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Custom Shipping/Assembly Trays Help Truck Engine Plant Meet Zero Contamination Standards and Simplify Handling of Camshafts

(INDIANAPOLIS, IN) -- Creative Techniques Inc, an Auburn Hills, Michigan-based producer of custom returnable packaging and material-handling products, has designed and produced custom shipping/assembly trays for camshafts used by International Truck and Engine Corporation at its Indianapolis engine plant. Trays with nested parts are stacked and completely sealed to protect parts and meet zero-contamination standards. The destination is the assembly line, where pre-oriented and accurately located parts are presented for removal via a lift-assisted operator.

Prior to development of the custom trays, machined camshafts were placed in wire baskets and transported by fork truck to the assembly area. Quality-assurance objectives dictated this method be replaced by trays that keep the parts separated and sealed from airborne contaminants, reducing potential for contamination or damage to the parts.

Creative Techniques designed special urethane inserts used within the trays to prevent shaving debris that could contaminate parts. This shave-resistance characteristic, in combination with the sealed design of the tray pack, meets International's strict specification for zero

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contamination for engine components. The tray itself is a structural-foam-molded copolymer polypropylene.

The current process at International for handling camshafts helps hold down the cost of labor, as well as enhances quality assurance. Finish-machined, ready-to-assemble camshafts are loaded into the custom trays via a material-handling robot. The trays are then stacked two trays per layer with five layers of seven parts each, plus a dummy layer with no parts, necessary to cover the top layer of nested parts, given the height of the sprocket OD. A lid is added to the top to seal the stacked pack.

A fork truck then brings the tray packs to the assembly area. The unloading of the parts and destacking of the trays is accomplished by an operator using a manually activated lift assist. The lift assist is also used to destack trays as they are emptied. The unloading lift equipment uses the same end-effector tooling as the part-loading robot at the machining area. The sealed tray pack is designed for shipping between plants as well as in-plant transport and handling.

Camshafts for both a V8 truck engine (21.5” length part) and a V6 engine (17.5” part) can be held in the same tray. Part orientation of the five parts in each tray is alternated 180° to maximize density within the tray. Creative Techniques designed the trays with a “forced” orientation so that they can’t be stacked incorrectly (i.e., turned 180°).

The outer trays are made by Creative Techniques using the Structural Foam process, a highly efficient low-pressure molding process for large parts that provides rigid material-handling trays and dunnage with a hard surface for long service life. Structural Foam also reduces the cost of tooling, a significant factor for production of molding batches in the thousands, as opposed to millions of parts. The low-pressure process allows the use of aluminum molds, reducing mold machining costs.

Creative Techniques' experience in designing and producing returnable packaging for the automotive/transportation industries includes engine, transmission, axle/differential, and body & assembly applications. Processes include both automated and manual assembly, shipping, and in-process part handling. Custom containers and trays can be engineered with unique features that support shot pin locating, escapement surfaces, and proximity tags, or other features as required.

Product protection, improved ergonomics, reduction of solid waste, and efficient interface with material-handling processes -- these are key reasons why manufacturers are moving away from disposable packaging and discovering the high ROI potential of durable returnable packaging engineered to their specific requirements.

20 Years of Service

Established in 1984, Creative Techniques, Inc. is an industry leader in the design and manufacture of custom returnable packaging and material handling products. Company innovations include the development of custom injection molded and structural foam containers, pallets and trays. Creative Techniques, Inc. serves a growing number of diverse industries where custom returnable packaging is required, including automotive, rubber and tire, food, pharmaceutical, appliance, consumer electronic manufacturing, and process industries. For more information, or to request an in-depth CD-ROM of company capabilities, contact Creative Techniques at (248) 373-3050, or visit the company's website at www.creativetechniques.com.

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Photo Caption

Stack of shipping/assembly trays, designed and produced by Creative Techniques (Auburn Hills, MI) hold seven camshafts per tray, locating the parts for both robot and lift-assist handling. Special urethane inserts are used within the trays to prevent shaving debris that could contaminate parts. The trays are designed with a “forced” orientation feature so that they can’t be stacked incorrectly (i.e. turned 180°).

(Above image for reference purposes only)