

Can a die casting machine predict energy consumption?

Finally, the feasibility and reliability of the proposed energy consumption prediction approach are verified with the help of three die casting machines and six types of products. The results show that the prediction accuracy of production time and energy consumption reached 91.64% and 85.55%, respectively.

Is die casting energy efficient?

Discussions Die casting is an energy-intensive process that has prompted energy efficiency evaluation toward achieving greener, more sustainable manufacturing processes. However, the complex production conditions require even higher real-time and dynamic performance of energy efficiency evaluation.

What is Overall Equipment Effectiveness (OEE) of die casting unit?

Overall equipment effectiveness (OEE) of die casting unit is the main indicator used in equipment management and energy efficiency evaluation and reflects the overall efficiency of equipment as well as the proportion of time or energy available to create value.

How effective is a die casting workshop?

To verify the effectiveness of the proposed approach, a case study of a die casting workshop was performed. The main results are as follows: 1) The OEE and energy utilization ratio of die casting units were increased by 3% and 7%, respectively; 2) Energy consumption per kilogram of die casting workshop was reduced by 7.9%.

How to reduce energy consumption in a die casting workshop?

Two approaches to minimize energy consumption in the die casting workshop were considered: 1) Management methods, such as production scheduling optimization, and logistics management, can be applied in die casting workshops; 2) Selecting more energy-efficient equipment or eliminating/improving the energy-intensive equipment.

Is die casting a high-energy consumption process?

For high-energy consumption processes like die casting, modeling their energy consumption is complex, time-consuming, and challenging. Specifically, aluminum casting has experienced continuous growth (Das and Yin 2007; Heinemann 2016) and dominates the nonferrous sector in general, comprising 78% of total nonferrous shipments (Rosen and Lee 2009).

This research collected energy consumption data for die-casting processes at a typical die-casting workshop with two casting machines. Each machine was designed to produce two product types with corresponding types of dies equipped. They are automatic, middle-sized, horizontal cold chamber die-casting machines using electricity as their power ...

Die-casting machine is an important basic technical equipment in die-casting production, which has a direct impact on the quality, production efficiency, operating cost, labor intensity, environment, and hygiene of

die-casting parts. ...

This is a new concept die casting machine that meets any needs, including energy saving and sophisticated functions. UH series catalog. 2-platen hybrid clamping system. ... Larger cast parts can be produced with smaller ...

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Advantages of integrated die casting. The key aspect of integrated die casting is that it replaces the stamping and robotic welding stages with a single large die casting machine, thus driving a revolution in car body ...

In the work presented by Watkins et al. [3], the die casting process was divided into die preparation, clamping, injection, cooling, and ejection stage, and a theoretical energy consumption model of the die casting machine was proposed, which can support energy efficiency evaluation of different stages.

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Technology group Bühler has recently completed the construction of the largest clamp-end locking force die-casting machine ever built at its North America facility. The Carat 610, the first megacasting machine and clamp-end ...

In order to solve this problem, energy storage technology came into being. Energy storage technology refers to storing energy so that it can be released when needed to meet the needs of the power system. As an important industrial equipment, the die-casting machine's research on efficient energy storage technology in the field of new energy has ...

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To accurately describe and analyze the energy efficiency level of the die casting workshop, the energy score with different levels (die casting unit level, production line level, and workshop level) is calculated as $(15) u_{bm} = E_p / E_{bm} \times 100$ where u_{bm} represents energy score, E_p denotes the actual ECPK of the die casting unit ...

Some die casting machines utilize a pneumatic or hydraulic actuator to fill die molds, and the accompanying

pneumatic/hydraulic components are necessary. ... Alternative & Renewable Energy Automation Technology Automotive ...

The effective storage of nitrogen energy in a die casting machine is influenced by multiple parameters. Accumulators come in various designs and sizes, impacting the overall ...

Molten metal processing is inherently energy intensive and roughly 25% of the cost of die-cast products can be traced to some form of energy consumption [1]. The obvious major ...

The largest die casting machines in the Carat series are as big as a house. ... The Roth family company is also a world market leader in the segments of energy storage systems, composite technologies and surface heating and ...

What is high-pressure die casting? High-pressure die casting is a process wherein molten metal is forced, under pressure, into a sealed mould cavity. It is held in place by a powerful compressive power (true die installed in hydraulics ...

Albertini die casting machines make use of the latest technological solutions and parts. New design, materials, processing techniques and treatment contribute to guaranteeing long durability of every single part and, consequently, of the ...

Nitrogen energy storage for die casting machine in the unlimited area of innovation and creativity for an enterprise. YIZUMI inherits the technical genes of HPM, a century-old In addition, the chamber capacity and installation size of the die-casting machine also meet the requirements.

Die casting machines, widely used in manufacturing industry, consume a significant amount of energy. To reduce energy consumption, the primary task is to accurately characterize and evaluate the ...

This research collected energy consumption data for die-casting processes at a typical die-casting workshop with two casting machines. Each machine was designed to ...

In order to calculate the total cost of making a die casting, the following costs should be taken into account: utilities (energy, gas, water), materials, pressure die, depreciation of the die casting machine, configuration of equipment and die casting, tests (chemical composition, dimensional accuracy, RTG/CT, strength, tightness, structure, etc.), finishing, storage and ...

displayed in the form and shape that it is expected to be in after exiting the die cast machine. Environmental Factors Safety is a major issue in die casting operations due to the extreme heat and emissions that are generated during the casting process. Robots are used primarily to avoid humans from being exposed to this dangerous environ-ment.

Effective energy management can not only significantly reduce production costs, but also improve the sustainable development capacity of enterprises. We will explore in depth energy saving ...

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Energy storage technology refers to storing energy so that it can be released when needed to meet the needs of the power system. As an important industrial equipment, the die-casting ...

There are several possibilities to optimize or adapt the casting process steps to increase energy efficiency and reduce energy consumption. Some research was done on evaluating energy efficiency improvements in the die casting process using cloud computing and an Internet of Things approach. The results showed that with the mentioned

Spine Die-casting Machine Application: Used for die-casting the spines for positive plates Composition: Die-casting machine, mould, shearing machine Performance & Features * It mainly uses hydraulic controlled die ...

Let's first review the advantages of die casting in zinc. At room temperature, zinc die casting alloys have the highest yield, hardness, impact strength, elongation, thermal and electrical conductivity of all the die casting alloys. These mechanical properties make zinc alloys an excellent choice for products across a wide spectrum of end uses.

This paper divides the die casting workshop into die casting machine level, die casting task level, and die casting workshop level and it proposes an energy monitoring and ...

Fraunhofer IFAM has been working on electromobility and the casting of electric drive components since 2008. The focus is on the development and testing of new casting concepts and design methods for electric motor castings. The ...

In such shaft furnaces typical die casting alloys, such as 226, 230, 231 and 239, can be melted with a high metal yield and a metallurgical quality that easily meets the specifications of the operators. Hence this furnace type ...

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