

James Walker	RGD Sample O-Ring Manufacturing Procedure	Date: Sep 20, 2021	Rev: 3	Page: Page 1 of 3	Document No: OPI 132 Approved by: Shift Managers
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REASON FOR UPDATE: Change of responsibility from M. Brook to Shift Managers

ASSOCIATED DOCUMENTS: FMP Ref: [FMP 20](#) QPD Ref: [QPD 28](#)
F Form Ref: [F245](#)

1. PURPOSE

- 1.1 We have eight 'flagship' grades of rapid gas decompression (RGD) resistant elastomers, each of which has been specifically developed for sealing duties in oil and gas production. Six of these grades – Elast-O-Lion® 101, FR25/90, FR58/90, FR68/90, LR8911/90 and LR8912/90 – are qualified to **Norsok M-710** for RGD-resistance and sour gas ageing.

These highly specialized materials have been extensively in-house validated, and are tested, approved and specified by oilfield operators and equipment manufacturers. They are widely proven to overcome the problems associated with high-pressure gas systems and the damage experienced to seals when there is a rapid pressure drop.

To pass these stringent tests the seals have to be manufactured to the highest standard. This OPI covers the compression moulding aspect of this procedure.

2. SCOPE

- 2.1 This procedure must be carried out for manufacturing O-Rings for the sole use of internal and external testing of RGD resistance and sour gas ageing. Typical references are 50-329, and 193478, though it covers any seals ordered for laboratory testing, either by James Walker, or third parties.

All the above samples are to be manufactured in the PD Cell and have full traceability throughout the manufacturing process.

This procedure also covers non standard production orders with nominal moulded sections of 6.99mm and above with internal diameters of 110mm and below. These items shall be moulded within the O-ring product stream.

3. RESPONSIBILITY

- 3.1 The Shift Manager is responsible for updating and communicating the details within this procedure.

4. PROCEDURE

4.1 MATERIALS & EQUIPMENT

It is assumed that the extrusion has been made to the highest standard possible following OPI 131 'Extrusion of RGD Materials' (Iddon Screw Extruders)

All O Rings shall be moulded using a Vacuum enabled compression moulding press.

RGD Materials

- FR25/90
- FR68/90
- FR58/90
- LR8912/90
- LR8911/90
- AF69/90
- Elast-O-Lion 101
- Elast-O-Lion 985

James Walker	RGD Sample O-Ring Manufacturing Procedure	Date: Sep 20, 2021	Rev: 3	Page: Page 2 of 3	Document No: OPI 132 Approved by: Shift Managers
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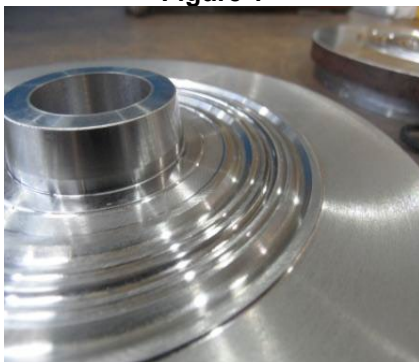
4.2 PROCESS

4.2.1 Mould care:

Ensure the mould has been 'backed off'/'relieved' (see fig 1) if not, take the mould to the toolroom to be done.

If the mould is new make sure the cavity is completely clean and free from cutting fluid or free from mould protection fluid and/or mould release from a previous use if the mould is not new.

Figure 1



4.3 SETTINGS

Always use the cure time and temperature from the latest version of the Cure Time Predictor found on Lionshare unless informed otherwise from the laboratory. If the latter is the case ensure the documentation reflects this.

Always;

- -Check mould temperature
- -Apply mould release as required
- -Check mould temperature again
- -Do **NOT** start moulding until desired temperature is reached.
Remember that the cure temperature is the mould temperature and not the press set temperature.
- NEVER post-cure seals more than once for any reason.

Typical tonnage for (not nested) moulds;

- Up to 15cm or 6 inch 50 ton
- 15cm or 6inch to 18cm or 7inch mould is 100 to 125 ton.
- 20cm or 8inch mould 150 ton.
- 25cm or 10inch and above maximum tonnage.
Always seek advice if unsure about tonnage to be used.

Breathes should always be set lower than the final tonnage, 25 to 50 ton is usually sufficient. A long delay time of 5 seconds or so can be used on the first or only breath to warm and soften the compound before the final push. This can help eradicate poor joins but care must be taken not to scorch the compound.

The vacuum must always be used.

4.4 EXTRUDATE

The extrudate must be kept free from contamination at all times and checked throughout the process to be free of particulates up to the point of being placed in the mould.

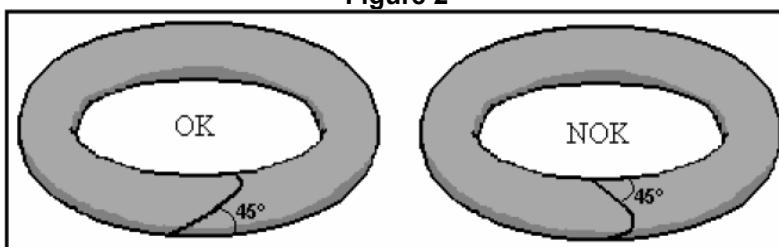
Profiles shall be oval unless otherwise specified.

James Walker	RGD Sample O-Ring Manufacturing Procedure	Date: Sep 20, 2021	Rev: 3	Page: Page 3 of 3	Document No: OPI 132 Approved by: Shift Managers
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For sections of 6.99mm and above, the extrusion shall be extruded around a mandrel approximately equal in inside diameter to that of the mould. This allows it to maintain a curvature equal to that of the mould, and allows the blank to sit in the cavity in an unstressed state.

It is advised that gloves are not worn when handling the extrudate so to eradicate the chance of fibres being transferred on to it.

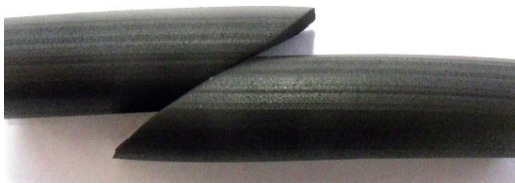
Figure 2



It is very important that when the extrudate is cut to length, the ends align correctly as in figure 2 above; the Join must be 90° to the applied pressure. There should be sufficient tack in freshly-cut joins for them to lightly bond. DO NOT USE SOLVENT OR TOUCH ON PRESS PLATEN.

Use an overlap like on figure 3 below to give good compression on the join.

Figure 3



The level of flash around the moulding must be even, and no less than 5% of the weight of the moulding.

- 4.5** After moulding the samples are to be inspected at the press looking for backrinding, damaged mould or dirty mould, peeling, foreign material and poor surface finish etc.
- 4.6** Finishing –the seals must then be trimmed in the cryo where possible (DO Not Roto-finish) and post baked as per Cure Time Predictor.

5. REPORTING

5.1 Inspection

All samples must have full traceability using the tracking sheet F 245

All samples to have a full dimensional report inspected to standard

[JW 200 009](#)

All samples must either be individually laser etched or individually bagged and labelled with relevant information. See DJ

IF IN DOUBT..... ASK !