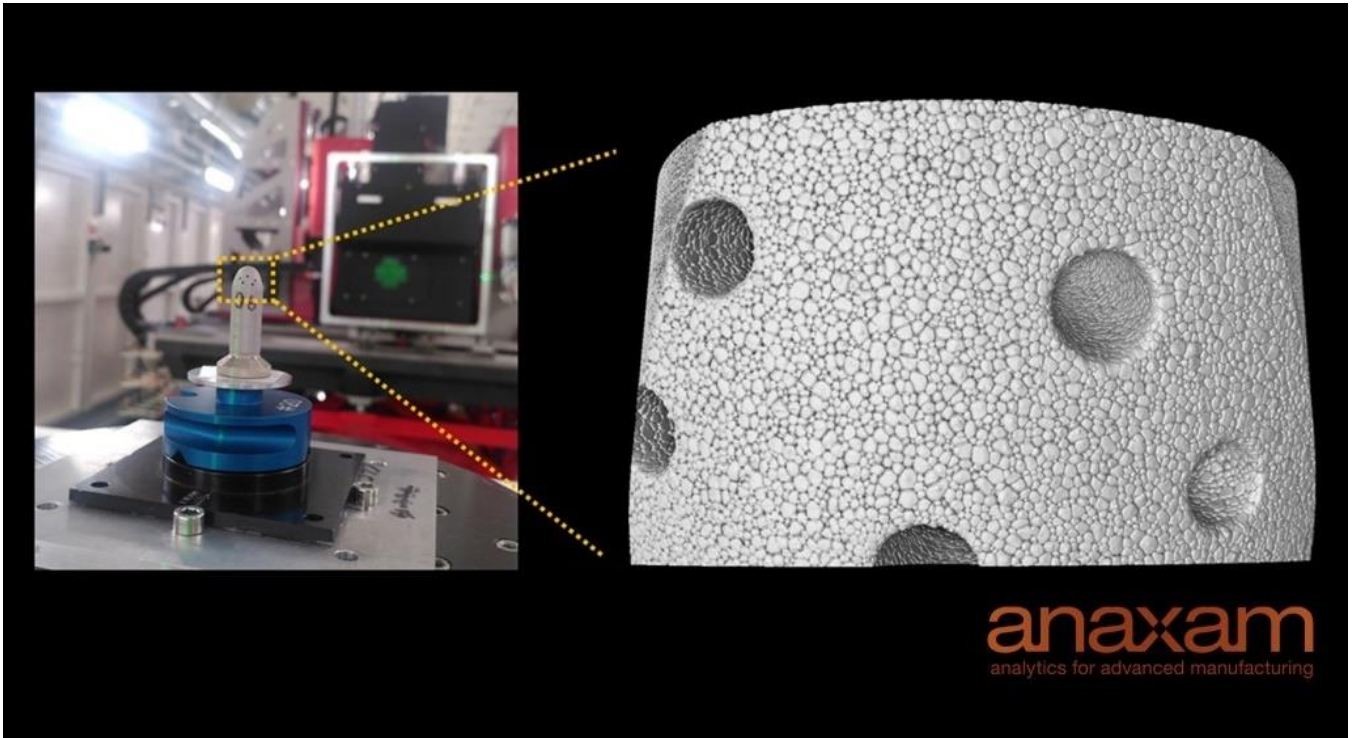


## Topography investigation of additive manufactured spray nozzles of diesel engines by Synchrotron-CT

Winterthur Gas & Diesel (WinGD) is a leading developer of low-speed two-stroke engines, which employ the most advanced technologies in emissions reduction, fuel efficiency, hybridisation and digital optimization. Today they are advancing the decarbonisation of marine transportation through an ecosystem of sustainable energy solutions. WinGD's innovative technology is behind the propulsion power of all types of deep-sea ships world-wide, such as oil and product tankers, bulk carriers,

car carriers, general cargo ships and container ships.

Fuel injection and the related spray nozzle is a key component of the combustion engine. Additive manufacturing offers new opportunities to design the internal structure of the spray nozzles, tailoring the spray behaviour to enhance the impact on engine performance.



The [applied material analytics](#) of ANAXAM using [Synchrotron-CT](#) helps WinGD to analyze the topography of internal channels of spray nozzles. Tomographic imaging reveals the structure of the additive manufactured nozzles

non-destructively and with spatial resolution as small as 5  $\mu\text{m}$ . Such investigation can lead to improvement of the additive manufacturing process to produce spray nozzles with optimal flow characteristics.

“ The unprecedented resolution gained by ANAXAM was very impressive and was what we had hoped for. The level of detail allows to really access the surface topography of complex internal features. In addition, small internal defects are revealed with a resolution close to what is known from light optical microscopy of metallographic sections.”

Dr. Frank Moszner, Expert Materials and Welding,  
– WinGD

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