Each year since 1973, NADCA has sponsored its International Die Casting Design Competition to showcase outstanding die cast designs while acknowledging the continuous contribution die casters provide to the manufacturing industry.

Submitted castings are reviewed by a panel of independent judges from which winners are selected. Categories are grouped by material and include aluminum, zinc and magnesium. For each category, a die casting is evaluated based on ingenuity of casting and product design, overall quality, cost savings and contribution to expanding the market for die casting.

This year, NADCA will honor its International Die Casting Design Competition award winners at the Die Casting Congress & Tabletop in Columbus, OH. Eight winners will receive awards.

“Once again competition continued to be strong in the magnesium over half a pound category this year” said NADCA project engineer Alex Monroe. “The competition also saw entries with applications in the commercial truck market. These examples seem to indicate an expanding market for die castings being driven by innovative uses of die casting technologies.”

NADCA wishes to thank all the die casters who submitted their entries in the 2011 competition, while congratulating the winners.
Aluminum Die Casting under One lb.

Part: Angular Hinge
Material: A380
Weight: 0.17 lbs
End Market: Fasteners and Hinges

Caster: Juqueuir H. Janz
Germany
Caster Award Nominees: Joachim H. Janz
Customer: Tequinus
Customer Award Nominees: Johann M. Di Giorgio

Comments: This angular hinge casting features a patented Pivot Bearing Insert (PBI). This technology allows for a rotating hinge to be cast directly in a single step process. The result of using this hinge technology is increased manufacturing speed, reduced weight, reduced costs, and improved quality. This technology can be used for both aluminum and zinc alloys, and it has potential for use in many end markets.
Aluminum Die Casting One to 10 lb.

**Part:** Multi-Function Food Processor Body  
**Material:** ADC12  
**Weight:** 2.7 lbs  
**End Market:** Home Appliances

**Caster:** Kong Sing Manufactory Co. Ltd  
204 E. Main Street, San Gabriel, CA 91776

**Caster Award Nominees:** Jacky Sin

**Customer:** Tricom Industrial Co. Ltd

**Customer Award Nominees:** Eric Ho

**Comments:** This casting supports and protects the drive motor for the food processor. The casting also supports the attachment of other items for the function the food processor. From the analysis of the 3D drawing that was provided to the die caster, a 3 plate die was created for this casting. The result is the ability to produce high volumes with very low scrap rates. Tight tolerances over this relatively thin casting (roughly 1.0 mm wall thickness) were also able to be maintained.
Aluminum Die Casting Over 10 lbs.

**Part:** Fly Wheel Housing  
**Material:** GD Al Si 9 Cu 3 (DIN EN 1706)  
**Weight:** 13.9 lbs  
**End Market:** Commercial Truck

**Caster:** Endurance Technologies Ltd.  
B1/3, M.I.D.C Industrial Area, Chakan  
Pune, Maharashtra, 410501 India

**Caster Award Nominees:**  
V. Subramanian – *Sr. Vice President Operations*  
Rajesh Aggarwal – *Head R & D*

**Customer:** Tata Motors Ltd.

**Customer Award Nominees:**  
Jaykumar S Chuttar – Deputy General Manager Materials, MPC

**Comments:**  
This part was initially converted from a gravity casting process because the gravity process was not capable of producing the required quantity of castings. In the conversion from gravity to high pressure die casting, significant weight savings were also realized. Simulation technology was extensively used to ensure the optimum tooling design. The result was a complex 8 slide die which successfully fulfills all the customer requirements.
Part: Aluminum MMC Brake Drum  
Material: A356.2  
Weight: 38.5 lbs  
End Market: Commercial, Military, and Special Vehicles

Caster: Delaware Dynamics  
700 South Mulberry St., Muncie, IN 47302 USA

Caster Award Nominees: Greg Prince, Ryan Haas

Customer: Century 3+ Inc.

Customer Award Nominees: Jim McManus, Charlie Janis

Comments: This brake drum was originally produced in cast iron. A unique horizontal squeeze cast process allowed a selectively placed ceramic preform to be infiltrated, creating a selectively reinforced, Metal Matrix Composite (MMC) aluminum brake drum. The new brake drum weights at least 45% less than its cast iron equivalent and surpasses cast iron in all FMVSS 121 Performance Criteria. The new drum has 20% less fade than cast iron which will help the heavy commercial vehicle market reach the new FMVSS stopping distance requirements. This technology has a great opportunity to improve fuel efficiency, reduce stopping distances, increase payload, and enhance the overall lifecycle of the part in all types of transportation vehicles.
**Magnesium Under .5 lb.**

- **Part:** Bezel Display  
- **Material:** AZ91D  
- **Weight:** 0.2lbs  
- **End Market:** Military Rugged Laptop

**Caster:** Phillips Plastic Corp.  
2930 Mondovi Rd., Eau Claire, WI, 54701

**Caster Award Nominees:** Brian Binczak

**Customer:** VT Miltope

**Customer Award Nominees:** Craig Ingram

**Comments:** This magnesium thixomolded bezel display is used to support the display on a ruggedized laptop computer. This high precision casting with wall thicknesses between 0.03 inches and 0.08 inches is machined, deburred, coated with NH-35, and painted. The finished casting contributes to a 30% smaller and 50% lighter ruggedized laptop.
Part: Oil Tank  
Material: AZ91D  
Weight: 2.03 lbs  
End Market: Snowmobile

Caster: Pace Industries Product Tech Division  
310 Congress St. W., Maple Lake, MN 55358  

Caster Award Nominees: Product Tech Engineering and Operations  
Customer: Arctic Cat Inc.  
Customer Award Nominees: Arctic Cat Engineering Group  

Comments: This magnesium oil tank replaces one that was a stamped aluminum and brazed assembly. The tank is part of a large magnesium chain case design. The case is comprised of 3 separate magnesium die castings. It is lighter and more tunable than the aluminum it replaces. In addition, improvements in the design allow a larger clutch and a longer clutch distance. This results in better cooling for the drive belt.
Zinc Under 6 oz. non-electroplated

**Part:** Bracket, Camera, ASIC  
**Material:** Zamak #3  
**Weight:** 0.065 oz.  
**End Market:** Infrared Interactive Whiteboard

**Caster:** Cast Products, Inc.  
4200 N. Nordica Ave., Norridge, IL 60706

**Caster Award Nominees:** Cast Products Engineering Group and Chicago White Metal Engineering Team  
**Customer:** SMART Technologies  
**Customer Award Nominees:** Michael Federkeil

**Comments:** This zinc die casting replaces an ABS plastic part. It improves the product durability and performance. The casting is used to hold a camera on an interactive whiteboard. This whiteboard connects to a computer and employs infrared light to locate all interactions with the whiteboard. This requires the infrared cameras to be rigidly held in place. Due to the high demand and aggressive timeline, a short timeline was followed which produced acceptable samples in just 5 weeks.
Zinc Over 6 oz. non-electroplated

Part: Steering Wheel Ignition and Lock Housing
Material: Zamak #5
Weight: 13.9 oz
End Market: Automotive

Caster: Dynacast
4Av. Transformacion No. 19
Fracc. Industrial La Joya, Cuautitlan Izcalli, 54730 Mexico

Caster Award Nominees: Samuel Alonso

Customer: Valeo Sistemas Electricos, SA de CV

Customer Award Nominees: Gabriel Castillo

Comments: The ignition and lock housing is a safety-critical component of the automotive steering column. It keeps the steering wheel locked until the car is ready to start and drive. This casting was previously produced in Europe. After moving the job to North America, an improved machining process was developed that streamlined the production of the components. This resulted in large cost savings by reducing steps and time associated with the secondary operations. In machining alone, there was a time savings of almost 70%. The cost savings were equivalent to 80% for the customer, who previously had to operate its own machining center for this component.