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. New for 2012 castings from other alloy families were accepted as well. 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 & Exposition in Indianapolis, IN. Eight winners as well as one honorable mention will receive awards.

“This year’s international competition was swept by North American Die Casters!” said NADCA’s Engineering Project Manager Alex Monroe. “Many of the entries showed the strong effort of North American Die Casters to produce highly engineered castings to replace assemblies and achieve dramatic cost savings. Also, this year we introduced a new category for the less common die casting alloys. This addition helps to promote the lesser known die casting alloys such as copper and brass.”

NADCA wishes to thank all the die casters who submitted their entries in the 2012 competition, while congratulating the winners.
Aluminum Die Casting Under One lb.

**Part:** Riser  
**Material:** A380  
**Weight:** 0.865 lbs  
**End Market:** Sports and Recreation

**Caster:** Chicago White Metal  
649 N. Route 83  
Bensenville, IL, 60106

**Caster Award Nominees:** Rob Malarky

**Customer:** Diamond Archery by BowTech

**Customer Award Nominees:** Nick Obteshka

**Comments:** This casting is a handle for a youth compound bow. The challenge making this casting was to meet tight tolerances and a “hogout” appearance while meeting a target price. This meant die casting was ideal for this application. To meet these requirements the die caster designed the casting to avoid shrinkage defects. In addition, the gating was designed to minimize trimming marks. Finally, a custom racking system was developed to ensure uniform painting without the paint accumulating in critical areas. The end result is a detailed aluminum riser that contributes to archery’s best youth compound bow—Diamond’s Atomic.
Aluminum Die Casting Squeeze/Semi-Solid

Part: Aluminum Composite Disk Brake Rotor
Material: A356
Weight: 1.98 lbs
End Market: Motorcycles

Caster: REL Inc.
57640 N Eleventh Street
Calumet, MI 49913

Caster Award Nominees: Adam Loukus

Customer: Matrix Brakes FTF LLC

Customer Award Nominees: Josh Loukus

Comments: This MMC cast brake rotor replaces milled and precision ground steel rotors. Using an aluminum MMC better heat transfer is achieved resulting in extended life and increased performance over steel rotors. Compared to steel 60% weight savings are also achieved. This further increases the performance by reducing un-sprung weight.
**Magnesium Under .5 lb.**

**Part:** Metal Spine Badge  
**Material:** AZ91D  
**Weight:** 0.1 lbs  
**End Market:** Communications

**Caster:** Pace Industries Product Technologies Division  
**Caster Award Nominees:** Product Technology Engineering and Operations  
**Customer:** Vocera Communications Inc.  
**Customer Award Nominees:** Vocera Engineering Group  
**Comments:** The Vocera communication badge is a hands free mobile communications device that uses voice over IP and speech recognition in primarily hospitals. The magnesium casting was used to provide rigidity and durability. As a result returns were reduced and the customers appreciate the strength and looks.
Magnesium Over .5 lb.

Part: Die Cast Magnesium Top Plate and Main Enclosure
Material: AZ91D
Weight: 5.97 lbs
End Market: Instruments

Caster: Twin Cities Die Casting Company
1070 SE 33rd Avenue
Minneapolis, MN 55414

Caster Award Nominees: Scott Braaten

Customer: Smith Detection and Nexus Design

Customer Award Nominees: Dave Manning

Comments: This set of two castings make up a lightweight enclosure for a portable gas chromatography / mass spectrometry analysis system. An internal lift was used to cast internal heat sink pins. This avoided the need for a separately cast heat sink. In addition minimum draft was applied to keep weight to a minimum. In addition center gating was used to achieve optimal filling. The end result was a casting with reduced cost and enhanced performance over alternative manufacturing processes.
**Zinc Under 6 oz. Non-Electroplated**

**Part:** Stabilizer  
**Material:** Zamak #2  
**Weight:** 5.05 oz.  
**End Market:** Recreational Vehicles

**Caster:** Cast Products, Inc.  
4200 N Nordica Ave.  
Norridge, IL 60706  
**Caster Award Nominees:** Cast Products Engineering Group

**Customer:** Dometic Corporation  
**Customer Award Nominees:** Dometic Engineering

**Comments:** This casting for a drive unit in retractable RV awnings replaces a 3 part assembly. The assembly consisted of 2 machined aluminum extrusions and 1 steel machine screw. The die caster was able to redesign the system to take advantage of a single zinc casting. The mold was designed and built in less than 6 weeks and the tooling cost was below the quoted price. Tooling payback was less than 2 months. The customer experienced an over 200% reduction in machining and assembly costs.
### Zinc Over 6 oz. Non-Electroplated

**Part:** Pump Housing  
**Material:** Zamak #3  
**Weight:** 8.96 oz  
**End Market:** Marine and Industrial Pump

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

**Caster Award Nominees:** Cast Products Engineering Group

**Customer:** SCC Pumps

**Customer Award Nominees:** SCC Engineering Team

**Comments:**  
This casting is a conversion from a bronze casting. The goal was to reduce cost without sacrificing quality, performance, or moving production outside America. The team at Cast Products was able to produce the die in under 8 weeks with the cost of the tooling under the quoted price. The casting also runs at such short cycle times that tooling payback was experienced in 32 days. All in all the pump housing in zinc was 1/5 the cost of the bronze component.
Zinc, Any Size with Decorative Finish

Part: Lever  
Material: Zamak #3  
Weight: 0.88 oz  
End Market: Sports and Recreation

Caster: Dynacast  
25952 Commercentre Drive  
Lake Forest, CA 92636

Caster Award Nominees: Kevin Hartnett

Customer: Fox Racing

Customer Award Nominees: Kyle Ness

Comments: This casting is used to easily adjust the suspension on a mountain bike. The rider can select between “climb,” “trail,” and “descend.” The casting is a conversion from machined 6061 aluminum to a zinc die casting. Significant effort was required to achieve the right color and consistency for the decorative finish. Even with this added effort, cost savings were achieved while the weight requirements were met.
Other Alloys, Any Size (Base Elements Exclude Al, Mg, Zn)

Part: Die Cast Brass Valve Body
Material: C 85800 Yellow Brass
Weight: 2.06 lbs
End Market: HVAC

Caster: Rheocast Company
N114 W19250 Clinton Drive
Germantown, WI 53022

Caster Award Nominees: Charlie Wright

Customer: Geo-Flo Products Corporation

Customer Award Nominees: Tom Wyer

Comments: This brass valve body is a conversion from the green sand casting process in C85550 red brass. By die casting the valve body the wall thickness was reduced. In addition, the finer surface finish in die casting allowed threads to be cast into the valve body. The result is a 79% reduction in the as-cast weight. Machining time was reduced by 90%. Assembly time was reduced by 80%. This results in significant weight and cost savings. The conversion to die casting also reduced the porosity exposed during machining. This has resulted in lower scrap rates and costs. These savings have allowed Geo-Flo to continue to be competitive in the international market.
Honorable Mention

Part: Housing for Spotting Scope
Material: AZ91D
Weight: 0.5 lbs
End Market: Sports and Recreation

Caster: Chicago White Metal
649 N Route 83
Bensenville, IL, 60106

Caster Award Nominees: Mike Dimitroff

Customer: Leupold and Stevens

Customer Award Nominees: Jeff Walker

Comments: This housing is for a light, compact, and rugged spotting scope. Each finished scope comes with a lifetime guarantee. This required absolute waterproof integrity. It also cannot leak the nitrogen that fills the scope. The complex geometry with thin walls (down to 1 mm) must be tightly controlled. This is because the optic path has to be tightly controlled to give the sharpest view. All these requirements make this a high performance die casting worthy of mention in the competition.