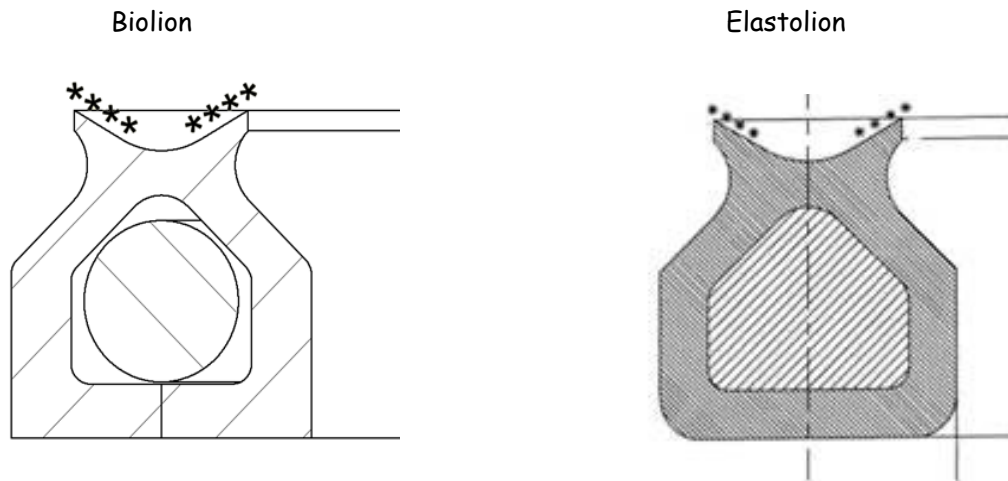


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### **General Overview**

This document should be referred to as a guide during the inspection of Y Seals, for both EOL 870 and Biolion elastomers. The guide should be used along with the production paperwork (Discrete Job), Drawing and SOP0227.

The diagram below shows a general view of the seal and its main features:



Areas highlighted by asterisks indicate the critical sealing surfaces. Other areas of the seal are non-critical for sealing purposes but must meet specifications JW 200 112 - Inspection of vulcanized extruded products and vulcanized extruded & moulded join products other than those of solid round, square or rectangular cross-section (for EOL 870 and general join requirements in any material not covered by this SIP which prevail the standard documents).

This Standard Inspection Process Guide covers the below steps.

- Visual Inspection of the finished seal and join area(s)
- OK/ NOT OK visual examples
- Join Inspection test
- Dimensional inspection requirements
- Packing requirements

1. Visual Inspection of the completed seal. Visual checks should be completed paying particular attention to the critical sealing area denoted on the JW drawing, demonstrated with asterisks.
2. The critical sealing face should be clean, sharp edged and free from any flash on the Y seal.

**EOL 870 Seals to be primary inspected using good lighting in the Extrusion Department. The entire seal to be inspected including the critical sealing area in Extrusion. The join area and the critical sealing area to be re-inspected in Unit 3 Join. Form F639 - Wartsila Y Seal Audit Form to be completed for documented evidence of the secondary inspection in unit 3 join area.**

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**BI-O-LION endless seals to be primary inspected in Custom mouldings and Large Mouldings Department. The base join, seal join (seal join where applicable) and critical sealing area to be inspected in unit 3 joining area. Form F254 - Wartsila Y Seal Audit Form to be completed for documented evidence of the secondary inspection in unit 3 join area.**

3. Any area of the seal with observed defects can be cleaned lightly using scotch bright or fine grit emery paper. Cleaning (dressing) the sealing face must leave the critical sealing face clean and the full profile must remain sharp edged. If in doubt check with the Quality team.
4. Locate the join(s) of the seal and place on 75mm mandrel.



Join located at 12 o'clock position on mandrel

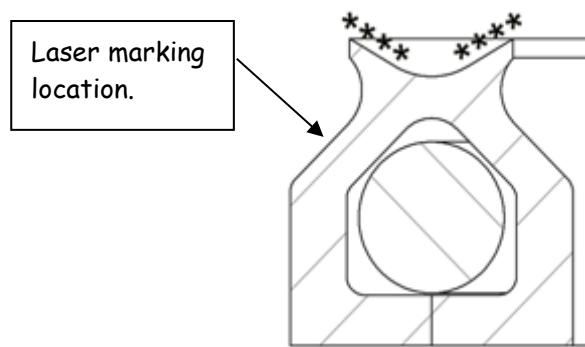
5. Place the seal as photo below - creating a 180° angle.



6. Starting with the sealing face towards you and maintaining a 180° bend, complete a full 360 degree turn on the mandrel until you are back with the sealing face towards you again. This will enable visual inspection of the join under stress and expose any defects in the join.

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7. Join inspection test Pass = seals rotated 360° on the 75mm mandrel resulting in zero defects found.
8. Join inspection test Fail = Defects on the join(s) area are found (i.e. split, rip, tear). Failed joins should be reported to the production team leader, Quality and Technical to investigate the join fail (rework and re testing may be agreed).
9. Seals will be marked for identification purposes on the outside diameter face with discrete "job, batch number, order number and seal number". Unless stated otherwise, laser marking will be used with settings 3.5mm height at 30% power.



10. 100% Dimensional inspection is to be carried out on all Y seal orders. Tolerance dimensions on the drawings should be recorded on form F254 for Biolion and F344 for EOL 870. Record 4 dimensions around the seal at equidistance on each seal. Depth and section to be recorded at the join area.

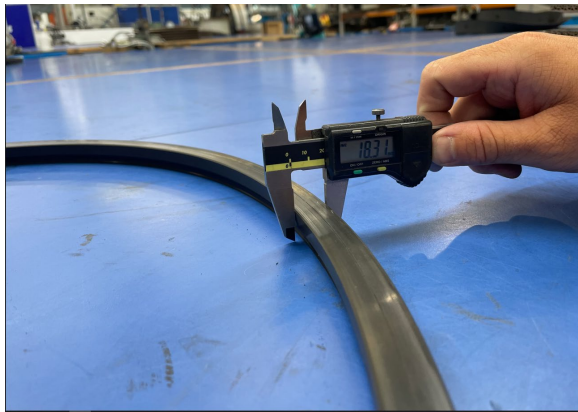


Outside Diameter



Depth

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Section

11. Internal rejects to be recorded on discrete job of the donor seals, and scanned with the complete production paper onto Lionshare or ERP based document retention platform as appropriate.
  
12. All passed seals should be packed flat to ensure the join(s) are stress free during transport, with a layer of cardboard in-between each seal to protect the critical sealing face.

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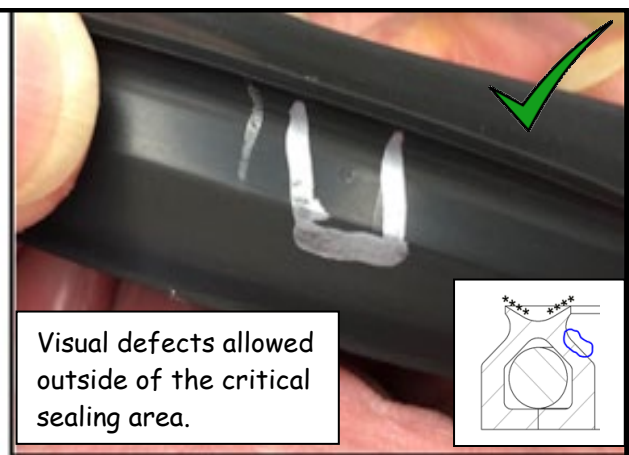
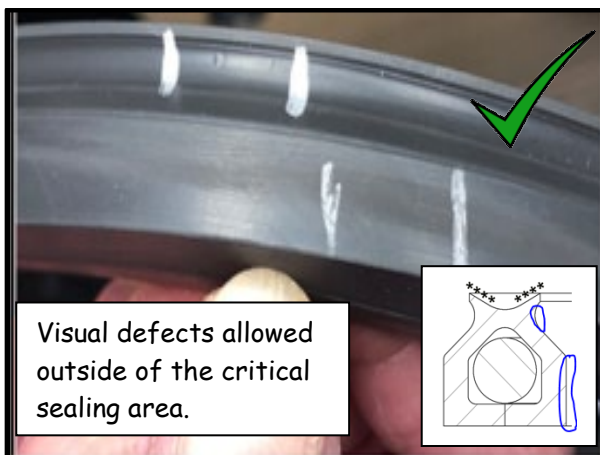
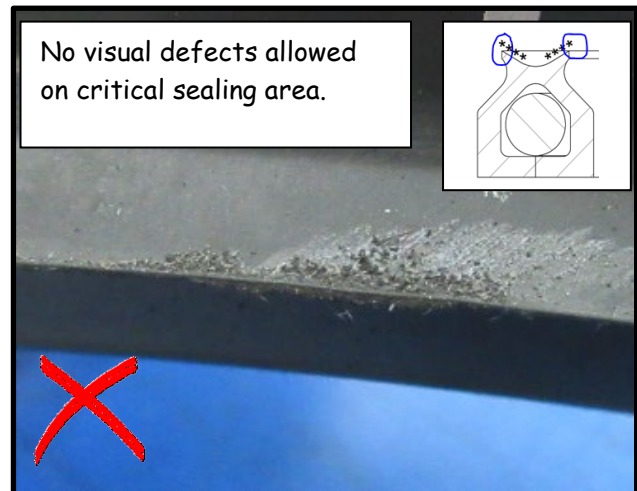
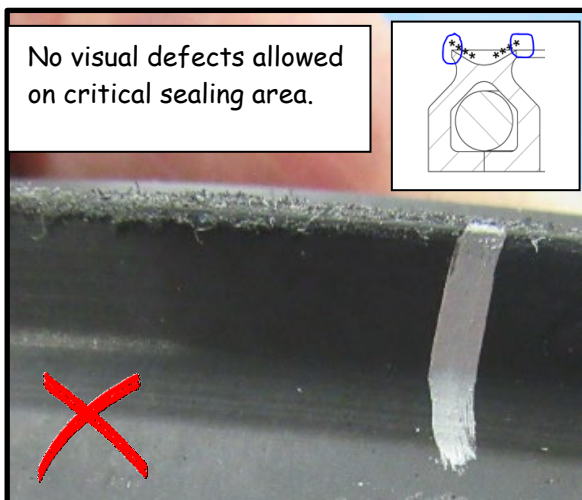
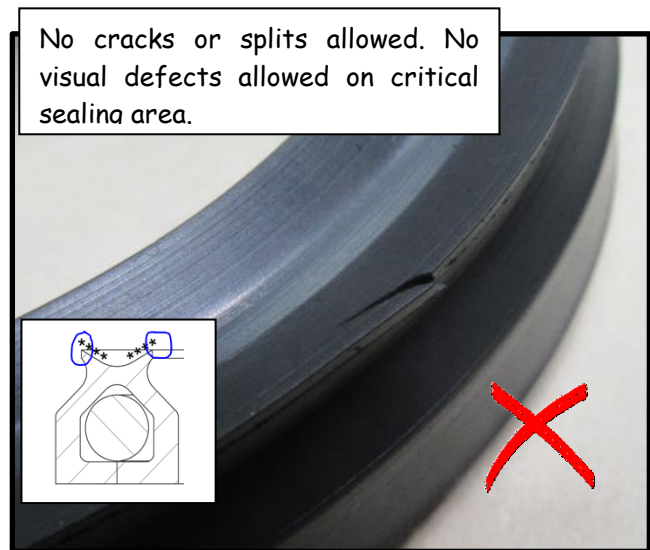
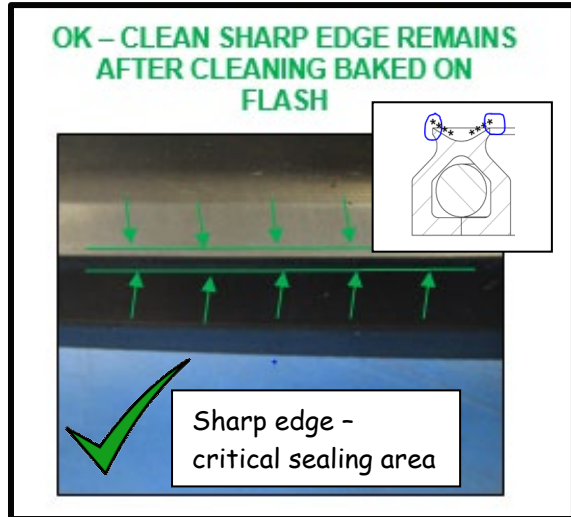
**PACKING STANDARD.**



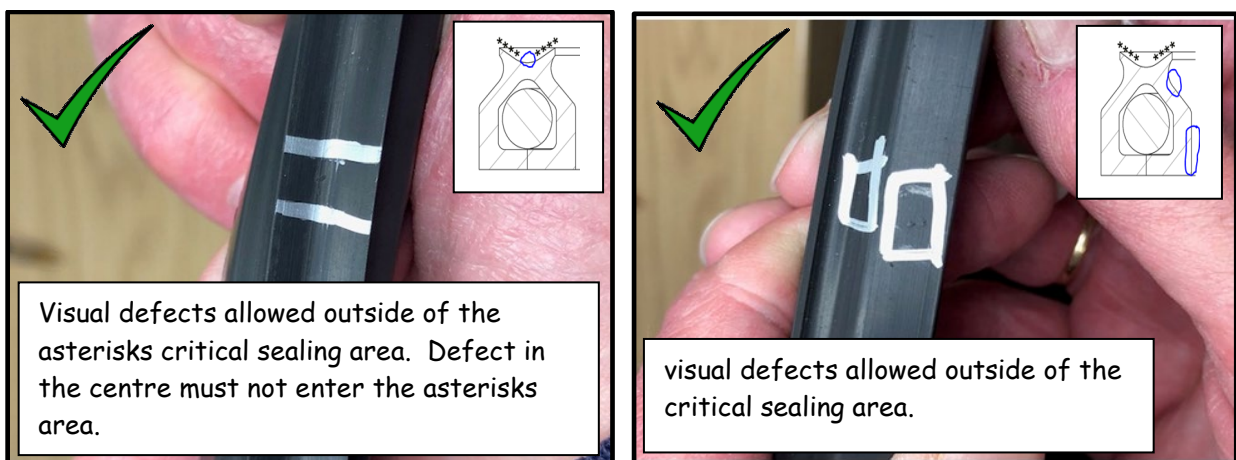
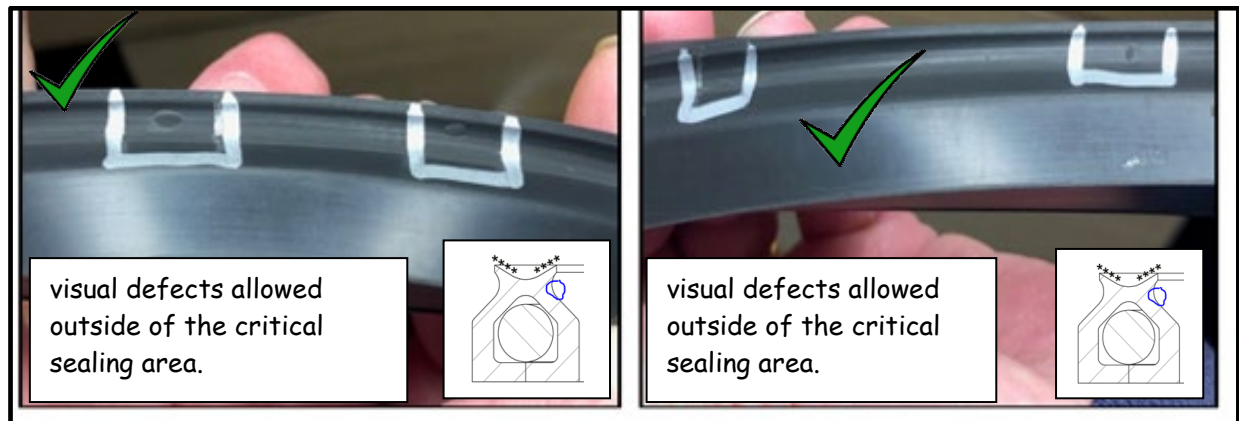


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### OK/ NOT OK VISUAL APPEARANCE - BIOLION



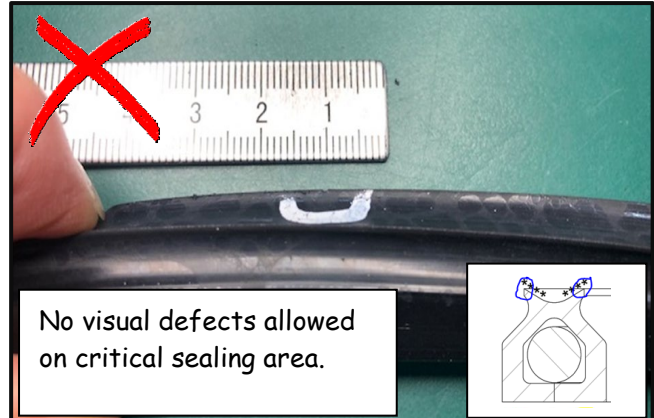
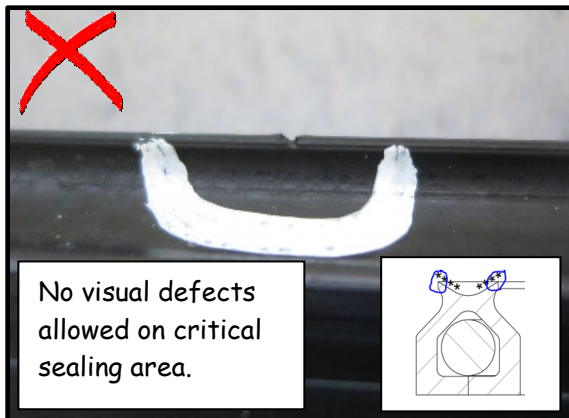
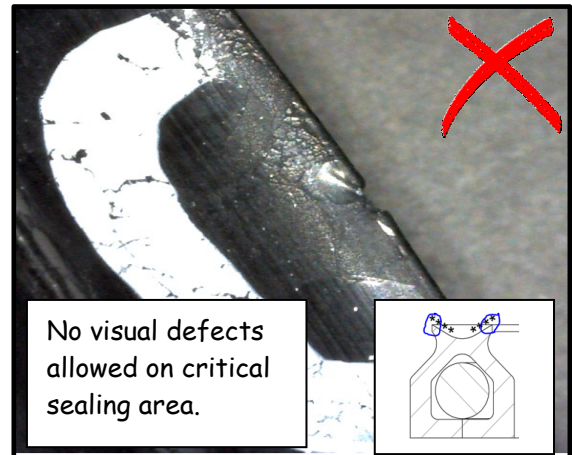
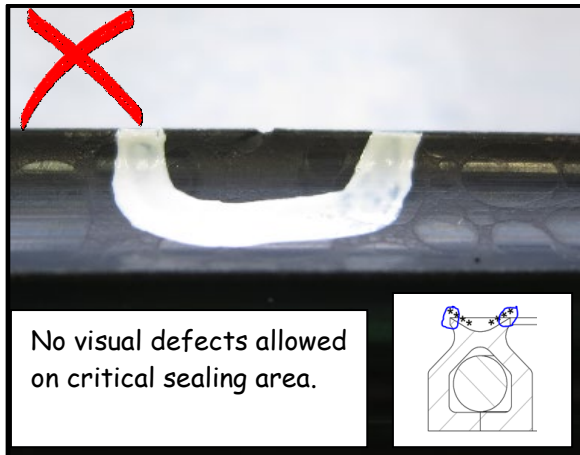
<b>James Walker</b>	<b>Title:</b>  Y Seal Join Inspection and Test	<b>Date:</b>  Oct 23, 2023	<b>Rev:</b>  10	<b>Page:</b>  Page 7 of 16	<b>Document No:</b> SIP07 <b>Approved by:</b> Quality Manager
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**NO SPLITS OR CRACKS ALLOWED ANYWHERE ON THE SEAL, EVEN AWAY FROM THE CRITICAL SEALING AREA.**

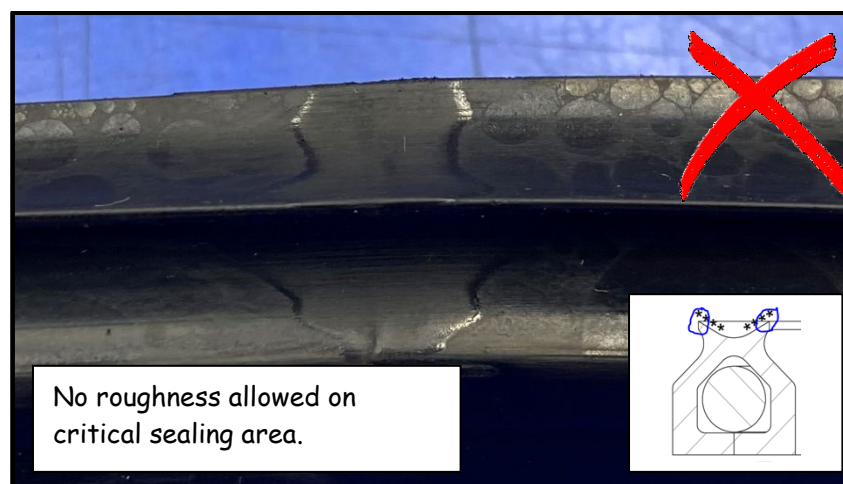
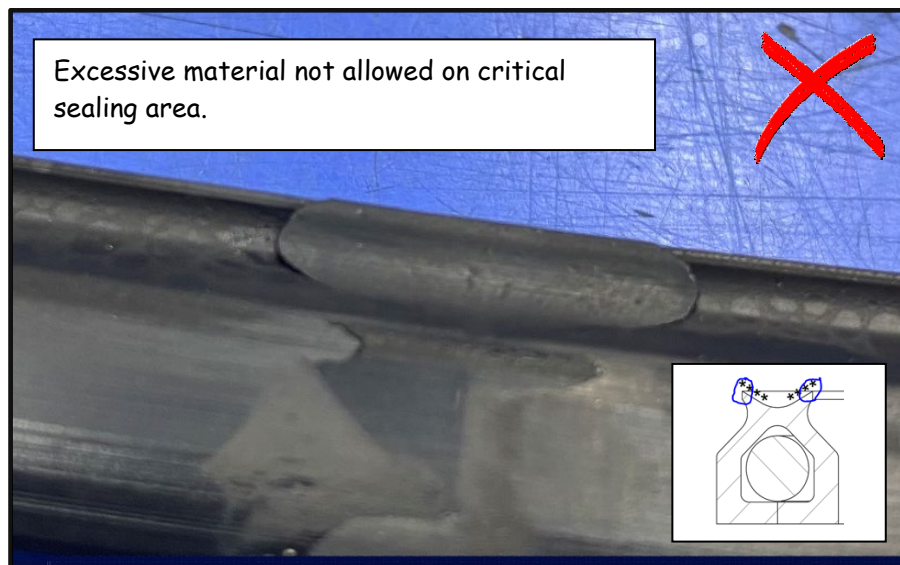
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**OK/ NOT OK VISUAL APPEARANCE - EOL 870**

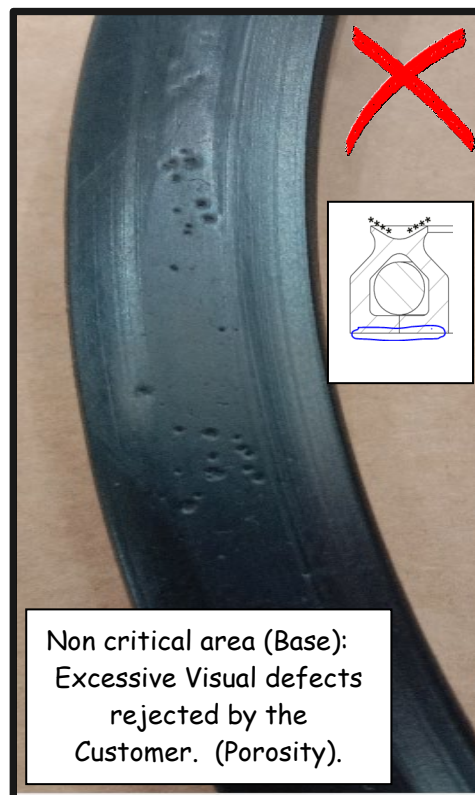
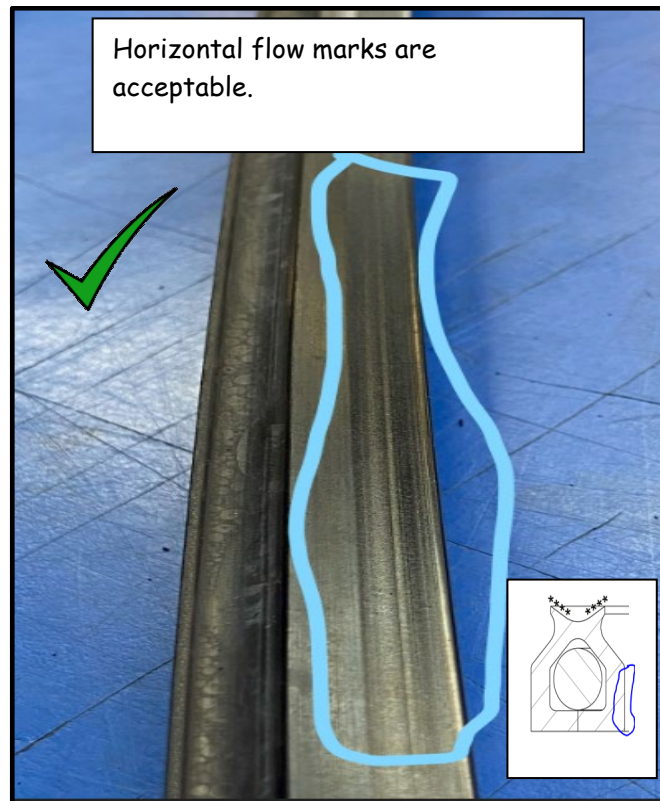




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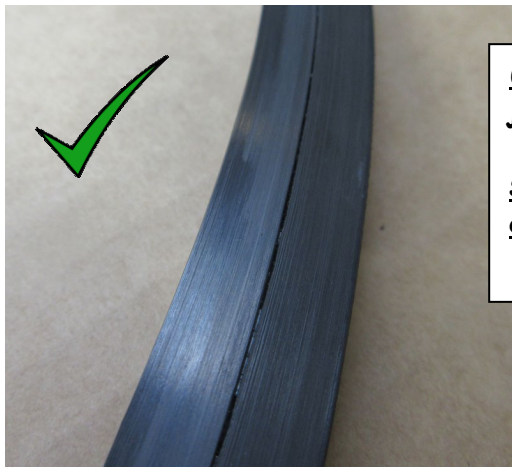
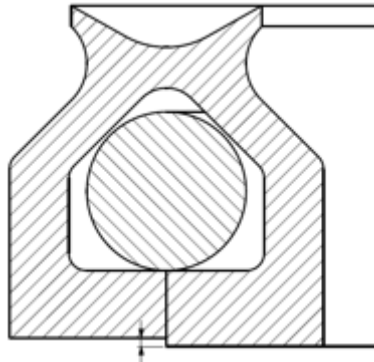
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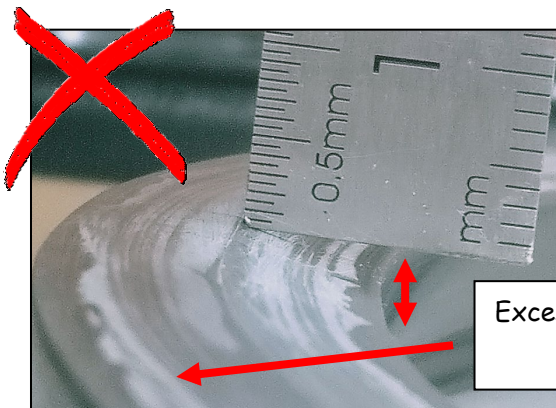
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**NO SPLITS OR CRACKS ALLOWED ANYWHERE ON THE SEAL, EVEN AWAY FROM THE CRITICAL SEALING AREA.**



**0.10mm maximum offset allowed on base join.**

**Section and depth dimensions to be within dimensional tolerances.**



**Excess adhesive not allowed on the base.**



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Excess adhesive not removed from base, cracking when the seal is manipulated

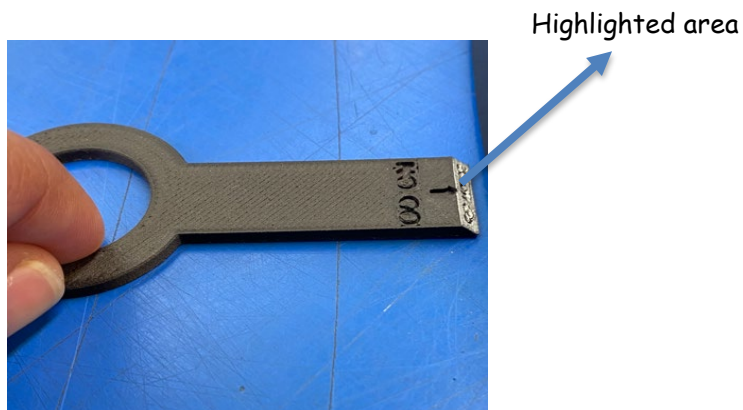
### Visual Tilt/ Canting.

Where seal canting/ tilting is visually observed, measure the level of cant in 4 places around the OD of the seal recording the average result. 3mm seal canting and below is deemed acceptable using a Vernier. The canting can also be measured using a 3mm Go/No Go gauge. Record the canting observations on Form F639 - Wartsila Y Seal Audit Form.

Seals with greater than 3mm canting must be retained. Please refer to the Quality Department for further support.



**Go/No Go gauge-** The canting can be measured using gauge. If the gauge stuck on the of seal edge (Silver highlighted area) then it is good to go, If it crossed the highlighted area then it not acceptable.



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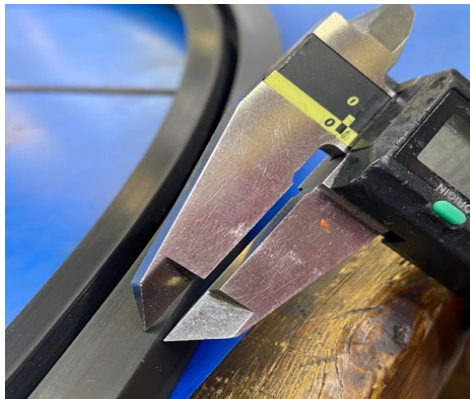


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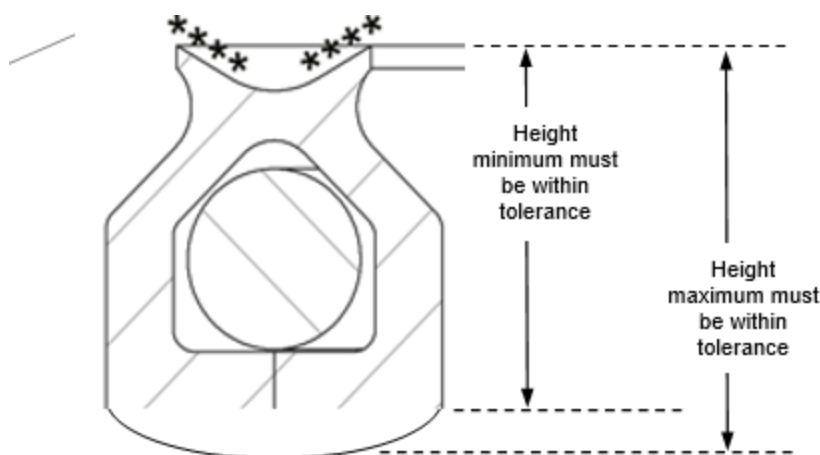


#### Chamfer/ Radius.

All biolion and EOL 870 seals require a 1 - 3mm chamfer/ radius. If this feature is not present within the moulding/ extrusion of the part, the chamfer/ radius is to be added to the seal manually.



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Curvature on seal base is typically caused by the expansion of the sponge core during the blowing process. Curvature on the base is permissible if the height of the seal remains in tolerance across the entire seal base

Version	Update Details	Date
3.0	Full document review of SIP07 to include inspection details for EOL 870 and Biolion. An OK/ NOT OK section added.	14.12.2020
4.0	Internal reject form added to the SIP.	22.01.2021
5.0	Biolion OK/ Not OK pictures added, inspection standard refined.	10.03.2021
6.0	Example of base joins added	10.03.2022
7.0	EOL870 base visual defect added from a Customer concern.	24.05.2022
8.0	Base offset tolerance added.	01.06.2022
9.0	Base offset amended following Customer feedback, Form F639 amendments and canting added.	04.08.2022
10.0	Developed and added Go- NO Go gauge for canting. Also, included some more pictures for Accept and rejects	23.10.2023