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54 **Rotor vanes.**

57 Rotor vanes for a rotor compressor are injection moulded of a composition comprising polymer and lubricant and a defined proportion of carbon fibre.

Description

ROTOR VANES

The invention relates to a rotor compressor of the type having movable vanes located in sockets in the rotor, the rotor being housed in a chamber having an inlet port for refrigerant gas to be drawn into the chamber and an outlet port spaced from the inlet port for discharge of the gas, the vanes defining between the inlet and the outlet at least one suction cell and at least one compression cell. Such compressors are exemplified by the disclosure of US patent 4049410.

It is known to make the vanes by injection moulding a composition comprising a polymer, a reinforcing carbon fibre and a lubricant. It has now been discovered that if the content of carbon fibre is kept within defined limits certain benefits result.

According to one aspect of the invention there is provided a rotary compressor comprising a housing including a chamber housing a rotor having rotor vanes, an inlet port and an outlet port being present in the wall of the chamber, the rotor vanes being located in sockets radially spaced about the rotor, the vanes being movable in their sockets and having been injection moulded of a composition comprising a mouldable plastics, carbon fibre and lubricant, characterised in that the composition of which the vanes are moulded comprises from about 22 to about 32 per cent by weight of carbon fibre.

Our evaluations have shown that to achieve a satisfactory combination of ease of moulding of the composition in manufacture and performance of the vanes in service, it is necessary to proportion the quantity of carbon fibre content in the specified range. Particular factors to be considered in service, especially at the tip of the blade, are wear, susceptibility to friction and degradation. Strength, mechanical stability and weight are also important, especially for the body of the blade. Cost is also a factor. By controlling the content of carbon fibre and also of the lubricant (as indicated below), the desired properties are achieved. More specifically, if the content of carbon fibre falls below the minimum level specified, the blade strength is reduced below an acceptable level. If the content exceeds the upper limit, the wear rate on the rotor and compressor profile increases to unacceptable levels. If the carbon fibre content is kept within the limits specified, the vanes have a long wear resistant life without breakage.

Preferably the carbon fibres are randomly oriented in the moulding composition.

The lubricant is preferably polytetrafluoroethylene and the content thereof ranges from about 5 to about 12 per cent by weight of the composition.

If the polytetrafluoroethylene content exceeds the upper limit, then the lubricant promotes excessive creep of the blade material on the high pressure reaction surfaces of the blades such as the trailing edge in proximity to the corner of the rotor slot and leads to premature failure.

The invention includes rotor vanes per se. The vanes may take any known shape and will usually

have a rectangular body and may include grooves on one side.

Claims

1. A rotary compressor comprising a housing including a chamber housing a rotor having rotor vanes, an inlet port and an outlet port being present in the wall of the chamber, the rotor vanes being located in sockets radially spaced about the rotor, the vanes being movable in their sockets and having been injection moulded of a composition comprising a mouldable plastics, carbon fibre and lubricant, characterised in that the composition of which the vanes are moulded comprises from about 22 to about 32 per cent by weight of carbon fibre.

2. A compressor according to Claim 1 characterised in that the carbon fibres are randomly oriented.

3. A compressor according to Claim 1 or 2 characterised in that the lubricant is polytetrafluoroethylene in a proportion of about 5 to about 12 per cent by weight of the composition.

4. A compressor according to any preceding Claim characterised in that the polymer is a linear aromatic polymer.

5. A rotor blade comprising a rectangular body adapted to be received at least in part in a socket therefor in a rotor, the blade having been injection moulded of a composition comprising a mouldable pastics, carbon fibre and lubricant, characterised in that the composition of which the blade is moulded includes from about 22 to about 32 per cent by weight of carbon fibre.