

F1 component manufacturer doubles productivity with the Russell AMPro Sieve Station™

Progressive Technology optimizes powder handling solution for additive manufacturing process while ensuring quality of powders is upheld

Progressive Technology is a market leader in CNC multi axis machining, using advanced modern machinery and additive manufacturing expertise to manufacture complex metallic components, primarily for the Formula One market.

Steve Shadwell, Manufacturing Manager at Progressive Technology, said, "We initially entered the F1 market manufacturing low-tech products, and have steadily progressed to where we are today – creating very high-end componentry and servicing most of the teams on the F1 grid. Since our expansion four years ago, we set out three key objectives; to invest and continually develop our machinery and production facilities; to employ and train highly skilled engineers; and to provide a full 24/7 manufacturing facility to meet the needs of our customers."




After initially entering the F1 market manufacturing low-tech products, Progressive Technology has trebled its turnover in the last four years and is now creating high-end componentry and servicing most of the teams on the F1 grid. A full 24-hour shift pattern allows rapid turnaround of parts, and the company invests in the highest quality equipment to optimize its production process. This is reflected in its additive manufacturing facility, where Progressive Technology continues to invest in the latest production technology, ancillary equipment and materials to ensure a high-quality product in minimal time.

Laser powder bed fusion technology has been chosen by Progressive Technology and provides significant benefits when producing F1 components such as increasing strength and the R&D time required to produce new designs with the biggest benefit coming from weight reduction.

A key part of this **additive manufacturing process** is the handling of the powders used to produce the parts. Metal AM powders such as titanium, aluminium and inconel are commonly used to produce the parts for F1 cars and therefore to ensure their quality, the powder must be qualified before use and after the build process is complete the unused powder is reclaimed and requalified.

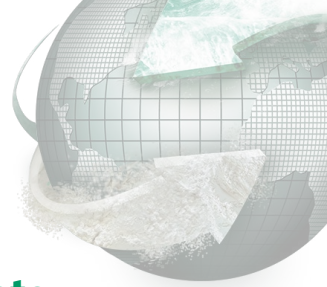


Figure 1. The Russell AMPro Sieve Station™ is used to reclaim and requalify AM powders from the build process at Progressive Technology.

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Ensure the quality of AM powders – Eliminate the risk of contamination and protect the quality of final components
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Reduce production downtime – A fully-automated powder handling system allows operators to focus on other key tasks and ensures a short turnaround between production runs
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Future-proofed powder handling process – A modular design can be adapted to a variety of production setups and manufacturing technologies into the future

Dave Cooper, Head of Additive Manufacturing Technologies at Progressive Technology Ltd., explained, "The quality of the powder is crucial as it dictates the material properties and is the only way to guarantee a high-quality product, giving confidence to our customers that we're ensuring the quality of materials used to produce the components for their cars."

Initially, the method used to process the powder was very time consuming with high product wastage. Now, Progressive Technology relies upon the Russell AMPro Sieve Station™ (AMPro) as an **automated solution to AM powder handling**.



Printer processing times can take an average of 20 hours to complete, and therefore it is imperative production downtime is kept to a minimum. With the installation of the Russell AMPro Sieve Station™, Progressive Technology has been able to double productivity with only half the labor previously used. Cooper continued, "The turnaround process between jobs used to take well over an hour. Using the AMPro has made this significantly shorter, as it makes the powder handling processes automated, allowing operators to focus on other key tasks such as preparing the machine for the next build. This has been a fantastic investment for us – speeding up our day-to-day process and improving our materials' quality – absolutely key when producing high-value parts."



Figure 2. The key to the Russell AMPro Sieve Station™ is how every detail has been designed and incorporated into a fully-automated one-button process.

This **automated powder handling system** can be applied to various stages of the AM process. Cooper continued, "When we receive a new batch of powder from a supplier, the first point of entry to our manufacturing system is through the AMPro, as we quality-check the powder from their containers and remove any contamination before it can enter our process. Sieving incoming powders under inert atmosphere also eliminates the risk of moisture damage. At the end of the build process, the AMPro is used to remove the unused powder from around the parts."

The key to the Russell AMPro Sieve Station™ is how every detail has been carefully designed and incorporated into one system resulting in a fully-automated process. An intuitive interactive user interface brings together all elements of

the system and allows for a fully programmable one touch operation which minimizes operator involvement.

"The AMPro has a very simple one-button operation to recover the powder, and a very fast process – taking around 5 minutes – which is great for our lead times when we are under pressure to deliver components in rapid time", states Cooper.

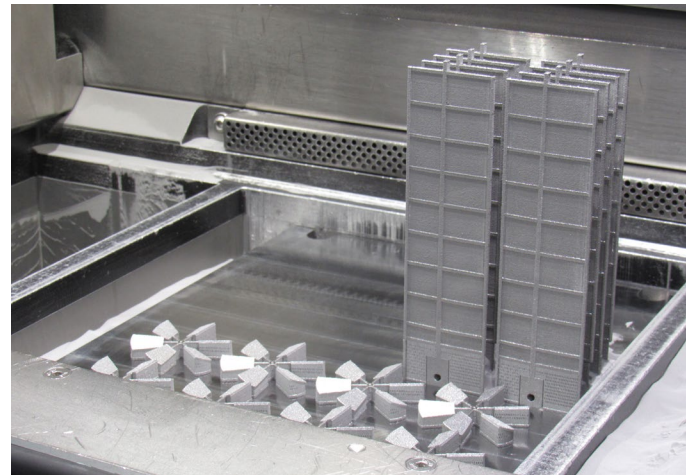


Figure 3. The Russell AMPro Sieve Station™ is used at Progressive Technology to evacuate unused AM powder from the built components

The system is completely modular, designed to integrate directly into an existing build process within DMLS, LMD, SLM, SLS and EBM systems. Cooper commented, "The system is future-proof as it can continue to evolve alongside our production setup. The AMPro has the potential to expand and change its control interfaces to adapt to new equipment as our machine park continues to grow."

Established in 1934, Russell Finex designs machines for an international market and supplies to over 140 countries. With its head office in the U.K. and subsidiaries in Belgium, the U.S.A, India and China, the company has a truly global presence, enabling a comprehensive approach to customer service and after sales support. This infrastructure and technical support was key to Progressive Technology working with Russell Finex. Cooper explained, "We've had an excellent working relationship with Russell Finex, meaning we could collaborate with the design of the system we needed to ensure the end product was tailored around our experience and setup, rather than an off-the-shelf product. We were able to trial the AMPro before purchasing and provided with equipment in the interim whilst our systems were finalized, allowing us to get up and running in good time."



Having worked within the AM industry since its outset, Russell Finex partners with global manufacturers to provide innovative equipment to meet the needs of this evolving market. The company has applied its 80 years of experience in manufacturing industrial sieving solutions to develop the award-winning Russell AMPro Sieve Station™ and is proud to offer the widest range of sieving equipment to the AM industry. Standard systems available include stand-alone units to suit any powder vessel, inert gas purging to preserve powder characteristics and integrated closed-loop powder recovery systems.



Figure 4. The innovation benefits from patented Russell Finex separation technology to provide maximum sieving efficiency