

# Hoffmann + Krippner revolutionizes the production of small series for plastic enclosures with HP Multi Jet Fusion technology



# Online Beratung mit Technology Case



Data courtesy of Hoffmann + Krippner

## Introduction

With the use of HP's Multi Jet Fusion 3D printing technology, Hoffmann + Krippner manufactures cases and boxes that are superior to their traditionally manufactured counterparts, in terms of weight, resistance and cost.

Hoffmann + Krippner is an enterprise expert in custom control units and printed electronics.

With well-engineered IoT solutions, they create devices for industrial applications that are fit for the digital future in cooperation with their customers. They are pioneers of the membrane keypad in Germany, a second-generation family-owned business and have matured into one of the market leaders for complex operating devices and control units.

As part of the HK technology network, six companies bundle their core competencies and provide know-how and individual solutions for complex operating units and user interfaces, electronics, sensors and housing solutions combined with future-oriented, cloud-based IoT solutions.

Thanks to close cross-company cooperation, in times of Industry 4.0 and digitization they provide customer-specific solutions, all from a single source.

### ● Industry

Industrial

### ● Sector

Electrical Components

### ● Objective

To improve functionality and mass customization through design development, article construction and industrialization, all centralized in a single source.

### ● Approach

Hoffmann + Krippner adopted HP Multi Jet Fusion technology to carry out the production of small series on an industrial scale.

### ● Technology | Solution

HP Multi Jet Fusion technology,  
HP Jet Fusion 4200 3D Printing Solution

### ● Material

HP 3D High Reusability (HR) PA 12

# Challenge

Hoffmann + Krippner manufactures small or medium series of single components, subsystems, and develops these products for different industrial areas and different requirements, so the challenges they have to face on a daily basis are several.

First of all, the need to manufacture complex shapes which must house electrical components, therefore potentially requiring a thread to be manufactured either externally or internally, while remaining completely waterproof and dustproof. Also, most cases and boxes that are produced from Hoffmann + Krippner need to integrate a fastening solution, but without adding too much weight to the part itself or compromising an easy and accessible opening mechanism.

Finally, some applications need to be used in harsh environments and might be subject to damaging hits if not carefully manufactured in a way that protects solidly the more delicate content of the cases.

# Solution

For the application of the Rosi-Box, using 3D printing made the manufacturing of undercuts and complex shapes possible and easy, along with a final quality that could not be obtained with any other conventional technology.

Design possibilities are endless with additive manufacturing: this is why the Top Hat Rail Universal Housing manufactured by Hoffmann + Krippner can be produced in customized sizes and textures, with maximum versatility in the thickness of each wall and positioning of the opening.

Weight reduction, optimized geometry and a robust structure are what make the IoT Smart Tag a strong component, ready for harsh environments. Thanks to 3D Printing, Hoffmann + Krippner managed to do rapid prototyping and had low turnaround times for final series production of the two versions of this product, with several thousand of units manufactured. A similar application that benefited from HP's technology solution is the Industrial Tracker M2M, which was assembled on big cable drums for transferring GPS information and other physical data.

The E-Scooter Charger is a good example of how additive manufacturing can benefit bigger applications too. It is an outdoor, water-protected housing, whose specialty is its size and the possibility to glue it with a display glass: the application is financed by showcasing advertisements on said display.

The final application, the IoT Sensor Housing, shows how 3D printed components can surpass laser-sintered parts in terms of strength and load-bearing capacity.

Rosi-Box



Top Hat Rail Universal Housing



IoT Sensor Housing



E-Scooter Charger



Industrial Tracker M2M



IoT Smart Tag



# Result

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Hoffmann + Krippner revolutionized the production of small series for plastic enclosures on an industrial scale through the adoption of HP Multi Jet Fusion technology.

In terms of resistance, material selection, final weight of the parts, 3D printed cases and boxes are superior to their traditionally manufactured counterparts. For instance, all cases are lightweight and easy to open and close, through the creation of board fastenings and snap-in hooks that also take away the need for additional screws.

All these applications were good examples of cost savings, as short-runs were produced in an economically viable method: the advantages of the rapid prototyping process make additive manufacturing very cost-effective indeed, and able to replace conventional plastic injection molding processes for small series on an industrial scale.

Finally, for all applications, the choice of the material, PA12, allowed for stable, ruggedized, dust-protected and water-resistant cases.

Combining high speed with low cycle times and low material costs, Hoffmann + Krippner's applications still are among their cheapest additive manufacturing processes, providing added value for logistics and production processes as a building block for Industry 4.0.

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