



DEUTSCHE BAHN

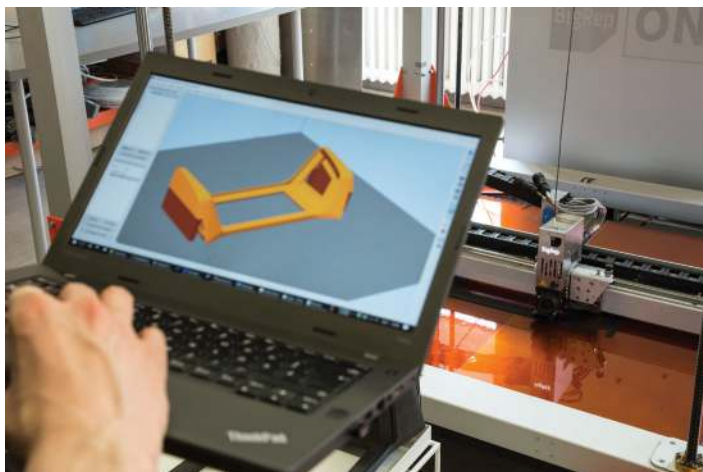
GOES ADDITIVE

WITH BIGREP

ADDITIVE MANUFACTURING FOR MOBILITY: DEUTSCHE BAHN WITH NOWLAB

Additive manufacturing (AM) is profoundly impacting production activities across all industries, including those like rail transport which require components that meet high-level specifications. However, different industries are being influenced in different ways.

Deutsche Bahn (DB) is one of the largest transport companies in the world, with a staff of 300,000 carrying out rail and logistics operations in over 130 countries. A company whose market strength relies on its technological leadership, DB recognized the importance of Additive manufacturing early on and took action in two ways. In September 2016, the company initiated 'Mobility Goes Additive', a network for bringing together organizations to lead the development of AM solutions for the logistics and mobility sectors. DB had already been working to bring the value of the technology to its operations, so establishment of the network took it several stations further, so to say.



“INSTEAD OF INVESTING A HUGE AMOUNT OF MONEY IN WAREHOUSING, WE ARE NOW ABLE TO 3D PRINT END USE SPARE PARTS ON DEMAND.”

Jörg Petri

Director of Innovation, NOWlab@BigRep

Deutsche Bahn holds significant older rolling stock, thus 3D scanning and then 3D printing looked to be the simplest solution for making spares of obsolete train parts. More generally for single-unit or small-batch production of a broad range of items, the lowest cost manufacturing solution can be 3D printing. Finally, if spare parts can be produced at short notice, then fewer excess parts are needed – this allows for a reduction in storage facilities and reduces unnecessary production.

“WE STARTED OUR ACTIVITIES IN ADDITIVE MANUFACTURING IN OCTOBER 2015. AT THAT TIME, WE DECIDED TO FOCUS ON THE REPRODUCTION OF MISSING SPARE PARTS.”

Stefanie Brickwede

Head of Additive Manufacturing at Deutsche Bahn



BIGREP FOR LARGE-SCALE AND MATERIALS INNOVATION

“WE WANTED TO CREATE NEW MATERIAL WHICH MIGHT BE AN ALTERNATIVE TO THE EXISTING MATERIALS. THEREFORE WE CREATED A VERY CLOSE PARTNERSHIP WITH BIGREP.”

Stefanie Brickwede

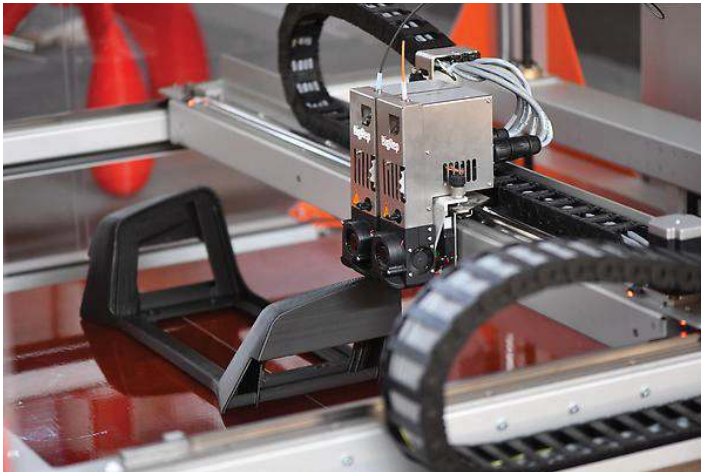
Head of Additive Manufacturing at Deutsche Bahn

Deutsche Bahn carried out an inventory of spare parts needs within their trains, stations and infrastructure, and sought to identify as many Additive Manufacturing use cases as possible. BigRep's track record of developing innovative [3D printer filament](#), and the size of its [industrial 3D printers](#), led DB to propose a partnership on production of a specific category of end use spare parts. The rail parts concerned are subject to stringent EU norms due to their proximity to transport users. Brickwede explains the context: "We need very special materials, which have to be flame retardant. Our requirements concerning flame retardancy are very high. Therefore, we contacted BigRep as we wanted to create a new material which might be an alternative to the existing materials."

Excited about this important, trailblazing project, BigRep assigned NOWlab to lead the work. NOWlab is the research and innovation hub within BigRep that endlessly searches for new ways to scale and shape additive manufacturing for tailored industrial use cases. NOWlab's team of experts work to create custom industrial application solutions using cutting-edge, patent-owned production methods and processes. As a key player in the research sphere, NOWlab is leading BigRep's journey to discover the future of industrial manufacturing and products – 3d printer materials development is a key dimension of this.

BigRep's experts are waiting to sink their teeth into your unique and challenging use case.

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“TOGETHER WITH OUR MATERIAL SPECIALISTS, WE ARE FOCUSING ON CREATING A NEW 3D PRINTER FILAMENT THAT ENABLES BOTH RIGIDITY AND FLAME RETARDANCE IN ONE GO.”

Jörg Petri

Director of Innovation, NOWlab@BigRep

Deutsche Bahn and BigRep are confronting the challenge with two parallel activities. Firstly, they are developing an initial test-run component. As the relevant category contains many non-structural rail carriage components, a reasonably large, polymer headrest seemed appropriate. With CAD files supplied by DB, BigRep has produced a number of prototypes for this spare part. [The BigRep ONE](#) large-format industrial 3D printer is delivering examples with correct specifications in terms of structure, form and surface finish. The second line of work is the development of the fire-retardant 3D printer filament material.

| ADDING NEW VALUE

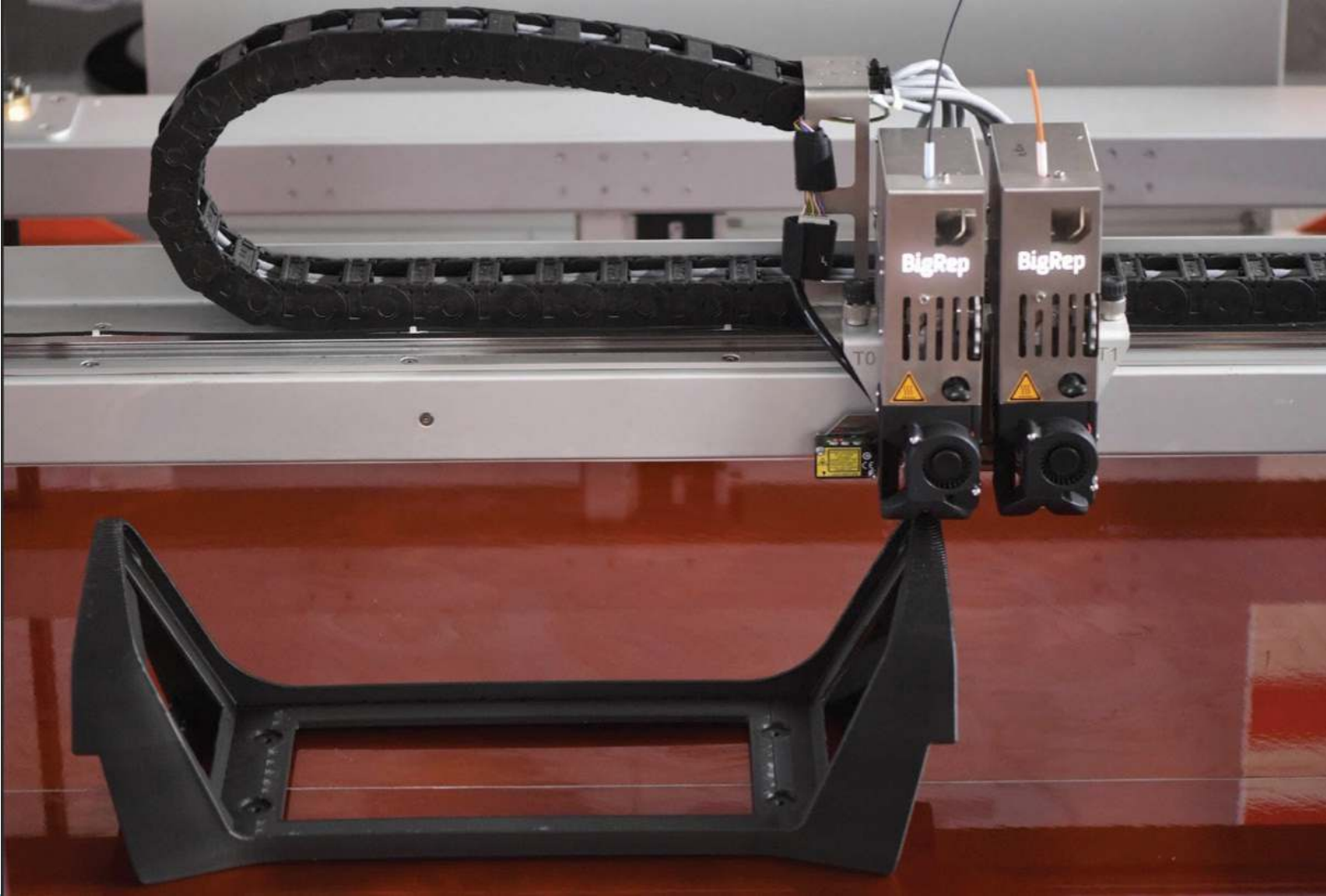
The developing partnership between Deutsche Bahn and BigRep is extremely promising. If the project is a success, numerous spare parts from across DB's logistics and mobility operations should become printable with BigRep 3D printers. And there is potential for increased collaboration between the two companies. Further 3D printer material innovation could make additional spare parts suitable for 3D printing. In a different area, the companies have already come together to print design prototypes for a new rail signal part.

The use case highlights the specific impact additive manufacturing is having on the logistics and mobility sector. Deutsche Bahn is set to 3D print 2,000 spares during 2017, and several times that number in 2018. In parallel, Mobility Goes Active continues to look at 3D-printing applications for tools, prototypes and new parts with complicated geometries.

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The project also shows that BigRep, a world leader in large-format industrial 3D printer technology, is well equipped to play a broader role in the sector as it increasingly adopts additive manufacturing techniques. BigRep offers its unique technology and commitment to engaging with the stickiest of challenges, to help specific clients and ultimately the industries around them to reach the full potential of the technology. In doing so, it shows the value that NOWlab can bring clients of all kinds when they need expert support, including 3d printer materials development, to realize the benefits of AM. Finally, as both BigRep and DB are aware, the 3d printer materials they are developing could be applied well beyond DB's rail spare parts needs. Other firms within the mobility and logistics sectors that are similarly subject to flame retardancy norms, are sure to take an interest in the new possibilities it would generate.



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THE USE CASE VIDEO

