SEAM New Equipment

Technique	**3D Printing - Direct Metal Laser Sintering**
Capabilities	Rapid prototyping and manufacture of metallic components
Equipment Make	EOS GmbH Electro Optical Systems
Equipment Model	M280
Problems addressed	Rapid production of prototypes. Freedom of design with regards complex shapes. Increased functionality of components.
Advantages	Significantly faster production of complex designs than traditional manufacturing techniques. Capable of producing designs and increased functionality impossible to make with subtractive manufacturing.
Limitations	Total build volume 250 mm x 250 mm x 300 mm, 200W laser power

Other Details

Containment	Inert gas environment
Turnaround Time	Turnaround time entirely dependent on the size of the component.
Report	Specific with customer requirements
Interpretation	Yes
Data on Analyst	Staff member working exclusively with technique since 2015
Indicative Price	Design and requirements dependent. Please contact for pricing information.
Industry Recommendation	The applications of this technique are practically limitless. Please ask us about your specific needs.

Quality & Systems Support

Quality Management System in place	n/a
Good Manufacturing Practice Status	n/a
Preventative Maintenance	Experienced staff perform regular maintenance. Manufacturer performs primary maintenance on as needed basis
Accreditation	Equipment is appropriately licensed by RPII

Technique Category	Industry problem
Other Techniques	Prototyping

Technique	**X-ray micro computed tomography**
Capabilities	Non-destructive 3D analysis of samples.
Equipment Make	GE Measurement and Inspection
Equipment Model	Nanotom
Problems addressed	Void analysis. Nominal comparison to CAD. Wall thickness analysis. CMM type measurements. Measurement of unusual features. Powder analysis.
Advantages	Significantly faster than micro-sectioning. Non-destructive.
Limitations	60mm diameter sample. System not suited to large metallic specimens.

Other Details

Containment	Five ton lead vault
Turnaround Time	Typically less than 5 working days from receipt of sample
Report	Available as PowerPoint, videos, DICOM, or CT data with a viewer provided
Interpretation	Yes
Data on Analyst	Staff member working exclusively with technique since 2011
Indicative Price	Sample and requirements dependent. Please contact for pricing information.
Industry Recommendation	The applications of this technique are practically limitless. Please ask us about your specific needs.

Quality & Systems Support

Quality Management System in place	n/a
Good Manufacturing Practice Status	n/a
Preventative Maintenance	Experienced staff perform regular maintenance. Manufacturer performs primary maintenance on as needed basis
Accreditation	Equipment is appropriately licensed by RPII

Technique Category	Industry problem
Particle Characterization	Defect analysis. Nominal comparison to CAD. Wall thickness analysis. CMM type measurements. Analysisof unusual features. Powder analysis.

Technique	**Rheometer**
Capabilities	Characterisation of delicate structures in fluids of any viscosity, polymer melts, solids, and reactive materials. Typical materials that can be tested include: thermoplastics, thermosets, elastomers, caulks and adhesives, solid polymers, asphalt binders, and oils and greases.
Equipment Make	TA Instruments
Equipment Model	AR 2000ex
Problems addressed	New materials development, materials selection, performance prediction, competitive evaluation, consistency monitoring, vendor certification, troubleshooting
Advantages	Peltier plate base with temperature range of 0 to 200$^{\circ}C$. Environmental test chamber with a temperature range of -160 to 600$^{\circ}C$.
Limitations	

Other Details

Containment	n/a
Turnaround Time	On request
Report	Yes
Interpretation	Yes
Data on Analyst	Trained operator
Indicative Price	On request
Industry Recommendation	On request

Quality & Systems Support

Quality Management System in place	n/a
Good Manufacturing Practice Status	n/a
Preventative Maintenance	n/a
Accreditation	n/a

Technique Category	Industry problem
Rheometry/Viscosity	Viscosity

Technique	**Spray Drying**
Capabilities	Able to operate in applications that range from aseptic pharmaceutical processing, ceramic powder production, Food powder production: milk powder, coffee, tea, eggs, cereal, spices, flavorings… Drying of solutions, emulsions, suspensions….. Microencapsulation, coating, spray crystallization, taste masking, agglomeration.
Equipment Make	BUCHI
Equipment Model	BUCHI MINI B191
Problems addressed	
Advantages	• Drying capacity = 1000 ml/hr • Efficient and economic than lyophilizer • It can be designed to virtually any capacity required • The actual spray drying process is very rapid, with the major portion of evaporation taking place in less than a few seconds • Adaptable to fully automated control system that allows continuous monitoring and recording of very large number of process variables simultaneously • It can be used with both heat-resistant and heat sensitive products • Offers high precision control over Particle size, Bulk density, Degree of crystallinity, organic volatile impurities and residual solvents • Powder quality remains constant during the entire run of the dryer. Nearly spherical particles can be produced, uniform in size and frequently hollow, thus reducing the bulk density of the product
Limitations	Maintenance

Other Details

Containment	No
Turnaround Time	Depends
Report	NA
Interpretation	NA
Data on Analyst	Formulation Research Scientist
Indicative Price	Depends on the number of trials and time consumed i.e. per slot
Industry Recommendation	YES

Quality & Systems Support

Quality Management System in place	YES
Good Manufacturing Practice Status	YES
Preventative Maintenance	YES
Accreditation	

Technique Category	Industry problem
Sample Preparation	Compound extraction

Technique	**Shore A & D Hardness**
Capabilities	Hardness determination of Polymers
Equipment Make	Checkline Europe
Equipment Model	DD-100-D/ DD 100-A
Problems addressed	Hardness determination of Polymers
Advantages	Small sample amount required, quick test
Limitations	Hardness of polymers only

Other Details

Containment	NO
Turnaround Time	1 week from receipt of sample
Report	Yes
Interpretation	Yes
Data on Analyst	Experienced Staff member
Indicative Price	
Industry Recommendation	Determination of the hardness of a range of polymers, from hard plastics to soft elastomers

Quality & Systems Support

Quality Management System in place	Yes
Good Manufacturing Practice Status	ASTM D2240
Preventative Maintenance	N/A
Accreditation	Calibration certificate

Technique Category	Industry problem
Mechanical Properties Analysis	Hardness

Technique	**3D AutoCad & Finite Element Modelling**
Capabilities	3D AutoCad provides the user the ability to create a 2D or 3D computer generated models of a desired part. These models can subsequently be collected together to form assemblies. This facilitates an overall working view of entire assembly allowing user interaction. Finite Element Modelling is a computational technique for design optimisation and a powerful tool for understanding failure mechanisms.
Equipment Make	SolidWorks & Ansys
Equipment Model	
Problems addressed	Capable of generating design changes for precision manufacturing companies. Used to create 2D and 3D models in for finite element analysis. Finite Element Analysis (FEA) is a powerful, computer-based modelling tool, applicable to a wide range of industrial sectors for the design and development of products. SEAM possesses FEA software capable of modelling complex components and systems such as thermal analysis and coupled-physics capabilities involving acoustic, piezoelectric, thermal-structural and thermoelectric analysis.
Advantages	• Robust user friendly software capable of quickly displaying and altering parts and assemblies. • Stress and strain visualisations to aid in the minimisation of components weight and cost • Refinement and optimization of designs prior to manufacture
Limitations	

Other Details

Containment	
Turnaround Time	Days
Report	Yes
Interpretation	Yes
Data on Analyst	Experienced staff.
Indicative Price	€
Industry Recommendation	

Quality & Systems Support

Quality Management System in place	
Good Manufacturing Practice Status	
Preventative Maintenance	
Accreditation	

Technique Category	Industry problem
Other Techniques	

Technique	**Optical and Digital Microscopy**
Capabilities	Visual inspection for R&D, quality and failure analysis ranging from 5x to 1000x magnification. Comes complete with integrated software providing a range of in depth analysis such as Z stacking for uneven surfaces, 3D image generation, video recording, real time measurement including but not limited to porosity and area calculations.
Equipment Make	Zeiss and Keyence.
Equipment Model	Zeiss Micro-imaging AxioCam and Keyence VHX digital microscope.
Problems addressed	Typical analysis involves, for example, investigation of medical device components, generation of 3D images of failed components on printed circuit boards and void/crack detection within micro-sectioned welded zone.
Advantages	Capable of producing fast high quality images at micron level scale.
Limitations	Limited to surface characterisation only.

Other Details

Containment	Dedicated surface imaging lab suitable for a range of material including bio hazard.
Turnaround Time	Hours
Report	Yes
Interpretation	Yes
Data on Analyst	Experienced staff.
Indicative Price	€
Industry Recommendation	

Quality & Systems Support

Quality Management System in place	
Good Manufacturing Practice Status	
Preventative Maintenance	Calibration available on demand for measurement analysis.
Accreditation	

Technique Category	Industry problem
Image Analysis / Microscopy	

Equipment Update Details for Attlas Website

(Please remove existing SEM on website and replace with below)

Technique	**Scanning Electron Microscope (SEM) with EDX**
Capabilities	General microscopy/Variable pressure microscopy/Quantitative analysis(morphology and composition). Uses include contamination identification, discolouration, determining elemental composition, particle shape, size and distribution analysis, surface composition/contamination, topography and weathering effects.
Equipment Make	Hitachi
Equipment Model	S-3000N VP
Problems addressed	Microscopy: Surface characterisations. Observation of micron to submicron particles. Elemental composition
Advantages	Resolution of 10 nm at 3 kV. Real time full screen image, dual image and signal mixing.
Limitations	Organic materials need to be gold coated prior to analysis to prevent charging

Technique Category	Industry problem
Image Analysis / Microscopy	