -1500 V (AC adapter, etc.)                                                                        | There is no direct reference to flame retardancy, and it is required to shut off the power supply when heated.<br><br>However, according to Section 4.2 (Selection of equipment), the following parts are required to be flame retardant.                                                                                                                                               | Built-in cables, components (Cables, connectors, printed circuit boards, insulating materials, etc.)                                                                             |
| UL 61010-1   | Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 1: General requirements<br><br>Applicable to electrical equipment for testing and measurement, electrical equipment for industrial process control, electrical equipment for laboratories, and life science equipment | Yes (Section 9.3 "containment of fire in equipment in case of fire," Section 14.7 'Printed wiring board')                                                                                                                                                                                                                                                                               | External parts (resin enclosure, etc.), cables (coating), internal parts (Connectors, switches, sensors, terminal blocks, etc.), printed circuit boards, etc.                    |

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| UL 61010-2-010 | Safety requirements for electrical equipment for measurement, control and laboratory use - Part 2-010:<br>Particular requirements for laboratory equipment for the heating of materials.<br>Applies to life science equipment, measurement equipment and testing laboratory equipment.                                                                             | Yes                                                                | Housing,<br>insulated wire, cable and printed board, etc. |
| UL 61010-2-011 | Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 2-011:<br>Particular requirements for refrigerating equipment<br>Applies to life science equipment, measurement equipment and testing laboratory equipment.                                                                                                       | Yes                                                                | Housing,<br>insulated wire, cable and printed board, etc. |
| UL 61010-2-081 | Safety requirements for electrical equipment for measurement, control and laboratory use - Part 2-081:<br>Particular requirements for automatic and semi-automatic laboratory equipment for analysis and other purposes<br>Measurement, Control and laboratory use electric equipment- Analysis and other usage automatic and semi-automatic laboratory equipment. | Yes                                                                | Housing,<br>insulated wire, cable and printed board, etc. |
| UL 61010-2-101 | Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 2-101:<br>Particular requirements for in vitro diagnostic (IVD) medical equipment<br>Measurement, Control and laboratory use electric equipment-in vitro diagnosis (IVD) medical equipment                                                                        | Yes                                                                | Housing,<br>insulated wire, cable and printed board, etc. |

| Standard No.  | Scope of the standards<br>on products/parts                                                                                                                                                                                                                       | Whether it directly mentions on flame<br>retardant criteria or not                                                                                                                                                                                                                                                                          | Applications<br>e.g. Power supply, cable                                     |
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| UL 60601-1    | Medical electrical equipment - Part 1: General requirements<br>for basic safety and essential performance<br><br>Applies to medical electric equipment.                                                                                                           | Yes(11.3)                                                                                                                                                                                                                                                                                                                                   | Resin enclosure, cable, connector,<br>printed board and terminal block, etc. |
| UL 60601-2-24 | Medical electrical equipment - Part 2-24: Particular<br>requirements for the basic safety and essential performance<br>of infusion pumps and controllers<br><br>Medical electric equipment<br><br>Drug infusion pump and controller                               | Yes                                                                                                                                                                                                                                                                                                                                         | Housing,<br>insulated wire, cable and printed board, etc.                    |
| UL 60335-1    | Household and similar electrical appliances - Safety - Part<br>1: General requirements<br><br>The standard covers electrical appliances with rated<br>voltages up to 250 V for single phase and up to 480 V for<br>others, as well as battery operated equipment. | 30.(Heat resistance and fire resistance):<br>30.1. (Heat resistance) Non-metallic and<br>thermoplastic parts shall be subjected to the<br>ball pressure test according to IEC 60695-10-<br>2.<br><br>30.2. 1 (Ignition and fire resistance) Non-<br>metallic parts shall be subjected to the grow<br>wire test according to IEC 60695-2-11. | General parts such as terminal covers.                                       |
| UL 60335-2-24 | Household and Similar Electrical Appliances – Safety – Part<br>2-24: Particular Requirements for Refrigerating Appliances,<br>Ice-Cream Appliances and Ice-Makers                                                                                                 | Yes. 60335 Refer to -1                                                                                                                                                                                                                                                                                                                      | General resin parts                                                          |
| UL 60335-2-34 | Household and similar electrical appliances - Safety - Part 2-<br>34: Particular requirements for motor-compressors                                                                                                                                               | Yes                                                                                                                                                                                                                                                                                                                                         | Compressor                                                                   |

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| UL 60335-2-40<br>(moved from UL 1995) | Electrical equipment for domestic and similar purposes -<br>Safety - Part 2 -40: Specific requirements for electric heat<br>pumps, air conditioners and dehumidifiers<br>Household and similar electrical appliances - Safety - Part 2-<br>40: Particular requirements for electrical heat pumps, air-<br>conditioners and dehumidifiers | In “30. Resistance to heat and fire” of EN<br>60335-1 (2012) +A15 (2021), there are<br>descriptions of "GWT, glow-wire flammability<br>index (GWFI), glow-wire ignition temperature<br>(GWIT), needle-flame test (NFT), V-0, V-1,<br>VTM- 0". In order to protect these, it is<br>necessary to add a flame retardant to the<br>resin. | Bobbins of fan motors, solenoid valves, four-way<br>valves, electronic expansion valves, louver motors,<br>connectors, mold resin, and terminal covers of<br>compressors. Contact holding parts of pressure<br>switches. Printed circuit board substrates, mounted<br>electrical and electronic components. Electrical<br>components such as connectors, terminal blocks,<br>electromagnetic contactors, overload protection<br>devices, fuse holders, film capacitors, and wire<br>coatings, as well as electrical component boxes for<br>storing them. Product casings, air filters, fan grills,<br>and all other resin components used in products. |
| UL 60335-2-89                         | Household and similar electrical appliances - Safety - Part 2-<br>89: Particular requirements for commercial refrigerating<br>appliances and ice-makers with an incorporated or remote<br>refrigerant unit or motor-compressor                                                                                                           | Yes                                                                                                                                                                                                                                                                                                                                   | Resin components such as refrigerators and life<br>science equipment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| UL 60309-1                            | Plugs, socket-outlets and couplers for industrial purposes -<br>Part 1: General requirements                                                                                                                                                                                                                                             | Yes<br>(27 Resistance to heat, fire and to tracking)                                                                                                                                                                                                                                                                                  | Industrial plugs, sockets and couplers                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| UL 60730-1                            | Automatic electrical controls-Part 1: General requirements                                                                                                                                                                                                                                                                               | 21 Heat resistance, fire resistance and<br>tracking resistance<br>ANNEX G: Heat and fire resistance tests                                                                                                                                                                                                                             | General resin parts of electric automatic control<br>units                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| UL 60947-1                            | Low-voltage switchgear and controlgear - Part 1: General<br>rules, Applicable to low-voltage switchgear and control<br>quipment with a rated voltage of 1000VAC/1500VDC or less                                                                                                                                                          | Yes<br>(IEC/EN60947-1:2021: 8.1.2 Materials, 9.2.2<br>Test of materials to abnormal heat and fire)                                                                                                                                                                                                                                    | Low-voltage switchgear in general:<br>Switches, relays, contactors, circuit breakers,<br>disconnects, motor starters, proximity sensors, etc.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

| Standard No.                                                                   | Scope of the standards<br>on products/parts                                                                                                                                                                  | Whether it directly mentions on flame<br>retardant criteria or not                        | Applications<br>e.g. Power supply, cable                                                                                                 |
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| UL 61496-1                                                                     | Safety of machinery — Electrosensitive<br>protective equipment<br>Part 1: General requirements and tests                                                                                                     | Yes<br>(4.2.3.7 Fire and flame protection)                                                | Electrically sensitive protection for human body<br>(safety sensors)                                                                     |
| UL 61800-5-1<br>(transferred from UL<br>508 C)                                 | Adjustable speed electrical<br>power drive systems –Part 5-1:<br>Safety requirements –<br>Electrical, thermal and energy                                                                                     | Yes<br>(5.2.5.4 Flammability test)                                                        | Variable speed drive system (motor driver)                                                                                               |
| UL 61810-1                                                                     | Electromechanical elementary relays<br>Part 1: General and safety requirements<br>Applicable to electromechanical relays with a rated voltage<br>of 1000VAC/1500VDC or less                                  | Yes<br>(16 Heat and fire resistance)                                                      | Electromechanical relays for low-voltage electrical<br>equipment<br>(including relays with forced guide contacts)                        |
| UL 224<br>CSA* C22.2 NO. [*]<br>198.1-06<br><br>*Canadian Standard Association | Extruded Insulating Tubing<br>Insulated tubing<br>(Thermoplastic/curable elastomer extrusion with both non-<br>thermal shrinkage and thermal shrinkage)<br>Widely used for multimedia, home appliances, etc. | Flame Test<br>VW-1 (equivalent to V-0)<br>Similar International Standard<br>IEC60332-1,-2 | Insulating resin used for electric wires<br>Reinforcing tube                                                                             |
| UL 1441<br>CSA-C22.2 No. 198.3-<br>05                                          | Coated Electrical Sleeving<br>Insulated Sleeving (Structure for coating and knitting resin<br>on textile material such as glass)                                                                             | Including Test and Evaluation Standards for<br>Flame Retardant Performance                | Insulated Sleeving (Protects the connection<br>between a cable conductor and a terminal such as<br>a connector (heat shrink tube, etc.)) |
| UL 2556                                                                        |                                                                                                                                                                                                              | Including Test and Evaluation Standards for<br>Flame Retardant Performance                | Cable                                                                                                                                    |

| Standard No. | Scope of the standards<br>on products/parts                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Whether it directly mentions on flame<br>retardant criteria or not                | Applications<br>e.g. Power supply, cable                                                                                                                                                             |
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| ANSI/UL 758  | Appliance Wiring Material (AWM)<br>UL collectively refers to wiring materials inside equipment and cables connecting equipment as AWM, and gives UL AWM STYLE Nos. for each rating, structure, and application based on UL758. On the style page of the standard, the structure, rated temperature, and voltage of wiring materials corresponding to each style number, conductor sizes and materials, covering materials and their thicknesses, descriptions of shields and covers (jackets), UL reference standards used for product evaluation, required markings, and intended use are described. [*]1 [*]2When ordering internal cables, specifications are often specified by UL Style Nos. [*]3 | Including Test and Evaluation Standards for Flame Retardant Performance           | Wiring in Equipment                                                                                                                                                                                  |
| UL 796       | Printed Wiring Boards                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | See UL 94.<br>UL 94 is referenced in UL 796.                                      | Printed wiring board (Rigid)<br>Printed Wiring Boards (Rigid)                                                                                                                                        |
| UL 796F      | Flexible Materials Interconnect Constructions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | See UL 94<br>UL 94 is referenced in UL 796F.                                      | Printed wiring board (Flexible)<br>Printed Wiring Boards (Flexible)                                                                                                                                  |
| UL 510FR     | Burn test for Tape<br>Cover tape such as:<br>Adhesive tape<br>Vinyl adhesive tape                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Test standards for flame retardancy of electrically insulating adhesive tape [*]4 | •Bundling of CRT degaussing coils/Bundling of electrical insulation wires and cables, clothing<br>•Heat-resistant coil locking and bundling<br>•Heat-resistant parts Exterior insulation, protection |

1 For example: <https://iq.ul.com/awm/stylepage.aspx?style=21151>

2 For example, UL Style No. 3239, 3265, 3266, 3271, 3289, 3832, 3887, 3888, 3398, 3613, 3633, and 10267 correspond to flame retardant cross-linked polyethylene electric wires.

3 Example of electric wire specification list: [https://images.100y.com.tw/pdf\\_file/Furukawa\\_wire.pdf](https://images.100y.com.tw/pdf_file/Furukawa_wire.pdf)

4 As a result of test on sample tape wound around a steel bar, the tape should not burn for 60 seconds or more. In addition, 25% or more of the mark should not burn and the marking cotton should not ignite.

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|              | <p>Polyester adhesive tape</p> <p>Acetate adhesive tape</p> <p>Fluororesin adhesive tape</p> <p>Glass cloth adhesive tape</p>                                                                                                                                                                                   |                                                                     | <ul style="list-style-type: none"> <li>• Exterior insulation, interlayer insulation of heat-resistant transformer</li> <li>• For insulation and strengthening insulation of various coils</li> <li>• Ground fault circuit breaker motor insulation</li> <li>• Insulation protection of camera-related parts</li> <li>• Wire harness bundling of household appliances</li> <li>• Bundling of compressors</li> <li>• Harness bundling of vehicle-mounted devices</li> <li>• Isolation of nickel-metal hydride battery cells</li> <li>• Fixing of electrical equipment receiving and distributing power</li> </ul> |
| UL 94        | <p>Tests for Flammability of Plastic Materials for Parts in Devices and Appliances</p> <p>This covers the flame-retardant performance of resin parts.</p> <p>The UL94 test method is divided into the following 6 types of tests according to the grade of flame retardancy and the nature of the material:</p> | Standards for Testing and Evaluation of Flame Retardant Performance | <p>General plastic materials.</p> <p>Concretely, housing, insulating sheet, board, connector, cable (heat shrink tube)/terminal cover, etc.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

| Standard No. | Scope of the standards<br>on products/parts                                                                                                                                                                                                                                                                                                                                                     | Whether it directly mentions on flame<br>retardant criteria or not  | Applications<br>e.g. Power supply, cable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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|              | <p>(1) Horizontal Combustion Test: HB</p> <p>(2) 50 W (20 mm) Vertical Combustion Test: V-0, V-1 or V-2</p> <p>(3) 500 W (125 mm) Vertical Combustion Test: 5VA or 5VB</p> <p>(4) 500 W (125 mm) Plate Material Combustion Test: 5VA or 5VB</p> <p>(5) Thin Material Vertical Combustion Test: VTM-0, VTM-1 or VTM-2</p> <p>(6) Foam Material Horizontal Combustion Test: HBF, HF-1 or HF-2</p> |                                                                     | <p>For example, in case of housing, at least V-1 class is required legally, but V-0 is adopted in consideration of the possibility of use by users.</p> <p>UL94 V-0 class applies to many electrical components.</p> <p>UL94 HF-1 class applies to EPDM foam sealant and foam for thin layer high recovery gasket/seal. EEE waterproof, airtight, soundproof, insulating material; Liquid crystal television buffer material, for display gasket of digital camera, etc. (Dustproof, buffer, etc.); Communication equipment: Used for gasket around LCD of mobile phone, etc.</p> <p>UL94 HBF class applies to EPDM foam sealant and connection joint tape. Used for connection, terminal treatment of wire cable, connection joint tape, etc.</p> <p>UL94 VTM-0 class applies to nonwoven double-sided tape, etc., and is used for electrical equipment components such as OA and home appliances.</p> |
| UL 746C      | <p>Flammability Testing Standards</p> <p>Evaluation method for resin materials used in electrical and electronic equipment used in non-hazardous locations</p>                                                                                                                                                                                                                                  | Standards for testing and evaluation of flame retardant performance |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| UL 50        | Enclosures for Electrical Equipment, Non-Environmental Considerations                                                                                                                                                                                                                                                                                                                           |                                                                     | Applies to enclosures used in electrical and electronic equipment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |



| Standard No. | Scope of the standards<br>on products/parts                                                                                | Whether it directly mentions on flame<br>retardant criteria or not | Applications<br>e.g. Power supply, cable |
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|              | Provides structural and performance requirements for protection of persons from accidental contact with enclosed equipment |                                                                    |                                          |