PVA TePla AG
Im Westpark 10-12
35435 Wettenberg
Germany

Press release

Wettenberg, October 27, 2014

High-vacuum diffusion bonding – Introduction into industrial series application is being prepared

- Highly efficient series production through flexible and automated process control as well as product-specific loading facilities
- Process homogeneity and accuracy paired with maximised component / batch size
- Suitable for materials that are extremely sensitive to reactions, such as titanium
- No filler materials, no post-processing of the components required

PVA TePla AG, Wettenberg, Germany, is launching a high-vacuum diffusion bonding installation ("MOV 743 HP") designed for series applications. The high-vacuum system is designed for process quality, reliability and a maximised component and batch size.

Benefits of diffusion bonding

By means of a hydraulic pressing device, the joining areas of the component to be joined are pressed against each other powerfully, therefore bringing them in close contact. By solid-state diffusion a virtually pore-free composite material emerges which meets highest mechanical, thermal and corrosion technical requirements. A key feature of diffusion bonding is that usually no filler material is used so that the joint does not have any foreign alloy components and therefore has properties similar to base materials when properly executed. Due to the absence of a molten phase in the joining pro-

cess, highly accurate and exact contour bonding of precision components can also be guaranteed. Examples of the preferred application of the diffusion bonding in this context are micro-coolers and/or micro-reactors that are characterised by extremely fine channel structures near the joint.

Performance features of the new installation

Due to an optional force or displacement control, the new installation allows industrial customers to optimally adapt the process and to counteract deformation damage and therefore unnecessary rejects. This ensures an improved total cost of ownership (TCO) and accelerated process development. The pressing plates are 900 mm x 1000 mm in dimension and are homogeneously actuated via several pressing stamps by means of proprietary technology from PVA TePla. This ensures an optimised homogeneity in the distribution of the press force. A constant and oscillating force application can be flexibly programmed in the process sequence. Up to 400 tonnes of press force offers the user a high degree of variability in the component sizes to be processed and the material requirements. Furthermore, integrated rapid cooling ensures the shortest process times.

The design of the system for high vacuum also allows for a broad application range with regard to the materials to be processed. In particular, the installation is also suitable for joining materials that are extremely sensitive to reactions, such as titanium and titanium-containing alloys. The processed components have an excellent visual appearance and usually do not need to be subjected to further post-processing.

More details about the hot presses can be found on the homepage of PVA TePla at the following link:

Diffusion Bonding

With this installation, PVA TePla expands their previous series, which contains standard equipment with pressure plate sizes from 300 mm x 300 mm and 600 mm x 800 mm with press forces up to 250 tonnes.

Co-operation in process development

PVA TePla also provides the option of evaluating processes in this promising technology together with their customers and possibly to add subsequent series production in the subsidiary PVA Löt- und Werkstofftechnik GmbH. As another development partner, the Günter-Köhler Institute for Joining Technology and Materials Testing GmbH (ifw) in Jena, Germany, which is a leading body in this field of technology, supports PVA TePla.

Horst-Günter Leng, Product Manager at PVA TePla, says: "With the MOV 743 HP hot presses, we are transferring diffusion bonding from the R&D sector to industrial production. The ideal combination of usable space, press force homogeneity, high vacuum and control flexibility puts diffusion bonding in a quality and productivity range that makes an introduction into industrial manufacturing processes almost mandatory. We see promising industries, for example, in the field of highly stressed components in aerospace as well as apparatuses for highly corrosive media in the chemical industry. The sale of several installations in the last twelve months proves that the importance of diffusion bonding is steadily growing in industrial production."

You can obtain more information from:

Horst-Günter Leng
Product manager
PVA TePla AG
Tel: +49(0)641/68690-145
horst.leng@pvatepla.com
www.pvatepla.com