The recommended handling and appropriate packaging for flange gaskets

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Today all kinds of industrial and household goods are transported all over the globe by different means of transport. The importance on protecting these products so they are delivered in good order is imperative. Appropriate packaging for products, some more fragile than the others, during transport or when loaded or unloaded from ship, aircraft, lorry or van is paramount.
This also counts for flange gasket materials which are being moved from one place to another. Since the ban of compressed asbestos gaskets, there has been a transition towards a variety of gasket materials, some of these being very fragile in handling.
Gasket materials should not only be protected during manipulation and transport, but also from the weather elements, such as extreme heat and/or humidity as these could degrade the components.
It's important that gaskets are identified and marked for traceability purposes (e.g. according to ASME B16.20, EN 1514-2). Packaging should be labelled with customer specified information such as order and article numbers and suppliers identification data.
This article gives an overview of some typical packaging and handling practices being used by some gasket manufacturers and end-users. It should be seen as a guideline for protecting different types of gasket materials in order to maintain their integrity.

Classification of gasket materials

Non-metallic gaskets or soft gaskets, mainly made from sheets such as elastomers, compressed fibre gaskets, graphite, PTFE based materials, mica, etc. Small sizes (up to 3") elastomer, compressed fibre gaskets as well as PTFE based gasket materials in small quantities can be packed in plastic bags. From 3" upwards these gaskets can be stacked and wrapped or vacuum-sealed with plastic foil (Figure 1). Larger size gaskets are preferably stacked in smaller quantities between cardboard sheets, which are then stapled or taped together to make a neat and protective package. Large size soft gaskets such as ePTFE, rubber, etc. are often transported in "rolled-up" condition, without compromising the integrity of the gasket, however, only when appropriately packed and protected from heavy weight articles put on top of these gaskets.

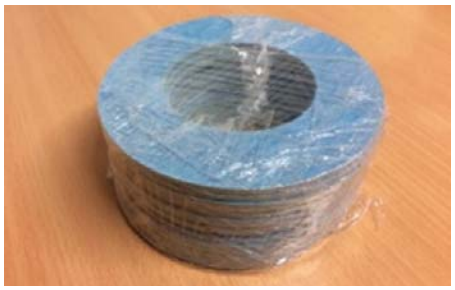

Figure 1

Figure 2

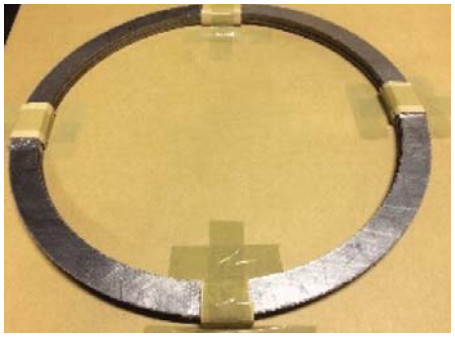

Figure 3

Figure 3a

Graphite gaskets are fragile and sensitive to distortion (prone to cracking, scratches), smaller sizes can be stacked and held together by protective plastic foil (Figure 2). Adhesive tape, when used to hold down gaskets, should be reversed in order to avoid the gasket surface being damaged or contaminated by the adhesive when the tape is removed.
Large size graphite gaskets should be stacked in fewer numbers and secured by protective plastic foam sandwiched between cardboard sheets, which are then stapled or taped together. It's important that gaskets should be fixed to the cardboard backboards by means of tape (Figure 3) or reinforced stretchable paper (Figure 3a) to restrict movement of the gasket when in transit. The sticky side of adhesive tape should not come in contact with the sealing element!
Semi-metallic gaskets such as Spiral Wound Gaskets (SWG), Double Jacketed Gaskets, Corrugated gaskets, Serrated or Kammprofile gaskets.
Small size SWG up to 3" can be sealed in plastic foil or vacuum sealed (Figure 4). From 3" up to 36" gaskets are preferably stacked with plastic separators (yellow plastic as seen in Figure 5) in order to protect the sealing element and then sealed. The larger the size, the lower the number of gaskets should be stacked. Larger size gaskets still may need to be protected overall with a polyethylene foam (Figure 6).

Figure 4

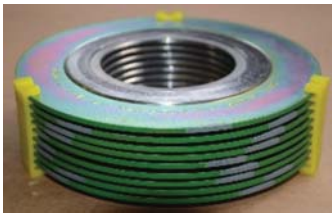

Figure 5

Figure 6

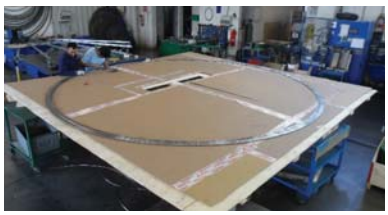

Figure 7

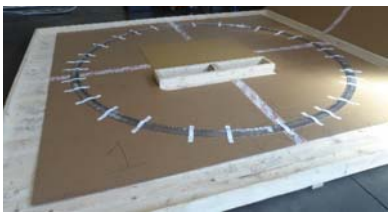

Figure 7a

Figure 8

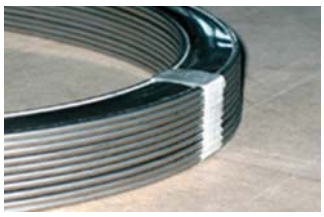

Figure 9

For very large standard sizes or equipment (heat exchangers, etc) SWGs are preferably packed individually on laminated tri-wall corrugated cardboard protected by polyethylene foam or foil. The gasket shall be firmly positioned between a second cardboard sheet which is then stapled or taped together for overall protection. (Figures 7 & 7a).
Double Jacketed, Corrugated and Kammprofile gaskets can all be treated in a similar way.
As with semi-metallic gaskets, care should be taken when using adhesives near the sealing surfaces, as removal of the adhesive can cause damage to the sealing faces.
Metallic gaskets such as Ring Type Joints (RTJ), Lens rings and welded gaskets. It is recommended that RTJ's of all sizes are being packed individually. Depending on the manufacturer's instructions smaller sizes will be packed individually in small cardboard boxes (Figure 8). Soft iron or carbon steel should be prior packed in a plastic bag. Larger sizes are individually wrapped by means of a protecting polyethylene foam tape and secured by self-adhesive tape and then fitted on a heavy tri-wall corrugated cardboard or fibreboard (Figure 9).

Handling gaskets general points

- Gaskets should be handled with care to avoid damage
- Protective gloves should be worn.
- During transportation, gaskets should be preferably positioned horizontally (Figure 10), however if this is impossible, the gasket in its package should be supported by a frame in a diagonal manner (Figure 11).
- During loading and unloading care should be taken to prevent the package from distortion/bending. Damage to gaskets often occurs by forklifts when loading or unloading pallets.

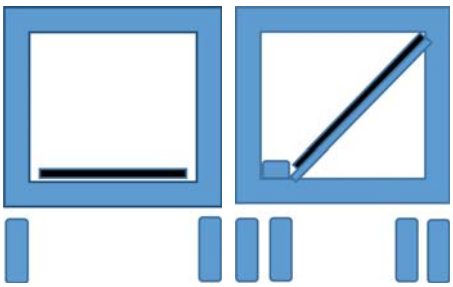

Figure 10 *Figure 11*

- Gaskets should be stored and kept horizontally, preferably in their original packaging.
- No other goods should be placed on the packages.
- Especially large size or fragile gaskets should be brought in their original package to the site of installation.
- Packages should be opened carefully on a flat surface. Take extra care not to cut through the packaging and into the gaskets when using knives!
- Gaskets with a diameter above 1000mm should be carried by at least 3 persons.
- Gaskets with a diameter above 1200mm should be carried by at least 4 persons.
- Gaskets with a diameter above 2000 mm should be carried by at least 8 persons.
- When carrying SWGs, ensure to hold the whole cross section of the gasket together (inner ring, windings and outer ring), in order to avoid inner ring and/or sealing parts falling out under its own weight. Do not carry the gasket by only the outer ring! (Figure 12).

Depending on, type, size and quantities, gaskets should be placed carefully into approved fibreboard or (ply)wood boxes with careful attention to secure and protect gaskets from being distorted during transportation. It is important to apply by means of self-adhesive labels an indication of fragility.

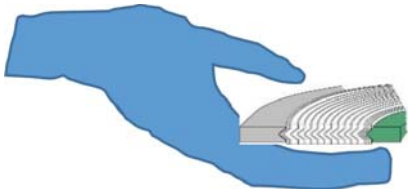

Figure 12

Summary

Gaskets are probably the most critical components in pipework systems. Whilst ultimate care is taken during every stage of the production process to achieve a high-quality end-product the risk of deterioration or damage during loading, transport and unloading should be limited by using preventative measures in terms of adequate packaging and careful handling. Gasket materials should be handled carefully to final destination to ensure their condition will retain all the sealing properties intended of the original gasket design. This in turn will permit sealing reliability and customer satisfaction.

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