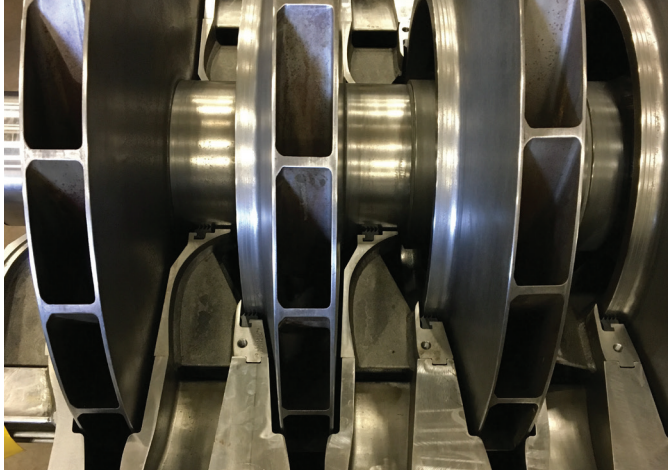


RULES OF THUMB - LABYRINTH SEALS

By Neal Wikert



Labyrinth Seals

Clearance is a strong factor in labyrinth seal performance. Most calculation techniques assume leakage is proportional to clearance cubed. That is, if you double your clearance your leakage will go up by a factor of 8!

A good rule of thumb for labyrinth seals is to set the radial seal clearance at .001" per inch of shaft diameter for spring-backed seals. Also, set a minimum radial clearance at 1 ½ times the bearing clearance to avoid rotor dynamic problems.

Labyrinth seals can be subjected to a pressure differential of 4-6 times that of a carbon ring seal with no shaft speed limitations. Carbon ring seals are generally limited to a fifteen (15) pound drop across the seal and to a shaft speed of less than 200 feet per second.

A stepped labyrinth can reduce leakage by up to 30% over a straight labyrinth.

Labyrinth seals in steam turbines cannot be made from aluminum, as the steam will attack the aluminum. Labyrinth seals in the bearing housings are often made from aluminum.

Labyrinth seals in ammonia service cannot be made from bronze material.

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