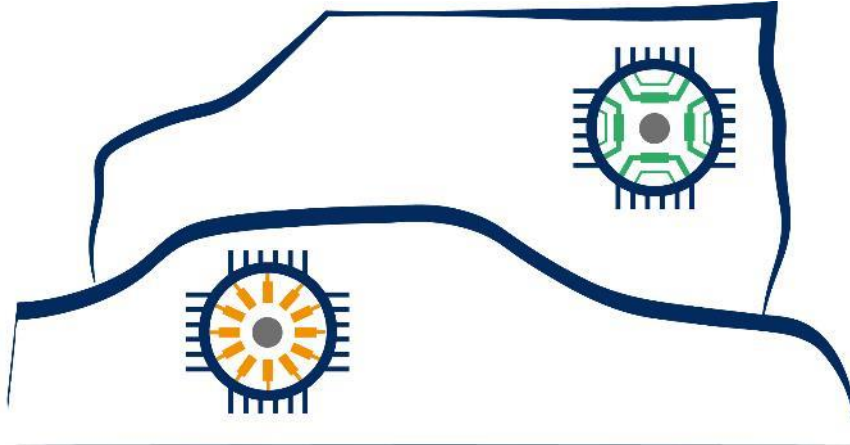




Rare Earth Free e-Drives Featuring Low Cost Manufacturing



ReFreeDrive

Collaborative Project

Grant Agreement Number 770143

Start date of the project: 1st October 2017, Duration: 36 months

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Work Package no.: 6
Title of the WP: Prototypes Manufacturing
Deliverable no.: 6.1
Title of the deliverable: Induction Machine with Die-Casted Copper Rotor for 75kW of operation

Contractual Date of Delivery:	29/02/2020
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Lead contractor for this deliverable:	TECNOMATIC
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Work package contributing to the deliverable:	WP6
Nature:	Report (Confidential)
Version:	0.7



ReFreeDrive



EXECUTIVE SUMMARY

The present deliverable D6.1 provides an overview on the manufacturing activities of the Induction Machine (IM) for 75 kW power with Die Casted Copper Rotor for the ReFreeDrive Project, based on the design accomplished within the Work Package 3 (WP3). The prototype of said Induction Machine is shown in Figure 1. Due to the decision taken in WP3, this Machine is identical to the Induction Machine for 200 kW power with Die Casted Copper Rotor. Therefore, the corresponding deliverable, D6.5, is substantially equal to the present one.

Rotor and stator winding assemblies, manufactured and qualified according to the machine design specifications (reported in WP3 deliverable D3.4), are shown in sections **¡Error! No se encuentra el origen de la referencia.** and **¡Error! No se encuentra el origen de la referencia.**. The last section concerns the machine assembly and functional testing steps.

The manufacturing goals were fulfilled with a large deviation in time, which is in major part attributable to the stops of the productions activities, due to the Covid-19 pandemic. The time delay causes the postponement of the dynamic testing activities, related to WP7 deliverable D7.1.



Figure 1 RFD Induction Machine complete assembly.

The main objective of WP6, task 6.1, is to manufacture an Induction Machine with continuous power target 75 kW, applying copper die-casting for the rotor cage manufacturing. In particular, the main goals of deliverable D6.1 consisted in:

- Stator and rotor cores manufacturing by laser-cut
- Rotor active parts manufacturing by Copper Die Cast
- Stator winding manufacturing with hairpin winding



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- Manufacturing of stator and rotor cooling system
 - Manufacturing of a junction box from the hairpin winding leads to the inverter bus-bars
 - Final assembly