CASE STUDY



For The Long Ride: How Langen Motorcycles Use 3D Printing & Vapor Smoothing for Premium Custom Motorcycle

Industry

Automotive - Motorsports

Material

PA12, manufactured using MJF (Multi Jet Fusion) technology

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amtechnologies.com // langenmotorcycles.co.uk // graphite-am.co.uk

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Langen Motorcycles specialize in blending precision engineering with craftsmanship. To support their vision of a lightweight, high-performance machine, Langen and their additive manufacturing partner Graphite Additive Manufacturing adopted 3D printing combined with AMT's PostPro vapor smoothing. The result: motorcycle components that not only deliver a premium look but also withstand exposure to fuel, oil, and harsh environmental conditions.

About the Application

Langen's Two Stroke motorcycle features several key components produced with additive manufacturing, including fuel tank cover components, breather pipe retainers, throttle cable retainers, chain guides, a belly pan mesh, and various brackets. These parts needed to combine strength, durability, and functionality with the refined design expected of Langen's brand.

By integrating 3D printing and PostPro vapor smoothing into their production workflow, they successfully realized their vision of a motorcycle that performs reliably on the road while maintaining a premium appearance.

Challenge & Solution

During the prototyping and development stage, the Langen team encountered several challenges, including:

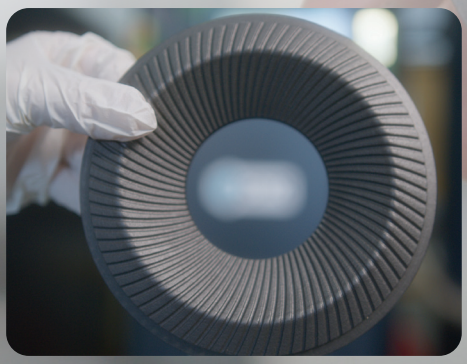
- Complex part geometries that were difficult or costly to produce with traditional tooling, especially when frequent design changes were required.
- Exposure to chemicals and liquids, such as fuel and oil, which can accelerate degradation in untreated polymer parts.
- The need for premium aesthetics to reflect the brand's focus on performance and design excellence.

These challenges led them to re-think their manufacturing workflow. Working with Graphite Additive Manufacturing, the team leveraged MJF printing with PA12 to manufacture lightweight, strong, and geometrically complex parts without tooling delays. This approach reduced lead times, optimised production for limited quantities, and provided the flexibility to refine designs quickly.

The Difference Made by PostPro Vapor Smoothing

3D printing in combination with PostPro vapor smoothing ensured the part's performance and a refined appearance thanks to its sealed surface, unlocking the following key benefits:

- **Resistance to liquid ingress:** Vapor smoothing achieves smooth, non-porous surfaces, making the part resistant to water ingress or other liquids, such as oil, fuel, or coolant.
- **Better look & appearance:** By sealing the surface, the motorcycle component appears more polished and darker, delivering a refined aesthetic consistent with Langen's design vision.
- **Improved durability:** Vapor smoothing improves the mechanical properties of 3D-printed parts, making them stronger and more durable in the long term, enabling them to withstand stresses from vibration, weather, and road conditions.
- **Consistency at scale:** Vapor smoothing enables reliable, repeatable quality for custom and serial production.



Fuel Tank Cover After PostPro Vapor Smoothing

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Benefits of Vapor Smoothing for Motorsports Applications

- Premium surface finish for visible, design-driven components & an aesthetic look
- Cost-effective production of complex, low-volume parts
- Resistance to fuel, oil, coolant & water exposure
- Extended part life with improved mechanical performance
- Faster development & iteration cycles for part optimization

Conclusion

By combining 3D printing with vapor smoothing, Langen Motorcycles produced components that not only meet demanding performance requirements but also adhere to the design concept of the brand.

In fast-moving, low-volume manufacturing like motorcycle production, this approach proved to be agile and functional, providing the team with a cost-effective approach, rapid prototyping, and maximum design freedom. This demonstrates the advantage of advanced post-processing for motorsports applications.



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Additive Manufacturing Technologies Ltd

Tinsley Park, Airport Business Park, Unit N,
Europa House
Sheffield S9 1XU, UK

Langen Motorcycles

Kingfisher Court
Wigan, Greater
Manchester
WN4 9DW
United Kingdom

Graphite Additive Manufacturing Ltd

Unit 10
The Vale Industrial Centre
Southern Road, Aylesbury
HP19 9EW
United Kingdom