

2020 Die-Casting Competition: prizes for innovative aluminium die-castings

Nuremberg, 14 January 2020 - The winners of the International Aluminium Die-Casting Award 2020 have been announced. In all, four castings were awarded prizes at EUROGUSS 2020 in Nuremberg, while two others received special commendations. The ninth International Aluminium Die-Casting Competition was organised by Düsseldorf-based Gesamtverband der Aluminiumindustrie e. V. (GDA). It was run in partnership with the German Foundrymen's Association (Bundesverband der Deutschen Gießerei-Industrie, BDG), the Swiss aluminium association (alu.ch) and the non-ferrous metals trade association of the Austrian Economic Chambers (Fachverband Nichteisenmetalle in der Wirtschaftskammer Österreich).

Die-casting has been a successful industrial casting process for series or mass production of structural parts for decades. Die-casting foundries have become increasingly important as suppliers to automobile manufacturers, companies engaged in mechanical and plant engineering and other branches of industry, such as communications technology, the furniture industry and the electrical and electronics industries. The development of ever-newer die-cast components is advancing rapidly. Whether it be structural elements, parts for electric cars or intelligent components for conventional vehicles, attempts are being made everywhere to make use of the outstanding options that die-casting has to offer. Together with machine manufacturers, alloy suppliers and processing companies, die-casters are constantly pushing forward the limits of the process by means of innovations. It is remarkable what innovative solutions and components have been developed.

The International Aluminium Die-Casting Competition has been a successful platform for demonstrating the high standard of quality of aluminium die-casting for many years. The aim of the competition is to increase interest in the versatile material aluminium and to highlight innovative areas of use. The criteria for evaluating the castings submitted to the International Aluminium Die-Casting Competition 2020 were compatibility with the die-casting process and the resource-efficiency of the design.

A jury of experts from research and practice awarded prizes to the following six entries.

The winners are:

1st Prize: Oil-coolant module

Hengst SE, Nordwalde, Germany

Alloy: AlSi9Cu3(Fe)

Weight: 8 655 g

Dimensions: L 443 mm, W 340 mm, H 195 mm

The first prize is being awarded for the consistent development methodology used from the design of the casting via the tool design through to the casting process, and which clearly has

no taboos and is aimed at achieving optimum results. Decisive aspects were the complex geometry, with inner slides and the smallest possible demoulding drafts and low tolerances, which at the same time meets the most exacting demands for pressure tightness. The intensive tempering using all technical means available is particularly impressive.

2nd Prize: Housing for HV booster

Druckguss Westfalen GmbH & Co. KG, Geseke, Germany

Alloy: EN AC-ALSi10MnMg

Weight: 2 785 g

Dimensions: L 344 mm, W 365 mm, H 176 mm

The winner of the second prize is a die-casting with a large number of integrated functions that is subject to the most stringent sealing requirements because it has water-conducting cooling zones arranged next to zones with electricity at high voltage. Despite the thin wall thicknesses, high stiffness and dimensional accuracy were achieved using stiffening ribs. The low-copper aluminium alloy used ensures the part has high corrosion resistance and strength in the as-cast condition.

3rd Prize: Upper part of housing for dual-channel EBS

Alupress AG, Brixen, Italy

Alloy: EN AC-47100

Weight: 780 g

Dimensions: L 193 mm, W 98 mm, H 98 mm

The winner here is a die-casting that must comply with stringent safety requirements. The aluminium die-casting has won through against injection-moulded plastic parts thanks to dimensional accuracy, with the smallest of tolerances and minimum radii, impermeability and the good finish of the as-cast sealing surface. Remarkably, the as-cast part is ready for assembly. The innovative and efficient tempering system with additively manufactured mould segments was also rated highly.

3rd Prize: Battery housing

Nemak Slovakia s.r.o., Žiar nad Hronom, Slovakia

Alloy: AlSi9Mn (non-heat-treatable alloy)

Weight: 15,900 g, Casting with extruded baseplate: 38 000 g

Dimensions: L 1 045 mm, W 753 mm, H 218 mm

Another third prize is going to a hybrid battery housing cast on a 4400 tonne machine using a complex 3-platen tool with four outer slides and a vacuum die-casting process. The casting is joined by friction stir welding to three extruded profiles that form the base of the housing. This provides the best possible guarantee of adherence to the stringent tightness requirements (helium tightness test). The use of a non-heat-treatable alloy eliminates the need for thermal treatment.

Special Commendation: Housing components for electric-vehicle control device

Alupress AG, Brixen, Italy

Alloy: AISi12(Fe)a

Weight: 1 450 g

Dimensions: L 350 mm, W 175 mm, H 70 mm

This casting is receiving a special commendation for the savings of up to 30% on installation space and weight that result from the integration of a large number of functions. The casting has an intelligent liquid cooling system with a laser-welded housing cover. From a design point of view, this meant adapting the original design and reducing the mass locally. A significant reduction in cycle time could be achieved by the use of laser welding for joining. Furthermore, the overall concept provided a cost-effective solution.

Special Commendation: String inverter

FBL Pressofusioni srl, Vobarno, Italy

Alloy: EN AC-46000

Dimensions Inner parts (2)

L 533 mm, W 386 mm, H 266 mm

Weight: 9 700 g / 9 600 g

Dimensions Outer parts (2)

L 705 x / 704 mm, W 527 x / 527 mm, H 150 / 150 mm

Weight: 12 000 g / 7 000 g

A four-piece string inverter with a large number of integrated functions and mounting options for the internal electrical components is also receiving a special commendation. The castings are characterised by deep ribs to cool the housing. The consistent method of developing the casting system with the aim of reducing porosity or distributing it to a non-critical area is also highly commendable.

The award-winning castings will be exhibited at EUROGUSS 2020 (14-16 January 2020) outside the venue for the Die Casting Congress (NCC Ost) and will also be on show this year at the ALUMINIUM trade fair in Düsseldorf (6-8 October 2020, Hall 13, Stand D49).

Link for downloading images:

http://www.aluinfo.de/download_DGW_2020/Druckgusswettbewerb_2020_Bilder.zip

Hashtag: #aluguss20

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