

HD-CR 35 NDT SUPPORTS BRINGING ASTRANIS SATELLITES INTO ORBIT

Astranis is building small, low-cost telecommunications satellites to connect the four billion people on Earth who currently do not have access to the internet. The company is headquartered in San Francisco and has raised over \$ 500 million from top global investors, with a team of over 300 world-class engineers. Founded in 2015 with an audacious mission: to connect the world by reducing the cost of internet services in rural and remote areas with small, powerful satellites for geostationary orbit.

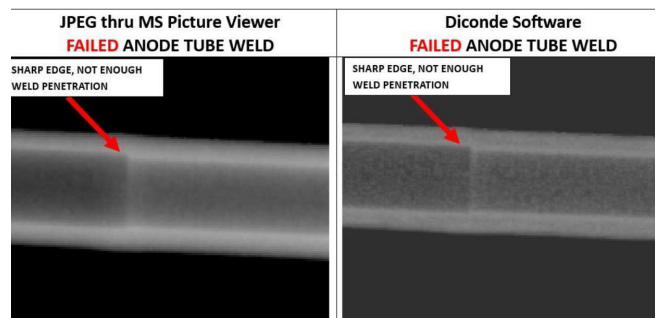


By owning and operating its satellites and offering them to customers as a turnkey solution, Astranis can provide bandwidth-as-a-service at a fraction of the cost of legacy providers, unlocking previously unreachable markets.

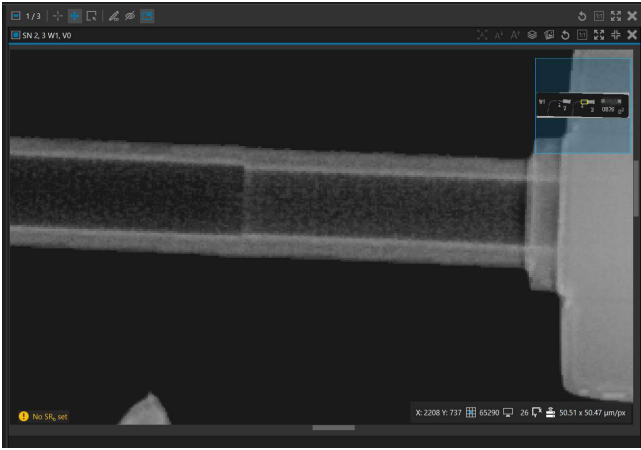
Each Astranis spacecraft operates from geostationary orbit (GEO) with a next-generation design of only 400 kg, utilizing a proprietary software-defined radio payload. This allows Astranis to provide dedicated satellites to small and medium-sized countries, Fortune 1000 companies, and other customers, as well as the US Government for national security applications.

Astranis uses a combination of the DÜRR HD-CR-35 NDT computed radiography scanner with high-resolution imaging plates and a Teledyne CP200DS X-ray generator to inspect orbital welds made in manifolds. Those manifolds distribute fuel to thrusters to power the spacecraft. The fuel is under high pressure for the lifetime of the spacecraft making it imperative to ensure leak-free welds prior to being put in service.

Astranis has three operators who are trained to use the DÜRR HD-CR-35 and produce about 30 X-ray images per week. Each orbital weld is meticulously inspected using the Dürr system to determine their compliance to the applicable Non-Destructive Testing (NDT) standards. A comparison between PNG and DICONDE files using the D-Text X, X-ray inspection software has shown that DICONDE files, provide more detail and allow for easier image enhancement.



Initially, Astranis did not use the D-Tect X software and instead used the images stored on the SD card of the HD-CR 35. In order to improve on the process for analyzing and processing radiographs they later purchased D-Tect X. This brought their inspection process to another level. They were able to manipulate the images to view them with more detail and capture inclusions that they would not have seen before, It simply makes the X-ray process so much easier for them.



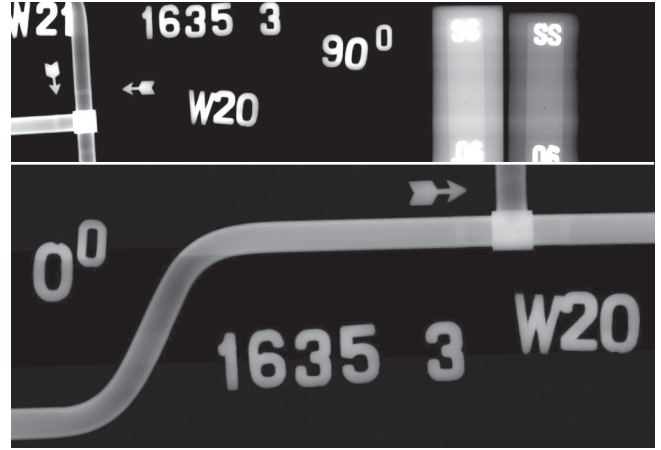
Screenshot D-Tect X software

Astranis was also getting film from their vendors, and this was difficult to organize digitally. With digital images, audits will be much easier to complete and the cost savings are tremendous. Sending these out to an X-ray vendor would cost them several times more than if they X-ray the parts in house. Turnaround time was also a factor. The scanner and software will automatically pay for itself.

The software and scanner are very user friendly. Everyone in the company is new to X-ray, so there is a steep learning curve to get the device running. The software makes it easy to navigate and organize the images, and scanning is a breeze.

The image quality is very precise. The Astranis operators can zoom in and verify if there are any discontinuities like inclusions, porosity, or cracks. Since they cannot rework a weld in space, it is critical that they verify the weld will hold on the ground before they send the satellite into space.

Astranis says “the DÜRR equipment has been very helpful to us. From the support side, dealer support has been great, and I can



X-ray images that passed the test

call Dan Guerrero (Willick Engineering) anytime for support. Dan is quick to respond, and questions are answered quickly.”

DÜRR NDT achieves this high level of support in partnership with Willick Engineering who also performs maintenance and any other required service activities to ensure the systems are always running per specification.

Astranis has successfully launched a satellite into orbit and is now underway with ten commercial programs.

This article was written based on discussions with Astranis and Willick Engineering.

