

 **LIEBHERR**

Anton Paar Instruments
Support Engine Development at
**Global Equipment
Manufacturer Liebherr**

Relevant for manufacturing



→ The Liebherr Group comprises more than 140 companies spread across every continent.

Liebherr Machines Bulle SA - which develops and produces diesel and gas engines and injection systems, as well as hydraulic components and splitter boxes – uses Anton Paar’s DMA 48 to measure the density of oil, and its viscometers to measure the viscosity of liquids.

Michel Dupont is a technical specialist at Liebherr, a German-Swiss multinational equipment manufacturer in Bulle, Switzerland. Liebherr comprises 140 companies organized into 11 divisions: earthmoving, mining, mobile cranes, tower cranes, concrete technology, maritime cranes, aerospace and transportation systems, machine tools and automation systems, domestic appliances, and components. Liebherr Machines Bulle SA develops and produces diesel and gas engines, and injection systems, as well as hydraulic components and splitter boxes.

Mr. Dupont joined Liebherr 30 years ago, as a test bed operator for diesel engine development, before there was any automatization at all. After working as a test bed operator for four years, and then a measurement technician for the development of diesel engines and the modernization of test beds, he switched to test-bed implementation of the common rail diesel engine injection system – still as a measurement technician.

Liebherr currently uses Anton Paar’s DMA 48 to measure the density of oil and its viscometers to measure the viscosity of liquids.

The company also uses an L-Vis viscometer for in-line measurements. “The advantage of this,” says Mr. Dupont, “is we can measure directly at the test strip without the need for a sample, and extra measurements. We can see any deviations or problems with our ingredients in real time – which also has implications for the quality of our products. And we save time. Because if oil gets into the gasoline, then that’s bad for the engine.”

The advantage of the L-Dens, meanwhile, is it measures density online, so any change in the density of the gasoline used for the engine delivery system is noticed immediately. This means that density can be measured relative to the temperature of the gasoline, which changes when it enters the test bed. “You can see the density curve right there online,” says Mr. Dupont. “Among other things, this saves time.”



→ The Anton Paar DMA 48, bought by Liebherr in the early 90s, is still in use twice a year.

Liebherr also uses an L-Dens for online measurements that show if there's a sudden penetration of water into the fuel tank, or to monitor tracers in the test bed gasoline to see if there's leaks or to control dosage. The online measurement of gasoline also allows Liebherr to monitor the quality of the gasoline they receive from suppliers.

Before, these measurements were done offline with a DMA 48. Once a week, they took a sample and measured it. This allowed them to plot a density curve, relative to different temperatures, for use in the test beds. Whenever they switched from summer gasoline to winter gasoline, the density changed. And so they had to perform regular measurements, every day even, for a while, until the density was stable, and then they would return to weekly measurements. This happened twice a year: switching from winter to summer diesel, and from summer to winter.

More generally, the advantage of Anton Paar instruments, says Mr. Dupont, is that they are reliable. They don't cause any headaches. Calibration of an instrument lasts a lifetime pretty much. And, of course, the quality of the measurements they deliver is very high.

Anton Paar scores high on service too. "Any time we need support, which is very rare, we get a quick response from Anton Paar," says Michel Dupont. "The person who comes makes sure we have at least a temporary solution so we can start measuring again right away."

Michel Dupont wouldn't hesitate to recommend Anton Paar instruments to others: "It's the measurement quality, the ease-of-use, and the reliability."

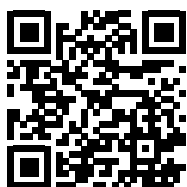


→ Mr. Dupont measuring density of winter diesel.

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response from Anton Paar”

Michel Dupont,
Measurement technician at Liebherr

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[www.anton-paar.com/
apcss-lvis](http://www.anton-paar.com/apcss-lvis)

DMA 48

Accuracy: 1×10^{-4} g/cm³ (density), +/- 0.1 °C (temperature)

Measuring temperature range: -10 °C to +70 °C

Measuring range: 0 to 3 g/cm³

L-Vis 510

Parameters measured: viscosity

Samples: lubricating oils and fuels

Accuracy: 1 % or 1 mPa.s