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3D MODELS

Three-dimensional printing comes of age

Technology used in 'demolition' of car in latest Bond movie is gaining real-world appeal

LONDON — James Bond has long had a difficult relationship with cars — none seem to survive a whole film. But when his immaculate, iconic Aston Martin DB5 reappeared in the latest Bond film, *Skyfall*, its demolition was particularly comprehensive. Putting it back together again seems almost impossible.

However, the film's producers had in fact adopted a novel approach: They made three models, each with 18 parts, so they could be filmed — and then blown up — without damaging the original. Immaculately finished, each model is indistinguishable on screen from a real DB5. If a part needed to be replaced, or to appear to be damaged on screen, they could simply print out



The Aston Martin blown up in *Skyfall* was a 3D-printed model. AP

a new piece to the right configuration.

Such 3D printing made its Bond debut in *Skyfall*, but it is rapidly gaining widespread adoption across a host of industries. It has been touted for more than a decade, but appears to be finally gaining real-world appeal.

3D printing allows the rapid fabrication of objects by using printers filled with liquid, powder or resin, quick to set and easy to bond together into almost any shape, so objects can be made cheaply and easily.

Autodesk, the company whose software played a large part in the special effects images in *Skyfall*, is also involved in consumer 3D printing. Even though the cost of printers is falling, it makes economic sense for users to print their creations on larger, faster industrial printers than to buy their own domestic versions.

Currently, companies that provide 3D printing services allow inventors, engineers and architects to print concept models, prototype parts as well as scale models of buildings. Besides these, Singaporean company 3D Matters also prints figurines for artists.

There are, of course, limitations to what can be printed in 3D, said The

Daily Telegraph's Consumer Technology Editor Matt Warman. As large printers are costly, it is best to reproduce bigger objects only if they are expensive (such as parts of a DB5, which for *Skyfall* were printed at one-third of real-life size by German firm Voxeljet).

However, the technology has been around for a considerable period, with companies such as Microsoft using it for years to produce mock-ups of its keyboards and mice to test ergonomics. Some of the pictures on Microsoft's product boxes have previously been of 3D-printed models, as functioning versions were only available in time for delivery, said Mr Warman.

The possibilities for the technology are almost endless: Rapid prototyping and manufacturing mean that new products no longer have to be whittled and tooled over long periods — and Bond's DB5 can be blown up over and over again. **AGENCIES**