

# How real is the risk posed by 3-D printed guns?

November 28 2016, by Thomas Birtchnell

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One of the weapons seized in the Operation Oscar Quantum raids. Credit: Queensland police

3-D printed guns are back [in the news](#) after Queensland Police reported last week that they had discovered a 3-D printer in a raid on what appeared to be a "large-scale" weapons production facility as a part of [Operation Oscar Quantum](#).

According to [police](#), the raid uncovered homemade weapons and ammunition in a workshop manufacturing facility "containing equipment used in the production of fully automatic machine guns, including a 3-D [printer](#), lathes, drill presses and other tools".

The Gold Coast Bulletin [reported](#) that Detective Superintendent Jon Wacker, of the Drug and Serious Crime Group, said the "Uzi"-style guns, thought to be made with the help of a 3-D printer, were "fairly close" to factory quality.

One of the home made weapons was captioned in [one media report](#) as being a "3-D-printed submachine gun". This could certainly raise alarm and hint at a new era of disorganised and decentralised weapons production, and a burgeoning "reshoring" of weapon manufacturing as an alternative to importation from overseas.

But the fact is that 3-D printing technology is not yet at the stage where it can readily produce weapons. Although it can be used to help rogue gunsmiths work their shady trade.

## **Impracticalities**

The fact is that today's home or consumer grade 3-D printers are not able to produce durable metal objects, such as would be required to print a gun. The standard nozzles used in the process of fused deposition modelling ([FDM](#)) simply do not get hot enough to melt pure metals.

There are certainly efforts to bring metal FDM 3-D printers to market. One of the future contenders for mass adoption is a prototype [open source FDM metal 3-D printer](#), much like a home welder. At the moment this does not really compare to the resolution of plastic printers, although the concept is claimed to be at least [proven](#).

However, there is constant innovation with 3-D printer materials. There are currently [efforts](#) to make metal-infused filaments in bronze and copper. These are certainly a promising development for budding home jewellery designers and makers, but not gunsmiths, as firearms require stronger and purer metal feedstocks.

One of the key hurdles for gunsmiths is the extremely high temperatures needed to melt or [sinter](#) metals. For example, iron sinters at between 1,100°C and 1,300°C, whereas a general FDM 3-D printer can reach 195-220°C.



The EOS EOSINT M 100 can print using metal, but it's not cheap. Credit: EOS

Another hurdle is the cost of "powderised" metals found in direct metal laser sintering ([DMLS](#)) or selective laser sintering ([SLS](#)) printers.

Powdered metals also require [safe facilities](#) to use them: finely divided metal powders, such as titanium and aluminium, can spontaneously combust causing fires.

It is possible to see limited runs of critical metal parts for automobiles and other specialist objects made on 3-D printers in many [research](#) and industry facilities.

Indeed, for small and medium-sized enterprises (SMEs) around the world, "additive manufacturing" using 3-D printers is a [game changer for supply chains](#). Many SMEs are investing in their own high end metal 3-D printers or utilising facilities in universities and incubators.

But one catch is the cost. For example, the [EOS EOSINT M 100](#) is a relatively "entry level" DMLS 3-D printer and costs between US\$100,000 and US\$250,000. Such machines are unlikely to turn up in the Christmas stockings of criminal gangs.

## Prototypes

What makes me sceptical that the guns recovered from Operation Oscar Quantum were 3-D printed in their entirety is not only the prohibitive cost of 3-D printing in metals, but the presence of typical gunsmith production machines at the facility.

But a 3-D printer could have certainly been used to manufacture many non- or near- critical parts, such as grips or the outer framework.

A 3-D printer may have also been used for "rapid prototyping" for mock-ups to test the final design in plastic. This is where a 3-D printer can quickly produce a prototype part for testing before the final part is produced using more conventional means. This is one of the most common uses of 3-D printers in industry today.

It should be noted that this is not the first time that police have flagged 3-D printing as playing a role in weapons production.



The 'Liberator' recovered by Queensland police in December 2015. Credit: Queensland Police

On December 10, 2015, Queensland Police [reported](#) that Taskforce Maxima found methamphetamine and steroids, drug paraphernalia and "a loaded handgun allegedly created by a 3-D printer" in a raid on a meth lab.

The handgun from Taskforce Maxima certainly appears to be made on a 3-D printer, featuring the characteristic surface ribbing you see from 3-D printed items. It also appears to conform to the design parameters of a 3-D printed gun, the "Liberator", produced by American organisation, Defense Distributed.

However, the critical part – the barrel – appears to be a conventional non-printed piece, most likely metal. Whether it would have actually worked safely or simply been used for intimidation is another question entirely.

NSW Police Commissioner Andrew Scipione's team was also [reported](#) to have bought a 3-D printer for A\$1,700 and made a polymer Liberator handgun from a design file downloaded from the internet.

## **Backyard gunsmiths**

We shouldn't really be surprised that 3-D printers are now an integral part of illicit gunsmiths' repertoires. 3-D printing is a near essential element of any pre-production suite, particularly for rapid prototyping. Metal 3-D printing will no doubt be a part of the suite too, if it is not already.

Gunsmithing also has a long heritage in Australia as the photo below shows. Indeed, [Lithgow Arms'](#) history dates back to 1912.

3-D printing also offers tremendous advantages and perhaps even a [new industrial future](#). Other local industries could benefit from 3-D printing boutique, custom and novelty objects. This would buck the trend of [offshoring](#) that has ailed Australian manufacturing over the 21st century.

And we should remember that it's not only 3-D printing that enables people to build illicit firearms. With the right tools, a skilled gunsmith can make a weapon in their back shed. However, 3-D printing can make

that process easier and more accessible to less skilled individuals.

This article was originally published on [The Conversation](#). Read the [original article](#).

Provided by The Conversation

Citation: How real is the risk posed by 3-D printed guns? (2016, November 28) retrieved 5 May 2024 from <https://phys.org/news/2016-11-real-posed-d-guns.html>

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