

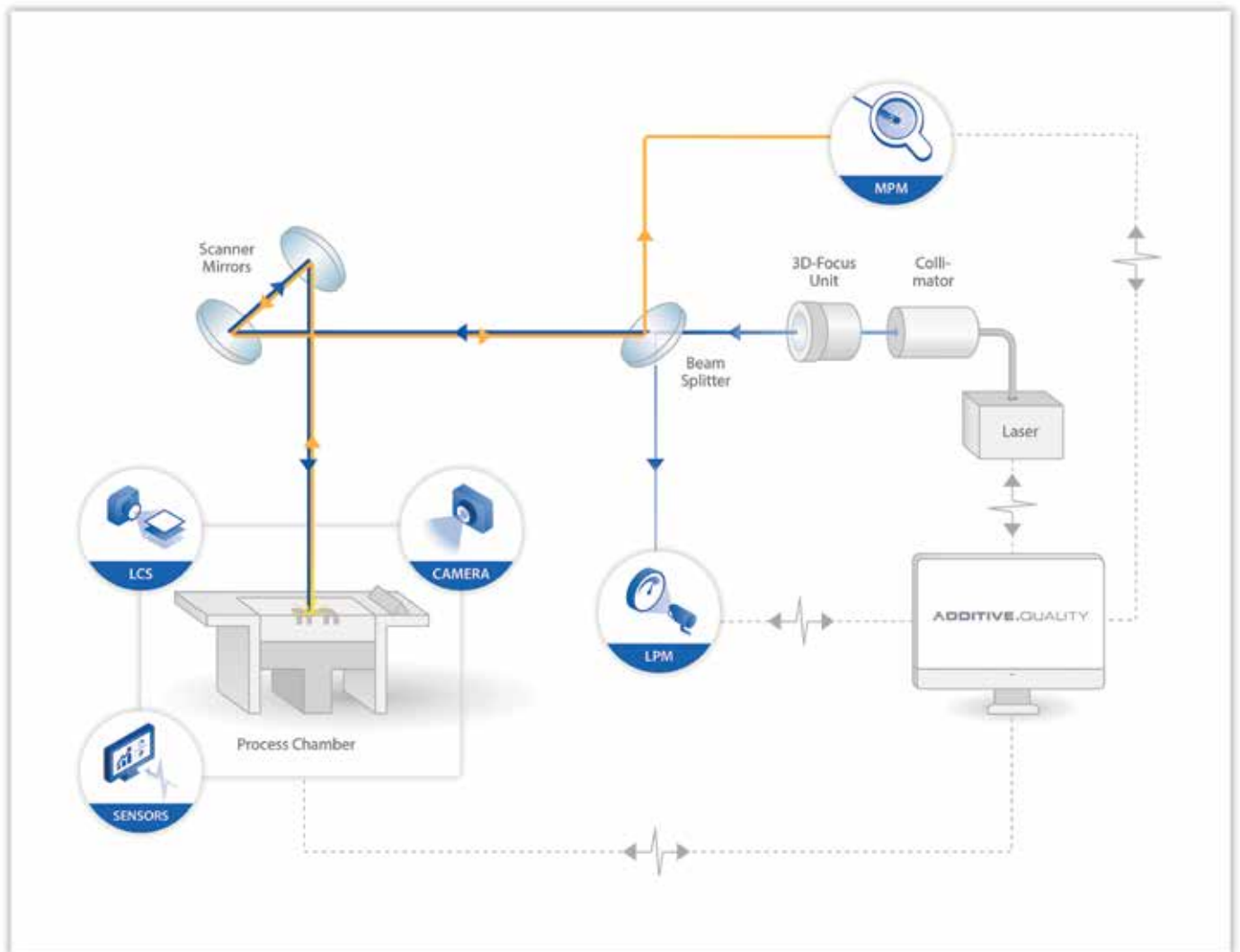
Quality Modules from SLM Solutions

Process Monitoring and Quality Assurance in the Additive Production Process



ADDITIVE.QUALITY

SLM Solutions' Quality Modules



Quality Assurance - What Does This Mean for SLM® Produced Components?

As selective laser melting systems continue to advance, the need for comprehensive process monitoring grows to ensure an integrated production process. SLM Solutions has developed the Additive.Quality product line to ensure the highest metal additive manufacturing standards are met. Various modules are offered to monitor, document and verify selective laser melting builds, especially important for industries with critical components and strict requirements.

- Guaranteed tracability in component quality
- Ongoing process monitoring for validation
- Reproducibility
- Process stability and improved process control
- Deeper understanding of your SLM® process



The Additive.Quality brand combines software and hardware offerings from SLM Solutions to guarantee the documentation of component-specific data during the entire SLM® process. The analysis of the detected data and the subsequent evaluation via specially developed algorithms enable the user to not only control the process, but also sustainably reproduce the finished component.



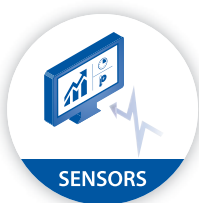
Melt Pool Monitoring (MPM) is an in-situ monitoring system for visualization of the melt pool thermal radiation during the SLM® process. The system records thermal radiation created from the melt, layer-wise, point by point during the entire production process. The system is utilized to detect thermal irregularities created during powder fusing, which can cause anomalies in the finished part.



Laser Power Monitoring (LPM) is an on-axis monitoring system to continuously measure and document the set laser power and the attained power during the entire production process. The instantaneous output is measured by uncoupling the laser beam in the optical path and reflecting it to a sensor. In so doing, any deviations between the target performance and the actual performance are identified.



Layer Control System (LCS) is a control and documentation module specially developed for the SLM® process to monitor the powder bed after each layer recoating and after each laser exposure to detect possible irregularities. If any are detected, the LCS responds via a control mechanism before damage occurs during the process.



The sensor system encompasses all sensors installed in the SLM® machine and acts as a condition monitoring system. This sensor system can detect indications of irregularities and deviations of the system environment, such as humidity or oxygen levels or chamber pressure, which may compromise the desired component quality.



The camera is a live transmission of the process chamber within the SLM® machine. It enables live monitoring and documentation of the build at the machine or in your office environment. In addition, it is possible to record the production process in order to conduct an analysis of the recorded image at another location or at a later point in time.

SLM Solutions - Technology Pioneers, Innovation Leaders

SLM Solutions helped invent the laser powder bed fusion process, was the first to offer multi-laser systems and all selective laser melting machines offer patented quality, safety and productivity features. Taking a vested interest in customers' long-term success in metal additive manufacturing, 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 SLM Solutions' software, powder and quality assurance products, the SLM® technology opens new geometric freedoms that can enable lightweight construction, integrate internal cooling channels or decrease time to market.

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



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