



Scratch/Dig Inspection Standard AS1001

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A	AS1001-01	A. Soto	October 29, 2007

Required Approvals			
Department	Name	Signature	Date
Engineering			
Manufacturing			
Quality			

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1.0 Purpose:

This standard documents inspection methods for cosmetic defects throughout the Abrisa Technologies, Santa Paula facility. Inspection of workmanship on customer orders without explicit inspection instructions will default to this standard.

2.0 Scope:

Customer orders without explicit inspection instructions will default to this standard. This standard applies to any product manufactured at the Santa Paula facility. Customer requirements may over ride information contained within if agreed upon by Abrisa Technologies' Manufacturing & Engineering.

3.0 Scratch/Dig Requirements:

Abrisa Technologies' standard metric for cosmetic defects is based upon industry standard for "Scratch/Dig". Typical requirements may be specified as 120/80, 80/50, or 60/40. Lower numbers are more stringent..

3.1 Scratches

Scratch Grade	Max Width
120	0.0047" (0.12mm)
80	0.0032" (0.08mm)
60	0.0024" (0.06mm)

3.1 Digs

Dig Grade	Max Diameter
80	0.0315" (0.80mm)
50	0.0197" (0.50mm)
40	0.0157" (0.40mm)

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4.0 Inspection Methods:

Inspection methods are driven by cosmetic requirements unless otherwise requested by customer and agreed upon by Abrisa Technologies. Standard inspection methods are outlined below:

Grade Type	Lighting & Background	Inspection Criteria & Packaging Method
<p>120/80</p> <p>Inspected by Transmission Only</p>	<p>Glass is not picked up unless chip spec or material type makes it necessary to do so (i.e. some coated materials, dark glass, mirrors)</p> <p>Inspected on rollers against factory overhead lighting.</p> <p>Chips inspected per given chip criteria. If none given, inspect to 0.060" or in ratio to size and thickness of part.</p>	<p>Inspection rate: 1.5 sec per sq. ft.</p> <p>Maximum scratch/dig dimensions per Section 3.0.</p> <p>Finished pieces packaged glass-to-glass. (no paper slips used to separate items).</p>
<p>80/50</p> <p>Inspected by Transmission Only</p>	<p>Glass picked up.</p> <p>Inspection performed perpendicular to glass surface at 18" distance.</p> <p>Part scanned against black background approximately 1" below fluorescent back lighting. (Not overhead lights).</p>	<p>Inspection rate: 3 sec per sq. ft.</p> <p>Maximum scratch/dig dimensions per Section 3.0</p> <p>All reflective surfaces pass.</p> <p>Finished pieces separated by paper slips.</p>
<p>60/40</p> <p>Inspected by Transmission Only</p>	<p>Glass picked up.</p> <p>Inspection performed perpendicular to glass surface at 18" distance.</p> <p>Part scanned against black background approximately 1" below fluorescent back lighting.</p> <p>Fluorescent lighting also placed overhead.</p> <p>Part tilted approx. 30° for reflection.</p>	<p>Inspection rate: 8 sec per sq. ft.</p> <p>Maximum scratch/dig dimensions per Section 3.0</p> <p>Reflective scratches with 1" separation allowed.</p> <p>Finished pieces separated by paper slips.</p>

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5.0 Definitions:

Bubbles: Also referred to as inclusions. Defects in the glass that can sometimes be at the surface. These are measured using the dig spec. unless the customer states different requirements.

Chip: Also referred to as face chips or edge chips: a small piece of glass broken from edge. Width is measured into the face from the edge. Length is the distance along the edge. Depth is the amount of thickness affected. The length of a chip should not exceed two times the maximum allowable width. Depth should not exceed 1/2 the glass thickness. Chips specs on mirrors typically have first surface (coated side) requirements and less stringent second surface requirements.

Dig: An oblong or circular abrasion to the surface of the glass. The cause is similar to that of the scratches, but digs are shorter in nature. Measurement of an oblong dig is $L+W/2$.

Flare: A flare can be positive (creating an outward dimension from the score line) or negative (creating an inward dimension from the score line). A flare is caused when breaking the glass away from each other after the scoring process. A flare can be detected by viewing the edge of glass. The edge will not be perpendicular to the surface of the glass (going outward or inward).

Frey: Continuous chipping. The default specification is length shall be no more than 10% ledge and 1/2 the chip width unless otherwise noted.

Inclusions: Also referred to as internals. Defects such as bubbles or stones in the glass that can sometimes be at the surface. These are measured using the dig spec. unless the customer states different requirements.

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Pinholes: Same as voids: an absence of coating, screen paint, or etch material that allows more light to pass through an area of the glass than the surrounding area. The dig spec. applies to this type of defect unless stated otherwise by customer.

Scratch: Abrasion at the surface of the glass, typically long and thin in nature. Can also be referred to as a scuff or handling scratch. Scratches are often caused by debris between two pieces of glass that scratch as the parts move together, or by scraping the surface with another piece of glass or other object.

Stones: Also referred to inclusions. Defects in the glass that can sometimes be at the surface. These are measured using the dig spec. unless the customer states different requirements.