Copyright And Trademark in 3D

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Imagine a world where you can comfortably sit behind your home computer and print customized products by downloading a small file from the Internet. Because of advances in 3D printing, that world is rapidly coming into existence, with the potential to create new digital empires and alter the business models of traditional manufacturing brands.

Indeed, McKinsey predicts that 3D printing will be a $550 billion industry by 2025.\(^1\) In just over a decade, McKinsey estimates that consumer will print products worth over $4 trillion in sales. Consumers will print 5-10% of all toys, accessories, jewelry, footwear, ceramics, and simple apparel using 3D printers.

As 3D printing expands, consumers will increasingly print 3D objects protected by existing copyright and trademark. This article analyzes potential copyright and trademark issues for users and growing 3D printing companies, including potential risks of direct and secondary copyright and trademark infringement claims.

**3D Printing Technology**

3D printers use digital design files – also known as Computer Assisted Design Files ("CAD" files) – to create tangible objects. These printers create objects by printing out microscopic layers and placing them one on top of another by either extruding or binding tiny particles of material. This “additive” process can create intricate structures and products with movable parts.

Everyday consumers can easily create 3D design files using widely available software. Powerful CAD design programs, such as Sketchup and AutoCAD, allow individuals to create detailed 3D design files. Consumers can create 3D design files by using a 3D scanner or even by simply uploading an image to services such as 123dapp (http://www.123dapp.com).\(^2\)

Several different types of 3D printers exist in the market – industrial grade 3D printers and personal 3D printers. Industrial grade 3D printers have been around since the 1980s and currently print in plastic, metal, glass, and ceramic. These printers can print objects in different colors. Over the next several years, industrial 3D printers will print circuit boards\(^3\) and even print objects made from multiple different materials (i.e., print objects consisting of both metal and plastic parts).

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\(^3\) See, e.g., 3ders, The Ex 1 rapid 3D circuit board printer launches on Kickstarter, available at http://www.3ders.org/articles/20131111-the-ex1-rapid-3d-circuit-board-printer-launches-on-kickstarter.html
Personal 3D printers lag behind industrial models, but are rapidly catching up. These printers retail from several hundred dollars to several thousand dollars and can print fully working objects in plastic. Over time, the range of products that personal 3D printers can print at home will likely approach that of industrial models.

**Parties Involved in Consumers 3D Printing**

A number of services have emerged over the past several years to allow consumers to create 3D printed objects. These services fall into several different categories, including 3D printing services and 3D file sites.

3D printing services, such as Shapeways (http://www.shapeways.com) and Sculpteo (http://www.sculpteo.com), offer creators of 3D design files the ability to open virtual storefronts and sell 3D printed products directly to consumers around the globe. These services own industrial 3D printers. When a user orders a 3D printed objects from a seller on a 3D printing service, the service prints out the object from an industrial 3D printer and sends the object directly to the user through the mail. The 3D printing service then divides the proceeds of the sale between the site and the seller.

The popularity of 3D printing services has steadily increased over the past several years. For example, Shapeways – the largest 3D printing service – currently prints over 120,000 products per month,

4 earning some of the site's top sellers hundreds of thousands of dollars.

Unlike 3D printing services, 3D file sites allow users to upload copies of 3D design files to a website, which other users can download and share. These sites do not manufacture or distribute physical products. Similar to YouTube, 3D file sites depend on user-uploaded content. Users upload 3D design files to these sites. Other users browse and download these files and then use these files to print objects on a personal 3D printer.

So far, the most popular 3D design site is Thingiverse (http://www.thingiverse.com). The site contains over 100,000 3D design files – which they dub “things” – ranging from toys to household goods.

5 Major brands have begun to affirm the legitimacy of 3D file sites. Last year, Nokia partnered with Thingiverse, when launching one of its phones, allowing users to download and print Nokia related phone accessories at home.

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5 Makerbot, *The 100,000th! Thing on Thingiverse!*, available at http://www.makerbot.com/blog/2013/06/08/100000th-thing-on-thingiverse/
Combined, these sites have created an ecosystem that enables consumers to print and share new products. These sites are empowering a new class of product designers who can design and sell goods to anyone across the world.

**Intellectual Property Implications of Consumer 3D Printing**

Even though 3D printing sites empower users to create new and original products, it also enables consumers to print copies of products currently protected by copyright and trademark. For example, on Thingiverse users have posted a number of 3D design files for popular toys, which are presumably protected by trademark or copyright. The site contains 3D design files for the “Star Trek Enterprise,” Mickey Mouse figurines, the “Minion” from the popular children’s movie Despicable Me, Lego bricks, and busts of well-known Star Wars characters like Yoda.

As the cost of 3D printing decreases, and as industrial 3D printing technology trickles down to personal home 3D printers, consumers will increasingly be able to print protected objects. 3D printers that can print metal may make it easy for people to print protected jewelry from iconic brands like Tiffany. Consumers also may gain the ability to print fashion goods, including Nike and Reebok sneakers.

As a result, consumers and 3D printing sites increasingly will have to grapple with the copyright and trademark issues stemming from 3D printing technology.

**Copyright and Trademark Rights in 3D Printed Products**

3D printed objects are protected by copyright. Copyright law protects “two- and three-dimensional works of fine, graphical, and applied works.” It protects models, sculptures, jewelry designs, and reproductions.

3D design files also are copyrightable. Uniquely designed 3D design files qualify as original works of authorship under the Copyright Act, much like an architectural blueprint. 3D design files created from a copyrighted work also qualify for

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6 Makerbot, Customize It: Design and Print Your Own Nokia Phone Case!, available at http://www.makerbot.com/blog/tag/nokia/
protection, so long as the creator of the design file exerted a minimal degree of creativity when creating the file.\textsuperscript{14}

Likewise, 3D printed objects may contain trademark protected graphics or words.\textsuperscript{15} Alternatively, an object may also resemble protected “trade dress” – or a protected shape or physical configuration of a product.

Any unauthorized use of a trademark on a 3D printed object, in commerce, that causes confusion, mistake, or deception among consumers, or dilutes the distinctiveness or tarnishes well-known, famous marks, would violate trademark law.\textsuperscript{16}

**Copyright and Trademark Liability for Consumers Who Use 3D Printers**

Consumers who use and print 3D printed objects potentially face copyright and trademark liability if they print protected objects. Equally concerning, they may also face copyright and trademark liability by merely downloading 3D design files.

**A. Copyright Liability**

Users who print, download, or upload a copyrighted 3D design could be found liable for direct copyright infringement. Printing a copyrighted object violates a copyright holder’s exclusive right of reproduction.\textsuperscript{17}

Downloading and uploading copyrighted 3D design files may also constitute copyright infringement. Copyright protection extends to copies that can be perceived only “with the aid of a machine or device.”\textsuperscript{18} It also extends to derivative works that merely translate the copyrighted expression from two dimensions to three, or vice-versa.\textsuperscript{19}

Under certain circumstances, users may have a fair use defense.\textsuperscript{20} However, in the context of digital music file sharing, courts have not found that the uploading copyrighted digital files – in and of itself – qualifies as fair use. *See, e.g., A&M Records v. Napster, 239 F.3d 1004, 1014 (9th Cir. 2001)* (concluding that “Napster users are not fair users.”)

\textsuperscript{14} *See, e.g., Express, LLC v. Forever 21, Inc.*, 2010 WL 3489308 (C.D. Cal. 2010) (denying fashion company’s claims that CAD files were copyrightable, because of lack of originality).


\textsuperscript{16} 15 U.S.C. §§ 1501 et seq.

\textsuperscript{17} 11 U.S.C. § 106(1).

\textsuperscript{18} 17 U.S.C. § 102(a).

\textsuperscript{19} *See, e.g., Winfield Collection, Ltd. v. Gemmy Indus., Corp.*, 147 Fed. App’x 547, 551–52 (6th Cir. 2005).

\textsuperscript{20} 17 U.S.C. § 107.
B. Trademark Liability

Consumers who print 3D printed objects may also face potential trademark liability, depending on what the consumer uses the 3D printed object for. If the consumer uses the 3D printed object solely for personal use, then the consumer should not be found liable for trademark infringement. In order for trademark liability to attach, the trademark must be “used in commerce.”21 The printing of personal copy of an object would likely not meet this standard.

By contrast, a user who prints or sells an object or the underlying 3D design file could face trademark liability. Such use likely qualifies as “use in commerce.”

A closer, and more unsettled, question is whether uploading or downloading 3D design file containing a trademark would qualify as being “used in commerce.” “Use in commerce” is defined as “the bona fide use of a mark in the ordinary course of trade, and not made merely to reserve a right in a mark.”22 However, what qualifies as “bona fide use in the ordinary course of trade” under current law is largely unexplored. It is arguable that uploading or downloading a 3D design file on a site that contains advertising qualifies as bona fide use under the ordinary course of trade.

Copyright and Trademark Liability of 3D Printing Services

3D printing services may also face copyright and trademark liability for making it easy for users to print protected objects.

A. Copyright Liability

Because 3D printing services manufacture and ship 3D printed objects, such services could be held liable for direct copyright infringement. However, courts have been hesitant to hold a service directly liable for copyright infringement when the service simply hosts and delivers content uploaded by users – in other words, services that engage in no “volitional” conduct.23 As a result, 3D printing services may be able to shield themselves from a finding direct copyright liability under appropriate circumstances. The more the site acts as a conduit for the sellers of 3D design files and the less a 3D printing service actively promotes a 3D printed product, the more likely the service will be able to avoid a finding of direct copyright infringement.

Even if these 3D printing services do not qualify as direct infringers, such sites still face potential liability under one of the three theories of secondary liability recognized under U.S. law – i.e., vicarious copyright infringement, contributory

22 Id.
23 See Cartoon Network, LP LLLP v. CSC Holdings, Inc., 536 F.3d 121, 131-32 (2d Cir. 2008).
copyright infringement, and inducement. Vicarious copyright infringement requires a showing that a 3D printing service: (1) possessed the right and ability to supervise the infringing activities; and (2) received a direct financial interest in such activities.\textsuperscript{24}

3D printing services will likely meet the “direct financial interest” requirement, if they receive payment for the sale of a copyrighted object. To satisfy this requirement, a copyright owner merely must establish “a causal relationship between the infringing activity” and that the 3D printing service received a “financial benefit.”\textsuperscript{25} The financial benefit standard is low. And, courts find such a benefit when the infringement simply “draws” users to the service.\textsuperscript{26}

Likewise, 3D printing services may be deemed to have the right and ability to control infringement. These services often promote 3D design files hosted on their sites and often provide additional support services to the sellers who create and sell 3D printing products. Such actions may demonstrate a sufficient “capacity to control” infringing behavior and thus may support a finding of vicarious copyright infringement.\textsuperscript{27}

Therefore, to lessen the risk of vicarious copyright infringement, a 3D printing service should consider limiting their supervision and review of the sale of products on their site. As with potential liability for direct copyright infringement, the less control a 3D printing service exercises over user and seller conduct, the less likely a court would find a 3D printing service vicariously liable.

It will be a far more difficult task to hold a 3D printing service liable for contributory infringement. To prevail on a contributory infringement theory, a copyright owner must prove that the 3D printing service had “knowledge of … infringing activity” and “materially contribute[d] to the infringing activity.”\textsuperscript{28} Courts assess knowledge by applying an objective standard, and knowledge can be either “actual or

\textsuperscript{25} See Ellison v. Robertson, 357 F.3d 1072, 1079 (9th Cir. 2004).
\textsuperscript{26} See Arista Records LLC v. Usenet.com, Inc., 633 F. Supp. 2d 124, 156-157 (S.D.N.Y. 2009); Ellison v. Robertson, 357 F. 3d 1072, 1079 (9th Cir. 2004).
\textsuperscript{27} See Arista Records LLC v. Usenet.com, Inc., 633 F. Supp. 2d 124 (S.D.N.Y. 2009) (right and ability to control present where site reserved right to terminate users’ accounts; restricted access to certain content; and chose which content appeared on its site); Disney Enters. v. Hotfile Corp., 2013 WL 6336286 (S.D. Fla. 2013) ("[S]ervice providers have the capacity to control the activities of their users simply by virtue of providing the means to commit direct infringement.")
\textsuperscript{28} Arista Records LLC v. Lime Group LLC, 784 F Supp. 2d 398, 432 (S.D.N.Y. 2011) (internal quotations omitted)
constructive." The relevant inquiry centers on whether the allegedly contributing infringers “know or have reason to know” of the direct infringement.

A 3D printing service faced with a claim of contributory copyright infringement will likely be found to have made a material contribution. Such services provide the “means to infringe” by manufacturing and arranging for the sale and distribution of an infringing product.

However, establishing a 3D printing service’s knowledge of infringement will be challenging. Because 3D printing services have many lawful uses, a copyright owner will need to show more than generalized knowledge of copyrighted material on the site. As held by the Supreme Court, “a purveyor of a product with substantial lawful uses may not be held liable [for secondary copyright infringement] without more acute fault than the mere understanding that some of [its] products will be misused.”

A 3D printing service may also face liability for inducing copyright infringement. An inducement claim arises when a defendant distributes hardware or software “with the object of promoting [their] use to infringe copyright.” 3D printing services may be liable for copyright inducement, if the service overtly encourages users, through statements or features of the site, to infringe copyrights. If a party creates a 3D printing service to overwhelmingly facilitate infringement, the service faces a potential claim of inducement.

3D printing services’ risk of copyright liability also is heightened, because such services may not be able to claim immunity under the Digital Millennium Copyright Act (“DMCA”). The DMCA creates a series of “safe harbors” for qualifying “service providers,” limiting qualifying service providers’ liability for damages. To qualify for these safe harbors, a service provider must “upon notification of claimed

29 Usenet, 633 F. Supp. 2d at 154.
31 See David Nimmer, 3 Nimmer on Copyright § 12.04[A][3][b] (providing “the means to infringe” establishes contributory liability).
33 Id. 919.
34 See, e.g., Columbia Pictures Industries, Inc. v. Fung, 710 F. 3d 1020, 1036 (holding website operator liable for inducement where operator actively encouraged the uploading of torrent files concerning copyrighted content through website features and communications with users).
35 Service providers are broadly defined to include any “provider of online services or network access, or the operator of facilities therefor.” 17 U.S.C. § 512(k)(1)(B); see In re Aimster Copyright Litig., 334 F.3d 643, 655 (7th Cir. 2003).
infringement . . . respond[] expeditiously to remove, or disable access to, the 
material that is claimed to be infringing or to be the subject of infringing activity.”

However, the DMCA’s safe harbors apply only to certain activities, regardless of 
whether the provider properly responds to DMCA notices. For example, the DMCA 
protects qualifying service providers from “infringement of copyright by reason of 
the storage at the direction of a user.”

3D printing services arguably do more than just provide “storage” for users to 
upload 3D design files. These services print objects and often promote them on 
their websites. This may draw 3D printing services outside the reach of the DMCA. 
Cal. Feb. 26, 2014), a court recently declined to grant a website DMCA protection on 
summary judgment, because the site did more than store content for users. Similar 
to 3D printing services, the website allowed users to upload images and print them 
on consumer products, like shirts, bags, and mugs, using the service’s own 
equipment.

B. Trademark Liability

Copyright infringement is not the only liability that a 3D printing service may face. 
3D printing services that print and sell physical copies of trademarked goods may 
be liable for trademark infringement. The sale of products that incorporates a 
trademark will satisfy the “use in commerce” requirement. A trademark owner also 
will likely be able to establish that the product causes sufficient confusion amongst 
consumer to support a finding of direct trademark infringement.

A 3D printing service also runs the risk of secondary trademark liability. Vicarious 
trademark liability is available if “the defendant and the infringer have an apparent 
or actual partnership, have authority to bind one another in transactions with third 
parties[,] or exercise joint ownership or control over the infringing product.” 3D

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38 As discussed further below, a 3D printing site may also lose DMCA takedown 
protection: (i) if it has actual knowledge of infringing content on its system, or "red 
flag" knowledge of "circumstances from which infringing activity is present," id.
§ 512(c)(1)(A); (ii) if the service provider has the right and ability to control 
infringing activity and "receives a financial benefit directly attributable to the 
infringing activity," id. § 512(c)(1)(B); or (iii) the service provider fails to register a 
DMCA agent with the Copyright Office, or to implement procedures for disabling the 
accounts of repeat infringers, id. § 512(c)(1)(C).
39 Hard Rock Café Licensing Corp. v. Concession Servs., Inc., 955 F.2d 1143, 1150 (7th 
Cir. 1992).
printing services that partner with infringing sellers – or appear to partner with infringing sellers – may open themselves up to trademark liability.

While trademark law recognizes contributory trademark infringement, this standard will be a more difficult to meet. Contributory trademark infringement only attaches if a 3D printing service “continues to supply its [service] to one whom it knows or has reason to know is engaging in trademark infringement.” To prevail on a claim for contributory trademark, a trademark holder would likely be required to show that the 3D printing service had “[s]ome contemporary knowledge of which [users] are infringing”; mere “general knowledge” – even of widespread infringement – will likely be insufficient. Nonetheless, a 3D printing service that fails to act when put on notice of trademark infringement on its site may face contributory trademark infringement liability. Accordingly, 3D printing services should be vigilant if a trademark owner informs the 3D printing service about potentially infringing material.

A 3D printing service also may be liable for inducement if it “intentionally induces another to infringe a trademark.” Incentive programs to reward popular (and infringing) 3D design files or active encouragement from a 3D printing service to printed trademark protected products may trigger trademark inducement liability.

Owners of famous trademarks have further rights against 3D printing services and can attempt to hold printing sites liable for trademark dilution. Shoddy 3D-printed versions trademarked products could “impair[] the distinctiveness” of a famous mark or “harm[] the reputation” of a well-known trademark holder, thus supporting a dilution claim.

Copyright and Trademark Liability of 3D Files Sites
3D files sites face different copyright and trademark risks from 3D printing services, since 3D file sites do not manufacture and distribute 3D printed objects, but merely host 3D design files.

A. Copyright Liability

41 Id. at 107.
42 See Louis Vuitton Malletier SA v. Akanoc Solutions, 658 F.3d 936, 940-41 (9th Cir. 2011) (web-hosting service liable because it failed to respond to “at least eighteen Notices of Infringement . . . documenting trademark . . . infringement occurring on numerous websites [it] hosted”).
43 See, e.g., Tiffany, 600 F.3d at 104.
45 Id. § 1125(c)(2)(B)
46 Id. § 1125(c)(2)(C).
A 3D file site may face potential secondary copyright liability under any of the above copyright infringement standards. However, like YouTube, these services should qualify for DMCA protection, because they host and store 3D design files at the direction of users.47

However, immunity for these sites is far from absolute. 3D file sites – as well as any qualifying 3D printing service – may lose DMCA protection:

- If the site has actual knowledge of infringing content on its system, or “red flag” knowledge of “circumstances from which infringing activity is present”;48
- If the site has the right and ability to control infringing activity and “receives a financial benefit directly attributable to the infringing activity”;49
- If the site fails to register a DMCA agent with the Copyright Office;50 or
- If the site fails to reasonably implement procedures for disabling the accounts of repeat infringers.51

To fall outside the scope of the DMCA, a 3D file site must exhibit a greater “right and ability to control” the infringement than is necessary to establish vicarious copyright liability.52 The site must exert “substantial influence on the activities of users”53 and a “high level of control over activities of users.” For example, the site must review or attempt to control the quality of the 3D design files on the site must induce users to violate copyright law.54 Simply hosting infringing material on a site, implementing a copyright filtering system, and having the ability to search for and locate infringing material is not enough to disqualify a 3D design file site from DMCA protection.55 Sporadic interaction by site operators with 3D design files on the site also will not qualify as sufficient influence over user activity.56

47 Viacom Intern., Inc. v. YouTube, Inc., 676 F.3d 19, 26 & 38-39 (2d Cir. 2012) (holding that YouTube stored content at the direction of the user, even though other users could play a video file through an online player); UMG Recordings, Inc. v. Shelter Capital Partners, 667 F.3d 1022, 1027-28 & 1031 (9th Cir. 2011) (same)
49 Id. § 512(c)(1)(B).
50 Id. § 512(c)(2).
51 Id. §§ 512(c)(1)(C), 512(i)(1)(A)
52 See Viacom, 676 F.3d at 38.
53 Id.
54 UMG, 718 F.3d at 1030.
55 Id.
56 See Capitol Records, LLC v. Vimeo, LLC, 972 F.Supp.2d 500, 530 (S.D.N.Y. 2013) (finding that de minimus interaction between Vimeo employees with content on the service and providing technical support was insufficient to disqualify Vimeo from DMCA protection).
3D file sites may also lose DMCA protection if they have actual or red flag knowledge of specific acts of infringement or acted willfully blind to infringement. Willful blindness can occur when a service provider is "aware of a high probability of the fact [of infringement] and consciously avoid[s] confirming that fact."57 General knowledge of infringement on the site is not sufficient to disqualify a 3D design file site from DMCA protection.58 Knowledge must be specific.

Moreover, 3D file sites may lose DMCA protection if they fail to register a DMCA agent with the United States Copyright Office or implement a DMCA takedown procedure that disables the accounts of repeat infringers. The former requirement is easily satisfied. A 3D file site must “designate[] an agent to receive notifications of claimed infringement . . . by making available through its service, including on its website in a location accessible to the public, and by providing to the Copyright Office, substantially the following information: (A) the name, address, phone number, and electronic mail address of the agent.”59 Per the express terms of the statute, “[o]nly substantial compliance with the enumerated requirements is required.”60

Further, 3D files sites must reasonably implement a DMCA takedown procedure and terminate repeat infringers. A 3D file site must adopt a policy that provides for the termination of access for repeat copyright infringers, inform users of the service policy, and implement the policy in a reasonable manner.61 To determine whether a website properly implements a repeat infringer policy, courts assess whether the website: “(1) has a system for responding to takedown notices, (2) does not interfere with the copyright owners’ ability to issue notices, and (3) under ‘appropriate circumstances’ terminates users who repeatedly or blatantly infringe copyrights.”62

If a site “purposefully fail[s] to keep adequate records of the identity and activities of their users and fail to terminate users despite their persistent and flagrant infringement,” the site will be ineligible for DMCA protection. As a result, 3D file sites should keep careful records of both DMCA takedown requests, notices sent to

57 Viacom, 676 F.3d at 35; see also 17 U.S.C. § 512 et seq.
58 See Capitol Records, Inc. v. MP3tunes, LLC, 2014 WL 503959, at *4-5 (S.D.N.Y. Jan. 29, 2014) (deeming evidence concerning general awareness of infringement irrelevant for purposes of determining whether specific instances of infringement occurred). Note, such evidence may be relevant for determining damages for copyright infringement. Id. at *6.
infringing users, and records identifying which users have been terminated as a result of a DMCA takedown request.

B. Trademark Liability

3D file sites also face potential direct trademark liability, if it either displays images of trademarks in the 3D design files hosted on their site. There is a reasonable argument that displaying such images would qualify as being “use in commerce.” Moreover, such conduct could arguably result in consumer confusion. Even if the consumer does not believe that a trademark owner will actually produce the goods printed from 3D design file hosted on a site, a consumer might well believe that the trademark holder authorized or sponsored the 3D design files and their use.

Likewise, a 3D file site that repeatedly fails to act when put on notice of trademark infringement on its site may face contributory trademark infringement liability. As with 3D printing services, 3D file sites should act expeditiously if a trademark owner informs the 3D printing service about infringing material.

Conclusion

3D printing is ushering in a new era of manufacturing and will create a new class of product designers and novel new products. 3D printing and 3D file sites should be careful to account for – and minimize – their risk of trademark and copyright liability. For 3D printing services looking to minimize this risk, such sites should aim limit their control over users who print or sell products through their site and should try to avoid entering into express or apparent partnerships with their users to sell products through their site. 3D file site and 3D printing services should also implement a DMCA takedown procedure, register a copyright agent, and ensure that they reasonably implement their takedown procedure. To the extent a 3D printing site learns of any trademark infringement, the site should expeditiously remove the infringing material.

63 See Louis Vuitton 658 F.3d at 940-41.