

Press Release

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VibroFlex – the new flexibility in optical vibration measurement

Everything vibrates in nature and technology. The heart beats, wings flap, sounds are sent out and received – life would be much too quiet without vibrations. Engineers and scientists around the world use laser Doppler vibrometers from Polytec to gain a better understanding of the dynamics and acoustics of their goods, like red-hot exhaust systems, sophisticated membranes for medical technology, high-end loudspeakers, ultrasound tools or microstructures such as MEMS. Non-contact laser Doppler vibrometry has established itself as a simple, non-intrusive measurement procedure that provides precision analysis of the real vibration characteristics of structures of any size – from nano to macro.

VibroFlex, the new modular vibration measurement system, solves questions on a wide range of applications: firstly, VibroFlex can be configured for frequency bandwidths from DC to 24 MHz and, secondly, it detects even the slightest movements in the sub-picometer range and even high vibrational velocities of up to 30 m/s. The VibroFlex modular vibration measurement system consists of the configurable front-end **VibroFlex Connect** with a user-friendly 7" touch display and a selection of special laser sensor heads, to create the optimum conditions for the specific measurement task and object. The optional **VibSoft** data acquisition and evaluation software complements the measurement system as a tool for effective and user-friendly data analysis. Measurement data is conveniently available via the fully digital **VibroLink** interface or as an analog signal for any data acquisition system. The **VibroFlex Neo** sensor head not only handles challenging vibration measurement tasks reliably and with high resolution, it is also suitable for measurements through transparent media such as glass in climatic chamber testing or water in ultrasound testing in a water bath.

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VibroFlex Xtra also determines high-resolution vibration measurement data from optically challenging surfaces such as dark, biological, rotating or moving objects. The Xtra laser technology is particularly suitable for demanding measurement tasks such as non-destructive testing, vibration displacement measurements from a distance, quasi-static displacement measurements, including the regulation of shakers.

Thanks to its compact design, **VibroFlex Compact** reaches measurement locations in confined test setups and in production lines. It enables quick and effective in-line inspections in the production environment, enabling reliable pass/ fail decision based on structure-borne noise monitoring the specific acoustic signature of a sample. The integrated HD+ camera and optional microscope objectives provide assistance in the testing laboratory and even enable microstructure analysis, e.g. of electronic circuit boards and microelectronics, with the very small laser spot (down to 1.5 μm) for simplified positioning on small samples with fine details. The highly flexible optical fiber sensor head **VibroFlex Fiber** enables the measurement of measuring points that are very difficult to access. It also uses differential fiber optics to measure relative movements, such as vibrations at joints, or compensates for environmental influences.

The extensive range of accessories like e.g. 90° beam deflection units, XY positioning stages and various objectives turn this modular laser vibrometer system into a practical and application-oriented precision analysis tool. VibroFlex offers new flexibility for optical vibration measurement with this versatile concept.

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Figure 1: Laser-based vibration measurement with VibroFlex Xtra is perfect for dark, moving or rotating surfaces – here being used to test the haptic feedback of an automotive control panel.



Figure 2: Non-contact measurement of vibrations even on the finest structures, e.g. for reliability testing of electronic components with the VibroFlex Compact with microscope optics, coaxial illumination unit and HD+ camera for visual control and documentation.

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