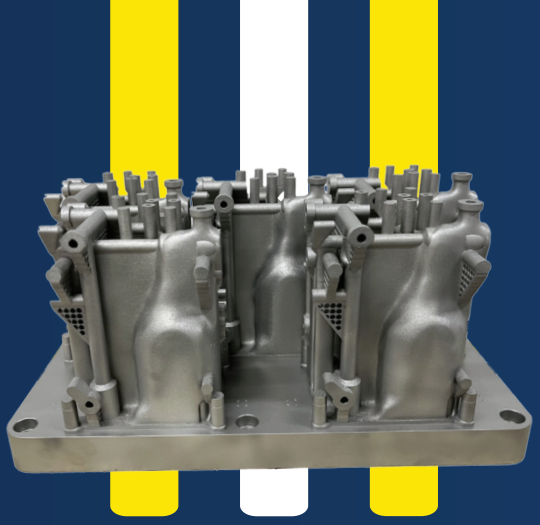


CASE STUDY

VALLAND SPA CASE STUDY

Valland 3D

Nikon SLM Solutions

A Nikon Company

Nikon

VALLAND SPA

With over 15 years of experience, Valland Spa is a distinguished OEM in manufacturing On/Off valves for the Oil, Gas, and Energy Industries. Their tailor-made Ball, Gate, and Check Valves are recognized for impeccable quality, reflected by certifications such as API 6A, API 6D, and API 6DSS. Valland's dedication to innovation is evident as they transitioned to incorporate an in-house 3D printing department in 2020, emphasizing R&D and Additive Manufacturing for severe service applications in compliance with API20T and API20S standards.

One of the noteworthy components produced using additive manufacturing is the Hydraulic Manifold for the valve's actuator. Traditional manufacturing methods, specifically milling, posed challenges in achieving internal connections.
Through Nikon SLM® technology, Valland Spa managed to optimize the manifold, striking a balance between performance, customization, and topological advancement.

TRADITIONAL LIMITATIONS REPLACED WITH NIKON SLM® TECHNOLOGY INNOVATIONS

Faced with the challenges of traditional manufacturing methods, Valland Spa embarked on redesigning the manifold component. The objectives were clear: maximize stiffness, reduce weight, optimize topology, cut down on production lead time, and ensure component customization.

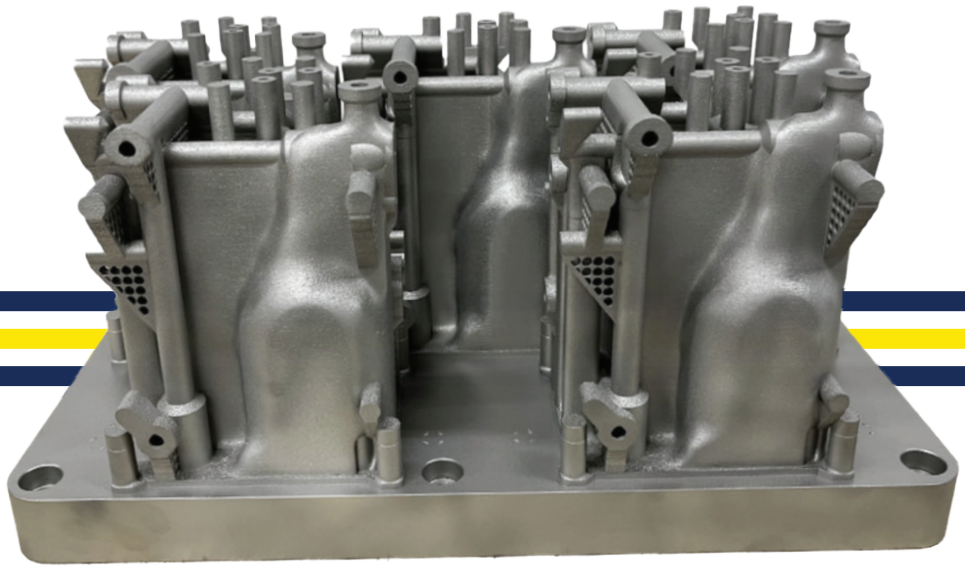
Nikon SLM® technology provided the tools and flexibility needed. The freedom of design granted by additive manufacturing enabled Valland to customize the component and achieve topological optimization.

With generative design, using a maximum stress lower than 60% of the material yield strength and a maximum mass of 12 kg, it has been possible to achieve a final mass for the additive manufacturing part of 9,8 kg. Considering that the traditional part was 25,6 kg, it has been possible to reduce the weight by 61,7%.

Moreover, considering the whole supply chain, with the traditional methods, it would have been necessary a lead time of 2-3 months to receive the forged material to be machined. Using additive manufacturing, it is possible to produce 5 parts in 4 days and, considering 2 weeks for the post-processing, it is possible to have them ready in 3 weeks.

“Nikon SLM®'s advanced technology suite, recognized for its precision and reliability, meets our complex design specifications and high-quality standards - essential for mission-critical components in the energy and oil and gas markets.”

- Luisa Elena Mondora, General Manager, Valland Spa



Hydraulic Manifold for a valve's actuator

1

MACHINE
SLM®500

2

MATERIAL
316L

3

LAYER THICKNESS
60 µm

4

BUILD TIME
97 HR

SELECTIVE LASER MELTING

Selective laser melting (SLM) builds up material layer by layer. In the SLM process, a layer of metal powder is spread onto a substrate plate, followed by selective laser melting to produce the desired part.
This method ensures complete melting and bonding between layers, yielding dense and durable metal components. Valland Spa capitalized on Nikon SLM Solution's capabilities to produce the Hydraulic Manifold, a crucial component for control panels in valve actuators within the oil & gas and hydrogen industries.

Collaborating with Nikon SLM Solutions, especially Senior Application Engineer Andrea Penna, was instrumental in ensuring the success of this project. The blend of Valland's industry-specific knowledge with Nikon SLM's technical expertise birthed an efficient and effective component, which promises advancements in lead time supply chain management and weight savings.

> **Valland3D is a leading innovator in the energy and oil & gas sectors, committed to transforming the industry through cutting-edge additive manufacturing technologies. Specializing in both polymer and metallic materials, the company focuses on the design, validation, and production of high-quality components, particularly in the valve sector. Valland3D's robust and reliable quality system is integrated with international standards, ensuring that its products meet the most stringent requirements. The company's mission is to lead, innovate, and deliver excellence, setting new standards in energy solutions for a safer, more efficient, and sustainable future.**
>
> **- Luisa Elena Mondora,** General Manager of Valland

> **It has been a pleasure to cooperate with Valland, assisting them in designing and producing industrial, custom-made parts according to their customers' requirements.**
>
> **- Andrea Penna**

> **We are very excited to work with Valland, one of the most important players in the additive manufacture arena in Italy, specifically in the O&G sector, capable of designing and manufacturing high-quality valve components. This manifold is a device that connects sections of a hydraulic system, the market for such components is massive, in the order of multi-billions of euros, and additive manufacturing can make a huge impact, introducing new components with performance improvement, better design and at the same time higher flow capacity with higher efficiency.**
>
> **- Fabrizio Ragusa,** Global Business Development Director Energy, Nikon SLM Solutions

VALLAND SPA

At Valland we are committed to the design and manufacture of high quality and tailor-made Ball, Gate and Check Valves. Our main market is the Oil & Gas exploration and production sectors, including subsea and transmission, and other special service industrial application.

Our Company was established in 2006 by people that have been working in the valve business since more than 30 years and have engineered valves which represent the most updated solutions for the severe offshore environment and subsea application.

Nowadays Valland is best known for its focus on the clients' needs, achieving outstanding performances by our continuous improvement and technical skills. Our primary goal is providing our customers with the best products equipped with cutting edge solutions and - of course - on time delivery!

During the last 10 years we have worked to establish a strong network of partners and local vendors that allows us to manage every step of the purchasing and manufacturing process.

NIKON SLM SOLUTIONS

Nikon SLM Solutions helped invent the laser powder bed fusion process, was the frst to ofer multi- laser systems and all selective laser melting machines ofer patented quality, safety and productivity features. Taking a vested interest in customers' long-term success in metal additive manufacturing, Nikon SLM Solutions' experts work, with customers at each stage of the process to provide support and knowledge-sharing that elevate use of the technology and ensure customers' return on investment is maximized. Optimal paired with Nikon SLM Solutions' software, powder and quality assurance products, the Nikon SLM technology opens new geometric freedoms that can enable lightweight construction, integrate internal cooling channels or decrease time to market.

A publicly traded company, Nikon SLM Solutions AG focuses exclusively on metal additive manufacturing and is headquartered in Germany with offices in China, France, India, Italy, Singapore and the United States and a network of global sales partners.

Further information is available on
www.nikon-slm-solutions.com