

Aquaporin Inside® Reverse Osmosis Flat Sheet Membrane Defects Identification Guide

Introduction

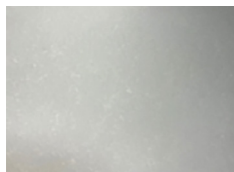
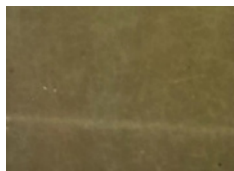
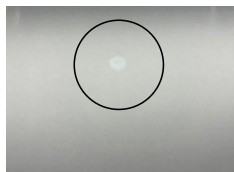
This document outlines the normal defects that may occur within the Aquaporin Inside® Reverse Osmosis Flat Sheet (RO FS) membrane material, along with guidelines on how to manage them. Material defects are classified into *Minor Defects* and *Actionable Defects*. Minor defects may include light wrinkles, minor stains, and other small defects that will require minimal corrective action. Actionable defects refer to more noticeable defects that will require precautionary actions to be taken, to protect the quality of the end-product.

This guide is designed to help customers gain a better understanding of the Aquaporin Inside® RO FS membrane material, and provides general instructions on how to identify and handle different types of defects.

Minor Defects

Minor defects are appearance defects on the surface of the RO FS membrane. These will have minor to no impact on the overall membrane performance. Please note that all minor defects less than 100 mm² or 1 cm² in area are considered not significant and are not labelled. All minor defects are not eligible for compensation. A list of common minor defects is shown in **Table 1**.

Table 1: List of minor defects

Defect Description	COA Defect Label	Example Photo
Light wrinkles ¹	NE	-
Light scratches ²	NE	-
Minor stains ³	NE	-
Slight light transmission spots	NE	
Foreign matter line	NE	
Glycerin spots	NE	

Legend

NE = no effect

Minor defects notes

1. Light wrinkles are small folds or ridges appearing on the surface of the membrane that do not affect the overall evenness or flatness of the membrane.
2. Light scratches are markings made on the membrane surface by sharp or rough objects, but that do not penetrate to the active layer.
3. Minor stains may appear lightly yellow or brown in colour due to the chemical reagents or physical equipment being used during the manufacturing process.

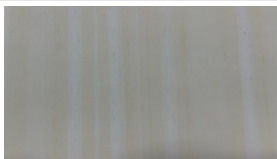


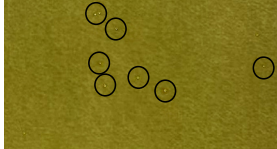
Actionable Defects

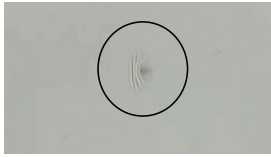
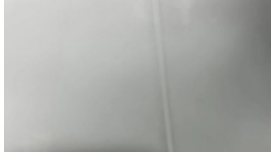



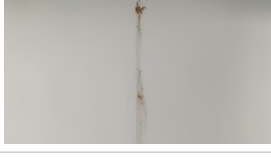

Actionable defects are defects that may occur during the production process which may compromise membrane performance or end-product quality. Do not use membrane areas that contain these defects. **Table 2** shows a list of common actionable defects.

Actionable defects should be identified and labelled with a coloured tag on the edge of the membrane roll, and processed appropriately as follows:

- All actionable defects should be labelled with coloured tags, as well as properly recorded in the COA. The defect description (as per Column 1 of **Table 2**) and the COA defect label (as per Column 2 of **Table 2**) will be stated in the COA.
- Point defects (defects < 5 cm in length) will be compensated with 0.3 m of membrane.
- Continuous defects (defects > 5 cm in length) will be compensated according to the actual length (in meters) in which the defects are present.
- Consecutive point defects occurring in less than 1 m of membrane length will be compensated as 1 m.

Table 2: List of actionable defects

Defect Description	COA Defect Label	Defect Photo
Uncoated organic phase	CD	
Translucent longitudinal stripes (machine running direction)	CL	
Physical damage (cutting/sampling/ defect resolution, etc.)	PD	
Pinhole(s)	CD	

Defect Description	COA Defect Label	Defect Photo
Translucent spots (wrinkling)	CD	
Wrinkles	WR	
Heavy scratch (through membrane active layer)	PD	
Discolored spots	CD	
Foreign materials	PD	
Black or yellow smudges (≥ 100 mm ²)	CD	
Splice ¹	SP	

Legend

CD = coating defect
 CL = coating line
 PD = physical defect
 WR = wrinkle

Actionable defects notes

1. A splice is done when one finished membrane is connected with another finished membrane to construct the full final length. Each splice will be compensated with a length of 1 m of membrane.

In the case that:

- other types of membrane defects not outlined in this document were found
- major defects that have not been reported in the COA were found
- major defects that have not been marked on the RO FS membrane were found

please contact the Aquaporin quality department as soon as possible by email at quality@aquaporin.com.

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