REASON FOR UPDATE: Update the section 4 addition of rubber insert

ASSOCIATED DOCUMENTS: **OPI Ref:** OPI 152

1. PURPOSE

1.1 Mould and mould joining of D Seals allow James Walker & Co to provide D Seals in diameter sizes which we do not have mould cavities for. For the customer this may mean a cost saving on the cost of a new mould by utilising an existing one of the same profile, or to JW it may mean the ability to supply a seal in a diameter size much greater than our press size capabilities.

Vulcanised techniques rely on an unvulcanised rubber, either in solution or sheet form and often a mixture of both, forming a chemical linkage with the cured section via heat and pressure. The quality of the join is therefore paramount in the integrity and performance of the seal in application. The Joining Table is part of the Extrusion Department onsite at JW & Co, Cockermouth

2. SCOPE

2.1 This procedure shall be carried out for all D Seals that have a vulcanised joining process, these may include 'mould and mould join' or 'cut back and mould join'.

3. RESPONSIBILITY

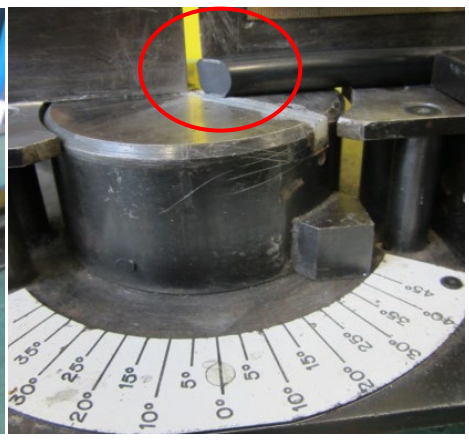
3.1 The Operations Director is responsible for updating and communicating the details within this procedure.

4. PROCEDURE

4.1 Check for marked up surface defects.

4.2 Cut a 30° to 45° scarf cut in the moulded ring using a guillotine set at the correct angle.

Guillotine cutting



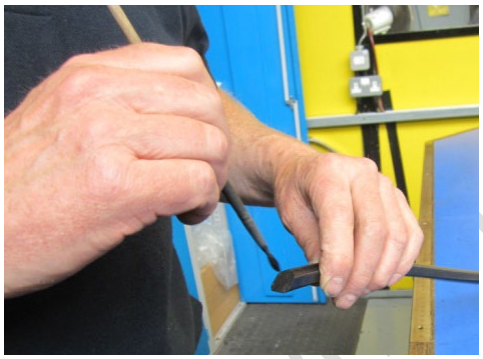
Cut profile

4.3 Wipe cut surfaces with MEK (butanone) to remove grease and debris.

4.4 Roughen the exposed join surface with emery paper then ensure the surface is clear from dust/debris

Roughening surface

4.5 Coat all rubber joining surfaces with **2 thin coats** of solution (see OPI 253 Appendix A for selection of correct solution components) and allow to dry.



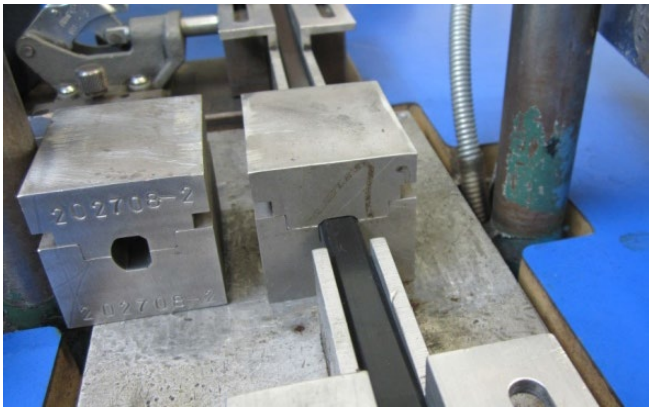
Applying solution

4.6 Clean the exposed joining surface with MEK and apply a piece of unvulcanised milled rubber sheet to a thickness the depth of the cut recess to the exposed rubber joining surface (see OPI 253 Appendix A for selection of correct rubber sheet material). Trim neatly around the profile of the seal. Wipe again with MEK.

Applying rubber sheet

Trimmed rubber sheet

4.7 Carefully align the two ends into a pre-heated joining mould, each section should be securely held in clamps with side pressure applied. Vulcanise join for 20 minutes at 165°C +5/-4° C (unless stated differently within OPI 253 Appendix A).

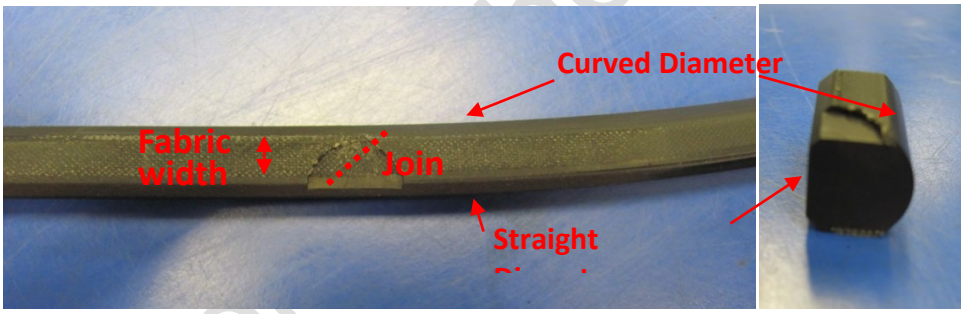


Ring in position in joining mould

4.8 Upon removal leave to cool, then check for joint integrity. Rub area around join with emery paper. If any gaps are present, cut and re-join.

4.9 Cut half- joined ring to length, measure using a linear tape to achieve OD of finished ring (see drawing). Repeat Steps 3.3 to 3.8 to form a complete joined ring. For each of the joins follow the following steps:

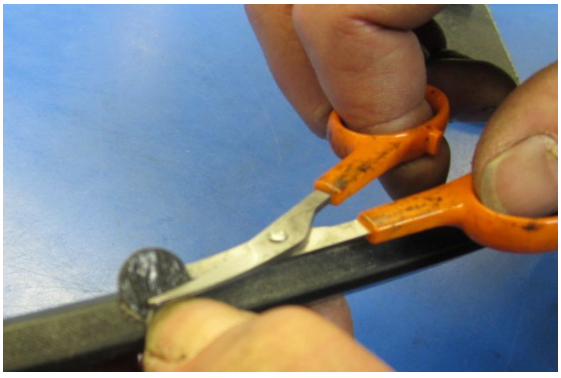
4.10 When cool, cut a recess into the profile of the straight diameter (the ID or the OD) to a depth of the fabric using a router. Dress slot after cutting.



Routed Recess *Side Profile View*

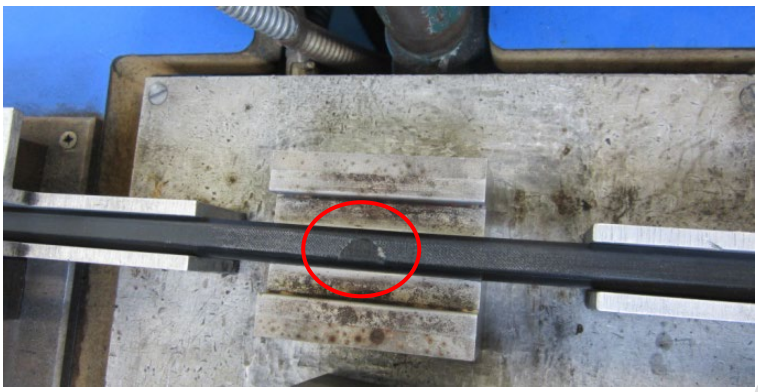
4.11 Cut out an insert piece of 0.4mm thick uncured milled rubber sheet, using a hand stamp to a slightly larger than the size of the cut recess.

4.12 Apply one coat of solution (see OPI 253 Appendix A) to the recess and the rubber insert piece. When dry fit the rubber insert piece into the cut recess and trim to fit profile.



Trimming insert

4.13 Place in a pre-heated vulcaniser, and cure for 20 minutes at 165°C +5/-4°C (unless stated differently within OPI 152).



Ring in position in joining mould

4.14 Dress join area as necessary
The join should be able to withstand considerable flexing without showing signs of parting.

5. REPORTING

5.1 Batch numbers of consumables to be recorded.

6. REFERENCE DOCUMENTS

6.1 OPI 232 'Vulcanised Joining of Moulded & Extruded Profiles' Appendix A

IF IN DOUBT…… ASK !

7. DOCUMENT CHANGE HISTORY

Version	Date	Revision Description	Revision Author.
Version 1.0	14 June 2013	n/a	L Thomas
Version 2.0	15 November 2013	Images changed on Step 4.10	K Walker/L Thomas
Version 3.0	26 November 2013	Change references from OPI 152 Appendix A to OPI 253 Appendix A. Remove references to fabric insert piece.	A Teasdale/L Thomas
Version 4.0	30 January 2017	Remove fabric, changes as per current STD, as per B.Gate with Customer agreement.	K Walker/ C Walker