

# Product Specifications Tentative Schedule

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## Group 1

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**Product Specifications**

After a secondary meeting with Danfoss – Turbocor most of the initial needs were able to be more refined. For organizational purposes the specifications will be divided into several categories: Fluid Properties, Shafting, Labyrinth Seal Sizes, and Measurements.

### **Fluid Properties:**

In reality the labyrinth seals will have R134A flowing through them. However due to cost as well as environmental issues the test rig will be using air. To get the best representation of leakage, we will determine the conditions of the air flow by matching the two fluid's Reynolds numbers. Unfortunately Turbocor has yet to send the conditions experienced by the refrigerant inside the seals so no numbers have not been calculated as of yet. Turbocor has said that the seal conditions will be made available by the end of this week (September 29<sup>th</sup> 2008).

### **Shafting:**

The shaft should be spinning at approximately 10,000 rpm, as requested by Turbocor. Also the outer diameter of the shaft is offset from the seal at a distance of 0.1125 mm when it is exactly centered. Since the test rig is going to be scaled up, the shaft - seal offset will be increased proportionally to this distance. It has been requested that the concentricity of the shaft be able to be varied. The test rig will be designed so that it can run with the shaft centered, and at 20%, 40%, 60% and 80% off center based on the seal size.

### **Labyrinth Seal Size:**

The test rig must be able to be used with varying seal designs. At the present time Turbocor has yet to supply the seal diameters and lengths. These dimensions should also be available by the end of the week (September 29, 2008). It is known that the physical length of the seals will vary based on the design. The seal diameter and teeth sizes will be increased proportionally based on the given designs given by Turbocor. The length of the seals is not going to increase.

**Measurements:**

To determine the best seal design the amount of air that is getting through the labyrinth seal needs to be measured. There are several possible methods to do this. At the present the two most favored measurement devices are pitot static probes and mass flow meters. The decision for the best measurement type will be made based on the final design and which device best fits it.