

EXECUTIVE SUMMARY



EQUIPMENT (Basic Machine)

1. Integrated melting and casting unit
2. Touch screen PLC control
3. Compact equipment footprint for easy transport and installation
4. Low capital, tooling and running costs
5. Minimal cover gas consumption
6. Thermally efficient electrical resistance heating

TECHNICAL SPECIFICATIONS

1. Power requirement 150kw
2. Furnace holding capacity 500kgs
3. Melt rate — pre heated ingots @ 150/200°C = 150kg/hour
4. Cover gas consumption and type CO₂@ 3.76kg/hour
5. SF₆ @ 0.05kg/hour
6. Die size (typical) Between columns: 1200 mm x 1200 mm
7. Open height: 1400 mm
8. Stroke max: 1000mm minimum daylight: 480mm
9. Die Cooling circuits (1 water, 3 air)

FEATURES (Basic Machine)

1. Tooling and running costs are low and comparable to gravity or low-pressure permanent mould casting of aluminium
2. Components can also be made to produce internally complex shapes using silica sand cores and standard binders
3. Final cycle times achieved using the T-Mag process largely depend on the part and tooling design. ie; typical cycle time for 19" motorcycle wheel with hollow spokes and centre is 3 minutes.
4. The basic T-Mag machine requires a dedicated operator. It is anticipated that ingot charging, casting take-out and core placements can be automated.
5. The basic machine will produce high quality production size parts up to 15kg in weight.
6. Die life will be improved compared to aluminium permanent mould process (lower embodied heat and much lower dissolution rate of iron in magnesium)
7. Die fills by gravity rather than by applied pressure

KEY BENEFITS

1. High-yield, typically 95%, which reduces recycling costs and maximizes productivity
2. High-integrity, heat treatable and weldable castings
3. Medium to large production quantities for a wide range of products in the automotive and other industries

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ATTRIBUTE	MAGNESIUM CASTING PROCESSES				
	SAND CASTING	GRAVITY PM CASTING	<i>T-Mag</i> *	LOW PRESSURE PM CASTING	HIGH PRESSURE DIE CASTING
Castable Surface Detail	Low	Medium	Medium	Medium	High
Sand Cores for Hollow Features	Yes	Yes	Yes	Yes	No
Tooling Cost	Low	Medium	Medium	Medium	High
Potential Casting Soundness	High	High	High	High	Low
Heat Treatable Castings	Yes	Yes	Yes	Yes	No
Weldable Castings	Yes	Yes	Yes	Yes	No
Casting Yield %	50% Typical	60% Typical	90% Typical	90% Typical	90% Typical
Plant Cost	Low	Low	Medium	Medium / High	High
Cover Gas Management	Difficult	Difficult	Easy	Difficult	Easy