

The environment surrounding the world, the change to Electric Vehicles and the impact on die casting industry

Session Chairperson : Nano-cast corporation Masao Kikuchi

Special lecture 1

Recent environmental regulations (mainly on EV regulation) in major countries and its impact for the die-casting industry

Nomura Research Institute Shoichiro Hara

I explain the automobile production volume (including the ratio of engine / xEV) in major countries and the new law or regulation centering for the EV. Furthermore, I will try to estimate the influence on the die casting industry by EV regulation. The worldwide production volume is growing with the market expansion of developing countries. It will be 100 million. The production volume of engine is the much higher than xEV now in the global environmental issue. However, EV regulations launched from European countries are spreading globally, including developing countries. I will try to estimate the influence on the die casting industry.

Special lecture 2

Automobile trends and Needs for Die Casting. Things to be mastered, changed and added accompanying automobile electrification

TOYOTA MORTOR CORPORATION Hidehiko Kadono

Automobile industries have been facing to the critical transition period once in 100 years because of electrified and self-driving cars. Diversity, safety and conformability in automobiles has been more and more necessary to be suitable for living environments in each country and supply the freedom of movement and the richness of life for more people. Light metal die casting has flexibility for product design, which has been contributed to lightweighting and stiffness improvement (NV enhancement) on powertrain units and vehicle as alternatives of iron structural components. Moreover, applying light metal components has been widely expected more than ever because battery weight will be added to vehicle weight with the transition to electrified cars. In this presentation, we consider added-value contributing future cars which die casting process will be able to give, while the other processes and materials such as Carbon Fiber Reinforcement Plastics (CFRP) has been widely adapted with overcoming the conventional difficulties.

Special lecture 3

Changes to Electric Vehicles and Expectations for Die Casting Technology

Nissan Motor Co., Ltd. Dr. Eng. Hiroshi Kambe

In order to solve global environmental problems, changes to electric vehicles are rapidly progressing. Many of die castings for automobile parts are applied to parts of engines and transmissions, so if they are replaced by electric motors, the impact on the die casting industry will be great. In addition, weight reduction of automobiles is also an important issue for improving fuel economy, and it is also required to apply die casting to parts that have not been used so far, contributing to weight reduction. In die casting process, it is possible to produce lightweight parts in large quantities at low cost, but many parts have not been applied in terms of performance and cost. In the future, it is important to apply it to parts that have not been applied conventionally or newly set parts by raising the characteristics of die casting. In this report, I will describe die casting technology required for future automotive parts application.

TECHNICAL PAPER PRESENTATION 11/8 (Thursday) **First venue F203~F206** ※ Auditing charge

Session Chairperson

Kyusyu Institute of Technology
Dr. Masahiko Hihara



JD18-1

Improving die life by PVD coating

Oerlikon Nihon Balzers Coating Co., Ltd.

● Takashi Osaki, Shigeo Fukui

With a growing need of automotive lightening, there is a great demand for Al die cast parts which is lighter and with high dimensional accuracy, as an alternative to steel parts. In order to improve the price competitiveness of Al die cast parts and increase its productivity, reducing the downtime and maintenance time by improving mold life-span is needed. The factors contributing to shortening mold life include seizure, heat check and erosion. We have been receiving a high valuation of BALINIT® LUMENA and

BALINIT® ALCRONA MODIFY, the coating technologies which realize longer lives of mold components, such as core-pin and insert. We are now presenting the achievements by applying our new coating procedure, BALINIT® FORMERA, which enables further life extension.

JD18-2

Characterization of Al₂O₃ coating prepared by plasma-enhance chemical vapor deposition

Oriental Engineering. Co., Ltd.

● Dr. Kazuki Kawata, Toru Kidach, Motoshi Komatsu,
Yuta Seino

Aluminum oxide (Al₂O₃) coatings were prepared on steel specimens using pulsed d.c. plasma-enhanced chemical vapor