

# Case Study

## Tone Wheel



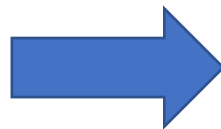
**Material:** Ferrophosphorus material  
for magnetic properties

**Process:** Warm Compaction

**UTS:** 380 MPa

### Previous Process:

Mold to 6.8g/cc  
Sinter  
Machine  
Resin impregnate  
Oil Leak Test



### New Process:

Mold to 7.1g/cc minimum with Warm  
Compaction  
Sinter  
Machine

### Benefit:

Warm Compaction with increased density eliminates the possibility of interconnected porosity and therefore, it also eliminates the need for resin impregnation or leak check.



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## Carrier Assembly



**Material:** Iron Copper Mix

**Process:** Warm Compaction  
with Sinterbrazing

**UTS:** 600 MPa

### Previous Process:

Mold Grey Iron Casting  
Machine top and bottom  
surfaces, inside top  
and bottom, outer  
spline, and mill holes.



### New Process:

Mold Spider with Warm Compaction  
Mold Flange  
Sinterbraze with copper infiltration  
Machine top face, bearing surface, and  
mill holes

### Benefit:

Warm Compaction provides high strength and the brazing of two components molded from powdered metal eliminates the need for much of the machining for a cost savings.



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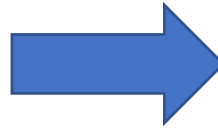
## Sleeve



**Material:** High Alloy Mix  
**Process:** Warm Compaction,  
Elevated Temperature Sinter  
**UTS:** 1560 MPa

### Previous Process:

Mold Forging  
Machine OD, Length, Groove.  
Machine ID Spline  
Machine Top Spline



### New Process:

Mold Part with Warm Compaction for  
High Density on Top Spline.  
Sinter with Elevated Temperature  
Machine Groove

### Benefit:

Molding by Warm Compaction to an extremely high density of 7.4 minimum provides high strength and meets the very high tensile strength requirements at the top of the teeth in the top spline. Elevated temperature sintering produces a pore rounding in the microstructure that provides added strength to the part and the teeth. The only machining required is the OD groove, resulting in an overall cost savings.