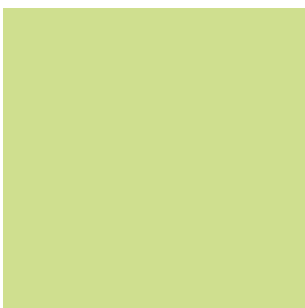
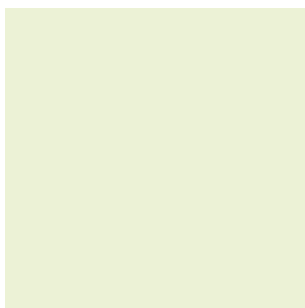


OneShot –
Self-punching fastening system



Plastics
Technologies
in Motion.



In cooperation with
BOLLHOFF

An ever increasing diversity of models and variants, new designs and materials as well as decreasing development times and product cycles lead to new and manifold tasks when connecting the most different materials. To meet these high requirements to the connecting technology, fastening elements and processing systems must be perfectly designed and harmonised. Böllhoff, as a specialist for fastening and assembly technology, and FRIMO, as specialist for tooling and machinery, have jointly developed an integrated new process. The advantage for the customers: bundled fastening and processing know-how for faster and economical processes. Rely on it.

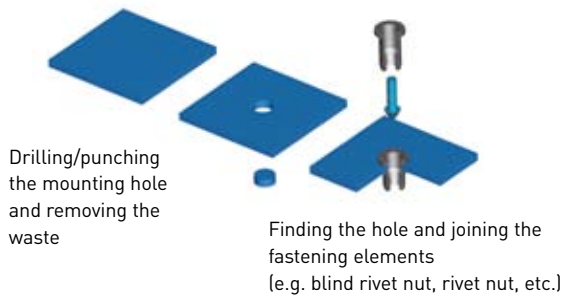
State-of-the-art: "Two-shot process"

The state-of-the-art technology for producing hole reinforcements and inserting threaded inserts or similar fastening elements is called "two-shot process". This process consists of two steps: punching including waste removal as a first step and inserting and beading over the fastening element as a second step. The problem is, that the exact position of the punched-out hole must be located again. Thus, the overall process is prolonged and complicated.

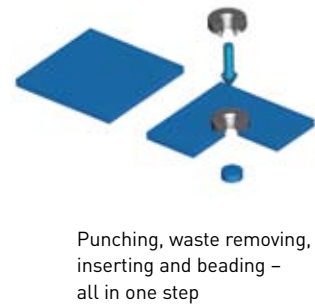
Innovation: "OneShot process"

Böllhoff and FRIMO have considerably improved this punching and joining process. The result is called *OneShot* process, a self-punching fastening system based on an innovative tooling technology in which newly developed fastening elements are utilized. This procedure is suitable for thin-walled structural components of fibre reinforced plastics, such as GMT, CFRP, SMC, PP long fibre.

Plastic component
2 - 8 mm strong

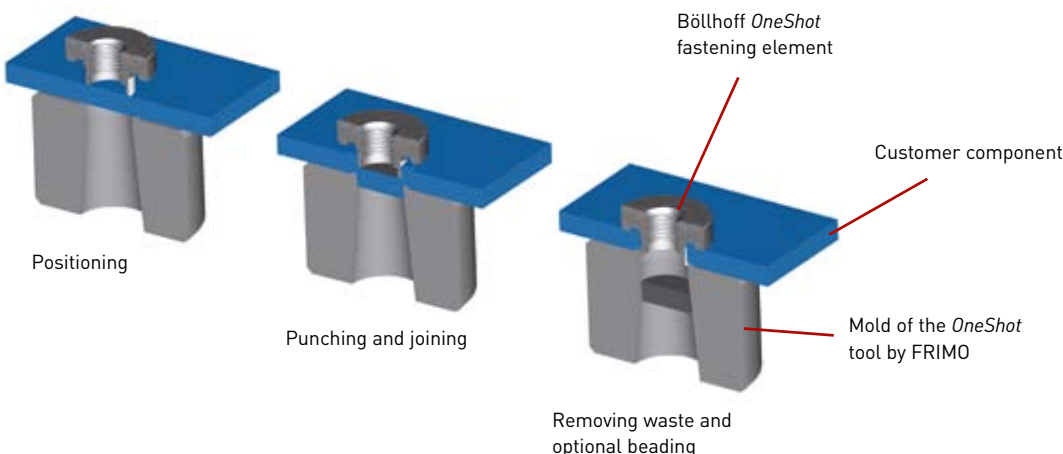


Plastic component
2 - 4 mm strong
(up to 8 mm for GMT)



OneShot process sequence

Schematic illustration of the joining process



Simple, fast and safe

Fastening technology

As one of the world's leading companies in the field of connecting and mounting technology, Böllhoff contributes its long-term know-how and expertise to all kinds of applications. Böllhoff offers solutions for metallic materials as well as for plastics in the area of blind rivet technology, thread technology and plastics engineering. As a longtime partner of the automotive industry, Böllhoff products are known for their reliability. For the *OneShot* process, developed in cooperation with FRIMO, Böllhoff supplies the customers with fastening elements that are perfectly designed for this process.

Variations of the *OneShot* fastening element

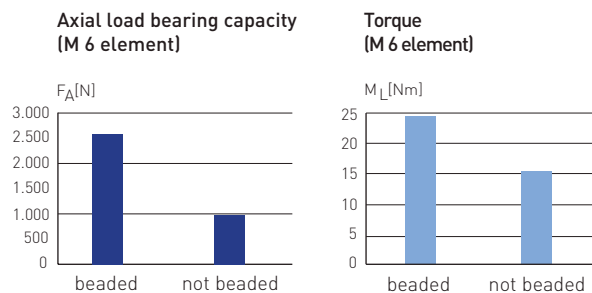
Customer specific requirements can also be realized, e.g. threaded bolts, ball bolts, etc.



Hole reinforcement (round, oval)

Technical data

OneShot thread insert with knurl joined into a 7.5 GMT (30 % GF). At room temperature, the axial load bearing capacity contrary to the setting direction F_A [N] and the torque M_L [NM] depending on a bead have been measured.

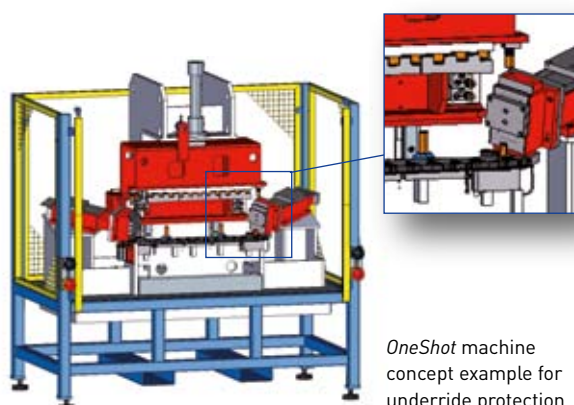


Tooling and machinery

FRIMO is one of the world's leading providers of system solutions for the production of high-quality plastic components and supplies its customers with project specific tooling and machinery for punching and other technologies. These are e.g. flexible trimming, PU processing, thermoforming, laminating, edgefolding, and joining. Applications for the automotive industry are the main focus. For the *OneShot* process FRIMO supplies its customers with perfectly designed tools and machinery.



OneShot tool module (example)



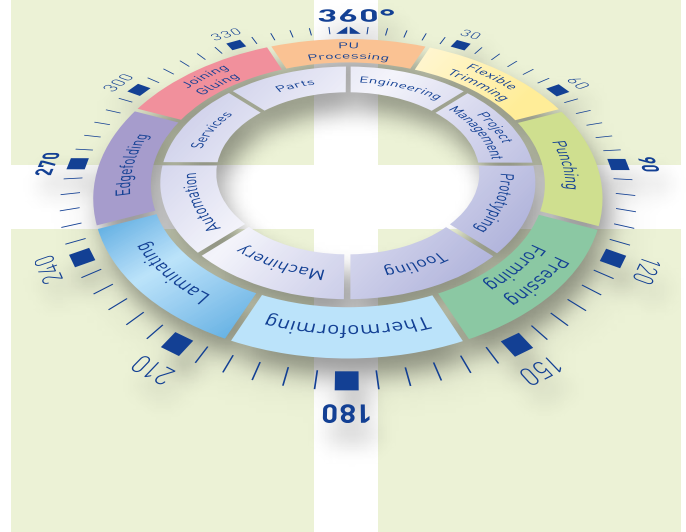
OneShot machine concept example for underdrive protection

Benefits

- Simple and safe production process – only one step
- Locating the hole afterwards is no longer necessary
- Clearance-free fit between fastening element and component
- High level of ejection and anti-rotation safety
- Suitable for large series production due to high process-reliability
- Standardized tool modules, individually configurable
- Development of customer specific tools for processing individual or several *OneShot* fastening elements
- *OneShot* tool modules can also be integrated in other production systems, such as punching, welding and assembly machines
- Automated or manual feed of fastening elements



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