

# FOCUS

## 3D PRINTING

### The legal implications of an emerging new technology

3D printing, additive manufacturing, direct digital manufacturing and rapid prototyping are just some of the terms used to describe a new form of printing where a 3D object can be created using successive layers of material (see box "How does 3D printing work?").

The technology is generating significant attention in the consumer technology sector in particular. For now, while basic 3D printers are available for less than £500, limitations in the strength and choice of materials (mainly plastics) mean that the technology is not an appropriate alternative to many ready-manufactured products. But as the technology becomes more advanced, the popularity of home production as an alternative to home delivery may rise, making it important for both businesses and consumers to understand the legal implications of the technology. For industry too, 3D printing will offer new ways to manufacture complex products.

It is too early to say whether sectoral specific legislation for 3D-printed products will be needed but it is clear that, as 3D printing technology develops, businesses will need to anticipate developments and act proactively, rather than waiting for the law to catch up to a fast-moving area.

#### Intellectual property

Copying an object protected by intellectual property (IP) laws without permission will usually be an infringement. The method by which the infringing item is produced does not affect the way that IP laws apply; conventional manufacture in a traditional factory and manufacture by a 3D printer using a computer-aided design (CAD) file both produce a copy of an object (see box "Enforcement difficulties").

However, if the items are being produced for non-commercial purposes by individuals

#### How does 3D printing work?

The item to be printed first needs to be represented in a computer-readable format, by using computer-aided design (CAD) software. The 3D design is uploaded to the printer, which prints the 3D object by laying down successive layers of plastic or by heating powdered metal to solidify it into a particular shape. 3D designs can be created from scratch using CAD software or they can be obtained from a third party, for example from one of the many online platforms that provide printable designs. 3D scanners also allow 3D design files to be created from physical objects, allowing their external faces to be copied. Since the 3D designs are simply computer files, they are easily reproduced and disseminated.

for personal use, they could fall within the personal use exceptions to infringement. These personal use exceptions could cause problems for IP rights owners where consumers are printing goods rather than buying them through traditional pathways.

**Spare parts and personal use.** An obvious attraction of 3D printing is the production of spare parts for other products. IP law generally treats the production of spare parts leniently; exceptions to infringement exist under:

- Patent law, provided that the spare part is not itself part of the inventive concept of the patent (*Schutz (UK) Limited v Werit UK Limited* [2013] UKSC 16; [www.practicallaw.com/8-526-6203](http://www.practicallaw.com/8-526-6203)).
- Design law, to replace a component part where the design is solely dictated by function or must fit or match another product (section 7A(5), *Registered Designs Act 1949 (as amended) (1949 Act)*; *Copyright, Designs and Patents Act 1988 (CDPA)*).

In addition, acts done privately and for non-commercial purposes are excepted from infringement under registered design and patent law. A lot of 3D printing that is done at home, whether or not for spare parts, may fall within this exception.

This combination of legislative provisions excepting private, non-commercial use of IP from infringement and allowing reasonable repair of a purchased item through the creation of spare parts was designed to avoid abuse of consumers by rights owners and to allow personal use and repair at a reasonable cost, rather than forcing consumers to replace the whole product whenever a component breaks or to buy replacement parts only from the original manufacturer.

However, these provisions may pose significant problems for those seeking to protect their rights in the context of 3D printing. Manufacturers will surely be grateful that the personal use copyright exception in the Copyright and Rights in Performances (Personal Copies for Private Use) Regulations 2014 (SI 2014/2361) was quashed by the High Court in 2015 and does not look like being reintroduced in any form, at least in the short term (*R (British Academy of Songwriters, Composers and Authors and others) v Secretary of State for Business, Innovation and Skills* [2015] EWHC 2041 (Admin); [www.practicallaw.com/9-618-3013](http://www.practicallaw.com/9-618-3013)).

**Commercial infringers.** In relation to large-scale commercial infringers, rights owners will much more readily be able to protect their IP (see feature article "3D printing: challenges for the fashion industry", [www.practicallaw.com/5-548-6188](http://www.practicallaw.com/5-548-6188)).

A patent is a monopoly right, so any independent creation of a product protected by a patent will be an infringement. Patent protection of spare parts was considered in *Schutz* where the court held that various factors are relevant when considering whether a spare part can be manufactured without infringing a patent, including whether the part is included within the inventive concept of the patent, whether the item is free-standing, and what its life expectancy is likely to be. The rise of 3D printing may result in manufacturers being more keen to register patents that are specifically directed to spare parts and potential spare parts for their products.

Trade marks may also be infringed if 3D-printed goods are printed with a brand name or logo on them, just as they would be had the goods been manufactured using conventional methods. This would also apply to individuals applying trade marks to items for their personal use.

Scanning items to create a 3D-printed version can be a copyright infringement in some circumstances, although protection of manufactured items under UK copyright law is far from straightforward. It is not a breach of copyright to make an article using a particular design, unless the design is an artistic work (*section 51, CDPA*). Instead, protection is given under UK unregistered design right for the much shorter term of 15 years, whereas copyright lasts for the life of the creator plus 70 years.

Whether the original from which the manufacturer produces its stock is an artistic work is therefore significant in the long-term protection of a design. In *Lucasfilm Ltd v Ainsworth*, the Supreme Court found that Star Wars Stormtrooper helmets were functional and were not works of artistic craftsmanship, so the copyright was not enforceable and the design right had already elapsed ([2011] UKSC 39; [www.practicallaw.com/8-507-8749](http://www.practicallaw.com/8-507-8749)).

It is likely, therefore, that many objects replicated on a 3D printer will be held to be functional objects and so will not gain copyright protection; only those objects created for a truly artistic purpose may retain copyright. Instead,

### Enforcement difficulties

Manufacturers of counterfeit goods often use jurisdictions where intellectual property rights (IPR) are not rigorously enforced or where the IPR are not registered or do not exist. Rights owners therefore rely on the customs authorities seizing counterfeit goods when they are imported to ensure that the goods do not get onto the market in the jurisdictions where the rights owners sell their products normally.

The use of 3D printing may mean that the routes to market of counterfeit goods are more direct. 3D computer-aided design files can easily be emailed across borders without detection and all that is needed within a jurisdiction is a suitable 3D printer. A greater use of search and seizure orders in the UK and of trading standards authorities, where appropriate, may become necessary if 3D printing of counterfeits becomes more prevalent in the UK.

the design could receive the shorter term UK unregistered design rights protection, along with Community unregistered design rights, which also arise automatically and co-exist with UK unregistered design, providing some limited, short-term (three-year) protection across the EU.

The current reduction in the term of copyright protection from the life of the author plus 70 years to 25 years only for items manufactured in numbers greater than 50 set out in section 52 of the CDPA is due to be repealed on 28 July 2016 ([www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/515305/Gov-response\\_s52.pdf](http://www.gov.uk/government/uploads/system/uploads/attachment_data/file/515305/Gov-response_s52.pdf)). This will assist in restricting the 3D printing of artistic works, even where these have been produced in significant numbers. The Intellectual Property Office has produced guidance to assist businesses and individuals affected by the repeal ([www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/515332/160408\\_guidance\\_s52\\_final\\_web\\_accessible.pdf](http://www.gov.uk/government/uploads/system/uploads/attachment_data/file/515332/160408_guidance_s52_final_web_accessible.pdf)).

Registered design protects the appearance of the whole or a part of a product resulting from the features of the product or its ornamentation (*section 1(2), 1949 Act*). Community-registered designs are also available providing EU-wide rights (see *News brief "Registered designs: proving infringement is no easy ride"*, [www.practicallaw.com/4-625-0745](http://www.practicallaw.com/4-625-0745)). These rights are likely to provide some protection for designers against 3D printing, as they do against traditional methods of manufacture.

However, design protection is difficult to enforce where even small changes are made to a design, so protecting against copies adapted using 3D printing may prove difficult. This is the implication of a recent series of cases in which design right owners have failed to prevent similar designs being marketed by competitors (*Procter & Gamble Co v Reckitt Benckiser (UK) Ltd [2007] EWCA Civ 936*, see *News brief "Community registered designs: spot the difference"*, [www.practicallaw.com/1-378-7732](http://www.practicallaw.com/1-378-7732); *Samsung Electronics (UK) Ltd v Apple Inc [2012] EWCA Civ 1339*, [www.practicallaw.com/3-522-6097](http://www.practicallaw.com/3-522-6097); and *Dyson Ltd v Vax Ltd [2011] EWCA Civ 1206*).

**Online CAD file-sharing.** An obvious challenge to rights owners is the online sharing of CAD design files, in much the same way that MP3 music files raised concerns for the music industry. These files could be unofficial designs produced by enthusiastic amateurs. Equally though, given the ease with which CAD files can be copied, they could be official design files that have leaked from the rights owner, for example through a cyber attack.

It may be possible to stop the supply of infringing CAD files by seeking orders requiring internet service providers to block file-sharing platforms, in a similar way that this is already done in relation to MP3 music files and film files in relation to the likes of *The Pirate Bay*, which already has a CAD file-sharing section (see *Briefing "P2P file-sharing: rocking the pirate boat"*, [www.practicallaw.com/0-500-3178](http://www.practicallaw.com/0-500-3178) and *News brief "Infringing torrent websites: another battle won"*, [www.practicallaw.com/7-525-3748](http://www.practicallaw.com/7-525-3748)).

Specific requests to, or legal action against, websites inviting them to remove infringing content is also a possibility. This might be easy to establish where the CAD files are official files that have been illegitimately copied. However, it will be more difficult where it is necessary to show that the CAD file infringes the IP right owner's 3D object, particularly if there are material differences. Reliance on trade marks or common law passing off may be an alternative if, for example, the look and feel of a product had been copied, or infringement of a registered design or patent might be available. Designers should therefore obtain patent rights where possible and register their designs, rather than relying on copyright, although unregistered designs will provide some limited term protection.

**Commercial alternatives.** 3D printing can represent an opportunity for rights owners as well as a threat. If consumers wish to 3D-print their own products, rights owners may choose to issue their own legitimate official CAD files instead. Design owners will need to consider how to license use of their design files. It is possible to sell a download of the file for limited use, for example, with digital rights management, but as with most software, the limitations on re-use are hard to enforce and are often circumvented. An ideal option would seem to be a one-print sale, where the design is sent direct to the printer, rather than a copy of the design being held on the buyer's computer. With the advent of the internet of things, this may become a possibility.

### Product liability

English law imposes a range of criminal and civil liabilities for those involved in manufacturing and distributing products that are defective, dangerous, or both.

This includes products manufactured by 3D printing. The challenge in the case of 3D printing arises not so much from the technology but more from the way in which it is used; that is, the new business models and supply chains involving 3D printing.

It is a criminal offence to place on the market a product that is unsafe (*General Product Safety Regulations 2005 (SI 1803/2005)*) (2005 Regulations). "Product" is defined broadly and includes products created by 3D printing and products involved in the printing process itself, including the printer and the materials involved.

Contracts for the sale of goods, including 3D-printed products, include implied terms as to quality and fitness for purpose under the Consumer Rights Act 2015 for business to consumer sales, and under the Sale of Goods Act 1979 in other cases. Product manufacturers will owe a tortious duty of care to end users, which may give rise to a cause of action in the event that a defective or dangerous product causes personal injury or damage to property.

The Consumer Protection Act 1987 (1987 Act) also allows consumers to recover damages for civil liability from the producer of a product that causes personal injury or property damage. The 1987 Act imposes strict liability, subject to certain statutory defences.

How this framework applies in the field of 3D printing will vary depending on the relevant circumstances. This may be best illustrated by two examples:

- A company uses 3D-printing technology to manufacture products for sale that prove

to be defective. If the defect means that the products are unsafe, the company will face criminal liability under the 2005 Regulations. If end users suffer personal injury or property damage, they may recover damages in tort and, in the case of consumers, under the 1987 Act. Buyers of the product will have a potential contractual claim against the seller, and the seller may, in turn, have recourse down the supply chain and ultimately against the manufacturer, depending on the contractual arrangements. In this scenario, the law applies just as it would to a product manufactured through a traditional process.

- A consumer with a home 3D printer prints a product based on a digital design template that he has downloaded. If the product proves to be defective, the consumer's recourse is much less straightforward. It may be difficult to argue that he has bought the printed product and so the implied terms as to quality and fitness for purpose in contract may not assist. If he can show that the defect arose from a fault in the printer, from an error in the digital design or from a defect in the printing material, he may have a claim against the relevant supplier but proving this is unlikely to be straightforward. If the product is unsafe, it may be difficult for the authorities to determine who, if anyone, is criminally liable as the producer.

---

*Andrew Moir and Anthony Dempster are partners, Rachel Montagnon is a professional support consultant, and David Bennett and Richard Woods are senior associates, at Herbert Smith Freehills LLP.*