

LINSEIS DILATOMETER L75/200LT

low temperature dilatometer for automotive diesel injectors (-60°C up to +200°C)



The newly developed dilatometer L75/200LT was especially developed for quality control purposes of invar cylinders, which are used as housing for diesel fuel injectors, that are necessary for the common rail injection method.

The common rail injection method uses a stack of piezo crystals in order to produce small diesel drops. These drops are produced in very small quantities and in very short times shorter than 1msec/drop. The goal is to inject several times during a single burning cycle.

Because of this high tech injection module it is very important that the container is made out of invar which is a special steel with close to no expansion in the used temperature range from -60°C up to +200°C. As even smallest expansion will change the geometry and the drop volume of the diesel drops, it is very important to make very high accurate measurements with the CTE behavior of the used invar steels.



The Linseis dilatometer L75/200LT was especially developed to enable these measurements. The best possible and most accurate technique was used which is the dual push rod technique using two measuring channels with the measurement of the invar against a standard (for example NIST).

The sensor is a highest accuracy LVDT sensor with 10nm resolution. The sensor is built on top of the furnace and the sample is held by a quartz measuring system. Both, the sensor and the measuring system use an electronic lift, so that the sample can be lowered into the low temperature furnace.

The furnace is a standard Linseis low temperature furnace L75/264. This furnace uses liquid nitrogen and can be cooled down as low as -150/-180°C. The sample is initially cooled down to the programmed starting temperature, and is then heated up against the initial cold atmosphere.

The temperature control and the data acquisition of the system is done with the well known Linseis 32 Bit Windows software WIN-TA / WIN-DIL. This software also includes a comprehensive data evaluation package.

LINSEIS