



Atos and Materialise create a revolutionary component for spacecraft structures made by Metal 3D Printing

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New titanium insert for composite panels reduces the mass of traditional solutions by nearly 70% and can only be manufactured by additive manufacturing

This alliance puts both companies at the top of providers of high-end products and advanced engineering solutions for 3D Printing

Madrid, 03 October, 2016 – Atos, a global leader in digital services, and Materialise NV, leader in software and solutions for Additive Manufacturing (also known as 3D Printing), have presented a revolutionary titanium insert for spacecraft structures. This joint launch puts both companies at the top of providers of high-end products and advanced engineering solutions for 3D Printing. The product was revealed last Friday at the European Conference on Spacecraft Structures, Materials and Environmental Testing, ECSSMET 2016.

Marta García-Cosío, mechanical engineering director at Atos Spain, says: "We are proud with this innovation. By creating this complex product in metal additive manufacturing in such a short time, Atos and Materialise are amongst the top of providers of Metal 3D Printing solutions. The weight reduction will allow the increase of useful equipment to be used in satellites and result in considerable cost saving in each launch".

70% weight reduction

These highly loaded inserts are used as mounting points to lift big and heavy structures. The comprehensive study performed by the Atos and Materialise team, has achieved a reduction of weight of the component up to a third of its initial weight, improving some of its properties and overall performance. Both companies used the advanced techniques of topology optimization and lattice structures design to reduce the insert's mass from 1454 gr to 500 gr. That is an impressive 66% reduction.

This kind of insert is widely used in the aerospace sector to transfer high mechanical loads in structures like satellites. Classical inserts are commonly constructed in aluminum or titanium in a brick-shape, as they are manufactured by machining. They are 100% solid filled, increasing their mass over what is necessary. With additive manufacturing, the interior space of objects can be hollowed out or designed with lightweight structures, using material only where necessary. Consider that each kilogram put into orbit costs around \$20,000 at the moment; any gram saved will make space a more attainable frontier.

The engineers faced the challenge to improve by far traditional concepts. The design was addressed to cover all space requirements, from conception phase to manufacturing. Atos' expertise in aerospace engineering and structural simulation, helped to design this new component both in the outside and in its interior, enhancing its overall performance. The Atos and Materialise team was formed by experts in aerospace, Computer-Aided-Engineering, structural design, materials science and additive manufacturing.

The insert was manufactured by Metal 3D Printing in titanium, in a process also known as Selective Laser Melting (SLM). Metal 3D Printing has incredible potential for the aerospace sector, meeting the fast lead times and the absence of prior tooling. Two inserts were manufactured at the Materialise Metal 3D Printing Factory in Bremen, Germany. As Materialise's center of competence for Metal 3D Printing, in both production and software development, the facility has demonstrated its scope for advanced manufacturing through projects such as this one.

A strong partnership in industrial 3D Printing

The Atos and Materialise partnership in 3D Printing has unmatched capabilities in Europe for high-end engineering services. Their collaboration is meant to help professionals to embrace additive manufacturing at industry-level. They offer solutions in 3D Printing from conception to manufacturing, supported by advanced engineering. The engineering teams are formed by experts from both sides, which work together to give an end-to-end solution. Atos and Materialise form a powerful combination for the future of manufacturing.

The inserts are accompanied by a research study named "Additive Manufacturing Hot Bonded inserts in sandwich structures", written by both parties and presented in ECSSMET 2016. Its results will help to improve the implementation of metal components made by additive manufacturing in aerospace and aeronautics.

About Materialise

Materialise incorporates more than 25 years of 3D printing experience into a range of software solutions and 3D printing services,

which together form the backbone of the 3D printing industry. Materialise's open and flexible solutions enable players in a wide variety of industries, including healthcare, automotive, aerospace, art and design, and consumer goods, to build innovative 3D printing applications that aim to make the world a better and healthier place. Headquartered in Belgium, with branches worldwide, Materialise combines the largest group of software developers in the industry with one of the largest 3D printing facilities in the world. For additional information, please visit: www.materialise.com.

About Atos

Atos SE (Societas Europaea) is a leader in digital services with pro forma annual revenue of circa € 12 billion and circa 100,000 employees in 72 countries. Serving a global client base, the Group provides Consulting & Systems Integration services, Managed Services & BPO, Cloud operations, Big Data & Cyber-security solutions, as well as transactional services through Worldline, the European leader in the payments and transactional services industry. With its deep technology expertise and industry knowledge, the Group works with clients across different business sectors: Defense, Financial Services, Health, Manufacturing, Media, Utilities, Public sector, Retail, Telecommunications, and Transportation.

Atos is focused on business technology that powers progress and helps organizations to create their firm of the future. The Group is the Worldwide Information Technology Partner for the Olympic & Paralympic Games and is listed on the Euronext Paris market. Atos operates under the brands Atos, Atos Consulting, Atos Worldgrid, Bull, Canopy, Unify and Worldline.

The group also has a highly experienced engineering division which is headquartered in Madrid, Spain, providing worldwide engineering services since 1997. They are experts in structural design in aerospace and aeronautics. Since 2012, this division also delivers engineering services for 3D Printing, helping its customers to create new revolutionary products, exploiting the benefits of Additive Manufacturing as done in this project.

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