

Buying Specification Guides for Durability and Repair

Fundamental Good Practice

Avoids Repair:

- Basic fault diagnostics advice available in the user's instruction booklet and online.
- The product to be of robust construction to avoid mechanical damage in use. You can make your products more resistant to damage by:
 - Protecting function-critical leads, switches and ports in strong housing and away from exposed areas or corners.
 - Specifying rounded corners on plastic mouldings - avoid use of sharp corners which can be weak.
 - Integrating placement holders into the interior case mouldings – to give rigidity to the screen and help prevent electrical components moving.
 - Ensuring stands give good support and stability – using interlocking or moulded parts that attach to the TV and give additional strength.
 - Using wall mounting points that connect directly to the main chassis to provide strength and stability.
 - Supporting connector blocks by the case moulding – not relying on solder alone on the circuit boards to keep them in place.
 - Using access fixings for repair that can withstand a number of repair cycles – such as the back panel.
- The product to be of robust electrical design to avoid failure in useⁱⁱ. This can be achieved in products by:
 - Specifying LED rather than LCD screens - they are non-hazardous, use less energy and reduce heat gain.
 - Specifying electrical connectors that are vibration-resistant and removable.
 - Minimising energy use to extend component life and reduce heat damage.
 - Adequately spacing and cooling high temperature components and circuits – by specifying heat sinks or fans to prolong life.
 - Riveting as well as soldering heat sinks on chips and the power board - to prevent joint damage.
 - Using surface mounted solder on circuit boards.
 - Electrically protecting power and control board components from power supply faults.
 - Preventing faults on key components causing faults to other components – by avoiding components being interconnected.
 - Using standard memory chips that are replaceable and self-programming.

Facilitates Repair:

- Repair manual and exploded parts diagrams to be available on the brand or manufacturer's websiteⁱⁱⁱ (free of charge).
- All spare parts to be clearly listed on the manufacturer's website with relevant pricing and information on stockists.
- All spare parts to be available for six years¹ following the end of model production^{iv}.
- Spare parts and sub-assemblies to be reasonably priced to facilitate repair outside of warranty^v.
- All major repairable/replaceable components (such as screen assembly, control circuit board, inverters and speakers) to be easily accessible once the rear casing is removed^{vi}.

Other Desirable Features

Avoids Repair:

- Model to display user warning when critical components exceed threshold temperatures (high cost models only).
- Non-critical component failure should not lead to product failure (e.g. remote control or DVD drive). The unit should have controls on the console to allow operation without the remote control. Universal remote control codes should be available to enable the user to operate in the event of failure.

Facilitates Upgrade and Repair:

- Fastener points to be clearly marked or labelled (making it clear which screws allow access to which component).
- Spare parts to be as standardised where possible across a product range or series².
- Minimum guarantee of 2 years, and 3 years on high-cost models that favours repair over replacement and covers parts and labour³.
- Internal service port (with connector lead and relevant software for upgrades) should be available to independent repairers (high-cost models only).
- Fault code descriptions to be available by model on manufacturer's website to enable fault diagnosis (high-cost models only).
- Single polymer (e.g. HIPS) or single polymer combination (PCABS) should be used for all external casing parts⁴.
- Components that are hazardous and require WEEE Annex II treatment should be clearly labelled or colour coded to assist recycling.

¹ The UK Sale of Goods Act (SOGA) offers protection against faulty goods when the manufacturer's guarantee has expired and states that goods must last a "reasonable time" which can be claimed anything up to six years from the date of purchase. Six years availability of spares is specified under the Blue Angel Eco-label scheme in Germany. Most of the larger manufacturers currently meet this requirement. 7 years is specified for the EU Eco label.

² Standardisation of parts is likely to lead to economies of scale in manufacture, lower parts prices and less stock to be carried by repair organisations.

³ Manufacturer warranties are available for 3 years on some mid-cost televisions and 5 years on some high-cost models. Warranty does not necessarily mean that products are repaired (as products can be disposed of and replaced during warranty). To encourage longer life, warranties should include parts and labour.

⁴ Single polymer casings facilitate recycling at end of life

Expected Life

The table below can be used to compare the repair benefits of different models where lifetime information on key components is available from manufacturers. Data on parts testing can be entered in number of hours in normal use. Information on the test method used by manufacturers should ideally be sought.

Expected Component Rated Life

Product model	Screen (hrs in use)	LCD backlight (hrs in use)	PCB (hrs in use)	CD/DVD drive (hrs in use)	Other key components
A:					
B:					
C:					
D:					

Further information can be gathered from manufacturers about other tests undertaken for example impact, drop, vibration, temperature and humidity as appropriate.

Endnotes: Further Detail

ⁱ As a guide function-critical parts such as power lead connectors, on-off switches, functional buttons, aerial sockets and SCART ports should be in strong housings or protected and located away from corners. On loaded areas or components, stress concentrations such as sharp corners in mouldings should be eliminated where possible through design such as using corner radii. The chassis/case should have inherent rigidity to minimise flexing of the screen, and displacement of PCBs and electrical connectors (can be assisted with moulded internal placement holders). Stands should be designed to provide good stability and be attached to the TV to provide good support and not rely solely on screws, but also on interlocking moulded or steel parts. Wall mounting points should connect directly to the main chassis to provide adequate strength and stability. Power leads should have sufficient protection under regular flexing to prevent damage. Connector blocks should be supported by the case moulding not only by solder on PCBs. Fixing points for main access screws should allow several access cycles (using brass threaded mounts - high cost models only).

ⁱⁱ As a guide electrical connectors should be vibration-resistant and removable, through use of lockable spade or flanged tongue connectors. Energy use should be minimised to extend component and circuit life by reducing thermal degradation. High temperature components and circuits should be adequately spaced and cooled e.g. through heat sinks or fans. Heat sinks on chips and the power board should be riveted as well as soldered to prevent joint damage. Surface mounted solder technology should be used where possible. LED backlights should be used rather than fluorescent tubes to enhanced reliability, generate less heat and they are non-hazardous. Key components on the power and control boards should be electrically protected from power supply faults. Faults on the power board should not cause faults to other components, such as the control board. Standard memory chips should be replaceable and self-programming.

ⁱⁱⁱ Section 17 of the WEEE Regulations requires instructions for product repair are provided by the manufacturer within one year of being placed on the market.

^{iv} Spare parts are those which may fail within the scope of ordinary use. Parts which normally exceed the life of the product are not to be considered as spare parts.

^v To facilitate cost-effective repair outside of warranty no individual spare part is more than 20% the cost of a new television and the LCD screen assembly is no more than 60% of the cost of a new television.

^{vi} As a minimum the back cover should be one piece and secured by screws to enable multiple access cycles, it should **not** use irreversible snap-fits. The backing chassis/PCBs should be removable in one assembly to access the screen components. Screw numbers should be minimal, with standard heads (limited to three head sizes). Electrical connectors should be removable (clip or screw) rather than soldered or crimped joints where access is required. Tamper-proofing (such as plastic covers or labels) should only be used to ensure authorised repair under warranty and should not inhibit other repairs outside of the warranty period. Compact Cold Fluorescent Lamps should be removable whole for replacement or treatment.

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