

APPLiA position regarding 3D-printed spare parts

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Summary

APPLiA believes that 3D-printing of spare parts by third parties fails to provide value for consumers or the environment. Even if manufacturers make 'original' CAD-files widely available, they cannot control important quality and safety parameters, which might cause a series of adverse effects.

1. Concerns and further recommendations regarding 3D-printed spare parts

Technical issues:

- Available CAD-data for components, manufactured using a specific manufacturing technology, cannot be transferred 'as such' for the effective use of a 3D-printer. As an example, the CAD-data for a component which is produced via the injection-moulding manufacturing process cannot be used on a 3D-printer. This latter situation results from the fact that every manufacturing technology has its own specific production-parameters, and these are not directly transposable from one to another technology. There is an existing incompatibility of CAD-data amongst the different manufacturing techniques.
- 3D-printing is mainly available to produce (limited types of) plastics, unlike other types of materials/elements widely used for the manufacturing of home appliances (e.g. metals, refrigerants for HVAC equipment¹, etc.). Further, the types of plastics used in 3D-printers are not always equivalent with the ones used to manufacture appliances/equipment parts. To substantiate this latter statement, the three most used plastics for 3D-printing purposes are Polylactic Acid (PLA), Acrylonitrile Butadiene Styrene (ABS), and Polyvinyl Alcohol (PVA), among others². Whereas, the home appliance sector mainly uses filled polypropylene (PP), (Expanded) Polystyrene (EPS/PS), Polyethylene (PE), Thermoplastic elastomers (TPE), and Polyurethane (PU), among others. The consequence is that the mechanical, thermal, and chemical resistance of 3D-printed spare parts could be lower than the equivalent moulded parts and insufficient to ensure functionality and safety of the repaired appliance or HVAC equipment.
- 3D-printing can only be used to print single-plastic parts and cannot be used for more complex components consisting of several different material types.

Safety and conformity issues:

- Not only spare-parts need to be in conformity at the time of the approval procedure of the entire home appliance or HVAC equipment, but they also need to be available, or, as a minimum, the list of spare parts has to be entirely described³. These two conditions would not be met in the case-scenario where 3D printed spare-parts would be produced by third parties, as a result that there would not be any conformity and availability check undertaken by the original equipment manufacturer (OEM) or competent authorities.

¹ HVAC includes heating equipment, ventilation equipment, and cooling or air-conditioning equipment.

² Other plastics used are Polyamide (PA), Polyethylene terephthalate (PET), etc. ([All3DP web source](#)).

³ The 'approval procedure' is the process that gathers all evidence to demonstrate, from a legal perspective, that a product is fit for the market of destination. On the other hand, spare parts' availability means that the parts need to be available as 'spare parts' at the time a product is placed or made available on the market.



- A manufacturer making available CAD-files cannot exercise sufficient control over the production process of spare parts by a third party. In fact, a CAD-file – irrespective of its design properties - is not enough to ensure an exact replica of an OEM’s produced spare parts. Additionally, a CAD-file does not allow for the quality control of (i) the material(s) being used in the production process of parts, (ii) the 3D-printing process itself (e.g. every 3D-printer is different), (iii) the precise shape or form of a spare part. Consequently, 3D-printed spare parts produced by third parties could never be accepted by the OEM, and by Market Surveillance authorities, for reasons of (non-) compliance of a home appliance or HVAC equipment.
- As a result of the fact that 3D CAD-data cannot control the material composition of a third-party spare part, we foresee food-contact materials’ (FCMs) conformity issues under Regulation (EC) No 1935/2004. Indeed, specific requirements for materials are set under such Framework Regulation, to ensure safety and inertness for all FCMs. On the other hand, we also foresee safety-issues for spare-parts that have to fulfill specific safety requirements, such as plastic housing-parts of printed circuit boards (PCBs) which need to restrain potential fire initiation, combustion and propagation processes, or plastic enclosures which shall have appropriate mechanical resistance to avoid access to live and moving parts.
- Regarding a 3D-printed spare part produced by a third party, we question whether it would need to bear the certification mark “CE” (or not), to prove compliance with health, safety, and environmental protection standards as set for the European Economic Area (EEA)? If yes, who would be liable to mark such printed spare parts? In terms of legal responsibility, we question who would be liable for the conformity of printed spare parts? What about in the case-scenario where the composition of a printed-part would be modified?

APPLiA would like to highlight that, in principle, 3D-printed spare parts could be manufactured by the OEM. Indeed, a proper approbation procedure⁴ could be established by the OEM to 3D-print a component in limited quantities. However, we should bear in mind that 3D-printing of spare parts encompasses important risks and inconveniences, as listed above. We warn that, if this criterion remains to further modulate fees on EEE, its potential misuse to get bonuses may result in creating “unfair competition” issues amongst OEMs and third-party spare parts producers.

It is important to recognise as well that, if the original tools to produce spare parts are still available, it would always be possible to produce the parts by using the original production method, such as injection-moulding, rather than 3D-printing.

Lastly, we would like to highlight that the lack of control by manufacturers making available CAD-files over third-party production processes of spare parts, and the consequences this is likely to yield, will neither benefit the environment, nor the safety of the end-user. On the contrary, it would foster a regime which undermines the goal of the OEM to manufacture spare parts, appliances, and HVAC equipment that are safe, designed for durability, and it would undermine further prevention of waste due to substandard quality.

We remain at your disposal to discuss the recommendations we have raised above. APPLiA is committed to provide the Commission with our experience and expertise.

APPLiA - Home Appliance Europe represents home appliance manufacturers from across Europe. By promoting innovative, sustainable policies and solutions for EU homes, APPLiA has helped build the sector into an economic powerhouse, with an annual turnover of EUR 50 billion, investing over EUR 1.4 billion in R&D activities and creating nearly 1 million jobs.



⁴ i.e. The preparation of all the necessary documentation and conformity declaration which demonstrates that the spare part is fit for the European market (or the market of destination, in general).