

**COSMETIC SPECIFICATION FOR OPTICAL FILTER LAMINATES****SCOPE**

This document is intended to specify the cosmetic and inspection criteria for optical laminated filters manufactured by Zytronic. This document is intended to serve as a default specification when a formal customer specification is not referenced or available.

Performance and cosmetic characteristics for anti-glare, multi-layer anti-reflective or conductive thin film surface coatings will default to the coating manufacturer's specifications.

Customer furnished material for incorporation into a Zytronic optical filter laminate must be accompanied by a formal written cosmetic specification. If no formal specification is available then the cosmetic specification will default to that of this document QADoc.II. Section 9.

However, Zytronic cannot be held responsible for defects in the final laminate, which are a direct consequence of the quality of customer furnished material.

**INSPECTION METHOD**

Laminates to be inspected shall be viewed in both transmitted light and reflected light from the end use viewing side only in a relevant inspection booth as detailed in Drawing No. 000/01/01.

For inspection in transmitted light, the laminate is positioned at the mouth of the inspection booth and viewed from approximately 450mm-600mm distance. The laminate is moved in an up and down and a right to left manner in order that the whole of the surface is examined.

For inspection in reflected light, the laminate is positioned at the mouth of the inspection booth and angled so that the upper strip light source reflects off the face being examined.

The dimensions of any defect observed shall be measured using an appropriate gauge or magnifying eyepiece and reticule.

The total observation time shall not exceed 20 seconds.

**OPTICAL SPECIFICATION**

a) Linear Defects, Opaque and Translucent.

This class of defects covers scratches, surface blemishes, lint or hairs, which are generally long and thin in nature. These types of defects are to be examined at their widest points. For lint and hairs: -

Defect Description	Defect Allowance
Width (W) > 0.076mm (0.003")	None.
W > 0.025mm (0.001") < 0.075mm (0.0029")	Maximum accumulated length shall not exceed 5mm.
W < 0.024mm (0.0009")	Disregard.

For surface blemishes and scratches: -

Defect Description	Defect Allowance
Width (W) > 0.076mm (0.003")	None.
W > 0.025mm (0.001") < 0.075mm (0.0029")	Maximum accumulated length shall not exceed 25% of the diagonal length up to a maximum of 25mm.
W < 0.024mm (0.0009")	Disregard.

b) Circular Defects.

This class of defects includes digs, bubbles, foreign matter, coiled hairs/lint and coating blemishes, which are generally round or circular in nature.

The diameter equivalent (D) of irregular shaped defects shall be taken as the arithmetic mean of the defect length (L) and width (W), that is  $D = (L+W)/2$ .

Defect Description.	Defect Allowance.
Mean Diameter (D) > 0.508mm (0.020")	None.
D > 0.245mm (0.010") < 0.507mm (0.019")	3 per 75mm Ø circle, min. spacing 13mm.*
D < 0.244mm (0.0096")	Disregard.

\*Any filters that have an anti-reflective/anti-glare/anti-scratch coating an additional allowance of 2 per 75mm Ø circle will be allowed on the surface only.

If louvered privacy filters are included, the allowances for the laminate are as detailed in the table below.

Diameter/Equivalent Diameter (Using Sylvania Limit Gauge)	Maximum Allowed
>0.025" (0.64mm)	None.
0.010" to 0.025" (0.25mm to 0.64mm)	3 per part; Minimum spacing 2" (50.8mm).
<0.010" (0.25mm)	Disregard if not visible at 18"-24" (457.2mm – 610mm) viewing distance, unless clustered in a 0.125" (3.18mm) Diameter area.

c) Edge Chips

Edge chips are permissible so long as they do not encroach into the viewing area and do not exceed, 3.175mm x 0.254mm in size and 3-off total in frequency, so long as they are no closer than 100mm to one another.

d) Contrast Defects.

This type of defect covers any hazing, smudges or discolouration of the filter. None of these items are acceptable.

**Note:** Should any defects become subjective then the screens shall be placed in front of an illuminated display and a switched off display and a "Fit for Purpose" approach shall be taken.

e) RFI Shielding Mesh

No tears or breaks in the woven mesh within the laminate are allowed.

Flying mesh/mesh skirts outside the laminate viewing area are permitted factory repairs to minor defects.

Uniformity of colour and treatment must be observed.

Non-linearity of the mesh must not exceed 5mm per 300mm.

To ensure that Moiré Fringing does not occur when a display is viewed the incorporated mesh is angled at a specific orientation. This specified angle must be maintained to within  $\pm 3^\circ$

f) Printed Borders (Where applicable).

Where a printed border has been applied, any defect which is behind the print and not visible when viewed through the front face shall be deemed "*Fit for Purpose*" so long as the functionality of the screen is not affected.

Print Faults.

This class of defects includes pin holes and print spot faults, which are generally round or circular in nature.

Defect Description	Defect Allowance
D. >1.0mm (0.039")	None.
D. >0.7mm (0.027") <1.0mm (0.039")	1 per laminate
D. >0.20mm (0.0079") <0.7mm (0.027")	5 per laminate, min spacing 100mm
D. <0.20mm (0.0079")	Disregard

**CHANGE LOG**

CHANGE	Date	REQUESTED BY	ITEM/SECTION	MODIFICATION OR REASON
1	03/04/2014	C Thompson	All Sections	Initial Document Creation and Approval
2	16/01/2017	K Gleghorn	All Sections	Document reformatted