



Industry

Mechanical Engineering

Area of use

Production

Customer



Main products:

Drive train

The customer is a world leading “**tier one**” **supplier** in the automotive industry, known for the development as well as manufacture of drivetrains.

Requirement

Improvement of documentation standards and minimisation of operator influence

Following soft turning and cutting operations, **shafts and gears** in the drivetrain are heat treated in pusher furnaces. The shafts are hardened and the gearwheels case hardened.

During **case hardening**, the surface layer of the components is firstly carbon-enriched and then hardened. This increases the hardness of the surface layer which results in increased compressive and fatigue strength as well as abrasion resistance. The core of the samples remains ductile with relatively high strength and is therefore shock resistant – essential characteristics in drive systems.

Finally, **tempering** is carried out as part of the hardening process. Tempering slightly reduces the hardness and considerably improves the yield strength (toughness).

For **fast and simple quality and process control**, one component from each batch must be tested immediately after the heat treatment process. At the same time, **improvement in the standard of documentation** was demanded. The classification of the batch must be available in future and all relevant data must be saved automatically.

The following **requirements** were defined for the hardness tester:

- **Component variation**, according to production line: very different geometries and sizes need to be tested.
- **Maintain process speed**: the component barcode is scanned, the hardness tester retrieves the test method from the database and returns the results after the test.
- **Minimise operator input**: test job assigned by supervisory QA software and the measurement result transferred as ASCII file via an RS232 interface to the QA software.
- **Simple operation of the hardness tester**: many operators conduct hardness testing on multiple production lines.
- **Light and compact**: due to space restrictions in the hardening shop, the hardness tester should not take up much space.

Solution



DuraJet 10, simple and fast

A **DuraJet 10** was placed on each production line. Thanks to the electronically controlled load application of the **main load from 49N to 1840N**, the entire Rockwell range can be covered by a single device. The surface hardness can be tested with a **rapid single measurement** directly on the production line.

In addition, at 300x740x565 mm, the DuraJet is a very **compact and light hardness tester**. Consequently, it doesn't require much space to set up. Thanks to the **high precision test head**, a wide range of components can be clamped and tested.



Complete data management is ensured using the **serial interface (RS232)**. All data is input and output in **ASCII format**. All data can therefore be exported to the company's QA software where it is further processed. As a result, data is no longer lost.

Why EMCO-TEST?



For the work preparation team leader, it was especially important that the machine should be **user friendly**. All employees in the hardening shop should be able to operate the machine without too much training. DuraJet fulfilled this criteria. The **software developed by EMCO-TEST** can be operated very simply via a **clear, backlit touchscreen display** using a finger or the screen stylus provided.

*"We've always cooperated with EMCO-TEST and are very satisfied. In my opinion, they are **leaders** when it comes to the **state of the technology**. I couldn't find a hardness tester like DuraJet from any other supplier in the market. The **electric clamping** of components functions **very precisely**. I also like the **design**. With other suppliers, the devices might be new on the inside but from the outside the design looks very old."*

Work preparation team leader