

DuPont Automotive

Innovation Spotlight: DuPont™ Zytel® XT and DuPont™ Vamac®



Turbocharger Twin Outlet T-joint

Application

A lightweight, cost-effective twin turbocharger outlet T-joint engineered using molded plastic, replacing the cast aluminum/thermoset rubber incumbent material. Developed by Hyundai and Hwaseung R&A Co., Ltd., for use in a Hyundai luxury sedan.

Unmet Need

Turbocharger components offer an area of focus for vehicle lightweighting, but material choices must be capable of enduring significant physical stresses, including vibration, extreme heat and aggressive chemicals.

Challenges

- Meet severe flow load, static/dynamic engine load, chemical resistance and vibration performance requirements
- Reduce cycle time

Solution

The injection-molded plastic outlet was assembled using a novel combination of infrared and vibration welding to reduce cost and minimize potential contamination in the finished component. Concentrated stress areas including bolting, leg were designed using an optimized rib pattern.

The T-joint:

- Enables significant weight and cost reductions
- Reduces air flow pressure drop rate through optimized design
- Enables NVH performance gains, including lower radiation noise versus aluminum, in a wide frequency range



DuPont Materials Chosen and Why

DuPont™ Zytel® XT was chosen for the T-joint component of this application because it offers:

- High strength
- Broad temperature toleration
- Stiffness and fatigue resistance over a wide range of temperatures, chemicals and moisture exposure

DuPont™ Vamac® was chosen for the hose components of this application because it provides:

- Flexibility
- Longevity in powertrain and air management applications
- Resistance to chemical exposure over a broad temperature range

For more information on the Assisted Positive Locking Junction Box and other SPE award winners and finalists, visit the [SPE Automotive Innovation Awards website](#).

Contact DuPont at the following regional locations:

North America 800-222-8377	Europe, Middle East, Africa +41-22-717-51-11	ASEAN +65-6586-3688	Korea +82-2-2222-5200
Latin America +0800-17-17-15	Greater China +86-400-8851-888	Japan +81-3-5521-2801	

Visit us at automotive.dupont.com

The information provided in this data sheet corresponds to our knowledge on the subject at the date of its publication. This information may be subject to revision as new knowledge and experience become available. The data provided fall within the normal range of product properties and relate only to the specific material designated; these data may not be valid for such material used in combination with any other materials, additives or pigments or in any process, unless expressly indicated otherwise.

The data provided should not be used to establish specification limits or used alone as the basis of design; they are not intended to substitute for any testing you may need to conduct to determine for yourself the suitability of a specific material for your particular purposes. Since DuPont cannot anticipate all variations in actual end-use and disposal conditions, DuPont does not guarantee favorable results, makes no warranties and assumes no liability in connection with any use of this information. All such information is given and accepted at the buyer's risk. It is intended for use by persons having technical skill, at their own discretion and risk. Nothing in this publication is to be considered as a license to operate under or a recommendation to infringe any patent. DuPont advises you to seek independent counsel for a freedom to practice opinion on the intended application or end-use of our products.

CAUTION: Do not use DuPont materials in medical applications involving implantation in the human body or contact with internal body fluids or tissues unless the material has been provided from DuPont under a written contract that is consistent with DuPont policy regarding medical applications and expressly acknowledges the contemplated use. For further information, please contact your DuPont representative. You may also request a copy of DuPont POLICY Regarding Medical Applications H-50103-5 and DuPont CAUTION Regarding Medical Applications H-50102-5.

Copyright © 2018 DuPont. All rights reserved. The DuPont Oval Logo, DuPont™, Vamac® and Zytel® are trademarks or registered trademarks of E.I. du Pont de Nemours and Company or its affiliates. (02/18) GNE-A11226-00-A0217