

Note 7: Safety Testing

Safety test information and sample requirements (as applicable)

In order to ensure prompt completion of the assessment we would ask you to provide:

- Working sample(s) - where the product case or assembly is likely to be distorted or destroyed when opened an additional sample will be require that has undergone final assembled i.e. prior to welding or gluing.
- Circuit diagram(s),
- Parts list(s),
- Approval documentation for safety critical components,
- Samples of safety critical components (including unpotted/unvarnished components)
UL 94 Flammability listings for all plastics, PCB material etc.
- Samples of components which are likely to be damaged during fault testing, e.g. fuses, voltage regulators
- Samples of transformers that employ thermal fuse protection if used in the product
- Specifications/details for critical parts (e.g. batteries, protection circuits etc...),
- User, installation, service manual(s),
- Brief description of operation

Electrical Safety Testing Assumptions (as applicable)

- All safety critical and approvable components and materials hold suitable approval including the charger. Suitable supporting documentation should be provided at the start of the project.
- AC powered equipment will be tested for a rated supply voltage of 230 Vrms ($\pm 10\%$), 50Hz only OR 115 Vrms (+6% / -10%), 60Hz only, unless specified and agreed otherwise.
- DC powered equipment will be tested for a supply tolerance of +20% / -15% unless a wider tolerance is specified.
- No flammability tests will be conducted. Materials shall have suitable flammability ratings in accordance with UL 94 or IEC 60707. Suitable supporting documentation should be provided at the start of the project. Verification of materials via application of fault conditions shall not be applied unless agreed prior to the assessment and will incur additional cost if required.
- Adequate isolation barriers in accordance with the standard tested are present where required within the design of the equipment. Verification of compliance by application of fault conditions, where allowed by the applicable standard, will incur additional cost if required.
- The equipment will be supplied fully loaded and configured for worst case normal operating conditions, including all loads required.
- The equipment does not contain heating or cooling systems dependent on external ambient temperature (e.g. variable speed fans, peltier cooling systems).
- If multilayer boards are employed in safety critical locations, layout artworks will be required and additional costs for assessment may be incurred.
- Creepage and clearance assessment will be based on an assumed Comparative Tracking Index (CTI) of IIIb (i.e. CTI between 100 and 175).
- Testing will include special national conditions assuming it is not intended for connection to an IT power supply system.
- The mains isolation transformer(s) is/are not of a potted or toroidal type construction

Externally mounted equipment (e.g. EN60950-22):

Requirements are specified for:

Rain, Dust, Icing, Protective Coating (not required if material is cast aluminium), **Gasket** (verification with the gasket ageing requirements will be based on manufacturer's own data and component approval)

Rain test (performed at TÜV)

Dust test (sub-contracted to a TÜV partner lab)

Icing (performed at TÜV)

Assumptions:



- The enclosure is suitably certified with an appropriate IP rating in accordance with IEC 60529
- The lowest declared ambient operating temperature is -50°C
- Compliance with the UV protection requirements will be based on inspection and review of data
- (any testing required will incur additional costs and revised timescales)
- Compliance with the resistance to corrosion requirements will be based on inspection and review of data (any testing required will incur additional costs and revised timescales)
- Any sealing gaskets used are not subject to contact with coolant or oil
- Any sealing gaskets are already (suitably) tested in accordance with EN / IEC 60950-22 Annex D
- The enclosure is entirely metallic
- No batteries are used in the design

Electrical Safety Compliance Assessment

Our Electrical Safety Compliance Assessment is intended to help you demonstrate compliance with the essential requirements of the Low Voltage Directive (LVD) and is ideal for use as a pre-compliance design assessment tool.

NB: There is no testing performed with this service

The Compliance Assessment covers:

- Product construction; Electrical, mechanical and fire enclosure; General construction and assembly; Marking; Protective earthing; Wiring connections and supply; Physical requirements (stability etc...);
- Protection against electric shock; Safety strategy; Creepage and clearance; Isolation barriers
- Documentation assessment; Safety critical components; Flammability ratings for plastics and other materials; User, Installation, and Service instructions.

etc.

Our findings will be detailed in an Electrical Safety Compliance Assessment report (non-UKAS) including:

- A summary statement briefly detailing if, in our opinion, the product construction meets or does not meet the essential requirements of the LVD
- Observations and comments noted during the assessment
- A comprehensive list of non-compliances
- Summary of Safety critical components and materials
- Documentation summary
- Guidance on supporting documentation required for safety critical components and materials
- Recommendation of any tests (fault testing etc...), we feel, are required to supplement the Compliance Assessment (to be applied at your discretion, either by yourselves or by TÜV SÜD on your behalf). Additional tests performed by TÜV SÜD will be supported by Test Data Sheets.

Documentation required:

- a) Completed Technical Information Sheet (TIS)
- b) Circuit diagrams
- c) Bills of material
- d) Data sheets for safety critical components
- e) Flammability data (UL listings) for PCB's and plastic materials used for isolation purposes
- f) User manual
- g) Product labelling
- h) Information detailing the method by which the sample can be set into the mode of operation that causes the most power to be drawn from its power supply
- i) Working sample(s)