



U.S. COPYRIGHT OFFICE & LIBRARY OF CONGRESS

In the Matter of)
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Exemption to Prohibition on)
Circumvention of)
Copyright Protection Systems for)
Access Control Technologies)
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Docket No: RM 2014-07
**CLASS 26: SOFTWARE OR
FIRMWARE IN 3D PRINTERS**

**RESPONSE OF STRATASYS, LTD. TO
U.S. COPYRIGHT OFFICE REQUEST FOR ADDITIONAL COMMENTS**

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Stratasys, Ltd. (“Stratasys”) hereby responds to the following request of the Copyright Office for supplemental comments in this proceeding:

During the hearing for this class, opponents of the proposed exemption expressed concerns that parts made with substandard materials could enter the commercial supply chain and pose risks to the public, citing the example of airplane parts printed with substandard filament. The Office welcomes comments addressing whether an exemption could or should differentiate between ‘commercial’ versus other types of uses and, if so, how those different categories of use might be defined.

Stratasys respectfully submits that (1) there is no meaningful way to differentiate between “commercial” and other, “noncommercial” uses of 3D printing, and (2) even assuming *arguendo* that it were possible to craft a workable definition differentiating between “commercial” and “non-commercial” uses, the statutory requirements and factors in 17 U.S.C. § 1201(a)(1)(C) would still weigh heavily against granting an exemption.

I. There Is No Meaningful Way to Differentiate Between “Commercial” and Other, “Noncommercial” Uses of 3D Printing.

In granting exemptions to the DMCA circumvention prohibition in the past, the Copyright Office has delineated between “commercial” and “noncommercial” uses for classes of copyrighted works only when a well-defined record supported such a distinction and other explanatory qualifiers (*e.g.*, “for purposes of comment or criticism”) were available to guide users in applying the exemption.¹ That is not the case here.

The 3D printing industry defies segmentation between “commercial” and “noncommercial” uses. One of the most exciting aspects of the 3D printing industry today is that it breaks down such traditional distinctions. As Wohlers Associates noted in its 2015 “3D Printing and Additive Manufacturing State of the Industry” report: “Never before have we had access to such powerful tools – and so many of them – for design, product development, and manufacturing. The breadth of new products, services, startup businesses, and entrepreneurship, with funding to support them, is incredibly exciting to so many around the world.”² It forecasts that what we see today is only “the ‘tip of the iceberg.’”³

¹ See Recommendation of the Register of Copyrights in RM2011-7, Rulemaking on Exemptions from Prohibition on Circumvention of Copyright Protection Systems for Access Control Technologies at 40-41, 78, 106 (Oct. 12, 2012) (hereafter, “2012 Recommendation”) (declining to grant an exemption applying to “personal mobile computing devices,” because the term “is susceptible to a wide array of interpretations, each of which could be subject to its own analysis...”; declining to grant an exemption for video game console firmware, noting that circumventing access controls to avoid paying the customary cost of existing works is recognized by courts as a commercial use, even though the consoles are typically used in homes; granting an exemption for “noncommercial” uses of film clips *for commentary or criticism* when there was a significant record showing this was a clearly-defined category and the scope was further defined not only as noncommercial, but by the requirement that such use be for purposes of commentary or criticism).

² Wohlers Associates, *Wohlers Report 2015: 3D Printing and Additive Manufacturing State of the Industry Annual Worldwide Progress Report* (hereafter “Wohlers Report”), p. 274.

³ *Id.*



Today, an individual 3D printer may be used for a “personal” or noncommercial use one day, and for a commercial purpose the next. For example, engineers and designers may have 3D printers in their homes, but use them for inspiration, experimentation, and prototyping that blend into their work. The same 3D printer may be used by other household members for personal hobbies or school projects. It is unrealistic to fashion an exemption applicable to the latter use, but not the former, for the same 3D printer.

The website 3Dhubs provides an even more complex illustration of this problem. It connects local 3D printer owners to users, turning individuals into service bureaus. The website states: “So you bought an awesome 3D printer, but it’s sitting idly most of the time? Put it to good use by sharing it with those around you and make some extra cash along the way.”⁴ 3Dhubs currently lists over 18,000 such printers, illustrating that this is no small trend.⁵

Custom-made products, a new breed of entrepreneurs, and a revolutionized supply chain are all at odds with distinctions between “commercial” and “noncommercial” uses of 3D printing. Indeed, because the professional/consumer line is so murky in the 3D printing industry, the term “prosumer” is routinely used to identify hybrid users. Futurologist Alvin Toffler is recognized to have coined the term “prosumer” in his 1980 book, *The Third Wave*, when he predicted that the role of producers and consumers would begin to blur and merge, envisioning that businesses would initiate a process of mass customization, of highly customized products. 3D printer prosumers include members of “maker” communities, or groups of do-it-yourselfers, inventors, and aspiring entrepreneurs, who start off experimenting with their 3D printers but may commercialize their projects over time. Crowd funding platforms Indiegogo and Kickstarter reflect dozens of such ventures.

Even personal or household uses of a 3D printer may be difficult to classify as “noncommercial.” If successful, 3D printing will eventually allow a household to become the end point of a vastly truncated supply chain. Instead of buying, for example, a wrench from a hardware store or a replacement part from a manufacturer’s warehouse, a 3D printer owner may purchase a design file (or enter into a license for it) to print a desired product.⁶ An exemption crafted for “non-commercial” uses may improperly be interpreted to apply to 3D printers used in this manner. Such an exemption would exacerbate the already formidable challenges for companies that would like to deliver products directly to end users, including quality control, product liability, and reputational concerns.

⁴ 3DHubs, <https://www.3dhubs.com/#community> (last visited June 26, 2015).

⁵ See also Wohlers Report, p. 135 (identifying individual 3D printer owners as a new type of service provider emerging in the marketplace). Such a trend is at odds with proponents’ claim that “the person who is using the printer is the person making use of the exemption, so they are going to be fully aware that they’re the ones using third party feedstock...” Copyright Office, 1201 Rulemaking Process Public Roundtable (May 28, 2015) (hereafter “Hearing”) Tr. 175; Il. 10-16. (Sherwin Siy testimony).

⁶ The 2015 Consumer Electronics Show included a “3D printed lifestyle” exhibit, showcasing that a variety of household goods such as furniture, toys, games, food, and décor as well as wearables may soon be delivered to consumers through their household 3D printers rather than through traditional retail channels. Laura Griffiths, *3D Systems Opens Up Its 3D Printed Home at 2015 International CES*, TCT News, <http://www.tctmagazine.com/ces-2015/3d-systems-opens-up-its-3d-printed-home-at-2015-international/> (last visited June 26, 2015).

It is worth noting that distinguishing between “desktop” and “industrial” printers would be an inappropriate approach to an exemption aimed at “noncommercial” uses. The majority of desktop printers are in fact used for commercial applications. Indeed, third-party data reveals that most users of desktop 3D printers are actually *businesses*, not individuals, as “[c]orporate level managers in multinationals and small and medium-sized enterprises are driving the purchase of low cost systems.”⁷ Stratasys’ desktop printers, while sometimes purchased by individuals, are widely purchased for commercial uses, be it prototyping or the manufacture of end products.⁸ Moreover, as described above, many individual buyers do not use their printers in a manner that is properly classified as noncommercial.⁹ Industry definitions segmenting desktop from industrial printers are also far from standardized.¹⁰

II. Even If “Commercial” Use Can Be Distinguished from “Noncommercial” Use, It Would Still Be Improper to Grant an Exemption Under 17 U.S.C. § 1201(a)(1)(C).

Even if the Copyright Office could define a category of “noncommercial” uses of 3D printers, doing so would not cure the fundamental deficiencies in proponents’ DMCA exemption proposal.

Proponents have not proven that (1) any uses, “noncommercial” or otherwise, affected by the prohibition on circumvention are or are likely to be noninfringing, and (2) as a result of a technological measure controlling access to a copyrighted work, the prohibition is causing, or in the next three years is likely to cause, an adverse impact on such uses. Rather, the economic report of Dr. Jonathan Baker and the factual testimony of Stratasys’ Vice President for Sales Patrick Carey establish, to the contrary, that granting an exemption would likely cause an adverse impact.¹¹

With respect to “noninfringing” uses, proponents have contended that an exemption would enable reverse engineering, allow for the fair use of copyrighted works, or would not implicate copyright law at all. Proponents have offered little to no factual support for their contentions.¹²

If use of non-manufacturer approved materials does not implicate copyright law at all, of course, then no exemption is needed. The record establishes, however, that the modification of

⁷ Wohlers Report, p. 112 (“It might be surprising to some that most of the revenue from the desktop 3D printing market is from companies, not individuals”).

⁸ Hearing Tr. 189, ll. 2-10; 150, ll. 7-12. (Pat Carey testimony regarding use of desktop printers by companies and professional engineers); *see, e.g.*, Heidi Milkert, *RoboHand to Team with College of the Quachitas to Open Printer Farm and Mass Produce 3D Printed Prosthetics*, 3D Print.Com, <http://3dprint.com/6992/robohand-3d-print-farm/> (last visited June 26, 2015) (describing use of Stratasys desktop printers).

⁹ *See* 2012 Recommendation at 38, 41 (avoiding paying the customary cost of works or devices has been recognized as a “commercial” rather than “noncommercial” use).

¹⁰ Wohlers Associates distinguishes “desktop” and “personal” 3D printers solely based on price (i.e., printers sold below \$5,000, with further subdivisions at the \$3,000, \$1,700, and \$500 price points), but this classification is far from a consistent industry standard, especially as prices continue to drop. Wohlers Report, p. 111.

¹¹ As Pat Carey noted, “If the part comes out not right, it affects our brand” because buyers believe that the printer is the problem and not the material. Hearing Tr. 173, ll. 4-6; *see also* Comments of Stratasys, Ltd in Opposition to Proposed Class 26 at 23-24 (March 27, 2015) (hereafter “Stratasys Opposition”) (it is well-established in the economic literature that the marketplace may not attribute the effects of non-genuine materials to the use of those materials).

¹² As Mr. Carey explained, software on 3D printers, even desktop 3D printers, is licensed, not sold. Hearing Tr. 164, ll. 10-15. Proponents have not offered any evidence to the contrary. With respect to fair use, proponents first raised fair use in the last minute of the hearing, and offered no supporting argument or facts. *Id.* at 186, ll. 22-25; 187, l.1.

copyrightable software in 3D printers and cartridges to allow for the use of non-manufacturer approved materials is likely in certain cases to result in the creation of infringing derivative works.¹³ While each 3D printer operates differently and the technology is still evolving, in order to use non-manufacturer approved materials, a user will likely need to modify licensed operating system software or firmware.¹⁴ Proponents have not submitted evidence demonstrating that such modifications would be “transformative” in nature, or that only a nominative amount of the copyrighted works would need to be modified; further, proponents have not countered Stratasys’ explanation that the marketplace impact on 3D printer manufacturers could be significant.¹⁵ Limiting the scope of the proposed exemption to exclude “commercial” uses does not make proponents’ arguments of “noninfringing” uses any more persuasive.

Moreover, proponents have not identified any adverse effects beyond the speculative effects described in the original petition; nor have they provided any evidence to “demonstrate ‘distinct, verifiable, and measurable impacts’ occurring in the marketplace.”¹⁶ Instead of evidence, proponents have spun a narrative that misapprehends the nature of the 3D printers at issue. Proponents’ narrative is that a user of a fully-integrated 3D printer would be able to use any material in his or her 3D printer, *but for* TPMs. The fact, however, is that removing TPMs does not cause a tightly-engineered 3D printer to turn into a multitasking machine. Manufacturers of such printers have designed the hardware and software – including motion control software, system control software, and software to convert a design file into a precision tool path – for materials with highly specific properties.

As the Register has established, “a proponent must...demonstrate that the technological protection measure is the *cause* of the claimed adverse impact.”¹⁷ Given the lack of causation between the DMCA and proponents’ asserted grievances, as well as the numerous 3D printers that are available without TPMs, many of which are less expensive,¹⁸ the evidence demonstrates that adverse effects are unlikely.

Moreover, the statutory factors set forth in 17 U.S.C. § 1201(a)(1)(C) would still weigh against an exemption even if “noncommercial” uses alone are considered. Harm to manufacturers’ reputations or disincentives for them to invest in innovation caused by an exemption would ripple throughout the industry.

¹³ Stratasys Opposition at 10; Hearing Tr. 132, ll. 9-12; 143, ll. 20-24; 141, ll. 15-22 (Testimony of Sherwin Siy and Michael Weinberg regarding modification of operating system software for circumvention); Tr. 173, ll. 17-25 (Pat Carey testimony explaining that “making derivative works of our server operating system is of huge concern...”).

¹⁴ A user may also need to modify a design file in order to use the material of the user’s choice. For example, when a user selects a material that requires post-printing processing or machining, modifications can be made to the design file to add material to the areas where such processing – like sanding to achieve a certain surface quality – occurs. *See* Wohlers Report, p. 46.

¹⁵ Stratasys Opposition at 23-24.

¹⁶ Exemption to Prohibition on Circumvention of Copyright Protection Systems for Access Control Technologies, 79 Fed. Reg. 55,687, 55,690 (Sept. 17, 2014), *quoting* Tom Bliley, REPORT OF THE HOUSE COMMITTEE ON COMMERCE ON THE DIGITAL MILLENNIUM COPYRIGHT ACT OF 1998, H.R. REP. NO. 105-551, pt. 2, at 37 (1998).

¹⁷ Exemption to Prohibition on Circumvention of Copyright Protection Systems for Access Control Technologies, 79 Fed. Reg. 73,856, 73,858 (Dec. 12, 2014); *see also* Stratasys Opposition at 16-17.

¹⁸ *See* Stratasys Opposition at 19-21, identifying 13 printers without access controls, which is only a sampling.



Indeed, cheap, non-genuine materials may represent the biggest problem for new adopters. One filament manufacturer disclosed that some companies “use things like saw dust in their raw materials” which leads to frequent clogs and other problems.¹⁹ He opined that manufacturers of such cheap materials damage the overall industry because new users become quickly disheartened with their printers’ performance.²⁰ Increased adoption of 3D printers is critically dependent on gains in reliability and ease of use – goals that are furthered by the use of secure, integrated 3D printing systems.²¹

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For the foregoing reasons and those set forth in its opposition, Stratasys respectfully requests that the Register recommend the Librarian decline to grant an exemption for circumvention of 3D printer firmware and software, whether or not limited to “noncommercial” uses of 3D printing.

If proponents respond to the Copyright Office’s recent request for additional comments, Stratasys respectfully requests that it be permitted to respond to any such comments.

¹⁹ Laura Griffiths, *rigid ink: ‘We challenge people to find better quality 3D printing filament,’* TCT Magazine, <http://www.tctmagazine.com/3D-printing-news/rigid.ink-we-challenge-people-to-find-better-quality/> (last visited June 26, 2015).

²⁰ *Id.*

²¹ See Stratasys Opposition at 25.