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(U//FOUO) 3-D Printed Plastic Weapons, Equipment, and Materials

(U//FOUO) Domestic violent extremists (DVEs) continue to exploit 3-D printing to produce weapons and firearm accessories that are unregulated and easy to acquire, according to recent federal and local arrests. This jointly authored *Reference Aid* is intended to highlight recent incidents of DVE misuse of 3-D printing and demonstrative examples of how the tactic could be exploited by DVEs in the United States. It also aims to provide a description of some elements of 3-D printing operations, including 3-D printers, firearms, components, and accessories made of plastic. The below items associated with 3-D printing operations are not an exhaustive list and may involve constitutionally protected activities that are not necessarily indicative of DVE use. 3-D printing operations should be evaluated in the totality of circumstances and in accordance with state laws.

(U//FOUO) 3-D Printed Plastic Weapons, Equipment, and Materials

(U) 3-D Printers, Materials, and Equipment

(U) Plastic 3-D printers vary in size, type, quality of product created, and cost—ranging from one hundred to several thousand dollars. Some 3-D printers may be large and require ground placement, while smaller models can be desk top sized or portable.

(U) 3-D printing relies on virtual blueprints called Computer-Aided Design (CAD) files. To print an item, a user must convert the CAD files using software to a Standard Triangle Language (.STL) file that the printer can read. CAD files can be downloaded through publicly available websites, paid subscriptions to private companies, and on the dark web. Technically advanced users can create their own designs and CAD files with purchased or free software. Internet searches, downloads, and requests for designs related to CAD or .STL files may be indicative of 3-D printing interest.

(U) Fused Deposition Modeling Printer (FDM)

(U) FDM printers are the most popular type of hobbyist 3-D printer and are used to create basic models and low-cost prototyping. FDM relies on polymers fed from spools of filament, which resemble plastic wire, to print. Polymers range in strength, cost, and ease of use. Over time, FDM printers have become cheaper and are considered a cost and time-effective method of 3-D printing.



(U) Stereolithography Printer (SLA)

(U) SLA printers are used for complex items that require detail and high resolution. This type of printing uses liquid photopolymer resin to create items. The items produced via this technique must be submerged in isopropyl alcohol and cured with a laser or UV light. Compared to FDM, SLA is more expensive and time consuming but results in a more detailed product.



(U//FOUO) Notable 3-D Printing Arrests in the United States in 2020



10 May, Nevada

(U//FOUO) Police arrested a suspect after finding pipe bombs, a 3-D printer, and printed silencer components at their residence. Authorities discovered the items during an unrelated call for service at the location.



22 June, Missouri

(U//FOUO) A suspected DVE was arrested for possessing explosives, firearms, and a landmine made from a 3-D printer. The landmine was enhanced with metal BBs, according to court documents. Friends of the suspect told police that he allegedly disliked "Hispanics" and "Blacks," and they were concerned he was plotting a "large-scale attack" to target protesters.



4 September, Nevada

(U//FOUO) Police arrested an individual for firearms charges after receiving an anonymous tip that the suspect planned to conduct a shooting. According to federal authorities, the suspect used 3-D printed firearm parts to convert weapons to fully automatic.



30 October, West Virginia












(U//FOUO) A suspected militia extremist and boogaloo adherent was arrested for selling machine gun conversion devices disguised as "portable wall hangers" to hundreds of people, including other boogaloo supporters, according to federal prosecutors.

(U//FOUO) 3-D Printed Plastic Weapons, Equipment, and Materials (Cont.)

(U) 3-D Printed Plastic Firearms, Components, and Accessories

(U) Technological advancements have lowered the cost and expertise required to produce 3-D printed firearms, components, and accessories. Despite these advancements, 3-D printing ammunition remains a challenge and is not necessary in jurisdictions where acquiring traditionally manufactured ammunition is easy. Fully plastic weapons, like knives or disassembled firearm components, may be able to bypass metal detectors, according

to academic research. DVEs may leverage 3-D printed items to bypass detectors and avoid government firearm regulation. Unless otherwise noted, the privately made firearms, components, and accessories featured in this table are legal to produce and own but are typically regulated by the Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF).

(U) ITEM	(U) DESCRIPTION	(U) IMAGE
(U) Fully 3-D Printed Firearms	(U) Fully 3-D printed firearms are almost entirely printed but may require minor non-printed parts, including metal firing pins and rubber bands. These weapons tend to only fire a few rounds and are the least reliable and durable type of printed firearm.	
(U) Hybrid Firearms	(U) Hybrid firearms are primarily constructed with 3-D printed parts but rely on readily available unregulated components, including steel tubing, metal bar stock, and springs. These firearms are more reliable than fully printed items, but less reliable than firearms that only use one or two 3-D printed components.	
(U) 3-D Printed Firearm Components, including Frames, Receivers, and Magazines	(U) 3-D printed firearm components, including frames, receivers, and magazines require other traditionally manufactured metal parts to function. Metal, factory-produced firearm parts are sold online and in gun stores. The ATF regulates frames and receivers, meaning 3-D printing these components would allow an individual to bypass government regulation. Similarly 3-D printing magazines allow individuals to bypass bans on high-capacity magazines. Firearms using a 3-D printed component are considered the most reliable 3-D weapon compared to hybrid and fully printed firearms.	<div style="display: flex; justify-content: space-around;"> <div data-bbox="1113 747 1449 919"> <p>(U) Handgun Frames</p>  </div> <div data-bbox="1470 747 1743 919"> <p>(U) Receivers</p>  </div> <div data-bbox="1764 747 2037 919"> <p>(U) Magazines</p>  </div> </div>
(U) Conversion Devices and Drop-in Auto Sears	(U) Conversion devices are illegal in the United States and allow some commercially available semi-automatic firearms to operate as fully automatic. These items are small enough to easily hide or disguise as household items.	<div style="display: flex; justify-content: space-around;"> <div data-bbox="1113 953 1323 1118"> <p>(U) Conversion Device</p>  </div> <div data-bbox="1344 953 1575 1118"> <p>(U) Drop-in Auto Sear Disguised as a Wall Hanger</p>  </div> <div data-bbox="1596 953 1785 1118"> <p>(U) Conversion Device Inside Firearm</p>  </div> <div data-bbox="1806 953 2037 1118"> <p>(U) Bump Stock</p>  </div> </div>
(U) Bump Stocks	(U) Bump stocks, illegal in the United States since 2019, allow a semi-automatic firearm to initiate a continuous firing cycle with a single pull of a trigger, according to the ATF.	<div style="display: flex; justify-content: space-around;"> <div data-bbox="1113 1152 1554 1269"> <p>(U) Suppressor</p>  </div> <div data-bbox="1575 1152 2037 1269"> <p>(U) Internal Baffle System</p>  </div> </div>
(U) Suppressor	(U) A suppressor is any device designed for silencing, muffling, or diminishing the sound of a firearm discharge. Plastic 3-D printed suppressors are less durable compared to traditional metal suppressors. Federally, suppressors are legal but require registration and a \$200 tax stamp.	

Source, Reference, and Dissemination Information

Definitions

(U) **3-D Printing:** A form of additive manufacturing; it is a manufacturing process that takes a liquid, powder, or pellet form of ceramic, metal, or resin-based material similar to plastic, and builds three-dimensional objects by layering the material – guided by computer processing – and binding it together by heat, light, or chemical compounds until the object is fully rendered. Depending on the material being used and the sophistication of the printing machine, itself, the finished object can serve as a mock-up from which copies can be reproduced or manufactured, such as when a plastic part is used as a mold for a metal copy, or it can serve as a fully functioning replacement for a broken or missing part.

(U//FOUO) **Boogaloo:** A term often used by both militia extremists and racially or ethnically motivated violent extremists (RMVEs) to reference a violent uprising or impending civil war. While RMVEs typically use the term to reference an impending race war or other conflict that will lead to the collapse of the “system,” including the US Government and society, militia extremists use the term to reference an impending politically motivated civil war or uprising against the government following perceived incursions on constitutional rights, including the Second Amendment, or other actions perceived as government overreach.

(U) **Dark web:** Dark net services and sites that are only accessible when using dark net networks – also known as “hidden services.”

(U//FOUO) **Domestic violent extremist:** An individual based and operating primarily within the United States or its territories without direction or inspiration from a foreign terrorist group or other foreign power who seeks to further political or social goals wholly or in part through unlawful acts of force or violence. The mere advocacy of political or social positions, political activism, use of strong rhetoric, or generalized philosophic embrace of violent tactics may not constitute extremism and may be constitutionally protected.

(U//FOUO) **Militia Extremist:** Groups or individuals who facilitate or engage in acts of unlawful violence directed at federal, state, or local government officials or infrastructure in response to their belief that the government deliberately is stripping Americans of their freedoms and is attempting to establish a totalitarian regime. These individuals consequently oppose many federal and state authorities’ laws and regulations, particularly those related to firearms ownership, and often belong to armed paramilitary groups. They often conduct paramilitary training designed to violently resist perceived government oppression or to violently overthrow the US Government.

(U) **Privately Made Firearms:** Alternatively referred to as ghost guns, home assembled firearms, or homemade firearms, these are non-serialized firearms or firearms without any identifying number stamped onto the weapon. Ghost guns are typically built from parts derived from a variety of processes, including but not limited to additive manufacturing, computer numerical control (CNC), firearm parts kits, cast molding or “ghost gun” kits. These weapons are legal to produce and possess by the individual that assembles them under federal law, unless they are prohibited from possessing a firearm. Ghost guns or non-serialized components can be acquired and assembled without the need for a background check.

Reporting Suspicious Activity	<i>(U)</i> To report suspicious activity, law enforcement, Fire-EMS, private security personnel, and emergency managers should follow established protocols; all other personnel should call 911 or contact local law enforcement. Suspicious activity reports (SARs) will be forwarded to the appropriate fusion center and FBI Joint Terrorism Task Force for further action. For more information on the Nationwide SAR Initiative, visit http://nsi.ndrc.gov/resources.aspx .
Dissemination	<i>(U)</i> Federal, state, local, tribal, and territorial authorities, and private sector security partners.
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