

Advanced 3D Measurement with Leica 3D Laser Tracker at IQ Metal

The implementation of advanced 3D measurement and scanning technology has elevated IQ Metal's capabilities to a new level, particularly in handling large-scale welding projects. Here's how we integrate this technology into our workflow:

#1 Import of Client's 3D File:

The customer's 3D model is imported into our system, serving as the foundational blueprint for the project.

#2 Generation of Bill of Materials and Part Drawings:

Based on the imported 3D file, a bill of materials and detailed part drawings are generated.

#3 Design of Welding Fixtures:

Our designers create welding fixtures tailored to the specifications of the customer's 3D file.

#4 Advanced Offline Robot Programming:

Our process programmers import the customer's 3D file to generate welding programs for robots using advanced offline programming techniques.

#5. Measurement and Adjustment of Welding Fixtures:

Once the welding fixture is produced, it is measured and adjusted using a 3D laser tracker until it adheres to the required geometric specifications.

#6. Post-Welding Measurement and Adjustment:

After the initial construction is welded, measurements are taken. If deviations from geometric tolerances are detected, adjustments are made to the welding process or, more commonly, to the welding fixture as compensation based on the physical measurements of the welded construction.

#7. Reiteration of Adjustments and Measurements:

After adjustments are made to the welding fixture, new control measurements are taken, followed by a trial welding and subsequent 3D control measurements. This process is repeated until there is full conformity between the customer's 3D specifications and the physical welded constructions.

The process may seem complex, but it represents a significant increase in competence and is really the highest degree of quality assurance that what IQ Metal delivers is in full compliance with the customers' specifications.

The advantage - and also the "disadvantage" - is that the 3D measuring equipment works with the highest precision and registers even deviations as small as 0.01 mm as non-compliant, which are furthermore measured in 3D. When competing in the market, IQ Metal often goes up against traditional measuring methods which are actually mechanical 2D measuring tools such as straight rulers, calipers and measuring tapes. This means that IQ Metal often competes with measuring tools that were introduced more than 100 years ago and are still prevailing in the industry and it is obvious that when IQ Metal may have to discard a 6

meter long welded structure because a cross measure is 0,05 mm outside a tolerance, the competitor has an easier task, as it is likely to assume that the 0.05 mm will be compensated by pulling the measuring tape a little tighter.

At IQ Metal, however, we consider the advanced measuring technology to be a major advantage. As described above, we not only ensure that our customers receive products in full compliance with their specifications, as described we have, with the integration of the 3D measurement technology with advanced 3D robot programming, lifted unsupported IQ Metal positioning as a leader in advanced welding.

And by the way, we can ask ourselves and our customers: It has been many years since you went from 2D to 3D construction, why do you accept that most subcontractors still use 100-year-old measuring techniques and equipment when they validate the output of their contractual obligations?