

CPI Packing Cases FAQ

What is the main function of the packing case?

The main function of a packing case is to act as housing for the free-floating packing rings (seals). The packing case is sealed by a gasket with the compressor cylinder and can be produced with vent and purge lines for improved sealing.

Some packing cases are called stuffing boxes. What is the difference?

The name stuffing box comes from the old steam engine/compressor days when the piston rod was sealed with soft packing that was stuffed into the annular space (box) between the rod and the cylinder. In today's machines, stuffing boxes and packing cases are the same component.

Is it necessary to cool packing cases?

This is a very complex question and cannot be answered in a straight yes or no manner. Traditionally it was felt that cooling was necessary on all types of packing cases at all pressures in both lubricated and non-lubricated services. However, with the development of CPI Polymer Alloys, most lubricated packings do not need to be cooled and even non-lubricated packings can be operated at up to 100 bar discharge without cooling in some applications.

Is it possible to manufacture packing cases in separate units for easier handling?

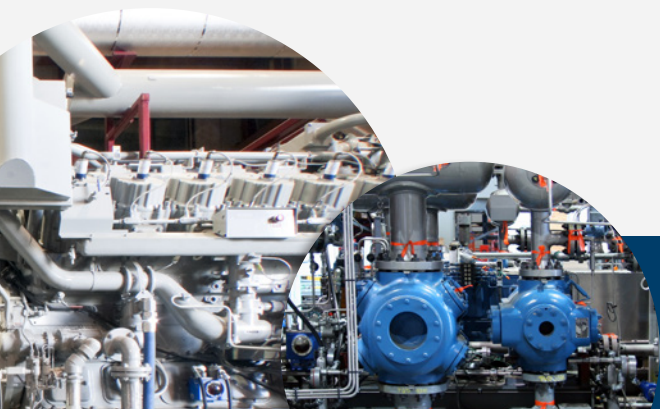
Yes, packing cases are increasingly being manufactured as cartridge units with the flange as a separate component for ease of handling.

What are the recommended materials of construction for packing cases?

For lubricated applications the preferred material is either cast iron or AISI 4140 alloy steel. For non-lubricated applications 13% chrome stainless steel AISI 400 series.

How do you ensure that the packing case cups are always assembled in the correct sequence?

All packing cases should have the cups numbered in a sequence starting at the gasket end and should only be assembled in this way. This ensures that all vent lubes and purge lines are directed to the correct position within the case.



In cooled packing cases which is the preferred design of cup? Plate and O-ring or Cast/welded cups?

The plate and O-ring arrangement, providing the O-ring grooves are designed to support the O-rings on their inside diameter, is the best, as it allows the cooling water channels to be cleaned thoroughly when the packing case is being reconditioned. Cast or welded designs can become blocked easily particularly as plant cooling water tends to be dirty.

How many cooled cups should there be in a packing case?

In order to achieve the correct water flow and the position of the inlet and outlet connections on the flange, there should always be an odd number of cooled cups in a cooled packing case.

How many lubrication points should there be in a lubricated packing case?

The number of lubrication points in a packing case depends on several factors including gas type, gas pressure, temperature and compression ratio. As a guide the higher the pressure the greater the number of points required.

Is it possible for the flange material to be different from the main body of the packing case?

Normally the flange material is the same as the main case material, but it is acceptable for it to be manufactured in less expensive materials, should commercial conditions dictate this.

What is the best type of gasket to seal between the packing case and the cylinder?

CPI's recommended gasket material is soft iron. This material is resistant to corrosive attack by most refinery and petrochemical gases and will not creep with time.

What cooling water flow rates should be used?

This varies with rod size but typically ranges between one and 5 gallons per minute.

What pressure should the cooling water be?

Normal cooling water inlet pressure should be 50 psi.

If the risk of any water entering the gas system cannot be accepted can the packing case be cooled with another fluid?

Yes, it is possible to use oil, anti-freeze or even gases such as air or nitrogen. However, CPI, part of the Howden group, may be able to re-engineer the packing case to be non-cooled, eliminating the risk.

Where should the vent of the packing case be connected?

The vent should be connected to either:

- Flare system
- The suction side of lower pressure cylinder

Is it possible to design a packing case that has zero leakage?

With modern venting, materials and spring loading of vent seals it is possible to design a packing case that is essentially zero leakage.

What are the main functions of tie rods?

The function of tie rods is to ensure that the cups are assembled in the correct angular position, ensuring all the lube and vent lines are aligned correctly. Tie rods are not designed to support the cups when the packing case is assembled into the cylinder.

Should the packing cups always be lapped or is grinding acceptable for low pressures?

If possible, all packing cups should be lapped but for low pressure air or high molecular weight gases, ground surfaces are acceptable providing the grinding is of a circular pattern.

Some packing cases are externally cooled. What is this?

This is when the space between the OD of the packing case and the bore into which it is installed is a sealed chamber with cooling fluid circulated in it. This is not the most efficient cooling system and was used on high pressure machines before the development of improved packing materials

Some packing cases have a guide bush in the nozzle flange, is this a good idea?

Guide bushes have been used in high pressure packing cases to guide the rod and prevent it from touching on the I.D. of the cups. However, with correct rider ring design, these guide bushes are now only needed on L.D.P.E. secondary compressor packings and have been known to be the cause of piston rod breakage due to their multiple support effect, when combined with rider rings and crosshead supports.

Why do some packing cases have intermediate pressure take off points?

This is an attempt in packing cases that must seal high pressured differentials to share the sealing function between all the seals. It is questionable if it works sufficiently well to be justified.

When is a packing case worn out?

Normally when the stack height is reduced to such an extent that the correct amount of crush cannot be exerted on to the end of the gasket. When this happens, it is possible to re-establish the correct height using spacers, but this is a technical compromise.

Does CPI recondition packing cases?

Yes, CPI reconditions all type of packing cases.

Why is there a wide variation in the number of seals used by different OEMs for the same application?

The selection of the number of packing rings required to seal relative to the pressure differential is based on the historical experience of different OEMs and component manufacturers and is clouded by other factors such as poor materials or incorrect design.

Should there be O-rings between all the cups on both cooled and non-cooled cases?

In order to ensure as good a seal as possible O-rings should be used between all the cups of the both cooled and non-cooled packing cases.

Does CPI pressure test new packing cases prior to shipment?

Yes, we do have the facility to pressure test both new and reconditioned packing cases prior to shipment provided this service is requested by the customer.

