For the last 42 years 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.

“The International Die Casting Competition is a chance to recognize die casters for their effort to improve quality, cost and capability and expand the markets for die casting. This year’s winners exemplified design optimization to increase productivity and casting properties, while reducing rejects and cost. Markets for this year’s winners varied widely from airplanes and bicycles to 3D printers and electronic key tethers. The winning castings prove that die casting is a versatile process that has extensive application potential,” said NADCA Project Manager Beau Glim.

Categories in the competition are grouped by material and include aluminum, magnesium, zinc and other alloy families, including squeeze casting and aluminum structural die casting. Both custom and captive casters are eligible. For each category, there are four equally weighted criteria: ingenuity of casting and/or product design, overall quality, cost savings as compared to other manufacturing processes and the part’s contribution to expanding the market for die castings. A panel of independent judges, acknowledged experts, with no ties to eligible casters, choose the winners.

“The design competition is an excellent forum for companies to showcase their capabilities,” said Twarog. “The recognition a company receives from this awards competition is a unique opportunity to attract more customers and greater market share.”

NADCA will honor this year’s award winners at its 2015 Die Casting Industry Awards Luncheon on Tuesday, October 6 at 12:15 - 2:00 pm during the Die Casting Congress & Exposition in Indianapolis, IN. The luncheon is an exceptional opportunity to meet this year’s winners and learn more about their innovations. The luncheon is complimentary with your registration. You can register online at www.diecasting.org/congress.

To Compete in 2016

Innovative die casting design entries may be entered in the 2016 Die Casting Design Competition. All award-winning castings will be displayed next year at NADCA’s Die Casting Congress & Tabletop, September 26-28, in Columbus, OH.

The competition is open to die castings from aluminum, magnesium, zinc, semi-solid & squeeze, and other alloy families. Within each category, there are more specific levels: aluminum under 1 pound; aluminum 1-to-10 pounds; aluminum over 10 pounds; aluminum squeeze/semi-solid; zinc under 6 ounces/non-electroplated; zinc over 6 ounces/non-electroplated; zinc any size with decorative finish; magnesium over 0.5 pound; and magnesium under 0.5 pound.

Any number of die castings may be entered in the awards competition. Complete and submit a separate entry form for each casting or assembly of castings. As-cast entries are required. The metal surface cannot be improved or concealed by tumbling, shot blasting, coating or other surface treatments. NADCA encourages sending secondary processed samples, but these must be in addition to the as-cast parts.

Castings submitted for the competition MUST have approval in writing from the customer allowing NADCA to use the casting(s) in exhibitions and magazine articles. When possible, information and photographs describing the design process will be published in Die Casting Engineer magazine, but because of proprietary reasons, not all information can be shared. Such exceptions should be noted on your entry form.

You can download the entry form at www.diecasting.org/castings/competition. All entries must be postmarked by July 1, 2016. For more information, contact: Beau Glim at glim@diecasting.org. Send entries, along with sample castings and descriptions, to:

NADCA - 2016 Casting Competition
3250 N. Arlington Heights Rd., Ste. 101
Arlington Heights, IL 60004

www.diecasting.org/dce
PRODUCTIVITY AWARD 2015

Caster: Briggs & Stratton
110 Main Street
Murray, KY 42071

Caster Award Nominees: Gary Greenlees

Customer: Briggs & Stratton
Part: W16 Cylinder  
Material: Aluminum 384  
Weight: 2.96 lbs  
End Market: Small Lawnmower Engine

Challenge/Method Used to Produce: The previous cylinder casting was a single cavity die in 900 TON DCM.

Solutions/Advantages: The new design is 21% lighter than previous design. It has a 2mm wall thickness in crankcase region. Finite element analysis was used to reduce stresses in design. Attention to detail goes into the parting lines and functional levels of every wall to maximize parallel wall design practices. Narrowing gasket surfaces resulted in higher gasket sealing forces between mounting bolts. New engine block design has improved breather and oiling features which have reduced number of parts thus saving additional costs. This engine has best power to weight ratio of any walk behind lawn mower in its class.

Die Caster’s Comments: Improved production by 50%. Complex part cast in 2 cavity die. Significant cost reduction.
ALUMINUM DIE CASTING
1-10 LBS

Caster: Pace
3737 Lexington Avenue
St. Paul, MN 55126

Caster Award Nominees: Darren Bombich

Customer: Titus HVAC
Part: Diffuser Grilles
Material: A380
Weight: 2 lbs
End Market: Underfloor Air Diffuser
(Manual & Electronic Controls)

Challenge/Method Used to Produce: Previously manufactured with plastic injection molding. Plastic diffuser grilles did not meet building codes because they could melt in a fire and cause a hazard to fire fighters.

Solutions/Advantages: Previously manufactured with plastic injection molding. Plastic diffuser grilles did not meet building codes because they could melt in a fire and cause a hazard to fire fighters.

Die Caster’s Comments: Replaces plastic injection part and meets new building codes. Integrates 3 castings into 1 design.
ALUMINUM DIE CASTING
1-10 LBS

Caster: Pace, Cambridge
67 Faulkner Street
North Billerica, MA 01862

Caster Award Nominees: Don Tremblay

Customer: Jamco America
Part: Structural Armrest for Adjustable Aircraft Cabin Seat
Material: A380
Weight: 8.28 lbs
End Market: Arm Rest Frame

Challenge/Method Used to Produce: Originally designed and produced as a very expensive and time consuming #6016 Aluminum hog-out from a billet.

Solutions/Advantages: Compliant with stringent aerospace specifications, especially Aerospace Material Specification AMS 4291G. Part is as structurally/mechanically strong as the machined from solid #6061 Armrest. Due to critical weight requirements, the casting could not exceed the weight of the previously made from solid Armrest. In the end and after extensive engineering design and analysis, the part met all requirements, yet only weighed 8.28 lbs. as compared to the original part weighing 9.35 lbs. Reduced the cost of the component by 85%, when compared to the original machined from extrusion part.

Die Caster’s Comments: Pseudo structural component. New application in the aerospace market.
ALUMINUM DIE CASTING
OVER 10 LBS

Caster:  Pace
1600 7th Avenue
Grafton, WI 53024

Caster Award Nominees:  Tim Kaderabek

Customer:  Kohler Enginers
ALUMINUM DIE CASTING OVER 10 LBS

**Part:** 824 Crankcase  
**Material:** A380  
**Weight:** 28.2 lbs  
**End Market:** Crankcase, Small Engines

**Challenge/Method Used to Produce:** New design product. Engine requires superior air cooling.

**Solutions/Advantages:** Casting utilized jet cooling and cast in liner. Was able to extend fin length for air cooling/engine reliability.

**Die Caster’s Comments:** Excellent use of new technology to create a quality part.
ALUMINUM DIE CASTING
STRUCTURAL

Caster: Fiat Chrysler Automobiles Canada
15 Browns Line
Toronto, ON M8W3S3, Canada

Caster Award Nominees: Jerry Peterson

Customer: Fiat Chrysler Automobiles
Part: Structural Front Crossmember  
Material: Silafont-36  
Weight: 15.7 lbs  
End Market: Structural front crossmember of D-segment SUV and Sedan

Challenge/Method Used to Produce: Was a stamped/welded assembly.

Solutions/Advantages: Reduced a multiple component assembly to a single casting. Improved corrosion resistance. Material properties improved the vehicle ride dynamics.

Die Caster’s Comments: Replaces stamp/welded part. Great example of structural die casting to help promote use of structural die castings.
ALUMINUM DIE CASTING
UNDER 1 LB

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

Caster Award Nominees: Chicago White Metal Casting Engineering Team

Customer: Confidential
Part: Main Print Frame  
Material: A380  
Weight: 0.995 lbs  
End Market: Main vertical support for a 3D printer unit

Challenge/Method Used to Produce: Previously an 8-part CNC hogout assembly.

Solutions/Advantages: An 8-part CNC hogout assembly was unified into a single casting, resulting in tremendous cost savings for the customer from eliminating assembly and excessive machining processes. An 88% part price reduction was a direct result of this change, which is a considerable amount being saved per year. The Challenge of this part is that a flatness of .002” is required across both x and y planes on a “picture frame” style part that measures 12” x 10”.

Die Caster’s Comments: Replace 8 piece CNC hog-out assembly. Piece price reduction of 88%.
MAGNESIUM DIE CASTING
OVER .5 LB

Caster: Pace
310 Congress Street West
Maple Lake, MN 55358

Caster Award Nominees: Jim Hegland

Customer: Superpedestrian
MAGNESIUM DIE CASTING
OVER .5 LB

Part: Multispeed Wheel
Material: AZ91D
Weight: 3.11 lbs
End Market: Hub and Enclosure

Challenge/Method Used to Produce: New product.

Solutions/Advantages: Magnesium allowed customer to maintain a low weight along with a highly cosmetic, rugged design. Use of a die casting for a new product increases the likeliness that similar products will utilize die castings.

Die Caster’s Comments: New product market application. Utilizes excellent tolerance control for fit between pieces.
Caster: Phillips - Medisize
2930 Mondovi Road
Eau Claire, WI 54701

Caster Award Nominees: Brad Kabes

Customer: IDEXX Laboratories
**Part:** Normalizer Plate  
**Material:** AZ91D  
**Weight:** 0.2 lbs  
**End Market:** Medical Chemistry Instrument

**Challenge/Method Used to Produce:** Previous similar version of such a part were made from stamped sheet metal and plastic injection molding.

**Solutions/Advantages:** Die casting provided decreased part cost, ability to create complex shapes/features, and precise repeatability of feature size. Overall flatness of part, strength of part, resistance to long-term creep of part, and thermal properties of part were additional advantages of the die casting process.

**Die Caster’s Comments:** Very thin wall and flat over large area. Replaces stamped sheet metal and plastic molded parts.
ZINC DIE CASTING UNDER 6 OZ

Caster: Lakeside Casting Solutions
#2 Lakeside Drive
Monroe City, MO 63456

Caster Award Nominees: Ron Burditt

Customer: Tether Technologies
Part: Pawl  
Material: Zinc 5  
Weight: 0.048 lbs  
End Market: Key Tether Belt Unit  

Challenge/Method Used to Produce: Critical to design and manufacture a small, intricate, but very strong part to satisfy the strength requirements of the part in very little space. Alternatives would have either yielded a larger overall product or a weaker and less robust solution, neither of which was an option.

Solutions/Advantages: The cavity die designed to run in a 4 slide casting machine, capable of producing 25 pawls per minute. The tight dimensional tolerance on the pivot shaft and spring slot width are cast net shape with no machining. 4 slide zinc die casting is the only process known to offer both dimensional capability and efficiency to produce this part.

Die Caster’s Comments: Unique application of zinc die casting.
ZINC DIE CASTING
DECORATIVE

Caster: Wilkast
8025 S. Division Avenue
Grand Rapids, MI 49548

Caster Award Nominees: Ron Holland

Customer: Harley-Davidson Motorcycle
Part: Upper Clamp
Material: ZA8
Weight: 1.99 lbs
End Market: Mount the Handlebar assembly in position

Challenge/Method Used to Produce: This is a new product design application. Highly visible location for casting. Must not have any visible imperfections.

Solutions/Advantages: The exceptionally high cosmetic standards are achieved by maintaining rigid process controls throughout the entire manufacturing process. Any surface imperfections would be magnified during plating or painting processes.

Die Caster’s Comments: Quality of casting highly visible on final product. Perfect example of excellent surface finish.