



REDUCE COSTS WITH GRAVITY CASTING

6 ECONOMIC ADVANTAGES OF GRAVITY CASTING
OVER SAND CASTING

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INTRODUCTION

Gravity casting, also known as **permanent mold casting**, offers numerous advantages over sand casting, including **significant cost reduction**.

In this white paper, we will **explore the main factors** that contribute to making **gravity casting** a more economical choice for the production of **aluminum components**.



GRAVITY CASTING

The molten metal is poured into a pre-heated permanent mold using gravity.

It is suitable for the production of **complex** and **precise components** with excellent surface quality



VS

SAND CASTING

The molten metal is poured into a sand mold prepared manually or mechanically.

It is used for the production of less complex and precise components with a lower surface quality



ECONOMIC ADVANTAGES

LOWER MATERIAL COSTS

Up to
50%

**less material
costs compared to
Sand Casting**

One of the main advantages of gravity casting is the use of reusable molds.

Unlike sand casting, which requires new sand molds for each production cycle, gravity casting molds can be used multiple times, significantly reducing material costs.

Studies show that reusable molds can cut material costs by up to 50%.



ECONOMIC ADVANTAGES

FASTER PAYBACK PERIOD

12

**months of
payback
period**

The investment in gravity casting molds typically pays for itself within a year of production commencement.

This quick return on investment (ROI) makes gravity casting a financially attractive option. Companies often see a payback period of less than **12 months**.



ECONOMIC ADVANTAGES

HIGHER PRODUCTION EFFICIENCY

40%

**more production
efficiency**

Gravity casting allows for faster production due to the use of permanent molds that require less preparation time compared to sand molds.

This results in increased productivity and reduced labor costs. Research indicates that gravity casting can improve production efficiency by **up to 40%**.



ECONOMIC ADVANTAGES

REDUCED MAINTENANCE COSTS

Up to
40%

**less maintenance
costs compared to
Sand Casting**

Gravity casting molds are generally more durable and require less maintenance compared to sand molds, which can deteriorate quickly and need frequent replacements.

This contributes to lower operational costs in the long term. Companies report that maintenance costs can be **reduced by up to 30%** with gravity casting.



ECONOMIC ADVANTAGES

LOWER SCRAP COSTS

25%

**less scrap
costs**

Gravity casting produces components with tighter tolerances and better surface quality, reducing the need for rework and minimizing scrap.

This leads to additional savings in production costs.

Scrap rates can be reduced by up to 25% with gravity casting.



ENVIRONMENTAL ADVANTAGES

LOWER ENERGY CONSUMPTION

50%

**less energy
than Sand
Casting**

To produce the same quantity of aluminum alloy components, Gravity Casting consumes up to 50% less energy than Sand Casting.

Lower energy consumption helps reduce greenhouse gas emissions and the impact on climate change, which is particularly important in the energy-intensive aluminum smelting sector.

If a company consumes 1,000,000 kWh of energy per year for the casting of aluminum alloys, switching to Gravity Casting could reduce its energy consumption by 500,000 kWh per year, a significant saving in environmental and economic terms.

CONCLUSIONS

Gravity casting offers numerous economic advantages over sand casting, including lower material costs, higher production efficiency, reduced maintenance costs, lower scrap costs, and reduced energy consumption.

These factors make gravity casting a more cost-effective and sustainable choice for producing aluminum components.





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