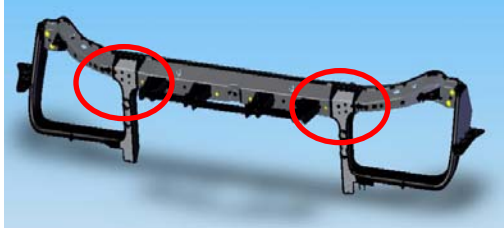


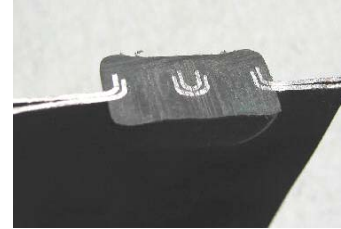
In Mold Assembly (IMA) Technology Case Study



Picture 1: Typical IMA Application



Picture 2: IMA Attachment Joint



Picture 3: Typical Spot Welding Joint

Materials Used: DURETHAN® BKV 30 and DURETHAN® BKV 50

The joining of multiple metal stampings together is typically done by welding (spot or MIG) in most automotive body structure applications. While this is a proven and robust solution, it does cause problems to dimensional consistency and repeatability, since a certain level of variation inherently occurs during the welding process. There are also significant costs associated with the welding process including fixturing and welding equipment, as well as the time required to do the work. In search of a method that would reduce such costs, and also provide equivalent if not better functionality, LANXESS has developed an innovative technology called In Mold Assembly (IMA) technology which is an alternative to traditional welding/joining. This process is an insert-molding technique in which injection molded plastic is used to permanently join at least two metal members together. Though originally developed to be an enabling technology for Plastic/Metal Hybrid applications, IMA technology can be used in virtually any application where the joining of multiple metal stampings is required.

IMA brings value compared to traditional welding techniques through cost savings, which can be in excess of 20% due to the elimination of fixturing and through time savings associated with the welding process. Therefore, cost savings are largely dependant upon the number of spot welds required. Though there are no significant weight advantages, there is the potential for functionality benefits. IMA offers weld strength which is equivalent or better than spot welding, as well as improved dimensional consistency and repeatability without the need for fixturing.

Advantages:

- Potential cost reduction of up to 20% compared to traditional welding.
- Potential increase in weld strength as well as improved dimensional consistency and repeatability compared to traditional welding.

As with any product, use of the products mentioned in this publication in a given application must be tested (including field testing, etc.) by the user in advance to determine suitability.



Health & Safety Information: Appropriate literature has been assembled which provides information concerning the health and safety precautions that must be observed when handling the LANXESS products mentioned in this publication. For materials mentioned which are not LANXESS products, appropriate industrial hygiene and other safety precautions recommended by their manufacturers should be followed. Before working with any of these products, you must read and become familiar with the available information on their hazards, proper use, and handling. This cannot be overemphasized. Information is available in several forms, *e.g.*, material safety data sheets and product labels. Consult your LANXESS Corporation representative or contact the LANXESS Product Safety and Regulatory Affairs Department in Pittsburgh, PA.

LANXESS Corporation • 111 RIDC Park West Drive • Pittsburgh, PA 15275 • 1-800-LANXESS • www.US.LANXESS.com

The manner in which you use and the purpose to which you put and utilize our products, technical assistance and information (whether verbal, written or by way of production evaluations), including any suggested formulations and recommendations are beyond our control. Therefore, it is imperative that you test our products, technical assistance and information to determine to your own satisfaction whether they are suitable for your intended uses and applications. This application—specific analysis must at least include testing to determine suitability from a technical as well as health, safety and environmental standpoint. Such testing has not necessarily been done by us. Unless we otherwise agree in writing, all products are sold strictly pursuant to the terms of our standard conditions of sale. All information and technical assistance is given without warranty or guarantee and is subject to change without notice. It is expressly understood and agreed that you assume and hereby expressly release us from all liability, in tort, contract or otherwise, incurred in connection with the use of our products, technical assistance, and information. Any statement or recommendation not contained herein is unauthorized and shall not bind us. Nothing herein shall be construed as a recommendation to use any product in conflict with patents covering any material or its use. No license is implied or in fact granted under the claims of any patent.

The information contained in this bulletin is current as of November 2006. Please contact LANXESS Corporation to determine if this publication has been revised.

