



MARKT 2014/083/D Legal review on industrial design protection in Europe

Overview of 3D printing & intellectual property law

**Under the contract with the Directorate General Internal Market, Industry,
Entrepreneurship and SMEs (MARKT2014/083/D)**

Annex 3



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Relevant legislation

Regulation No. 6/2002 of 12 December 2001 on Community designs

Directive 98/71/EC of the European Parliament and of the Council of 13 October 1998 on the legal protection of designs

Directive 2001/29/EC of the European Parliament and of the Council of 22 May 2001 on the harmonisation of certain aspects of copyright and related rights in the information society

Regulation No. 207/2009 of 26 February 2009 on the Community trade mark

Directive No. 2008/95/EC of 22 October 2008 to approximate the laws of the Member States relating to trade mark

Directive 2009/24/EC of the European Parliament and of the Council of 23 April 2009 on the legal protection of computer programs

Directive 2004/48/EC of the European Parliament and of the Council of 29 April 2004 on the enforcement of intellectual property rights

Agreement on Trade Related Aspects of Intellectual Property Rights

Berne Convention

WIPO Copyright Treaty

Directive 2000/31/EC of the European Parliament and of the Council of 8 June 2000 on certain legal aspects of information society services, in particular electronic commerce, in the Internal Market

Executive summary

The purpose of this assessment is to provide the European Commission with an analytical view of the legal (intellectual property) issues surrounding 3D printing as part of the legal review on industrial design protection in Europe. 3D printing technology is likely to disrupt the production and distribution of a number of goods in certain industries, while at the same time creating unseen potential for innovation and consumer involvement. Whether disruptive or not, the intellectual property rights, if applicable, concerning the production and use of existing and new products will very likely be affected.

This assessment will not focus on other issues, such as regulatory issues or liability issues. For example, 3D printers could create

- Product liability or labelling issues with the material implementations of technical designs, in particular in the medical devices industry;
- Issues with data protection and loss of confidential information;
- Consumer safety issues (general product safety and toy safety).

We will particularly look at

- 1) The approach taken by law makers
- 2) The approach taken by courts
- 3) The approach taken by industry

1) Approach taken by the law

| Item | Question |
|-------------------------------------|---|
| Intellectual property rights | <p>Which legal framework(s) currently govern(s) the intellectual property rights issues in the field of 3D printing?</p> <p>What is the potential impact of 3D printing on intellectual property rights in general (copyright, trademarks and patents) and design protection in particular?</p> |
| Enforcement | <p>Which parties are involved in the process of 3D printing and potential intellectual property infringements?</p> <p>Against which parties enforcement can (best) be achieved?</p> <p>Enforcement against end-users?</p> <p>Enforcement against intermediaries?</p> |

First we will observe that the intellectual property rights at stake may go from copyright and design right to patents and trademarks. All of these rights are subject to infringement by the end-user or intermediaries in the technology's creation and dissemination process.

With regard to the end-user

Compared to traditional counterfeit goods, 3D printing has the novelty of allowing end-users to obtain counterfeit goods without the intervention and assistance of commercial counterfeiters, thus making piracy more decentralised. Traditionally, manufacturers would be able to go after the large-scale counterfeiting manufacturers but this part of the counterfeiting chain is disappearing in the context of 3D printing.

We will further see that copyright, if applicable, theoretically offers the best intellectual property protection against large-scale piracy by individual end-users, as it allows going after end-users who use the 3D printed object for private and non-commercial purposes. This is not the case with trademarks and design rights where private and non-commercial use will not be considered infringing. Moreover, trademarks must be registered before their protection can be invoked. But pursuing individual end-users that make or order 3D printed objects may be cumbersome and costly. The decentralised character of 3D intellectual property infringements certainly does not facilitate enforcement. For right holders it may be difficult to know which protection strategy to adopt and how to pursue infringers. A lot will probably depend on how courts will react to the legal challenges of 3D printing.

With regard to intermediaries

Several intermediaries may be involved in the process of 3D printing, from the creation and dissemination of the blueprint for 3D printing, the so-called object design or computer aided design (CAD) files, to the actual creation and dissemination of the 3D printed object. Yet, the role of intermediaries is likely to decrease when high-quality 3D scanners and 3D printers become accessible for end-users in their domestic environment, thus making 3D printing even more decentralised.

In practice right holders may prefer to go after intermediaries (for indirect liability) instead of after end-users (for direct liability but often exempted because there is no commercial purpose). The most obvious intermediaries in the supply chain are those website platforms that (allow users to) make available CAD files for 3D printing. Typically, this means they host or communicate the related files, either with or without the consent of the original intellectual property right holder. Other intermediaries may be third parties taking care of printing jobs on behalf of the end-user as well as the producer of the actual printers.

We will assess the role of such intermediaries in enforcement of intellectual property rights in the context of 3D printing, in particular if relying on intermediaries for enforcement of breach of design rights via 3D printing is a viable option which the Commission could consider and whether this requires any intervention at the policy level.

Along these lines, we will examine whether we can learn any lessons from current law/practice in relation to the role of intermediaries in protecting IP infringement. It is true that the challenges presented by 3D printing and intermediaries are to a great extent similar to those challenges previously arisen in the context of the digitisation of books or music and the sharing of digital files between end-users. Similarly to file sharing of digital audio-visual content, the likelihood of liability for committing or facilitating intellectual property infringement will be higher when the intermediary becomes more actively involved in the 3D infringement process. With regard to distribution of files and software via Internet, the same blocking and content removal obligations as for audio-visual content will be applicable. In practice, it will be most efficient for right holders to send a notice and take down request to online platforms to prevent them from relying on the safe harbour provisions contained in the e-commerce legal framework. According to literature on 3D printing, the first takedown notice for a 3D printed object would have been served back in 2011 and several such requests followed in the years thereafter.

2) Approach taken by courts

| Item | Question |
|---|--|
| Specific case law | Is there specific 3D printing related case law? |
| Existing case law applied by analogy | Can we can apply existing case law from other fields by analogy? |

We are not aware of existing claims for infringement of IP rights via 3D printing before courts in the EU, but it is likely that such claims will arise as 3D printing becomes more popular.¹

On the other hand, one can state that in the past years courts clarified many of the legal issues relating to the control of illicit copies of items protected by intellectual property rights in the context of audio-visual piracy, thus making right holders better prepared to face the challenges of 3D printing.

3) Approach taken by the industry

| Item | Question |
|------------------------|---|
| Self-regulation | Are there voluntary industry initiatives? Are such initiatives rather protective or embracing of the new technology? |

We are not aware of specific voluntary industry initiatives with respect to enforcement of intellectual property rights and 3D printed objects.

¹ The literature we consulted mentions one court case in the USA, where a right holder sued the popular 3D sharing platform Thingiverse and obtained a court order obliging Thingiverse to remove an infringing file.



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This being said, we see the following actions as possible voluntary initiatives.

- Possible digital rights management (DRM) protections on software files with instructions for 3D printing of the object;
- Keeping certain information such as raw materials for the composition of an object or certain processes and methods confidential as a trade secret;
- Building customer relationship management strategies, e.g. for the supply of authentic, authorised CAD files and raw materials needed for 3D printing;
- Creating collective rights management and enforcement organisations between right holders;
or
- Notice and takedown mechanisms implemented by websites hosting 3D object design files (online depositories of CAD files).

1. About 3D printing

3D printing is an additive technique. It is a process through which a three-dimensional solid object of virtually any shape, using a large range of raw materials, is made from a digital model. It works by first taking a design model or blueprint stored on a digital file, either after scanning the original object or by writing the code on a Computer Aided Design (CAD) file. This file then serves as guidance for the subsequent printing, “slicing” that digital design model into cross-sections. That “sliced” design is then sent to a 3D printer, which manufactures the object by starting at the base layer and building a series of layers on top until the object is built using the raw materials that are needed for its composition.

A good understanding of the various actions and persons involved from the making of the 3D model to the actual printing of the 3D replica will be important to assess potential infringements of intellectual property rights.

| Action | Scope | Actors involved |
|--|--|--|
| The making of the 3D model | 3D scanners allow for the preparation of the 3D model in a Computer Aided Design (CAD) file, an accurate digital image of the object that will be printed by the 3D printer. 3D object design CAD files may also be written from scratch. | The designer/manufacture/supplier of the 3D scanner and the person scanning the object. The designer of the 3D model/blueprint either by first scanning the object or by directly writing a digital CAD file. |
| The subsequent dissemination of the 3D model | People who want to print 3D replica will first need access to the 3D model. | The disseminator of the 3D model; often this will be a website platform offering links to the 3D model. |
| The actual printing of the 3D replica, the object based on the 3D model | People who have access to the 3D model will need a 3D printer to print the 3D replica. | The designer/manufacture/retailer/seller of the 3D printer and the person making the copy, which can be the end-user or a third party making the copy on behalf of the end-user. The supplier of the raw materials. |
| The subsequent dissemination | People who print the 3D replica can keep it for private and non-commercial purposes or disseminate it for free or against payment. | The holder of the 3D replica, which can be the end-user or a professional printing company. |

| | | |
|----------------------|--|--|
| of the 3D replica | | |
|----------------------|--|--|

Since 3D printing technology first appeared in the mid-1980s, it has evolved at an ever-faster rate and is used for a greater number of applications (including areas as diverse as: architecture; biotechnology; construction; fashion; food; footwear; and industrial design). Currently objects are being made out of an increasing variety of materials including: molten metals, plastics, wood, brick and chocolate. The range of manufactured objects themselves is diverse (including: coat hangers, cufflinks, shoes, teacups, and toy cars).

Today the cheapest 3D printers are available at less than €1,000 and the 3D printing technology “ecosystem” has developed to the point where there are a number of professional/commercial equipment manufacturers, raw material suppliers, online design repositories, 3D printing “on demand” stores, and universities/educational institutions involved.

3D printing technology is a potentially disruptive technology in certain sectors with relatively simple designs and materials. It offers a quick, flexible and low-cost solution to making personalised solid objects for both prototyping and distributed manufacturing.

As an “additive” process, whereby successive layers of material are laid down in different shapes, it is distinct from traditional machining techniques, which mostly rely on the removal of material by methods such as cutting or drilling (so-called “subtractive processes”).

Yet at present it remains difficult to assess the nature and speed of the 3D printing’s impact on product manufacture and related activities. Currently the technology is better for making customised products rather than mass-produced, generic products. No one can predict with any certainty how 3D printing technology will develop and what exactly its impact will be.

There is a reasonable expectation that 3D printing will soon have a meaningful impact in the business environment as certain activities, such as prototyping, can take place in a more flexible, lower cost manner than before. Also, 3D printing may actually stimulate innovation when fans of certain products start creating improved products.

Regardless of the nature and speed of 3D printing technology’s impact, the increasing visibility and usage of 3D printing is already raising the prospect of a number of potential legal and regulatory issues, including product liability and consumer protection issues. In this note we will focus on intellectual property issues only.

In this respect it is also interesting to see how some companies decide to offer open source licensing agreements allowing the users of their products to improve the products whereas other companies do not. Online depositories of CAD files seem to also encourage open license to promote actions such as customisation and remixing by end-users as part of a collaborative community.

2. Relevant intellectual property rights in the context of 3D printing

First we will have a look at the relevant intellectual property rights that may be at stake in the context of 3D printing.

| Intellectual property right | Registration and protection period | Conditions for protection | What is protected? | What is <u>not</u> protected? |
|---------------------------------|--|---|--|--|
| Copyright | No registration, protection until 70 years after the author's death. | Originality (required level for this condition is rather low) Applies automatically if the object meets the originality criteria under applicable law. | Original, creative objects. A 3D CAD file written from scratch (not a 3D scan from an existing object) could potentially fall hereunder because of its technical drawings, diagrams and models. Derivative works (3D CAD can be a derivative work). | Specific materials used for the production. Shapes with a purely technical function, such as moulds for another object. In some countries useful objects may be excluded. |
| Software (computer code) | Same as for copyright | A form of expression. | The expression of computer code (courts may limit the scope of such protection). Some might argue that a 3D CAD is a software but courts may not follow this view. The CAD file is not meant to be executed by the computer, but, instead, <i>read</i> by the computer. | The functionality of software. |

| | | | | |
|------------------------------------|---|---|---|---|
| Design right (registered) | Registration required for long-term protection, renewable every 5 years (maximum 25 years). | New appearance and individual character of the whole or part of an object towards the informed user (overall impression of dissimilarity to previously existing designs). | The external shape and features of the whole or part of the product (3D). Appearance of the materials. ² | Raw materials. Internal parts not visible during normal use ³ . An object that is commonplace in the relevant technical field. Design features configured for mechanical connection to another product (most spare parts). Features dictated by technical function only. Computer programs. |
| Design right (unregistered) | No registration required, protection during 3 years from the date of disclosure, not renewable. | | | |
| Patent right | Registration, stops after legal protection period expires. | New. ⁴ Inventive. Industrially applicable. Licit. | The innovation and technology contained in the object. A CAD file that contains a plan for a patented item, certainly if cited in the patent claims. | Esthetic lay-out. |

² CJEU Case C-488/10, Celaya Emparanza y Galdos Internacional SA v Proyectos Integrales de Balizamientos, [2012] ECDR 4: "Article 19(1) of the Regulation must be interpreted as meaning that, in a dispute relating to infringement of the exclusive right conferred by a registered Community design, the right to prevent use by third parties of the design extends to any third party who uses a design that does not produce on informed users a different overall impression, including the third party holder of a later registered Community design.

³ Consideration 12 Community Design Regulation. See also: Hof 's-Gravenhage 24 februari 2009, IER 2009/49, p. 211.

⁴ Most physical objects will not meet this condition.



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| | | | | |
|------------------|--|---|---|--|
| Trademark | Registration required, renewable. In rare cases registration is accepted for the shape of products. | Graphic representation. Distinctive. Licit. Available. | The use in trade of the trademark as registered, including sharing on the Internet. | The private use of the trademark, because the user will not be confused about the origin when he adds the trademark himself. |
|------------------|--|---|---|--|

3. Infringement of intellectual property rights in the context of 3D printing

Intellectual property infringement issues may relate to patent, copyright (proprietary versus open source), trademark, and design right law.

When assessing the relevant issues, we will look at two different processes:

- 1) On the one hand the creation process of
 - The 3D model (object design file) and
 - The 3D replica.
- 2) On the other hand the dissemination process of
 - The 3D model (object design file) and
 - The 3D replica.

In particular, we will look at what actions in the creation and dissemination process are likely to cause infringement of the protected right and what actions would not be considered infringing.

3.1 The technology's creation process

3.1.1 The 3D models/CAD files

| Intellectual property right | Protected item | What may constitute infringement? | When may use be <u>non-infringing</u> ? |
|-----------------------------|---|---|--|
| Copyright | The object itself. | Digitisation of an object with a 3D scanner. Private use is infringing if no valid exceptions apply. | Private use provided the user can validly invoke an exception under applicable copyright law, e.g. 1) private copying ⁵ 2) repair. ⁶ Reverse engineering is possible. |
| | 3D scanning software, including the graphic user interface or programming language. | Copying the software. | |
| | A computer aided design (CAD) file? | Copying the CAD file. To be clarified if using it to run a print job amounts to copying. | |

⁵ Article 5,2 (b) InfoSoc Directive. Provided the source of the 3D copy was legal.

⁶ Article 5,3 (l) InfoSoc Directive. Courts will apply the right to repair in a more narrow or wider sense in the context of 3D printing.

| | | | |
|---------------------------------|---|---|---|
| | | The CAD file itself is not a copy of the original work, just a representation. | |
| Software (computer code) | The expression of the computer code in view of operating its functions. | The temporary or permanent copying of the program. The translation, adaptation or other alteration to the program. The distribution of the program to the public. | The actual functionality of the software (it must remain possible to reach the same functionality with a different code). Reverse engineering is possible. |
| Design right | The shape and configuration of the object. | Digitisation of an object. There will only be a design infringement if the 3D model is used in the course of trade. | Private and non-commercial use is not infringing ⁷ . |
| Patent right | The innovation/technology contained in the object. | Using or producing the invention. Patent holder could argue the CAD file to be a copy device. Includes reverse engineering. No exception for independent creation. | Writing a new CAD file from scratch without copying the patented innovative technology. Copying unpatented parts of the object including the patented parts. |
| Trademark | The trademark as it has been officially registered. | The creation of the CAD file is probably not infringement. | N/A |

3.1.2 The 3D printed object itself

| Intellectual property right | Protected item | What may constitute infringement? | When may use be <u>non</u> -infringing? |
|-----------------------------|--------------------|--|---|
| Copyright | The object itself. | Actual reproduction by the maker of the 3D printed object. Private use is infringing. | Private use is not infringing provided the user can validly invoke an exception under |

⁷ Article 20,1 (a) Design Regulation.

| | | | |
|---------------------|---|--|--|
| | 3D printing software, including the graphic user interface or programming language. | Copying the software. | applicable copyright law, e.g. private copying ⁸ or repair ⁹ . With respect to private copies, the EU Court of Justice has recently held that, to fall within the exceptions of the Directive, a copy made for private use must be made from a lawful source. ¹⁰ It might therefore be inferred, by analogy, that the CAD plan will have to have been made with the rightholder's consent for the private copy exception to apply. Reverse engineering is possible. |
| Design right | The shape and configuration of the object. | Commercially manufacturing a product incorporating a protected design. | Private and non-commercial use ¹¹ . |
| Patent | The object itself. | Making the object. | Printing for personal use is not infringing. Individual elements may not be protected by patent, which may make it easier to print replacement parts of a larger object. |
| Trademark | The trademark as it has been officially registered. | Commercial 3D printing using the trademark in a way that consumers would think the | Privately printing at home. |

⁸ Article 5,2 (b) InfoSoc Directive. Provided the source of the 3D copy was legal.

⁹ Article 5,3 (l) InfoSoc Directive. Courts will have to apply the right to repair in a more narrow or wider sense in the context of 3D printing.

¹⁰ CJEU Case C-435/12, *ACI Adam BV and Others*, ECLI: EU: C: 2014: 254.

¹¹ Article 20,1 (a) Design Regulation.

| | | | |
|--|--|--|--|
| | | object is produced by the trademark owner. | |
|--|--|--|--|

3.2 The technology's dissemination process

3.2.1 The 3D models/CAD files

| Intellectual property right | What may be protected? | What may constitute infringement? | When may use be <u>non-infringing</u> ? |
|-----------------------------|---|-----------------------------------|---|
| Copyright | A CAD file. | Sharing the CAD file | Not sharing the CAD file with others. |
| Design right | The CAD file itself would not be protected by a design right. | N/A | N/A |
| Patent | The innovation/technology contained in the CAD file. | Uploading the CAD file. | Sharing a newly written, non-infringing CAD file. |

| | | | |
|------------------|---------------------------------|---|--|
| Trademark | Using the name on the CAD file. | Using the trademark when commercially disseminating the CAD file. | Using the trademark when disseminating the CAD file in a non-commercial way. |
|------------------|---------------------------------|---|--|

3.2.2 The 3D printed object itself

| Intellectual property right | What may be protected? | What may constitute infringement? | When may use be <u>non-infringing</u> ? |
|-----------------------------|---|--|---|
| Copyright | The 3D printed object itself as a copy of the original product. | Actual reproduction by the maker of the 3D printed object. Private use is infringing. | N/A |

| | | | |
|---------------------|---|---|---|
| Design right | The shape and configuration of the object. | Putting a product incorporating a protected design on the market, offering it for sale, marketing and importing or exporting the product. | Private and non-commercial use of the 3D printed object. |
| Patent | The object itself. | Selling or trading the 3D object copying the invention. | Private use of the 3D printed object. |
| Trademark | The trademark as it has been officially registered. | Using the trademark when commercially disseminating the 3D printed object. | Selling an object with trademark printed in the private home. |

4. Enforcement of intellectual property rights in the context of 3D printing

When eventually the intellectual property rights in the elements of 3D printing technology have been determined, the issue of how to enforce them will follow.

Right holders have two options. They can either go after the end-user or after intermediaries involved in the creation and dissemination process.

4.1 Enforcement against the end-user

| Legal ground | Scope |
|---------------------|--|
| Copyright | <p>Copyright is the only option to go after the end-user who uses the 3D printed object for his own private purposes and this to the extent the original object is protected by copyright. The other intellectual property rights require a commercial use and therefore are not useful against the end-user (see below).</p> <p>However, it may be difficult in practice to go after the end-user and prove that the object is counterfeit. Class-action lawsuits could be a way to target end-users provided right-holders can easily obtain their identity but in practice even such actions will prove very difficult.</p> |
| Design right | Design law typically requires the use to be commercial in order to offer protection. |
| Patent right | <p>Patent law typically requires the use to be commercial in order to offer protection.</p> <p>Also, the drawback of patent litigation is that it has become increasingly expensive and the outcome is often unsure.</p> |
| Trademark | Trademark law typically requires the use to be commercial in order to offer protection. |

4.2 Enforcement against the intermediary

The right holder could try to go after:

- The maker of the CAD files;
- The platform hosting the CAD files, if such is done without his consent;
- The maker of the 3D printer;

- The printer operator, i.e. the service provider taking care of the actual printing, (like a traditional copy shop)¹².

Some of these intermediaries could be exposed to joint liability together with the end-user or to indirect liability for materially contributing to, facilitating, inducing infringing acts directly carried out by the end-user. That is of course if there is intellectual property infringement in the first place. And the second question will be what the role of the intermediary is. Depending on the answer thereto, once will be able to say if the intermediary may need a license from the party owning intellectual property rights in the 3D printed object before engaging in its activities.

For right holders, platforms disseminating digital files of their protected objects will often be an interesting target, as they present the real source problem, especially if they are actively encouraging the infringement. None of the known online depositories for 3D CAD files seem to be actively encouraging counterfeit. In their terms and conditions, all the online sharing platforms put in any case all liability with the end-users, making them responsible for the content they design, edit, modify, customise, remix and share. Also, most of these platforms appear to be based outside the EU and governed by the laws of these foreign countries, thus making it impossible to invoke the European e-commerce hosting provisions towards them.

The intermediary could, for example, be accused of infringing

- Patent rights by making available means for counterfeit or
- Copyright and design rights as a co-infringer.

| Intermediary | Scope |
|---------------------------------------|--|
| Maker of the CAD files | Creating the CAD file may potentially infringe intellectual property rights. |
| Platform hosting the CAD files | <p>Hosting CAD files that infringe an intellectual property right or offering tools for the modification of CAD files may create a secondary liability for the online depository if it plays an active role in the infringement and consciously allows infringements while not expeditiously removing the infringing content upon receipt of a motivated notice thereof.¹³</p> <p>It is important to remember that intermediaries are and cannot act as a judge or police officer. Hence, they should never actively monitor the hosted content and act diligently in case of notice and takedown requests. This also means they are entitled to challenge such requests if <i>prima facie</i> they appear unreasonable, illegitimate or abusive.</p> |

¹² These intermediaries will exist as long as good quality 3D printers remain expensive, the same as people used to rely on Internet cafés before good quality domestic Internet connections became widespread.

¹³ See also Judgment of the European Court of Justice in Case C- 324/09, L'Oreal versus eBay.

| | |
|---|--|
| Maker of the 3D printer | <p>Courts are likely to consider the manufacturer of the 3D printer the same way as Sony Betamax when it first put video recorders on the market. The VCR could be used for illegal purposes but also for substantial legitimate purposes such as "time-shifting" and hence the VCR was not considered illegal as such. The same will be true for 3D printers. Putting them on the market does not mean authorising or encouraging intellectual property infringement. It is advisable for the manufacturer to include warnings in this respect when putting his product on the market.</p> <p>Courts could potentially also consider the manufacturers of the 3D printers to be like Napster, and hold them liable for contributory copyright infringement even though the actual copying is done by end-users.</p> |
| Printer operator | <p>The operator of a 3D printer is commercially active and may be accused of infringing intellectual property rights. On the other hand, some courts may keep him out of the scope if he is acting solely on behalf of the end-user who is entitled to make a private copy for his own personal use.</p> |
| Distributor of the 3D printed object | <p>The distributor of the printed object could be accused of infringing the original author's distribution right under patent, trade mark, copyright and design laws when distributing the printed object to the public. We understand, however, that this aspect is not really part of the Study's focus.</p> |

5. Conclusion and recommendations

Online 3D printing platforms are still a relatively small phenomenon and the intellectual property issues are limited but they will probably grow. At this stage, it may be prudent not to stifle innovation and penalise new technology by acting at the legislative level. Concrete recommendation can only be made after a comprehensive review of the impact made by 3D printing is undertaken. The issue is a cross-cutting one which impacts not only design rules, but also patent, trade mark, and copyright laws. Thus, 3D printing should be assessed and examined across the intellectual property spectrum, taking into account the different product sectors affected by 3D printing.

Copyright protection is only granted if the creation is sufficiently original. The actual scope will vary depending on the relevant EU jurisdiction. The advantage of copyright is that it can also be invoked in case of private use, be it that the right holder must be able to identify the end-user first. An important question to clarify by courts and in particular the European Court of Justice would be if and to what extent a CAD file is capable of copyright protection. A 3D CAD file could file hereunder because of its technical drawings, diagrams and models. On the other hand, courts need to be aware that no copyright is granted to technological solutions and progress. Potentially a 3D CAD file could also enjoy copyright protection as a computer program. One can indeed argue a 3D CAD is software. On the other hand, unlike traditional software, a CAD file does not control the hardware of the 3D printer. It just represents, embodies the 3D object. The use of the CAD file to print the physical object in 3D, even if the CAD file can be argued to be copyright protected, should not be considered counterfeit because the physical object itself does not carry the copyright that was vested in the CAD file.

Patent protection will only be granted if it has been applied for and the conditions are met. Often this protection is not or no longer available.

Design rights could potentially be the most useful intellectual property right for larger manufacturers to challenge commercial 3D printing of every day objects. Whether the design rights are registered or unregistered, and valid, the manufacturing of a product incorporating the protected design will be illegal if done by third party for commercial purposes, even without intention and knowledge of the infringing behaviour. This right may therefore especially be useful in the pioneer years where high-quality 3D printers are not yet affordable to the large public and where third parties make 3D prints upon the order of end-users. There will however be no design right infringement if the end-user makes the 3D print for personal and non-commercial use.

The infringement of design rights through 3D printing moreover raises the issue of fair compensation. Allegedly, this compensation mechanism does not exist under design law, contrary to copyright law. However, it may be argued that 3D printers are new modes of copy of designs, which allow for unlimited unlawful copies to be made, and which make, as such, the introduction of a fair compensation mechanism into design law increasingly relevant.

With regard to intermediaries in the creation and dissemination process of 3D technology, the current e-commerce legal framework and the case law based thereupon seem to offer a legal basis for acting against them in case of indirect infringement arguments. The option of inserting a provision into design law, concerning 3D printing from unlawful sources could be explored.