

A Guide to Rubber Mouldings

*White
Paper*

November 2014



Content

Executive Summary	3
Mouldings Defined	3
Moulded Components – Materials	3
Moulded Components – Shapes and Sizes	4
Moulded Components – Applications and Industries	5
Moulding Techniques	6
Which Moulding Technique	7
About J-Flex	9
Moulded Components From J-Flex	10
About The Author	12

Executive Summary

J-Flex has created this white paper “A Guide to Rubber Mouldings” to provide those within the engineering and manufacturing industries with a quick reference guide to the wonders of mouldings.

This White Paper provides an overview of mouldings, moulded components, shapes, sizes, applications and industries as well as the techniques that can be employed to make a moulded component.

Whatever your engineering requirements, J-Flex can help you to design it and specify it, and then we can make it for you too. When it comes to widgets for all sorts of applications, we can help.



Mouldings Defined

What is a moulding?

A moulding is defined on Wikipedia as „The physical shaping of materials by forming their liquid form using a mould.“

See

http://en.wikipedia.org/wiki/List_of_industrial_processes#Moulding for more details.



Whilst a mould is “A hollow container used to give shape to molten or hot liquid material when it cools and hardens”

(<http://www.oxforddictionaries.com/definition/english/mould>)

When it comes to mouldings from J-Flex, we are looking specifically at rubber mouldings. We use moulds of various shapes and sizes to produce moulded components to very specific shapes and dimensions as required by the customer.

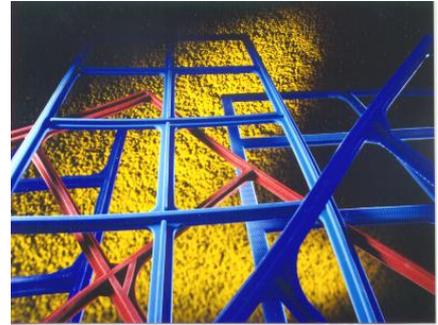
Many of these moulded components would be called „widgets“ – not a particularly technical term but one used for decades to describe small components that are often needed as part of a larger machine or as part of a production line.



Moulded Components – Materials

Mouldings can be made from a wide range of materials. At J-Flex we use both natural and synthetic rubbers. Our polymer range is vast. We can offer Natural, Neoprene, Nitrile, E.P.D.M., Butyl, Hypalon®, HNBR, CXNBR, Silicone, Fluorosilicone, Viton®, Fluoroelastomers, Aflas® and Perfluoroelastomer.

Which material is best for your application will depend on the environment that the material will be subjected to as well as what the component needs to do such as protect, seal or insulate.



Moulded Components – Shapes and Sizes

When it comes to moulded components, the shapes and sizes are infinite. Mouldings can be made to order if required where the exact moulded component is produced for the individual application.

The types of mouldings we manufacture include:

- Bellows
- Discs
- Covers
- Gaiters
- Boots
- Vibration Mounts
- Grommets
- Rubber / Metal Bondings
- Cups
- Suckers
- Diaphragms
- Extrusions
- Sheets
- Balls
- Gaskets
- „O‘ Rings
- Rubber Rollers
- Seals
- Washers
- Chocolate Moulds
- Pads
- Masking Plugs
- Valve Seals
- Pinch Valves



Circular Bobbin Mounts
Buffers
Mounts
Moulded Sheets

As you can see the shape can vary as can the size. At J-Flex we can provide moulded components up to 2.5 metres in diameter and hand fabricated gaskets with bonded joints could be as large as 5 metres in diameter.



Design Advice

J-Flex has been specialising in rubber mouldings for over 30 years and we are able to assist in the development of your future component requirements. In addition we can give advice on material selection.

Moulded Components – Applications and Industries

When it comes to applications and industries, J-Flex has come to realise that practically every manufacturing or engineering environment will require mouldings of one sort or another.

As examples of industries where mouldings can be used:

- [Food, Drink and Pharmaceutical Industry](#) (where components must also comply with US FDA, BfR, UK WRAS as well as EC Food Safety)
- Energy and Utility Industries where components are often required to withstand severe environments and are needed to seal, insulate and repair. Detailed examples are available at <http://www.j-flex.co.uk/markets/energy-utilities/>
- [Engineering](#) and manufacturing in all its variants including aerospace, F1 Cars, marine industries, beverage, flow control, solar and renewable industries.



Examples of specific applications include:

- Moulded Viton® Bellows - to protect huge hydraulic rams operating in 300°C environment.
- Hand Moulded Bladders - 1 metre diameter x 2.5 metres long to operate in water deluge tanks on oil rigs.
- Moulded Pump Diaphragms - a combination of moulding and hand forming – these huge components are replacements for pumps deemed obsolete.
- Suction Cups – used in many food processing applications.



If you consider the types of functions components need to perform, applications include:

- Moulded Viton® and PVC Nitrile vapour seal sections
- Fabricated expansion joints contain flue gas emissions
- Fire resistant / low smoke low toxic silicone door and hatchway seals
- Fully bonded rubber/metal track pads on pipe laying equipment
- Pipe systems piggy-back mouldings
- Pipe tensioning pads

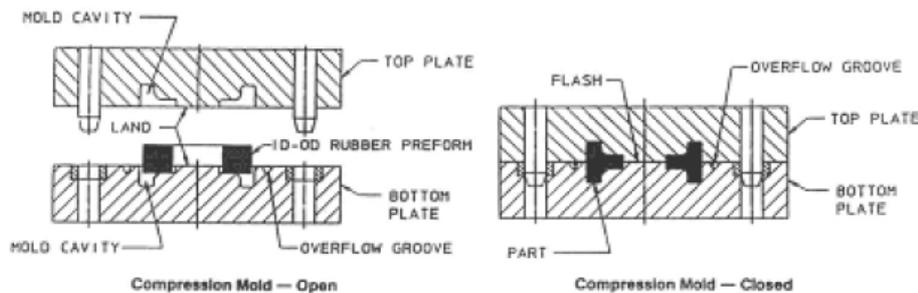
Moulding Techniques

There are various moulding techniques available. At J-Flex, we offer compression, transfer and injection mouldings. Below is a brief explanation of each technique.

Compression moulding is a method of moulding in which the moulding material, generally preheated, is placed in an open, heated mould cavity. The mould is closed and pressure is applied to force the material into contact with all mould area. Heat and pressure are maintained until the moulding material has cured. This is shown on the diagram below.

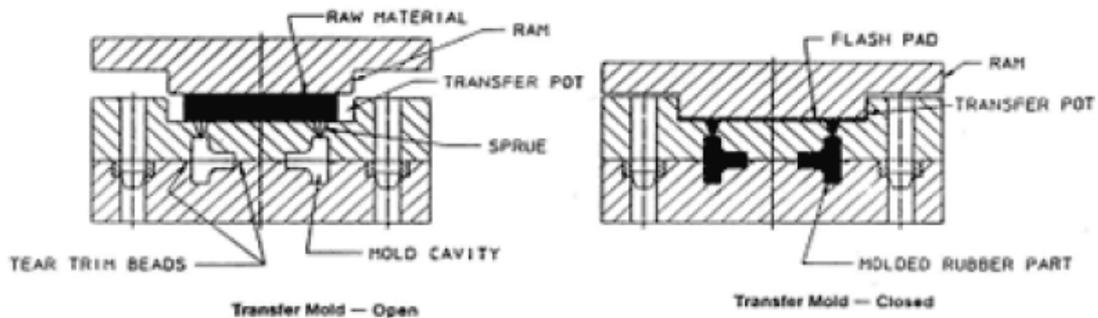


COMPRESSION MOLDING



Transfer moulding is a process where the amount of moulding material is measured and inserted to the transfer moulding, in what is called a transfer pot. The pot is clearly identified in the diagram below.

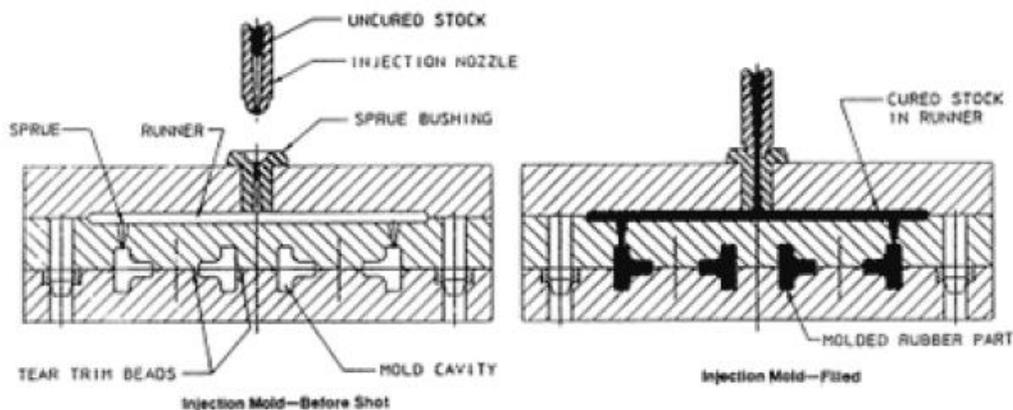
TRANSFER MOLDING



Once the „raw material“ is in the pot, the material is forced through the two „sprues“ in the diagram above and into the mould cavity. The mould remains closed until curing has taken place.

Injection moulding is a manufacturing process for producing components by injecting the raw material into a mould. The diagram below shows the injection moulding process.

INJECTION MOLDING



J-Flex tends to produce the majority of customers moulded components using the Compression Moulding technique. However where appropriate J-Flex also offers transfer and injection mouldings.

Which Moulding Technique?

Compression moulding has a number of advantages as outlined below:



- small to medium volume, high-pressure method suitable for moulding fairly straightforward components
- ability to mould large and often intricate parts
- where fabric inserts and metal parts are required
- wastes relatively little material which can be crucial when materials are expensive
- suitable for very large basic shape production in sizes beyond the capacity of extrusion techniques
- lowest cost tooling option



However, compression moulding is not suitable for some types of parts.

Transfer moulding has a number of advantages as outlined below:

- high quality/precision
- complex shapes and designs
- larger volumes
- rubber/metal bondings
- less flash
- lower tooling costs than injection moulding



Injection moulding has a number of advantages as outlined below:

- can be used for very small to medium sized components
- versatility is limited only by design
- ideal for high volume requirements of the same part
- tooling expensive – but most competitive unit cost

Injection moulding set up and tooling costs tend to be more expensive than other moulding methods. However where large volumes are required the per-unit cost makes injection moulding a good choice.



Let us mould your requirements into shape – with a little pressure!

About J-Flex

Established in 1984, and with over 30 years in the industry, J-Flex is an independent components manufacturer of rubber mouldings, specialising in customer made items mainly made by compression moulding. We also offer transfer and injection moulding.

Nearly every moulding project we look at for customers is a new project with new shapes, sizes and materials. However while each project is unique, the processes and expertise built up over 30 years means we can provide customers with the components they need for their individual requirements.

Our mission is to help our customers by providing the right moulded component, at the right time, in perfect condition.

We pride ourselves in good, old-fashioned customer service. Our customers are looking for product availability, reliability and a quick and efficient response to their requests. We deliver every time.

We are already helping over 1,500 customers and we export to over 40 countries.

We are accredited to BS: EN: ISO 9001: 2008 and are Registered Licensees under the DuPont Genuine Viton® Licensing Scheme. We also ensure where appropriate our products are tested and approved by the relevant authorities, and will provide relevant certifications on request.

J-Flex is also a member of the Gasket Cutter's Association (GCA), the European Seals & Gaskets Association (EUSGA) as well as a semi® Member.

If you are struggling to specify the right solution for your particular circumstances, please contact us and we'll do our very best to help you make the right decision.

Check out the download area of our website www.j-flex.co.uk for product information, data sheets and more.

J-Flex Moulded to Perfection

Why use J-Flex?

- No tooling outlay costs in some cases
- 100 years Management experience in rubber production.
- ISO 9001 + Trade & Industry Approvals
- Wide range of well-maintained compression presses
- Quick mould production & first off sampling
- We work from your CAD files
- Good material range – natural & synthetic polymers
- Acknowledged market leader in customer service
- Stringent inspection in accordance with industry A.Q.L. levels
- Full dimension & material conformity
- Delivery by agreement – never late
- Assembly/kitting to your specific requirements

Moulded Components From J-Flex

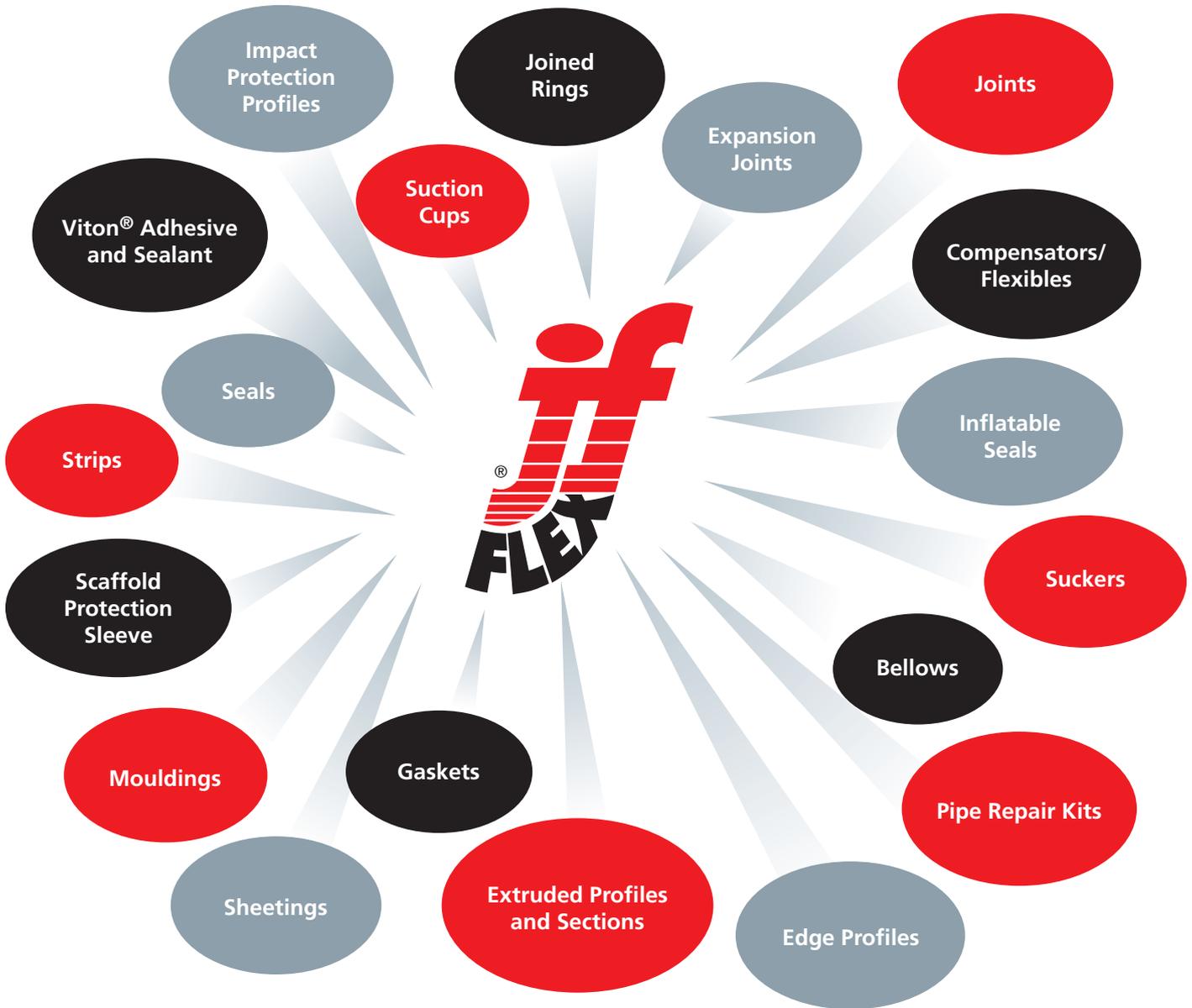
When it comes to moulded components preparation is important. As part of specifying the moulded component you require it is important to think through the requirement you have and ideally to provide details as shown below:

- 1) Drawings or full dimensions with tolerance.
- 2) Surface finish required.
- 3) Is the complete elimination of flash or the position of the flash line important?
- 4) If metal or fabric parts are included, is the bond strength important? If metal parts, state if free issue, and also confirm the type and specification of metal.
- 5) Stressing conditions, i.e. whether in shear, tension, compression, bending, etc.; the normal (static) stress or deformation; frequency and amplitude of any periodic deformations; magnitude of any shock loading.
- 6) Any special assembly conditions.
- 7) Any other specialised requirements.

If you need help developing your specification, J-Flex is here to provide guidance. You can contact us directly on +44 1777 712 400 or email lance@j-flex.co.uk or michelle@j-flex.co.uk and we will be in touch.

Below for your review is details of the types of components J-Flex can provide. Please note however that this list is by no means exhaustive so if you don't see what you are looking for, please contact us to discuss your requirements as we relish a challenge and are eager to provide solutions to those tricky situations.

For you today J-Flex supply the following Components:



ALL silicone sheet products supplied by J-Flex comply with these regulations



Food Safety,
EC No. 1935:2004

Could YOU use any of these?

J-FLEX RUBBER PRODUCTS

Engineering Rubber Components & Specialised Sheeting Products

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About The Author



John Kirk set up J-Flex in 1984 and is the Managing Director of the company. As an industry veteran, with over 45 years' experience in the rubber industry, John relishes the opportunity to help customers with solutions to their industrial rubber engineering challenges.

Travelling worldwide on a regular basis, John is able to tap into his extensive network of contacts to drive the J-Flex business forward to the benefit of customers. With a strong customer focus, John is also keen to develop new products to meet customer requirements.

John is eager to ensure the rubber industry as a whole meets the quality standard customers expect which is one of the reasons for writing this White Paper.

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