Cat-i Glass
Glass Handling, Inspection
&
Demarcation of Defects

Surface Quality Criteria

Delivered Product Storage and Handling

It is recommended that delivered glass should be stored in a controlled environment with the humidity level under 50% and a temperature range of 65-75F. Glass should be stored standing on the edge and not be stored horizontally. When removing glass from boxes, or crates, avoid sliding glass on glass, even if it is separated by paper. Hinge the part being removed away from the rest of the parts and the lift it away, preventing edges and corners from contacting the adjacent glass surface.

Lighting Conditions and Measurement

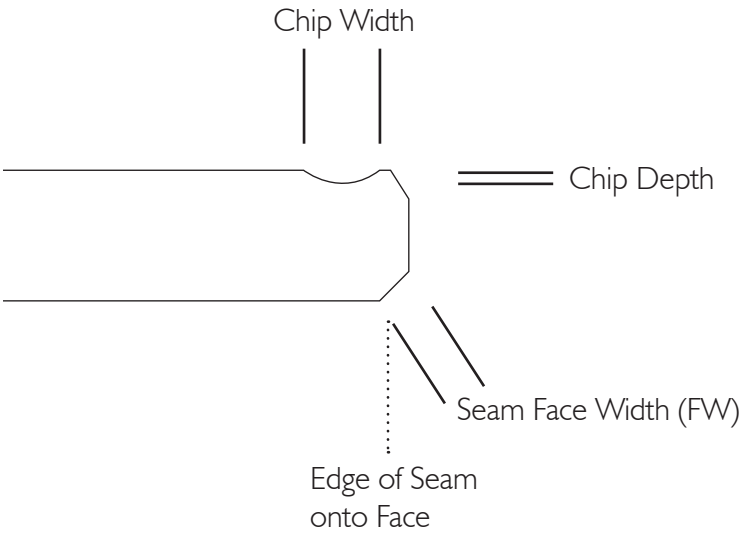
Inspection lighting described below is uniform fluorescent lighting measuring ≥ 160 foot-candles at 12" from light source.

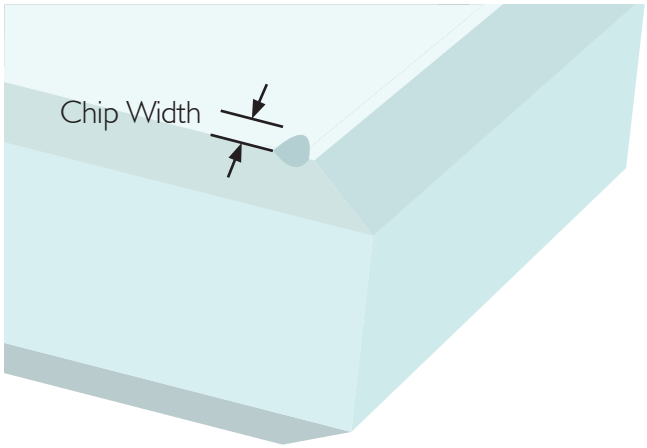
Defect Identification and Returns

At Cat-i Glass we pride ourselves in manufacturing a superior glass product for our customers. If for any reason there is a defect that you feel it out of specification please mark the defect using a static cling sticker or some other sticker with a non-marring adhesive tape such as a Post-It Note®. Glass that has any coatings, etch, or films cannot be marked using any sort of pen or marker. If the parts are found to be within the agreed upon specification after Cat-i anaylzes the part(s) we will return those parts to you. Parts marked with anything other than static cling or non-marring adhesive tape will not be credited due to customer mis-handling and labeling. Please contact your customer service representative if you have any questions or concerns before sending parts back.

Surface Quality Criteria
Chips

Chip- A small piece of glass broken away from the face or edge of the part. Small chips may be repaired by a heavier seam where allowed. Chip width is measured from the edge of the seam onto the face; chip length is the distance along the edge. Chip depth typically should not exceed 1/2 the thickness of the part.





The chip allowance specification will vary by part depending on the glass thickness and processing methods, as well as product application and glass mounting method.

Surface Quality Criteria

Delivered Product Storage and Handling

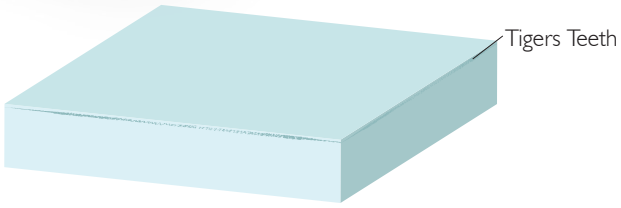
It is recommended that delivered glass should be stored in a controlled environment with the humidity level under 50% and a temperature range of 65-75F. Glass should be stored standing on the edge and not be stored horizontally. When removing glass from boxes, or crates, avoid sliding glass on glass, even if it is separated by paper. Hinge the part being removed away from the rest of the parts and the lift it away, preventing edges and corners from contacting the adjacent glass surface.

Lighting Conditions and Measurement

Inspection lighting described below is uniform fluorescent lighting measuring ≥ 160 foot-candles at 12" from light source.

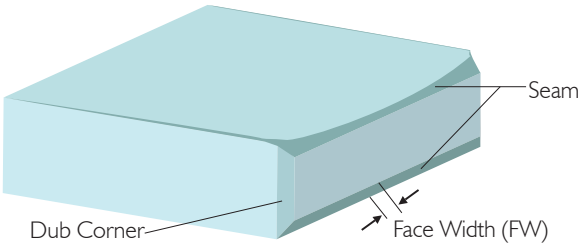
Standard Glass Edge Profiles

Cut



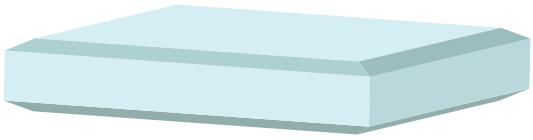
Clean Cut Edge, No Seam

Cut/Seam



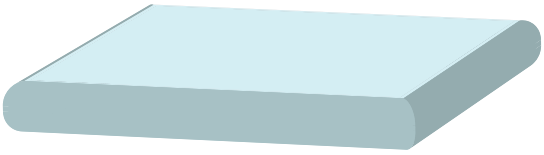
Cut Edge, with Standard .020 FW x 45° Nominal Seam
Dub Corner Option

Flat Ground or Flat Polish



Flat Ground or Polished Edge, Arris Optional
(shown with Arris)

Pencil Ground or Pencil Polish

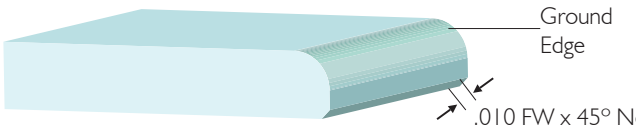


Pencil Ground or Pencil Polished Edge

Beveled Edge

Beveled Edge, with Remaining Lip
(Ground or Polished)

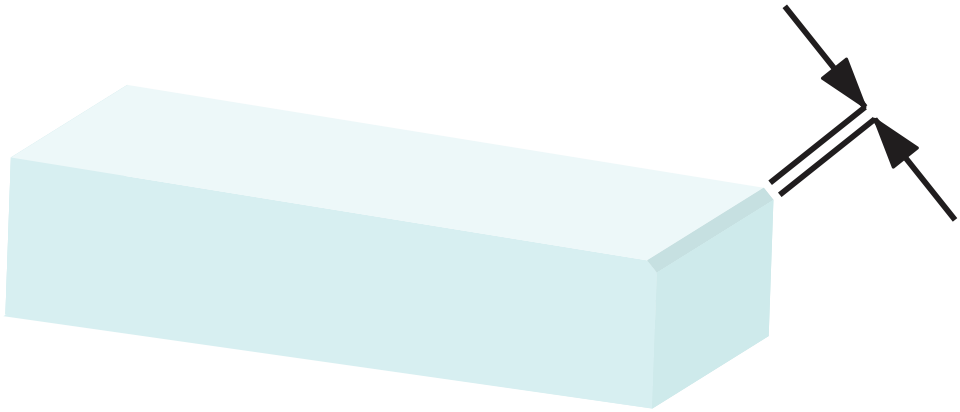
Combination Profile



Ground Edge, with .010 FW x 45° Arris
(Pencil Ground w/ Flat Ground Edgewall and Arris)

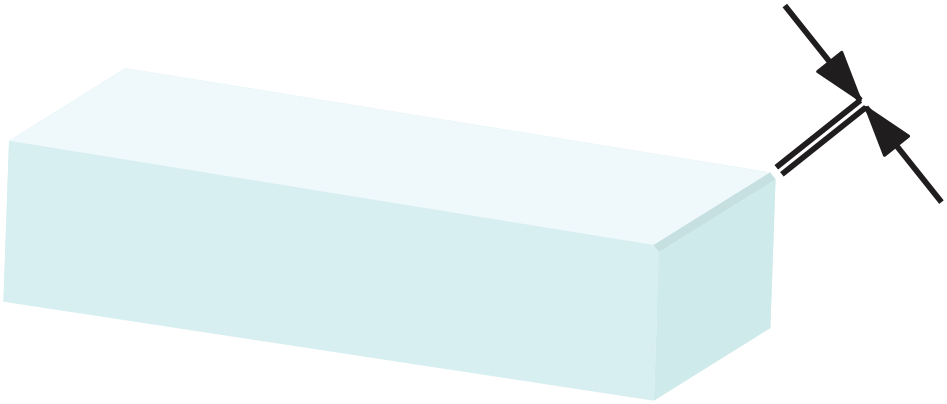
Nominal Seam Definition at Cat-i Glass

.040” FW Nominal



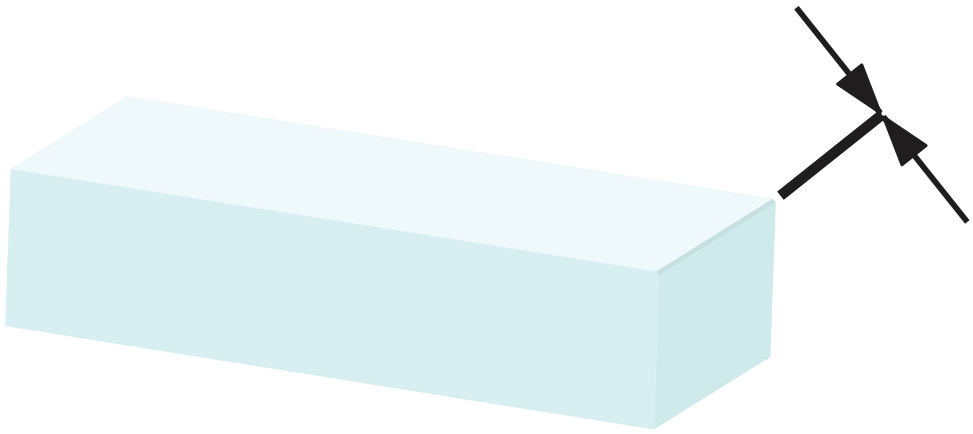
.040” FW Nominal defined as:
.010” - .070” Reference

.020” FW Nominal



.020” FW Nominal defined as:
.005” - .040” Reference

.010” FW Nominal



.010” FW Nominal defined as:
.0024” - .020” Reference

Surface Quality Criteria
220/200

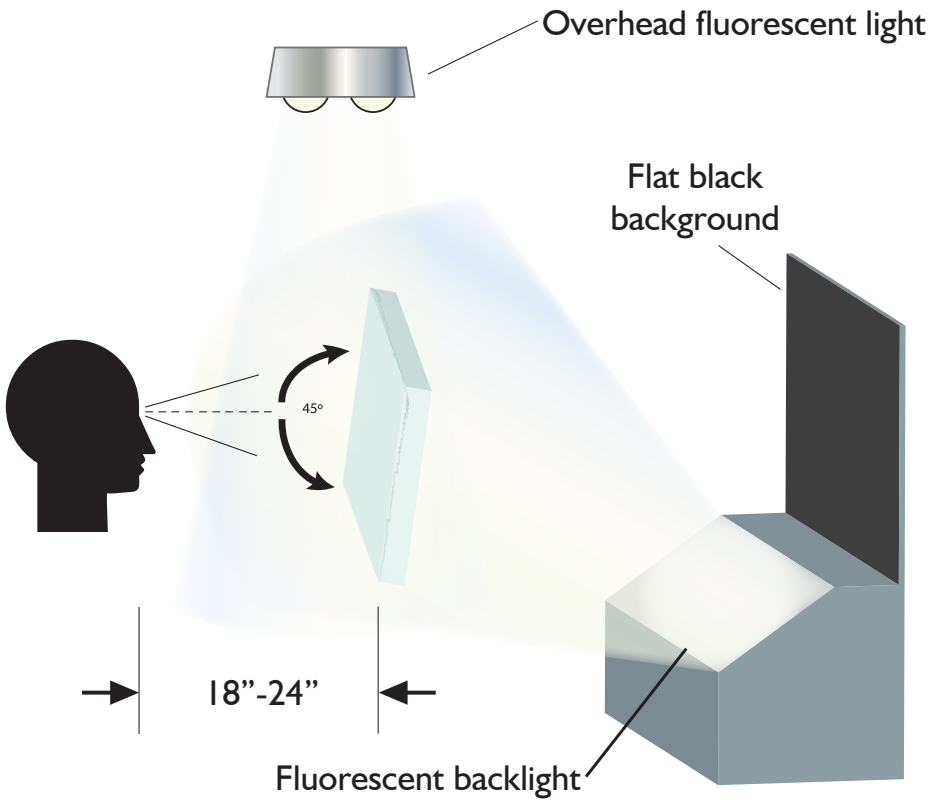
<u>Note</u>: Inspection Method Starts in Transmission and is Rotated into Reflection

Digs:
Max avg. dia. digs .030 ≤ .079”, 3 max. per 4” diameter
Avg. dia. dig x ≤ .030" not counted

Scratches:
Max width scratch at .005” - .009"
Scratch width ≤ .005" not counted
Max Length Single Length 1.000"
Max Accumulated Length 3.000"

View perpendicular to the eye, at 18”-24”, in transmission and rotated into reflection at a 45° angle to the eye for 10 seconds against a flat black background using a 45° backlight and overhead light. Part may only be rotated toward and away (not side to side) from the eye to detect “ reflective defects. Surface defects will show up as “sparkle, streak, or a colored spot on AR coated substrates (silver, red, violet, blue, green)”.

Note: Stains visible under transmission are not acceptable. Light stains under reflection are acceptable. Stains that do not exceed the scratch/dig specifications or do not affect the spectral performance beyond the scratch/dig limits are acceptable.



Page Added After Books were Printed Rev. Does Not Match Books on the Floor

Surface Quality Criteria
60/20

Digs:
Max avg. dia. dig x ≤ .008", 3 max. per 1" dia.
Avg. dia. dig x ≤ .005" not counted

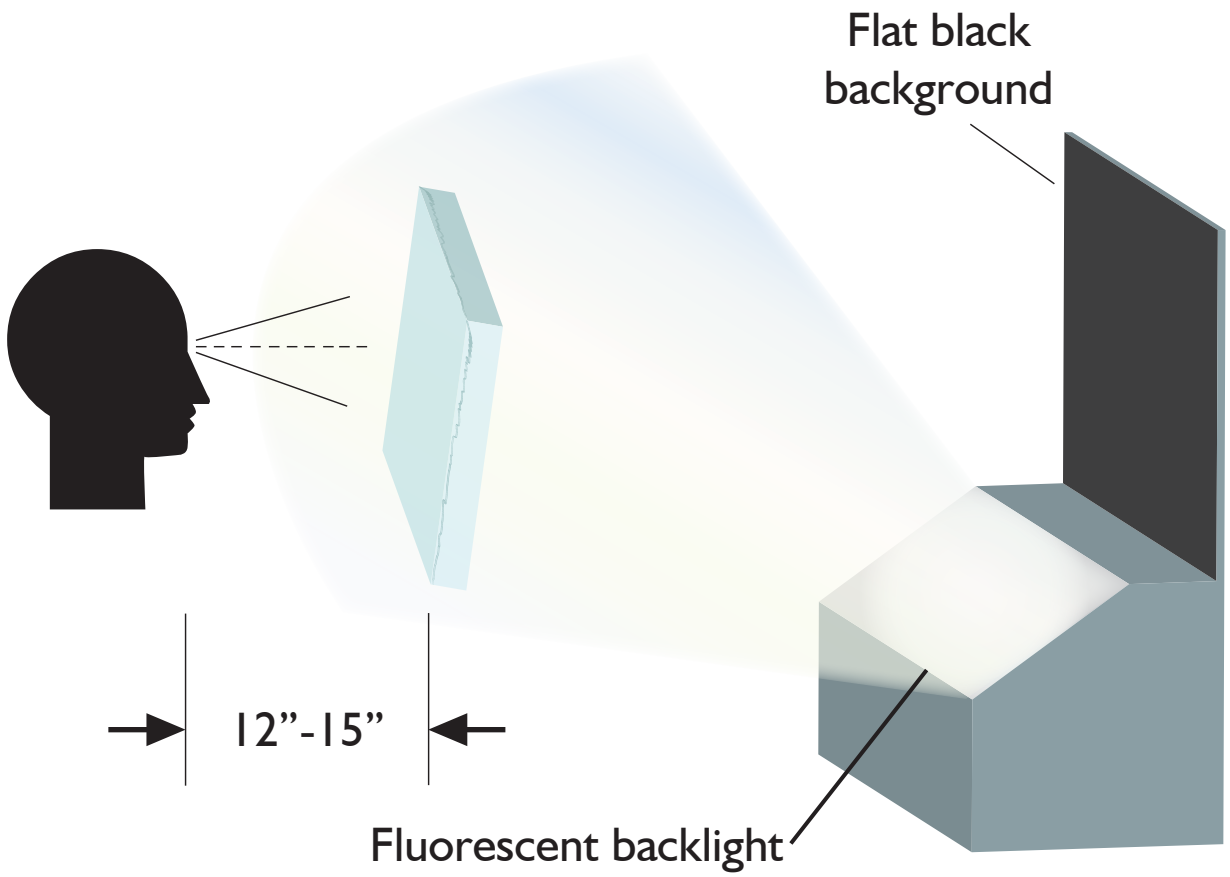
Scratches:
Max width scratch x ≤ .0024"
Calculate the max allowed scratch length as follows:
For square or rectangle parts:

$$\text{Max Length} = \frac{\text{The square root of (LxW / 3.1416)}}{2}$$

For circles:
Max Length = Dia. /4

Multiple scratches accumulated length to not exceed max scratch length

View perpendicular to the eye, at 12"-15", in transmission for 2-7 seconds against a flat black background and 45° backlight.



Surface Quality Criteria
60/40

Digs:
Max avg. dia. dig x ≤ .016", 3 max. per 1" dia.
Avg. dia. dig x ≤ .010" not counted

Scratches:
Max width scratch x ≤ .0024"
Calculate the max allowed scratch length as follows:
For square or rectangle parts:

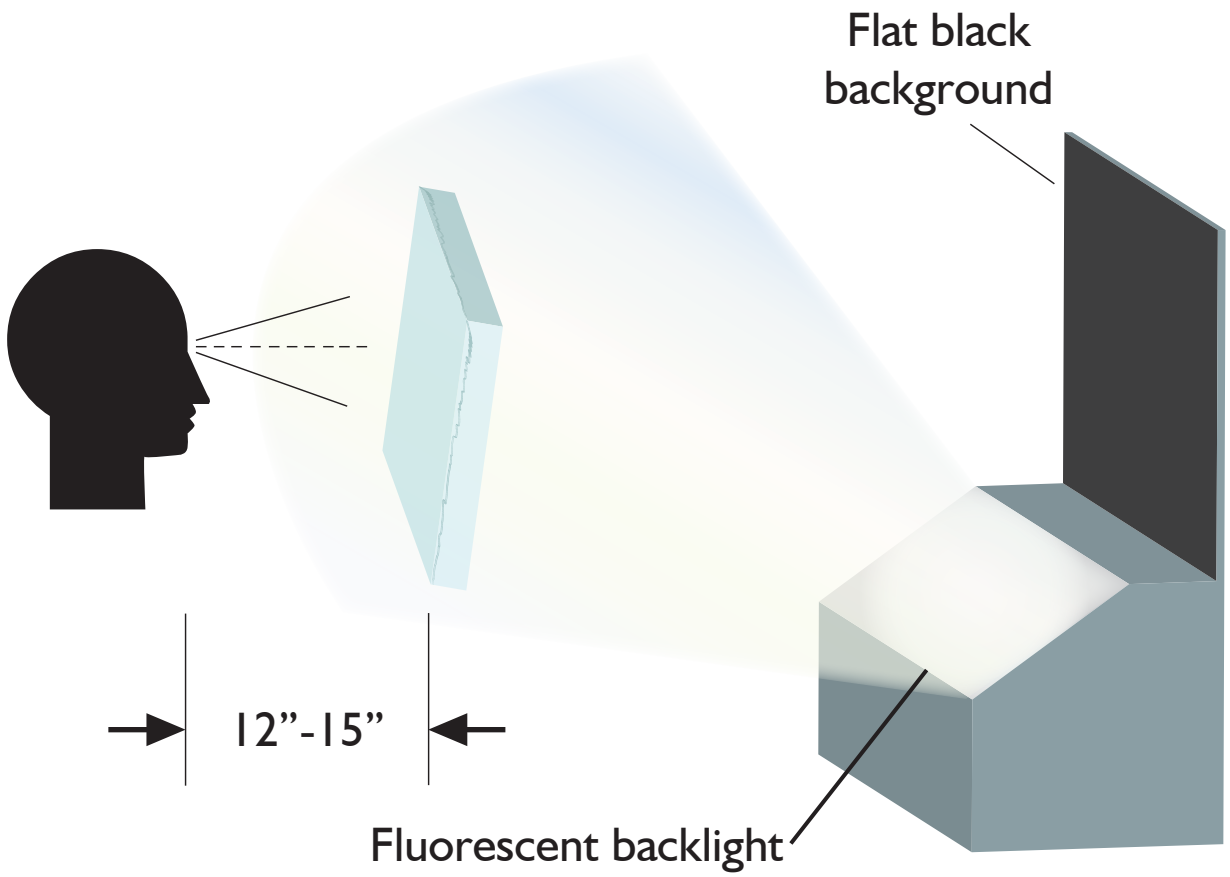
$$\text{Max Length} = \frac{\text{The square root of (LxW / 3.1416)}}{2}$$

For circles:

Max Length = Dia. /4

Multiple scratches accumulated length to not exceed max scratch length

View perpendicular to the eye, at 12"-15", in transmission for 2-7 seconds against a flat black background and 45° backlight.



Surface Quality Criteria
60/40 - Display

Digs:
Max avg. dia. dig ≤ .016", 3 max. per 1" dia.
Avg. dia. dig x ≤ .010" not counted

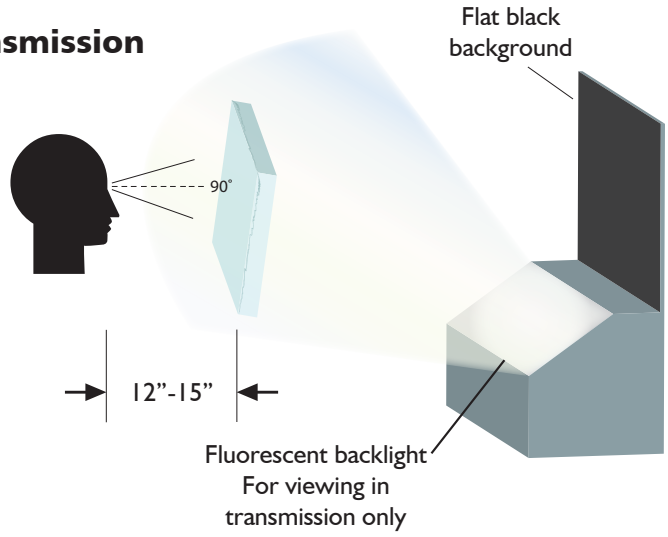
Scratches:
Max width scratch x ≤ .0024"
Calculate the max allowed scratch length as follows:
For square or rectangle parts:

$$\text{Max Length} = \frac{\text{The square root of (LxW / 3.1416)}}{2}$$

For circles:
Max Length = Dia. /4

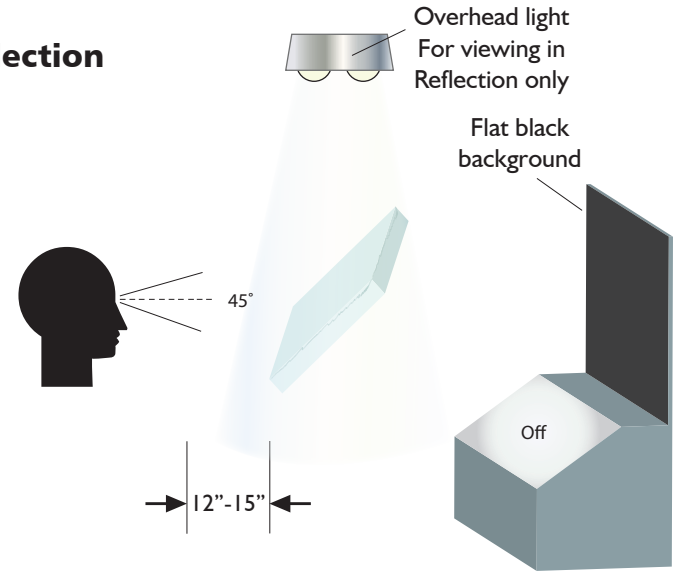
Multiple scratches accumulated length to not exceed max scratch length

Transmission



View perpendicular to the eye, at 12"-15", in transmission for 2-5 seconds against a flat black background and 45° backlight.

Reflection



View at 45° to the eye, at 12"-15", in reflection for 2-5 seconds against a flat black background.

Surface Quality Criteria
60/40 R

Digs:
Max avg. dia. dig ≤ .016”, 3 max. per 20mm dia.
Avg. dia. dig x ≤ .010" not counted

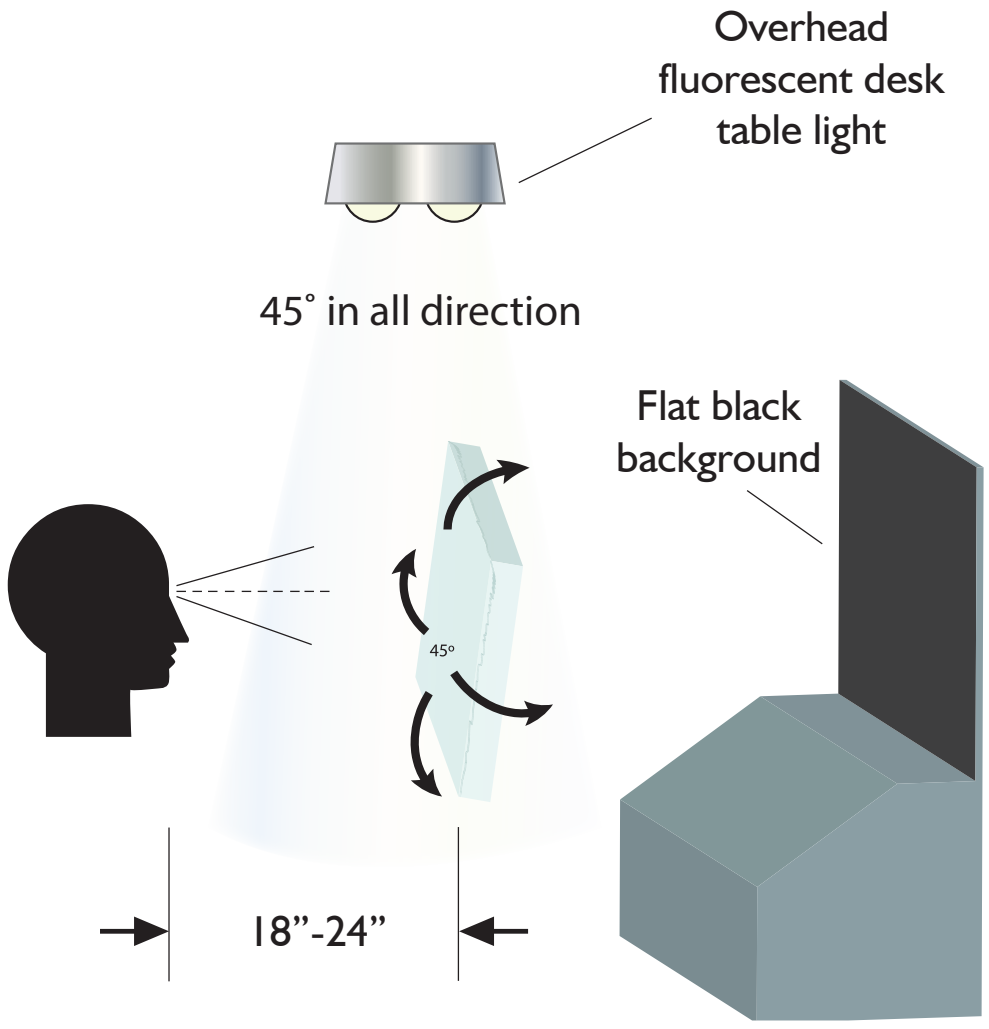
Scratches:
Max width scratch x ≤ .0024”
Calculate the max allowed scratch length as follows:
For square or rectangle parts:

$$\text{Max Length} = \frac{\text{The square root of (LxW / 3.1416)}}{2}$$

For circles:
Max Length = Dia. /4

Multiple scratches accumulated length to not exceed max scratch length

View perpendicular to the eye, at 18”-24”, in transmission & reflection for 1-5 minutes against a flat black background & over head fluorescent desk table light. Using F15T8D (daylight) bulbs.

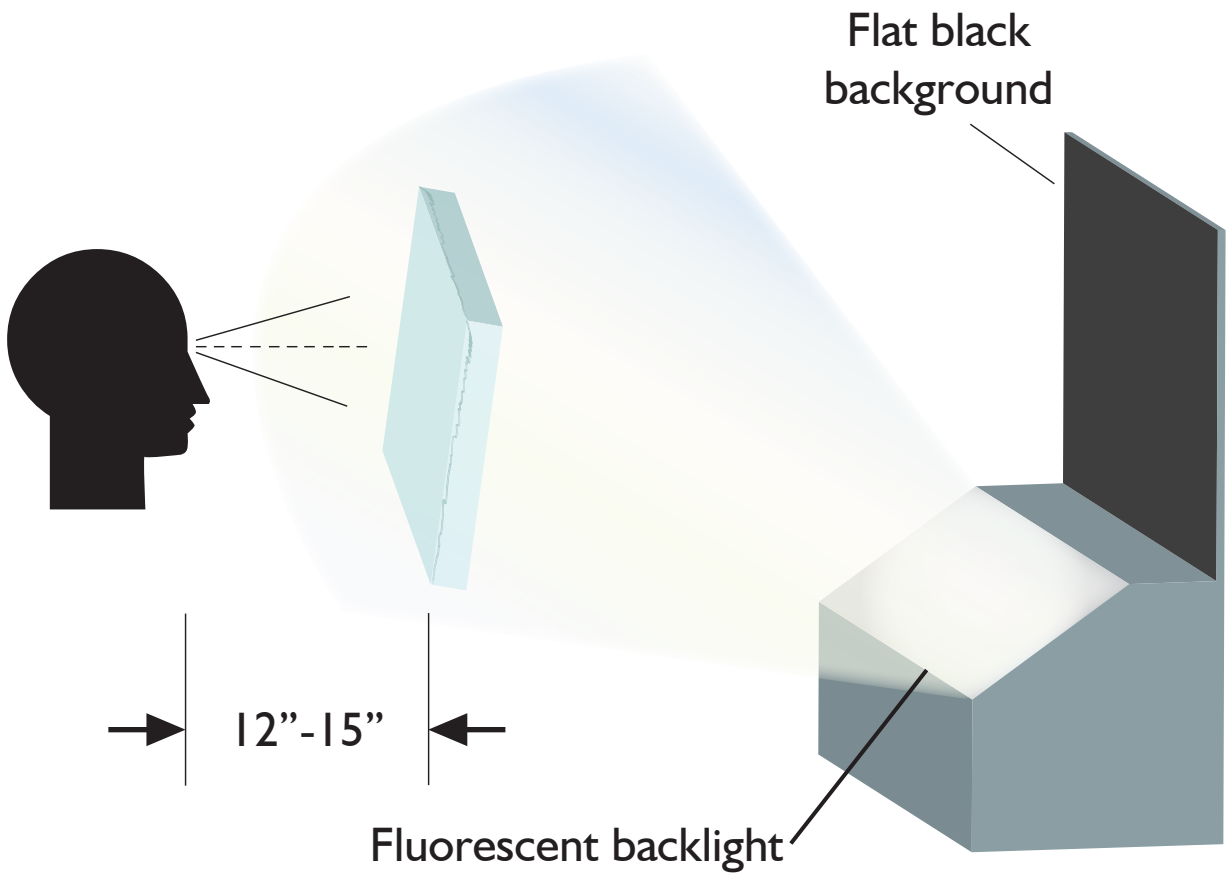


Surface Quality Criteria
80/40 T

Digs:
Multiple digs ≤ .016" avg. dia., 3 max. per 1" diameter
Single dig at .016" avg. dia.
Digs > .016" avg. dia. not allowed

Scratches:
1 max width scratch at .0032"
Max scratch length = 2.000"
Chips are measured from edge of glass
No stains in excess of scratch/dig
No Internal bubbles of any size allowed

View perpendicular to the eye, at 12"-15", in transmission for 2-7 seconds against a flat black background and 45° backlight. Move part up & down approximately 3" in each direction keeping the part perpendicular to the eye to detect etch defects exceeding scratch / dig criteria.



Surface Quality Criteria
80/50

Digs:
Max avg. dia. digs ≤ .020", 3 max. per 1" diameter
Avg. dia. dig x ≤ .010" not counted

Scratches:
Max width scratch x ≤ .003"
Calculate the max allowed scratch length as follows:
For square or rectangle parts:

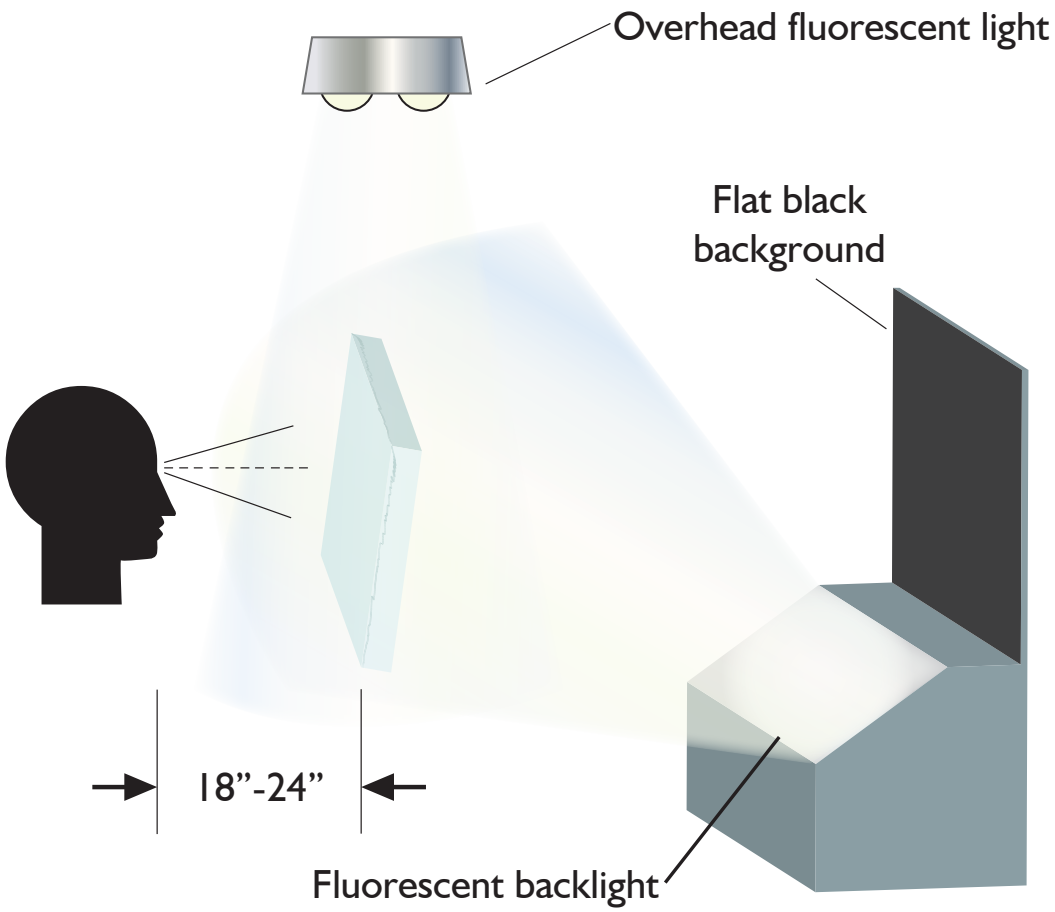
$$\text{Max Length} = \frac{\text{The square root of (LxW / 3.1416)}}{2}$$

For circles:

Max Length = Dia. /4

Multiple scratches accumulated length to not exceed max scratch length

View perpendicular to the eye, at 18"-24", in transmission for 2-5 seconds against a flat black background, using a 45° backlight and overhead light.



Surface Quality Criteria
80/50 AMT

Digs:
Avg. dia. dig .010" ≤ x ≤ .020", 5 max. per part
Avg. dia. dig < .010" not counted
All defects must be separated by ≥.400"

Scratches:
All defects must be separated by ≥.400"
Max width scratch x ≤ .003"
Calculate the max allowed scratch length as follows:
For square or rectangle parts:

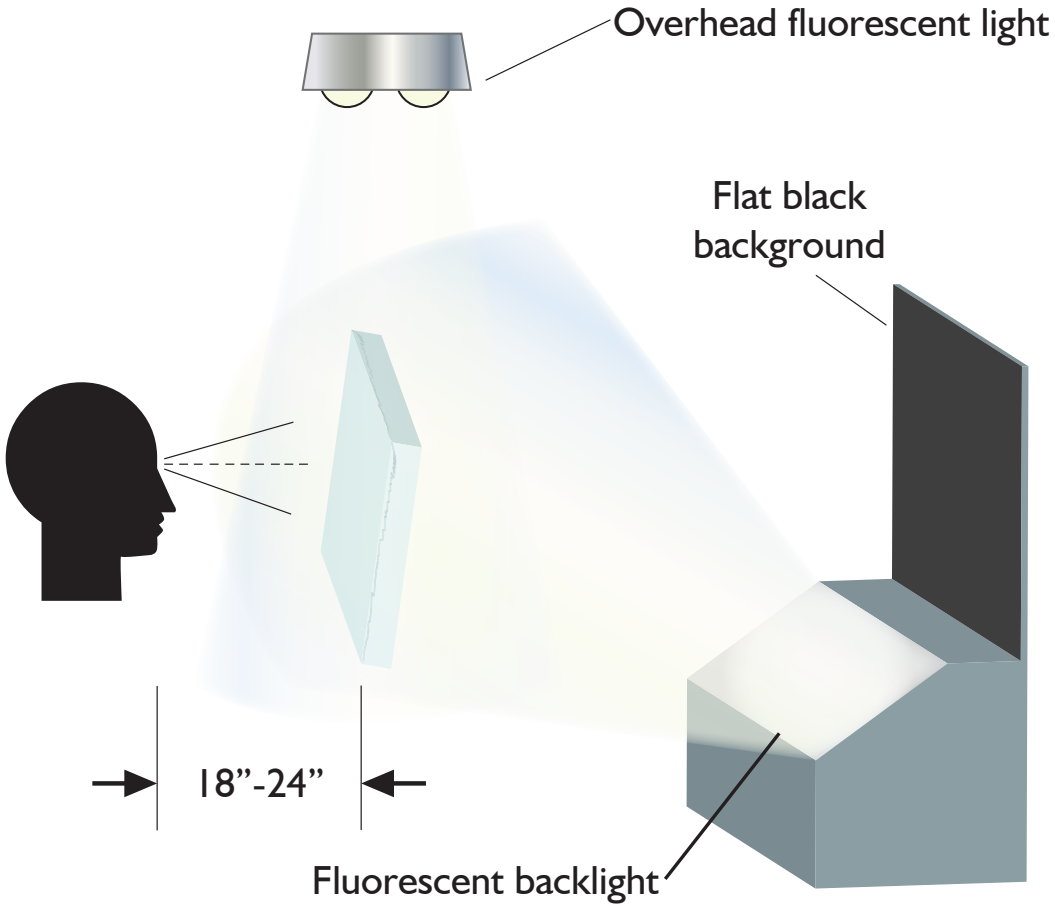
$$\text{Max Length} = \frac{\text{The square root of (LxW / 3.1416)}}{2}$$

For circles:
Max Length = Dia. /4

Multiple scratches accumulated length to not exceed max scratch length

Note:
All sensor defects are measured against glass defect criteria

View perpendicular to the eye, at 18"-24", in transmission for 2-5 seconds against a flat black background, using a 45° backlight and overhead light.



Surface Quality Criteria
80/50 C

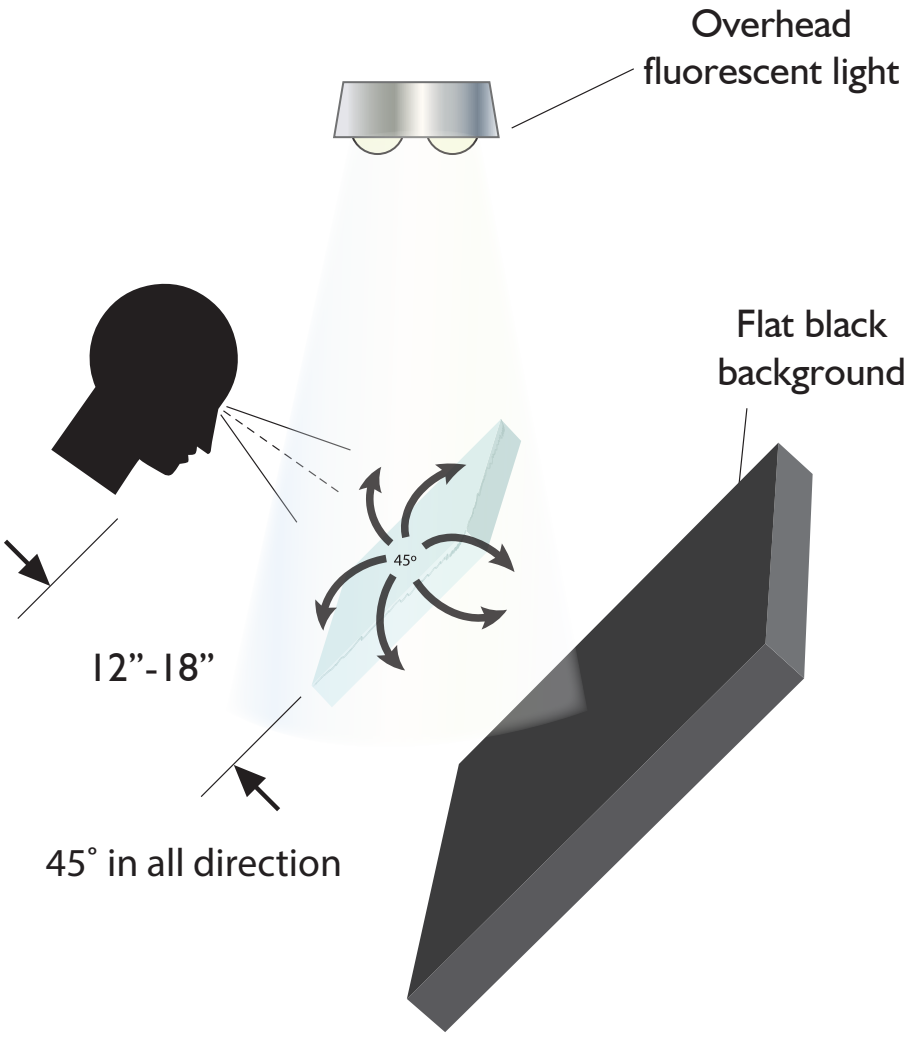
Digs:
Max avg. dia. dig ≤ .020”, 3 max. per 1.000" dia.
Avg. dia. dig x ≤ .010" not counted

Scratches:
Max width scratch x ≤ .003”
Max length scratch = 0.500

Multiple scratches accumulated length to not exceed max scratch length

View perpendicular to the eye, at 12”-18”, in transmission & reflection for 15 seconds against a flat black background & over head fluorescent light. Emphasis of the inspection time is on reflection.

Inspection lighting described below is uniform fluorescent lighting measuring ≥ 160 foot-candles at 12" from light source.



Surface Quality Criteria
80/50 N

Digs/Bubbles:
Max avg. dia. dig ≤ .020”, Multiple allowed if separated by ≥.25"
Avg. dia. dig x ≤ .010" not counted

Scratches:
Max width scratch x ≤ .003”
Max length scratch = 0.500

Multiple scratches allowed if separated by ≥1"

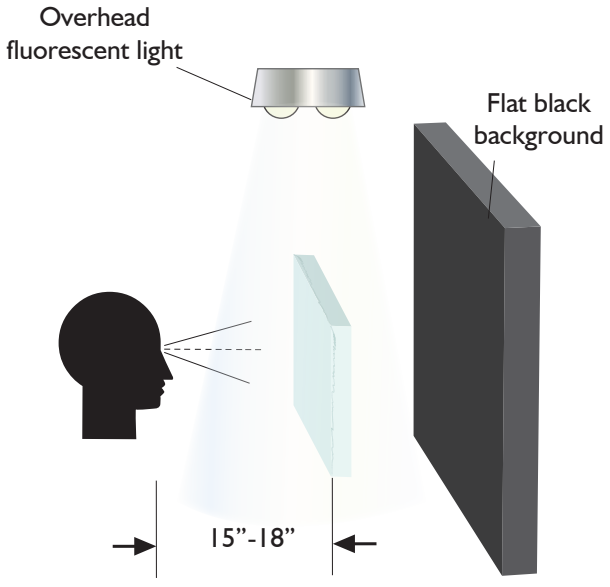
Coating Defects:
HEA/HiTar - Max avg. dia. ≤ .020, Multiple allowed if separated by ≥.25"
Commercial AR - Max avg. dia. ≤ .060, Multiple allowed if separated by ≥.25"

Warp:
.010" Max on any size part

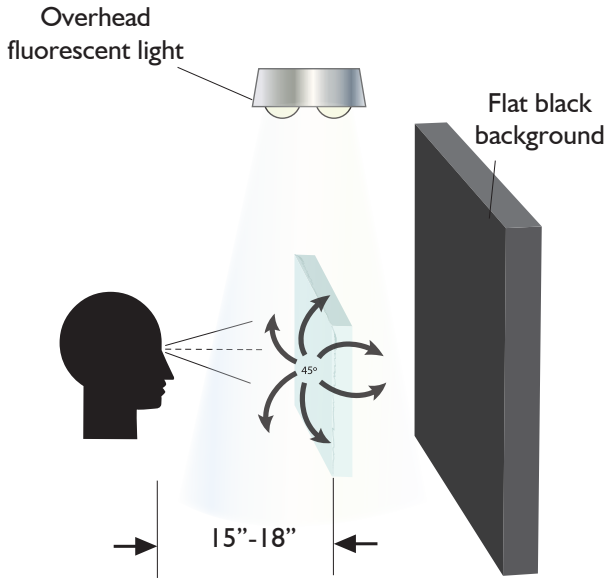
View perpendicular to the eye, at 15”-18”, in transmission & reflection for 3-5 seconds against a flat black background & over head fluorescent light. Emphasis of the inspection time is on reflection.

Inspection lighting described below is uniform fluorescent lighting measuring ≥ 800-1200 lux at 12" from light source.

Standard Inspection



Coated Glass Inspection



45° in all direction

Surface Quality Criteria
80/50 E

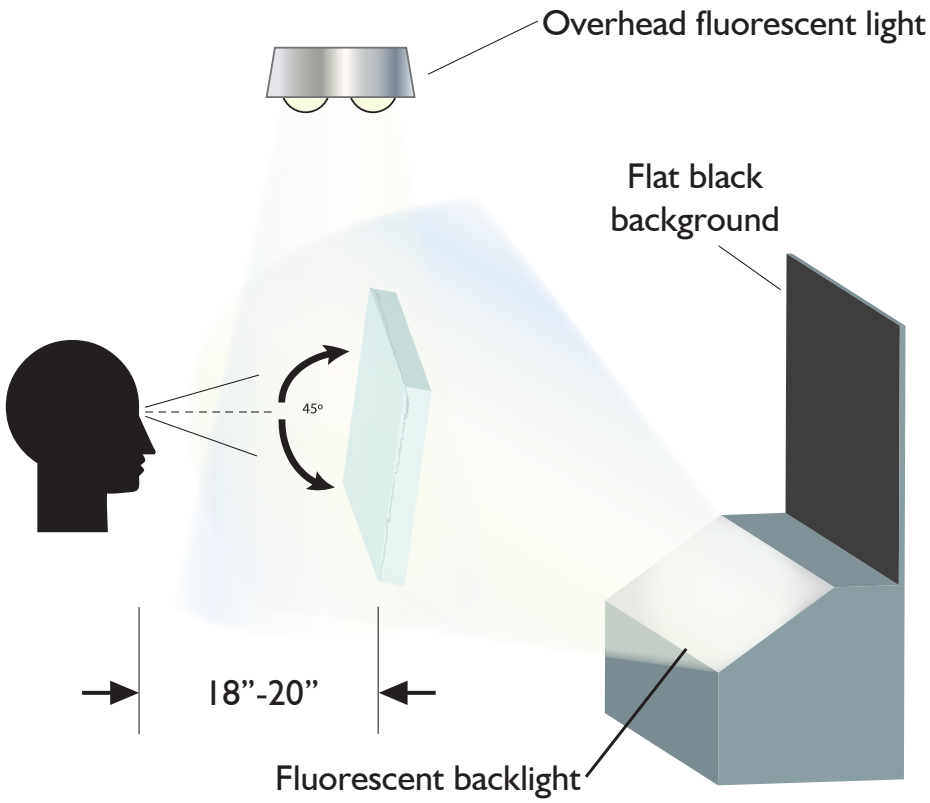
Note: Inspection Method Starts in Transmission and is Rotated into Reflection

Digs/Coating Voids:
Max digs ≤ .020" allowed when separated by ≥.400", 5 max. per part
Single dig at .020" allowed
Digs > .020" not allowed
Note: dig dimension is Max. distance in any direction - Not Average

Scratches:
3 Max width or less scratches at .004"
Max Length=.400"
Scratch separation must be ≥1.000"

Multiple scratches accumulated length to not exceed max scratch length

View perpendicular to the eye, at 18"-20", in transmission and rotated into reflection at a 45° angle to the eye for 7-10 seconds against a flat black background using a 45° backlight and overhead light. Part may only be rotated toward and away (not side to side) from the eye to detect " reflective defects. Surface defects will show up as "sparkle, streak, or a colored spot on AR coated substrates (silver, red, violet, blue, green)".



Surface Quality Criteria
80/50 - JD

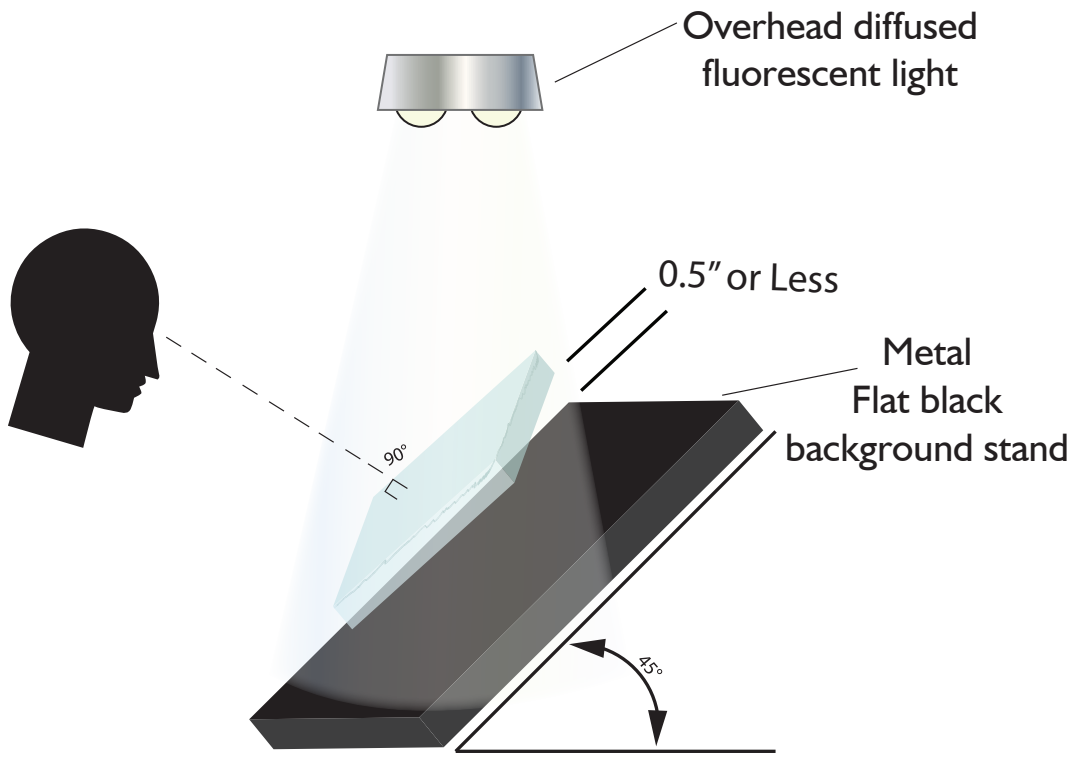
Digs/Bubbles:
Within any 20mm (.787") diameter circle on the part.
No More than 1 defect between .016" ≤ x ≤ .020" average diameter
3 defects between .004" ≤ x ≤ .016" average diameter

Scratches:
1 scratch between .0024" ≤ x ≤ .0032" wide x 1" long
3 scratches between .0024" ≤ x ≤ .0032" wide x .4" long
3 scratches ≤ .0024" wide x .4" long

View perpendicular to the eye, at 18"-24", in Transmission & Reflection for 2-5 seconds against a flat black background and overhead light.

*****When a Surface Quality calls for 80/50 JD A&B, parts must be viewed against a flat black & white background.**

Method A = White Background @ 45°
Method B = Black Background @ 45°
Method A & B = Both White & Black Background @ 45°



Surface Quality Criteria
80/50 DISPLAY

Note: Inspection Method Starts in Transmission and is Rotated into Reflection

Digs:
Max avg. dia. digs ≤ .020", 3 max. per 1" diameter
Avg. dia. dig x ≤ .010" not counted

Scratches:
Max width scratch at .003"
Calculate the max allowed scratch length as follows:
For square or rectangle parts:

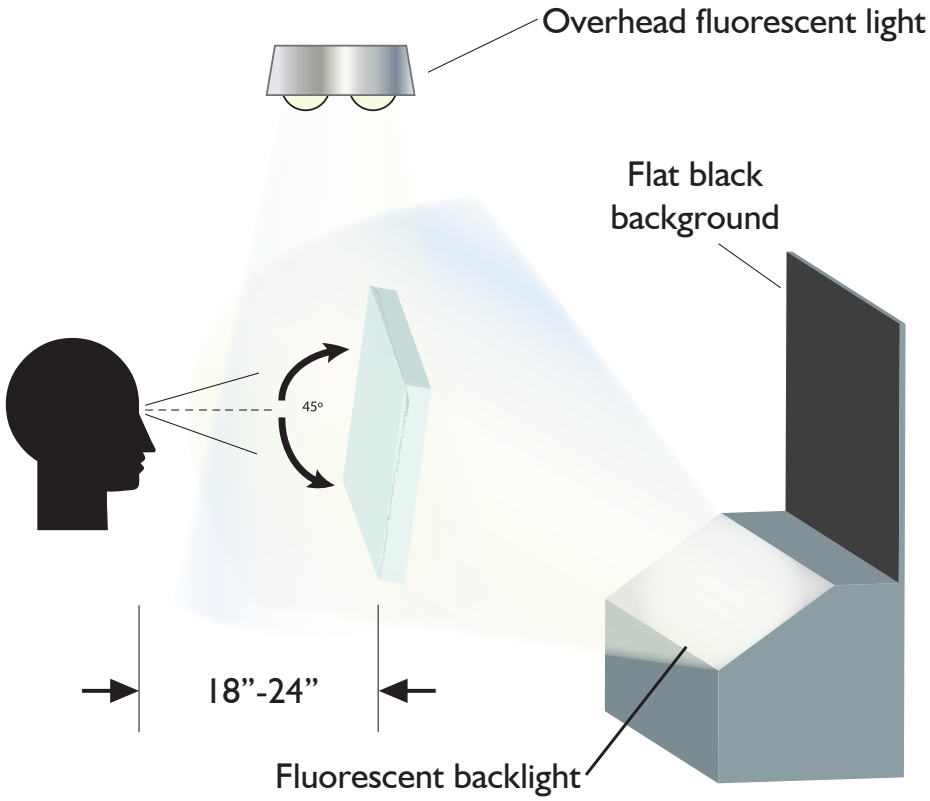
$$\text{Max Length} = \frac{\text{The square root of (LxW / 3.1416)}}{2}$$

For circles:

Max Length = Dia. /4

Multiple scratches accumulated length to not exceed max scratch length

View perpendicular to the eye, at 18"-24", in transmission and rotated into reflection at a 45° angle to the eye for 2-5 seconds against a flat black background using a 45° backlight and overhead light. Part may only be rotated toward and away (not side to side) from the eye to detect " reflective defects. Surface defects will show up as "sparkle, streak, or a colored spot on AR coated substrates (silver, red, violet, blue, green)".



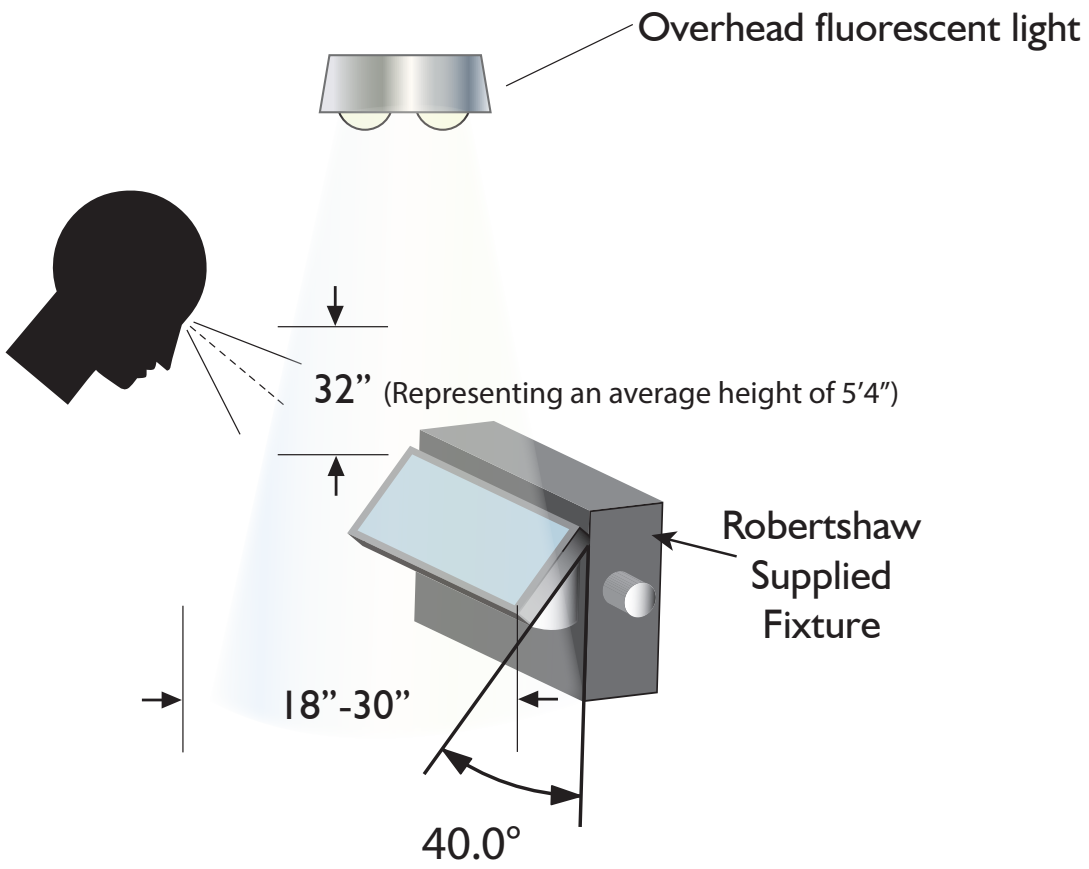
Surface Quality Criteria
80/50 RS

Note: Inspection Method To Be Used Only When Parts Are Questionable to Standard 80/50 SQC

Digs:
Max avg. dia. digs ≤ .020", 3 max. per 1" diameter
Avg. dia. dig x ≤ .010" not counted

Scratches:
Light Scratch: ≤ .010" Wide or ≤ .500" Long (Can't feel with fingernail)
Medium Scratch: ≤ .010" Wide or ≤ .250" Long (Can feel with fingernail)

View 32" below the eye, at 18"-30", in fixture set at a 40° angle for 2-5 seconds against an overhead light.



Surface Quality Criteria
Touch HK P/N - 6500549

Digs/Bubbles:
Dig: Max dia. .020", 5 max. separated by 3.000"
Dia. < .005" ignore
Bubble: Max dia. .030", 5 max. separated by 3.000"
Dia. < .005" ignore

Note: digs/bubbles are measured as max dimension in any direction

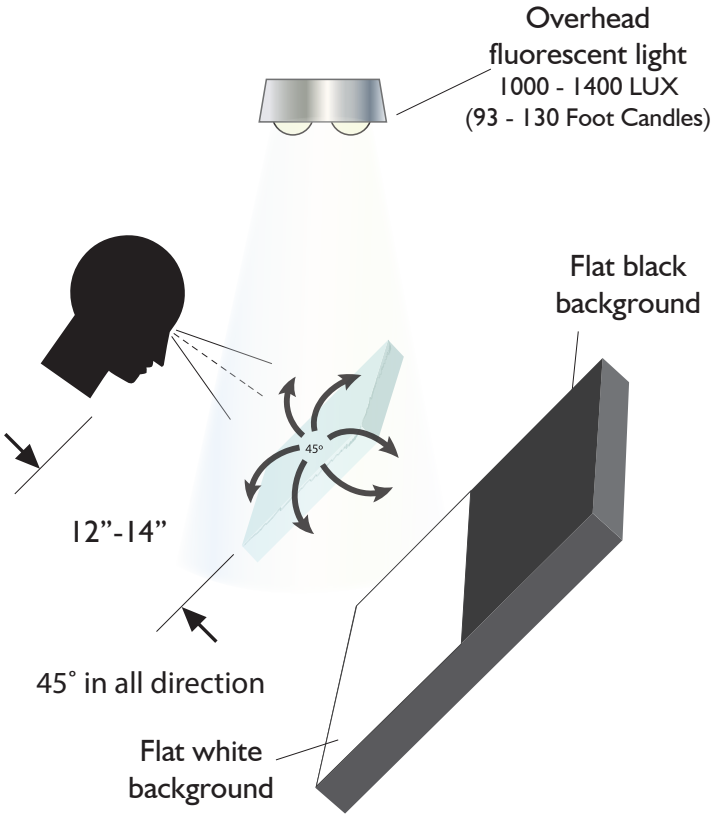
Scratches:
Scratch width ≤ .005" x ≤ 1.000" long, 5 max, separated by 3.000"
Scratch width ≤ .002" x any length ignore

Chips:
Corner: Max width ≤ .080", Max length along edge ≤ .080", Depth is less than 1/2 thickness of glass, 2 max.
Edge: Max width ≤ .080", Max length along edge ≤ .120", Depth is less than 1/2 thickness of glass, 5 max. separated by 1.000"

Note: Chips measured from edge of the glass

View perpendicular to the eye, at 12" - 14", in Transmission & Reflection for a total of 12 - 18 seconds against a flat black & flat white background and overhead light. Emphasis on the inspection time in reflection.

Inspection lighting described below is uniform fluorescent lighting measuring at 12" from light source.



Surface Quality Criteria
Touch HK P/N - 6500262

Digs/Bubbles:
Max dia. .020", 5 max. separated by 1.000"
Dia. < .005" ignore

Note: digs/bubbles are measured as max dimension in any direction

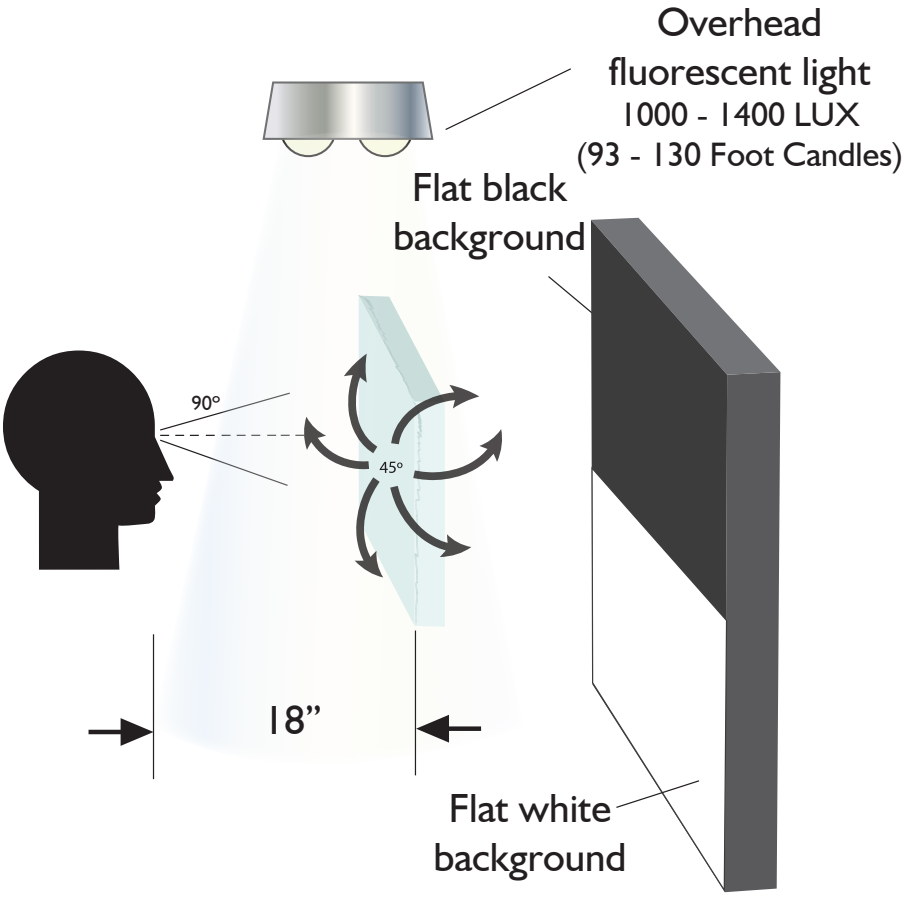
Scratches:
Scratch width between .002" < x ≤ .004" x ≤ .500" long, 5 max separated by 1.000"
Scratch width between .004" < x ≤ .005" x .300" long, 5 max separated by 1.000"
Scratch width ≤ .002" x any length ignore

Chips:
Corner: Max width ≤ .080", Max length along edge ≤ .080", Depth is less than 1/2 thickness of glass, 2 max.
Edge: Max width ≤ .080", Max length along edge ≤ .120", Depth is less than 1/2 thickness of glass, 3 max. separated by .800"

Note: Chips measured from edge of the glass

View perpendicular to the eye, at 18", in Transmission for a total of 12 seconds against a flat black & flat white background and overhead light.

Inspection lighting described below is uniform fluorescent lighting measuring at 12" from light source.



Surface Quality Criteria
Q3E

Digs:
Max avg. dia. digs ≤ .030" , 3 max. per 1" diameter
Avg. dia. dig x .010" not counted

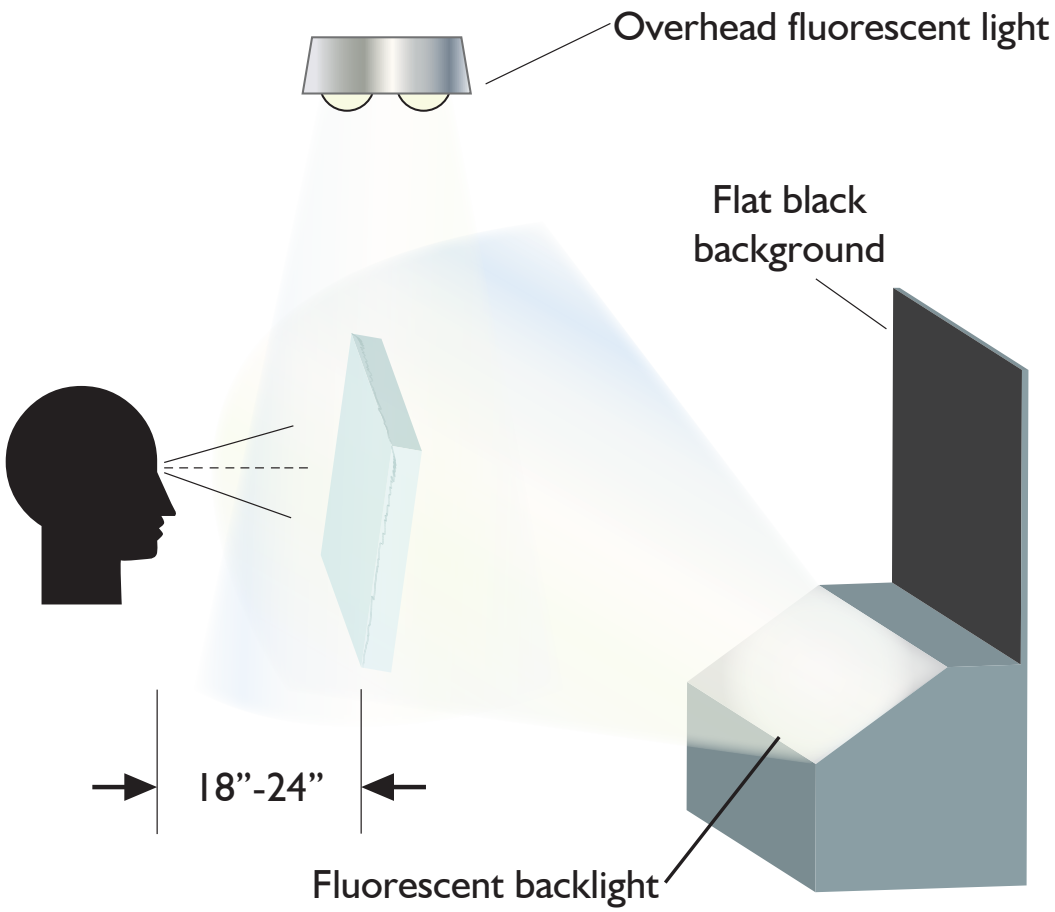
Scratches:
Max width scratch at .003"
Calculate the max allowed scratch length as follows:
For square or rectangle parts:

$$\text{Max Length} = \frac{\text{The square root of (LxW / 3.1416)}}{2}$$

For circles:
Max Length = Dia. /4

Multiple scratches accumulated length to not exceed max scratch length

View perpendicular to the eye, at 18"-24", in transmission for 3-5 seconds against a flat black background, using a 45° backlight and overhead light.

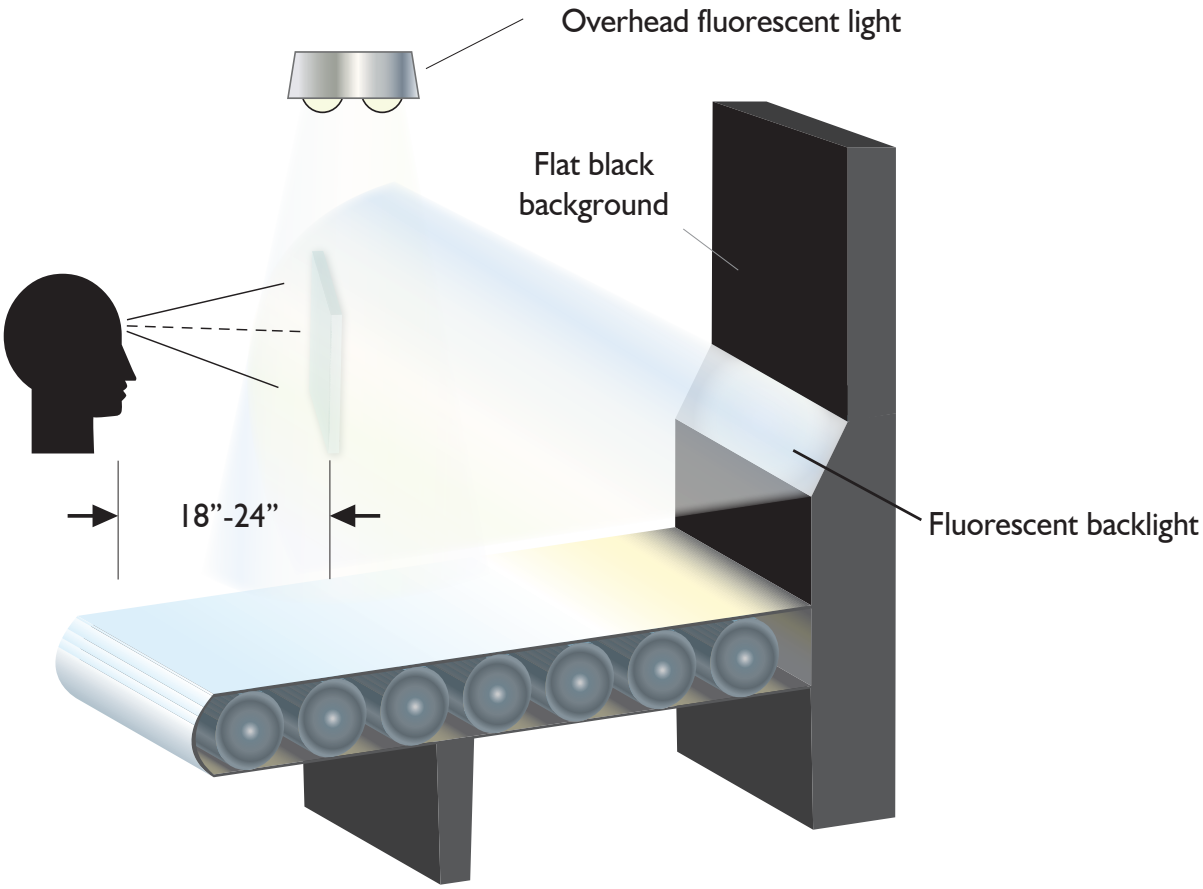


Surface Quality Criteria
Q3

Digs:
Max avg. dia. dig ≤ .030", 3 max. per 1" diameter
Avg. dia. dig x ≤ .010" not counted

Scratches:
1 scratch at approximately .003" max width, less than 3" in length.

View perpendicular to the eye, at 18"-24", in transmission for 2-3 seconds against a flat black background, using a 45° backlight and overhead light.



Surface Quality Criteria
Dimples

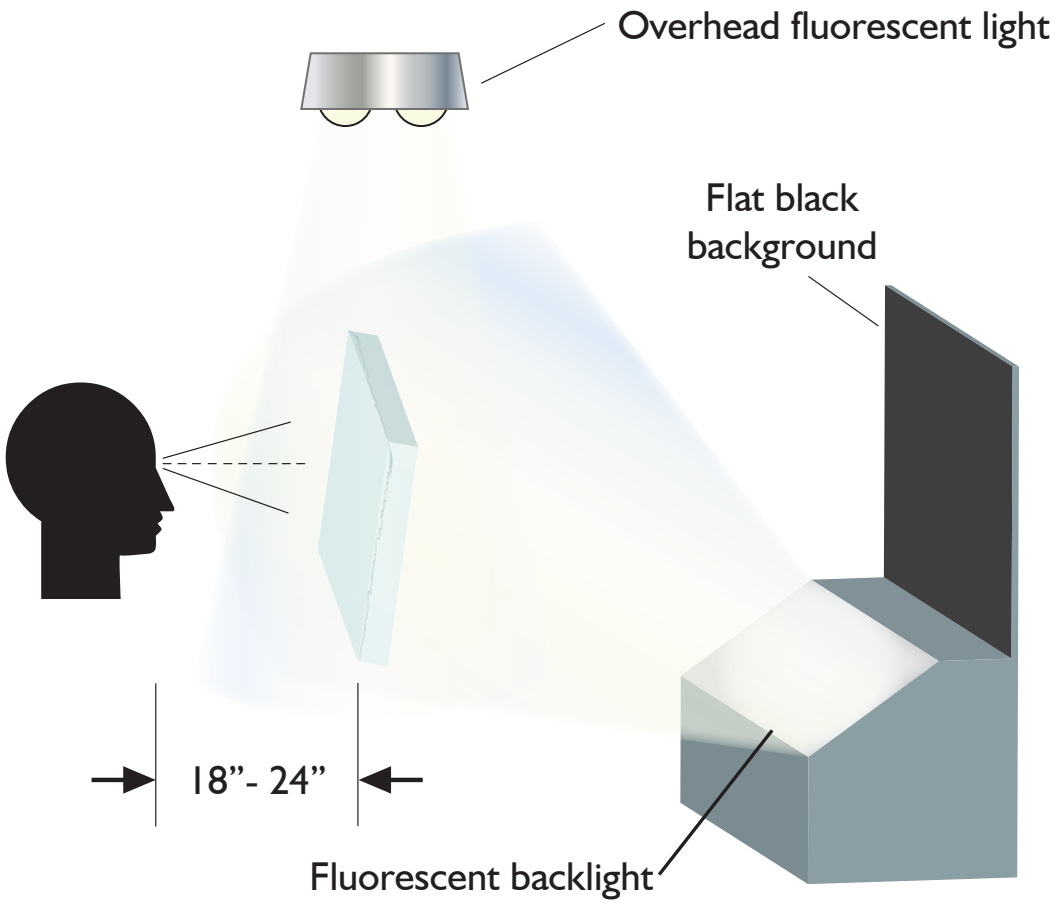
Dimples: Clear, localized surface deformation with an average diameter typically between .015 and .030". Dimples are a non-desired characteristic of small tempered parts as a result of glass being heated to its softening point while in contact with fixturing.

Dimples ≤ .020" in avg. dia. are disregarded.

Dimples in a detectable pattern are not allowed

No more than 6 dimples are allowed within any 2" diameter inside the clear aperture of the lens.

View perpendicular to the eye, at 18"-24", in transmission for 2-5 seconds against a flat black background, using a 45° backlight and overhead light.



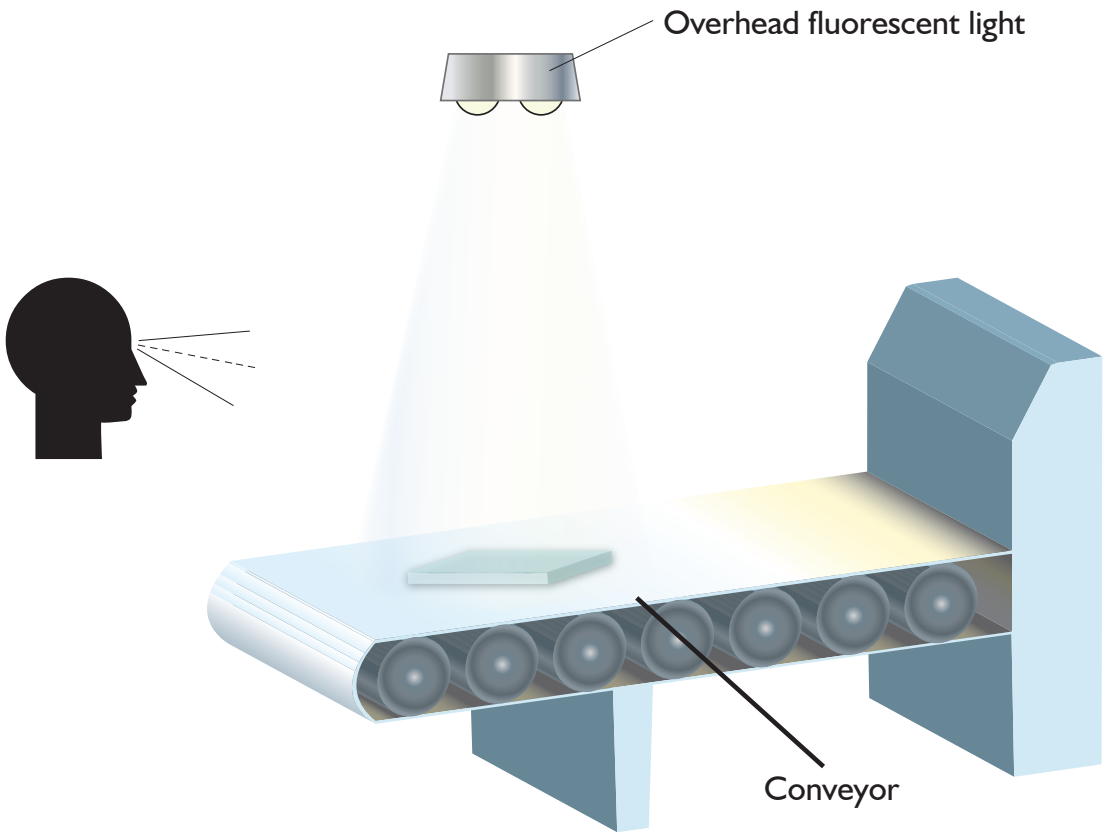
Surface Quality Criteria
120/80

Digs:
Max avg. dia. digs ≤ .030", 3 max. per 1" diameter
Avg. dia. dig x ≤ .010" not counted

Scratches:
Max scratch at .005" ≤ x ≤ 3.000" long.

The above defects are determined visually.

View on the conveyor under uniform, overhead light.



Surface Quality Criteria
16"-37" Diagonal Laminate Displays

Digs:
Max avg. dia. dig ≤ .030" (.76mm), 2 max. per 6" diameter, 3 max. per 12" diameter
Avg. dia. dig x ≤ .016" (.4mm) not counted

Scratches:
Scratch at .003" (.076mm) max width and ≤ .500" (12.7mm) Length
2 max. per 6" diameter, 3 max. per 12" diameter

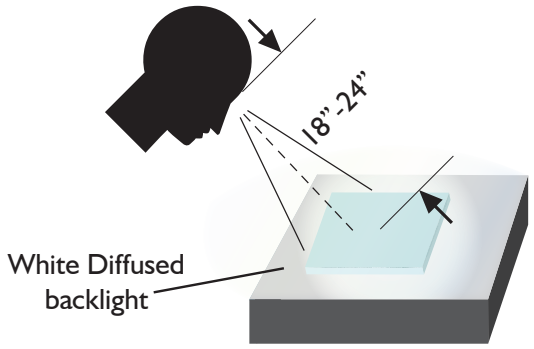
All defects except cracks pass within the .500" (12.7mm) Non-critical border around perimeter.

Use light source for both pre and post lamination inspection
View part flat on White diffused light source 18"-24" away from eye for 15 seconds.

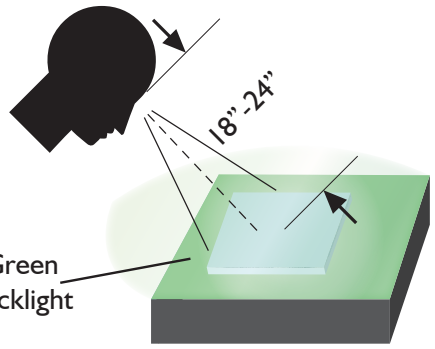
Inspection for Air Bubbles
View part with Green light source after lamination for inspecting air bubbles. Air bubbles are to be inspected the same as Digs.

Inspection for Stains
View part against flat black background 18"-24" away for 15 seconds
No Fingerprints allowed in laminate. Stains that can't be seen or are faint at 18"-24" away pass.

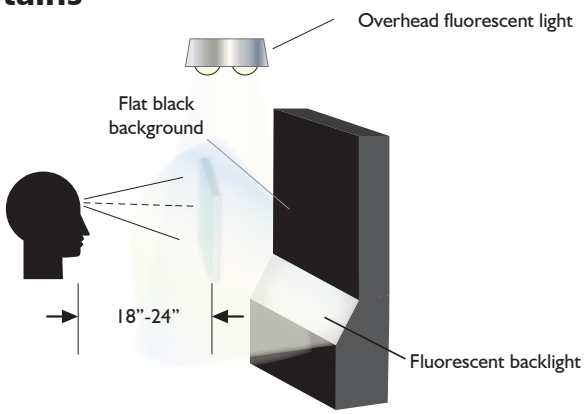
Inspection Pre and Post Lamiantion



Inspection of Air Bubbles



Inspection of Stains



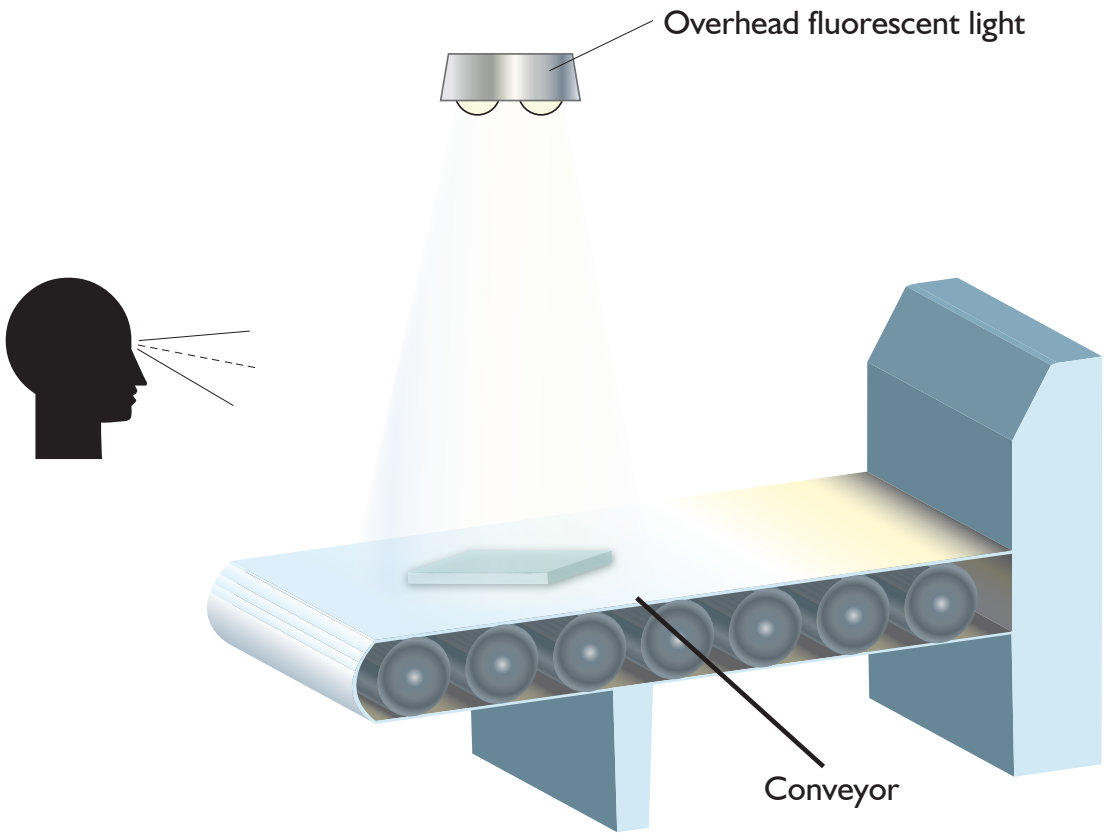
Surface Quality Criteria
Q4

Digs:
Max avg. dia. digs ≤ .060”, 3 max. per 1” diameter
Avg. dia. dig x ≤ .010" not counted

Scratches:
Max width scratch at .005” ≤ x ≤ 3.000” long.

Defects are determined visually. No attempt should be made to physically measure defect sizes.

View on the conveyor under uniform, overhead light.



Surface Quality Criteria
Q6, Pattern Glass, and Art Glass

Pattern Glass:
Irregularities in texture, color, and thickness are acceptable.

Scratches:
Max width scratch at .006" ≤ multiple scratches are acceptable.
Score like scratches are not acceptable. Minor scratches are allowed.

Art Glass:
Irregularities in texture, bubbles, color, and thickness are acceptable. Bubbles in art glass are common.

Defects are determined visually. No attempt should be made to physically measure defect sizes.

Surface Quality Criteria
Fused Glass

Everything is allowed so long as it passes the chip spec. on the job ticket.

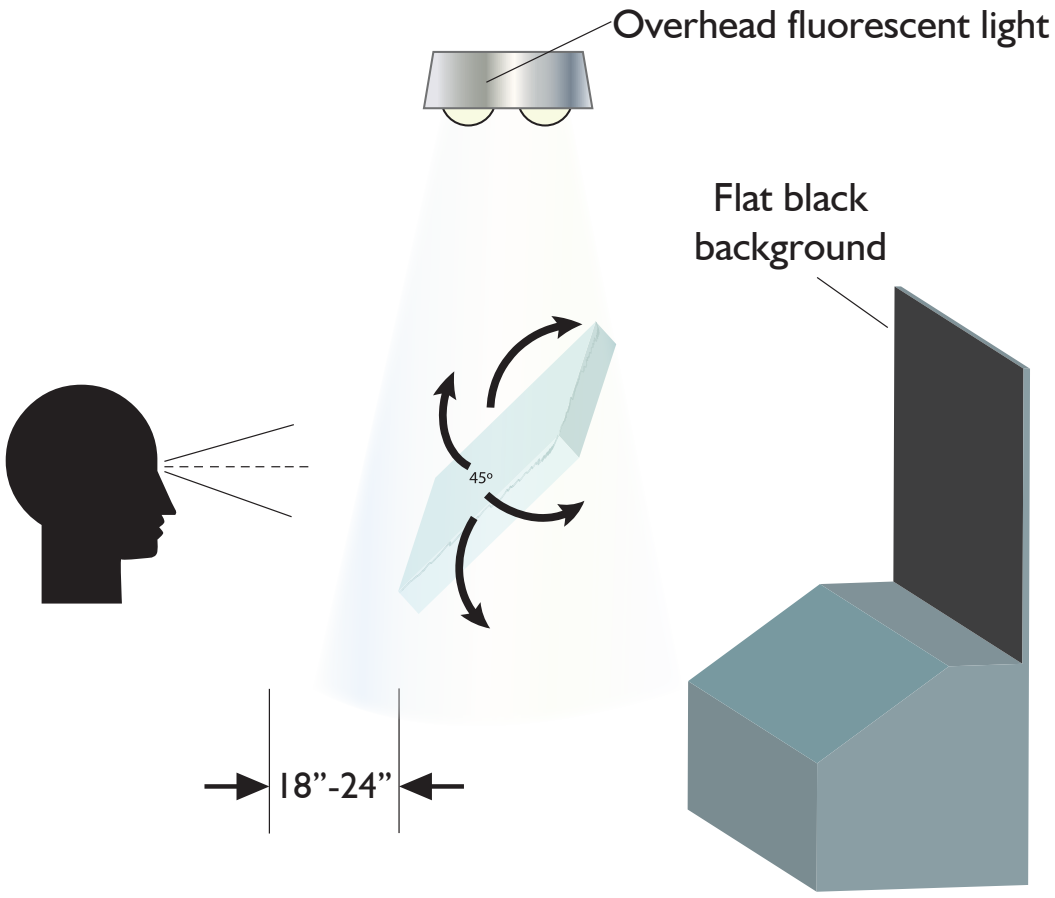
Inspection Method for Coated Glass

Applies only when specifically called out on Drawing,
Customer Specification, or Job Ticket

In Reflection:
An overhead fluorescent light is used. High intensity light may also be used.

Part is viewed at a 45° angle to the eye and the light at a distance of 18" - 24" (depending on the cosmetic specification). Part may be rotated slightly toward and away from the eye to detect "reflective" defects, not normally seen at one specific angle. Surface defects will show up as "sparkle, streak, or colored spot (silver, red, violet, blue, green)".

Viewing time is 2 to 7 seconds, depending on the cosmetic specification.



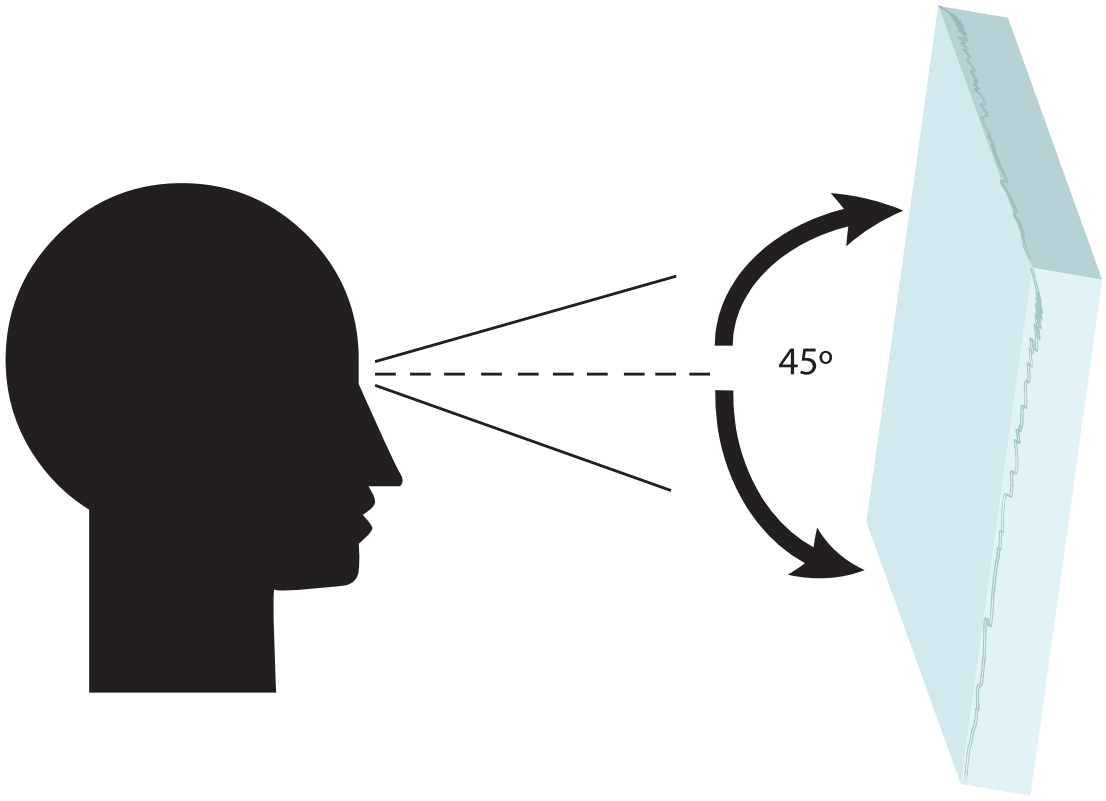
Inspection Method for Display

In Transmission Rotated into Reflection:
Lighting conditions per respective surface quality.

Viewing conditions per respective surface quality, in transmission and rotated at a 45 degree angle to the eye and the light at a distance of 12" to arms length (depending on the cosmetic specification) into reflection. Part may only be rotated toward and away (not side to side) from the eye to detect "reflective" defects. Surface defects will show up as "sparkle, streak, or colored spot (silver, red, violet, blue, green)".

Viewing time is 2 to 7 seconds, depending on the cosmetic specification.

All lighting and viewing conditions are determined by the respective surface quality on job ticket and blue print.



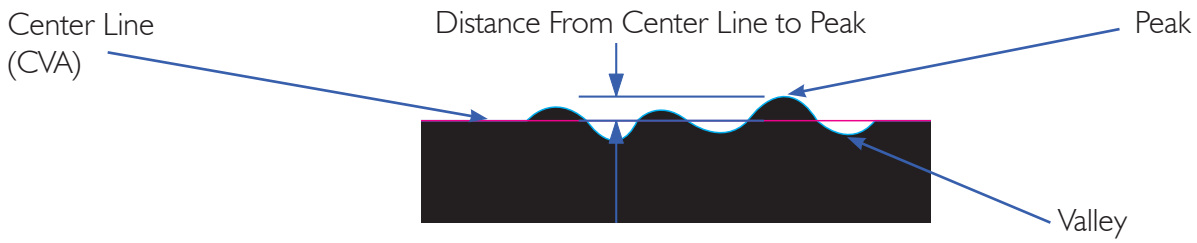
Screen Print Graphics

Sight Glass/Lighting:

Line Definition - .020" Max
Pinholes/Voids - Same as Scratch/Dig Spec.
Voids - Same as Scratch/Dig Spec.
Dark/Light Spots: Point Defects - Same as Scratch/Dig Spec.
Linear Defect - Pass if can not be seen in standard viewing conditions (not back-lit).
% Transmission/Optical Density - Per Customer Requirements (Nominal Tolerance)

Display/Medical/Aerospace/Instrument:

Line Definition: Frit & Epoxy Ink - .010" Max (from center line to peak or valley)
UV ink - .005" Max (from center line to peak or valley)



Pinholes/voids - Same as Scratch/Dig Spec.
Dark/Light spots: Point Defect - same as Scratch/Dig Spec. when back-lit.
Linear Defect - same as Scratch/Dig Spec. when back-lit.
% Transmission/Optical Density-Per Customer Requirements (nominal tolerance).

Coupons/Automotive/3D Bed:

Line definition - N/A
Pinholes/Voids - Q4
Dark/Light Spots - N/A
% Transmission/Optical Density - N/A

Viewing Conditions - Per Surface Quality designation in transmission only unless otherwise specified.

Cat-i Recommended Cleaning Agents for Glass Decorated with Inks

Reagent Grade Isopropyl Alcohol (IPA) (90+% Purity).
Non-ammoniated window cleaners.
Distilled or Deionized water at room temperature.

Use only a soft, lint free cloth. Avoid aggressive rubbing on the ink surface. Dry thoroughly after cleaning.

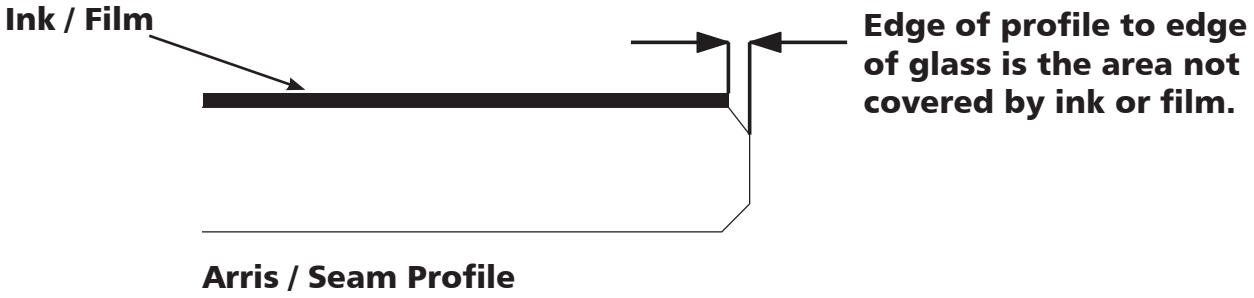
DO NOT USE:

Abrasive cleaners or brushes
Hydrocarbon solvents
Acidic or highly alkaline solutions

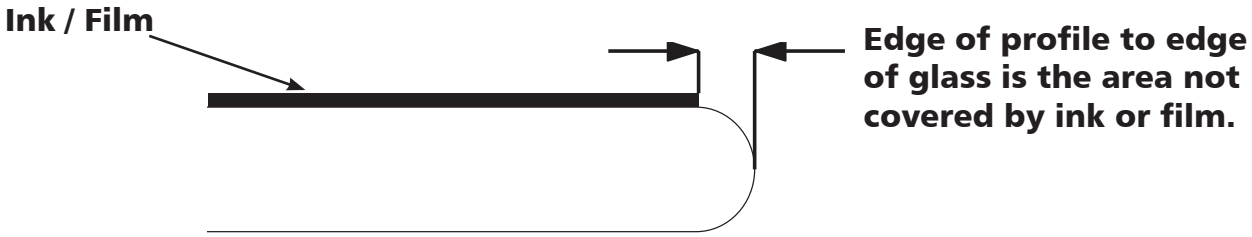
Definition of Non-Printed / Film Border

A Non-printed border is defined as the edge of the ink or film to the edge of the profile, not the edge of the glass.
Zero Non-Printed / Film Border shows ink / film goes directly to edge of profile.
Defined Max Non-Printed / Film Border shows clear glass area between ink / film to edge of profile.
Edge profile and non-printed borders will vary based on customer specifications.

Zero Non-Printed / Film Border

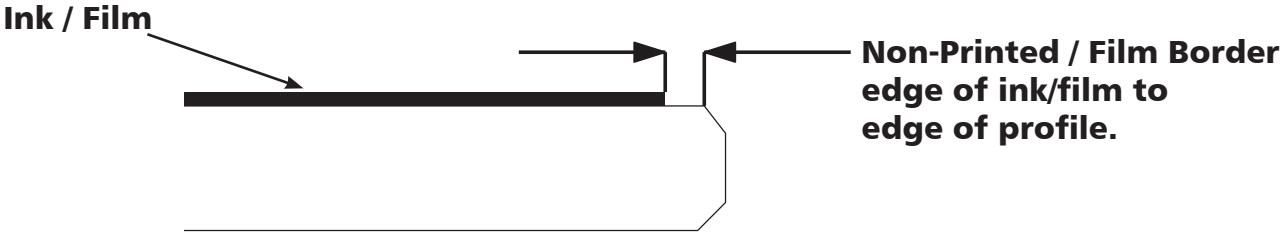


Arris / Seam Profile

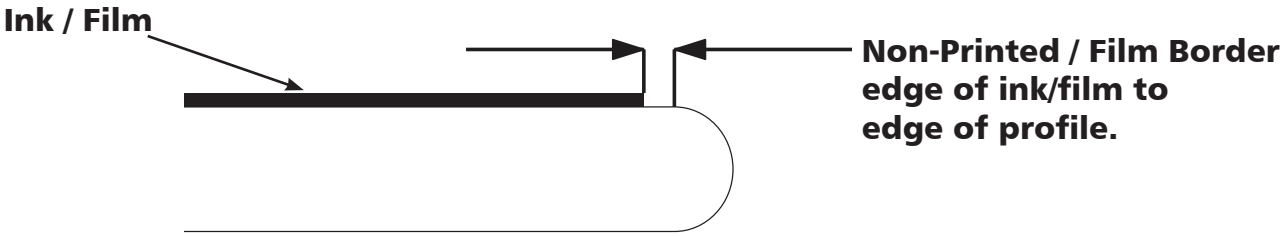


Pencil Profile

Defined Max Non-Printed / Film Border



Arris / Seam Profile



Pencil Profile

Film Defect Definition

Viewing Conditions (Film Only – Does Not Apply to Glass): The Glass Surface Quality establishes the Lighting and Viewing Distance(s) to be used. While holding the glass orienting the film 2nd surface to the eye, the part is to be viewed starting vertical and perpendicular to the eye in transmission, rotating the piece about the x axis 90 degrees away from the eye into reflection, and back into transmission over 3-5 seconds of total time.
Film defects identified while viewing are measured using an ocular comparator (O.C.) for Categories 1-3, and visual for 4-6. Max allowed film defects must have a 1" separation or ≤ 3 film defects are allowed inside a 1" diameter. Any defects inside a 1" diameter must have a combined total less than the allowed max film defect. Translucent defects are measured as the sum of the defect and surrounding gaseous cavity. Temporary surface protectants used as packaging during transport and/or customer assembly do not adhere to this specification.

Example of Surface Quality with film catagory: 80/50 F2

Note: Sensors are not included in Film Defect Defintinon. Sensor defects will go by part Surface Quality.

Film Laminations:

Point Defects (Film Dimples, PSA Gels, Air Bubbles, Foreign Contamination) - See Definition Below
Linear Defects (Lint, Film Hair) - Same as Scratch/Dig spec.
Ink Step - .030" Max Average Width in Viewing Area Only.
Laser Trimming: Film Line Definition - .020" Max
PSA Definition - .040" Max

Film Categories	Definition
F1	.010" max average diameter opaque defect .020" max average diameter translucent defect
F2	.020" max average diameter opaque defect .040" max average diameter translucent defect
F3	.040" max average diameter opaque defect .070" max average diameter translucent defect
F4	.070" max average diameter opaque defect .100" max average diameter translucent defect
F5	.100" max average diameter opaque defect No limit translucent defect
F6	No Limit – Not Critical