

Optimized Process Technology for clean, high-strength Joints

Vibration Welding ‚Plus‘

Vibration welding is a powerful joining technology for thermoplastic polymers and, due to its short cycle times and excellent mechanical joint properties, well-established in demanding automotive applications. Especially this industrial segment is characterized by continuous design improvement, elevated operation temperatures ‚under the hood‘, a further reduction of filtering devices in fluid- / air-passed systems and a general tendency towards package envelope optimization – thus resulting in steadily increasing demands on the weld seam, concerning optical appearance, cleanliness and strength.

Vibration Welding ‚Plus‘ by BRANSON is a further development for the reproducible production of clean, high-strength joints. Its scientific fundamentals have been provided by three university institutes through comprehensive studies on simple and complex specimen. In cooperation with partner companies, the excellent experimental results were subsequently transferred to a various series applications. Vibration welding ‚Plus‘ is based upon two complimentary approaches:

Clean Joints (IR+): Particle emission and fluff formation at the beginning of the process are almost completely eliminated by a fixture-integrated pre-plastification of the weld plane. A non-contact IR heating by means of special, contour-adapted, medium-wave metal-foil emitters lets the vibration start ‚on molten surfaces‘. The outcome: a homogeneous, neat and clean weld seam with reduced notch effects and elevated strength – particularly when submitted to thermal and long-term loads.

Amplitude Control (PPL+): This innovative drive technology bases on the modular ‚Power Package Linear‘ concept, utilizes optimized amplitude controllers and enables significantly shortened ramp-up times and, by that, additionally improved joint optics. Besides, the Amplitude Control of the weld head minimizes the mechanical stress to the weld area during solidification / re-crystallization in the holding stage. Significant changes in morphology and considerably increased joint strength are the positive results - especially for technical polymers, e.g. short-fiber glass-filled polyamide (PA-GF).

A consistent implementation of **Vibration Welding ‚Plus‘** by BRANSON offers brand-new options for a smart molding / joint design. Furthermore, the substantially improved weld seam quality has a clear potential for fundamentally expanding the application diversity of this mature joining technology.

Improved joint optics on PBT-GF30



‚Conventional‘ Vibration Welding



Vibration Welding with PPL+ and IR+

Optimized joint properties on PA66-GF25

