

## Painting, Powder Coating, Plating and CNC Machining

**Purpose:** This Visual Quality Standard has been developed by STAR for creating an objective methodology for inspecting painted finishes and to ensure the consistency of cosmetic appearance.

**Scope:** The scope of this standard covers surfaces that have been painted, powder coated, plated, machined or received some other secondary finishing process. This scope is generally defined by our current production abilities. If the client doesn't have a VQS standard, then we will reference this standard. If the client has a VQS, and it's equal to or below our standard, then we will use that standard as the reference. If the client's VQS is more demanding than our standard, then we need to communicate with the client to reach an acceptable compromise for both parties.

### Conditions for Visual Inspection:

- Viewing Distance : 300mm +/-50mm
- Viewing Time : 30s +/-10s (depending on part size and geometry)
- ISO10526 : 1999-E (D65 Lighting Standard Illumination) : 1000(LUX) +/-200

### VQS Classification

#### Product Size Classification:

The purpose of classifying product size is to define the number of defects that are permissible in a given surface area.

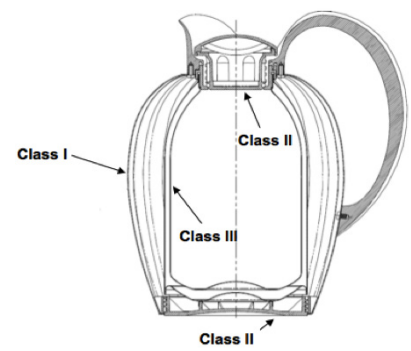
1. S: 1-100mm<sup>2</sup>
2. M:100-200mm<sup>2</sup>
3. L: 200-300mm<sup>2</sup>
4. XL: >300mm<sup>2</sup>

#### Example of Visual Surface Classifications:

Preferably, the customer is to provide STAR with a 2D isometric drawing with visual surface classifications clearly stated on the drawing. These classifications will be used to define the visual quality standard (VQS) which is to be applied to the part.

#### Class I- Direct Visual Surface:

A direct visual surface means that this is the surface most easily seen and judged by the client. This surface will receive the most critical attention and therefore defects on this surface are to be kept at a minimum. If it's a transparent part, then all the surfaces will be deemed class I.



**Class II- Indirect Visual Surface:**

This is a surface that the customer will be able to see, but is not necessarily in their direct view. For example, if we were to machine a cube, the left and right side of the cube would be considered indirect visual surfaces if the normal view is the front face of the cube. Depending on the geometry of the part, STAR reserves the right to determine which surface(s) will be considered indirect. Visible occasionally or likely to be seen by user.

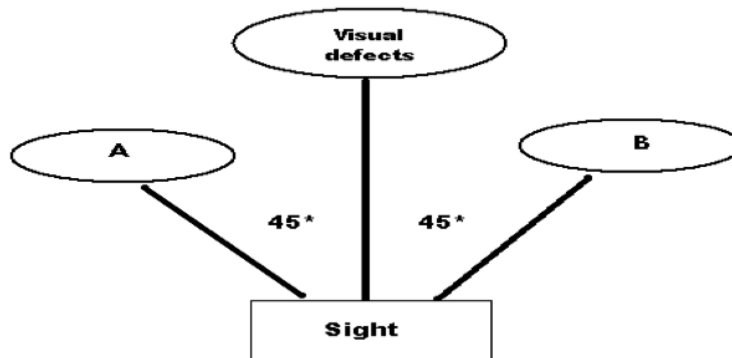
**Class III: Non-Visual Surface:**

As the classification implies, this surface has no particular visual requirements. As a general rule, non-visual surfaces should not contain any types of defects related to poor handling, assembly and functioning such as scratches and fingerprints unless permitted due to do the constraints of a particular working process. Normally not visible or only visible during installation. If the part is an internal part, then all the surfaces will be deemed class III.

**Inspection Method:**

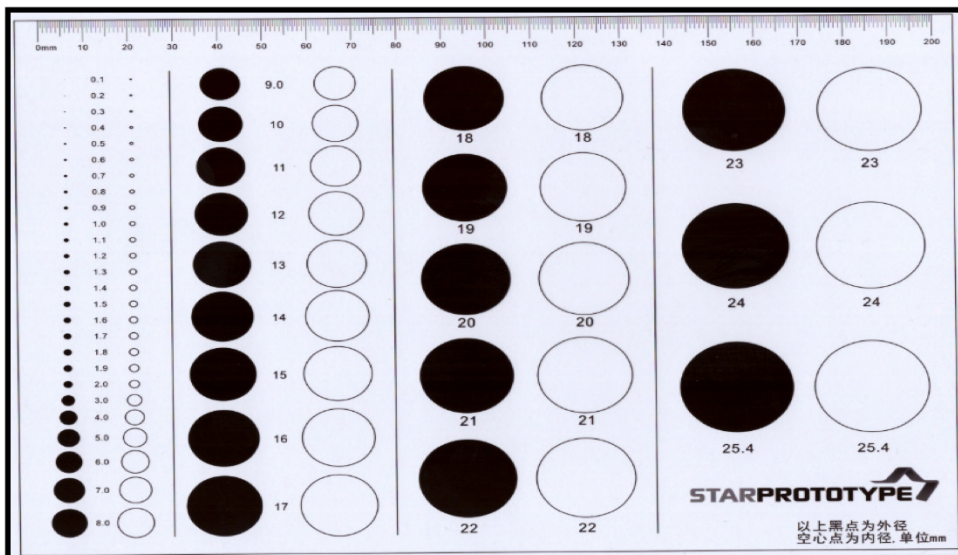
The reason for this section is to minimize subjectivity as much as possible. In cases where certain defects are questionable or at the highest limit of our defect specification, we use this method to arrive at an objective decision.

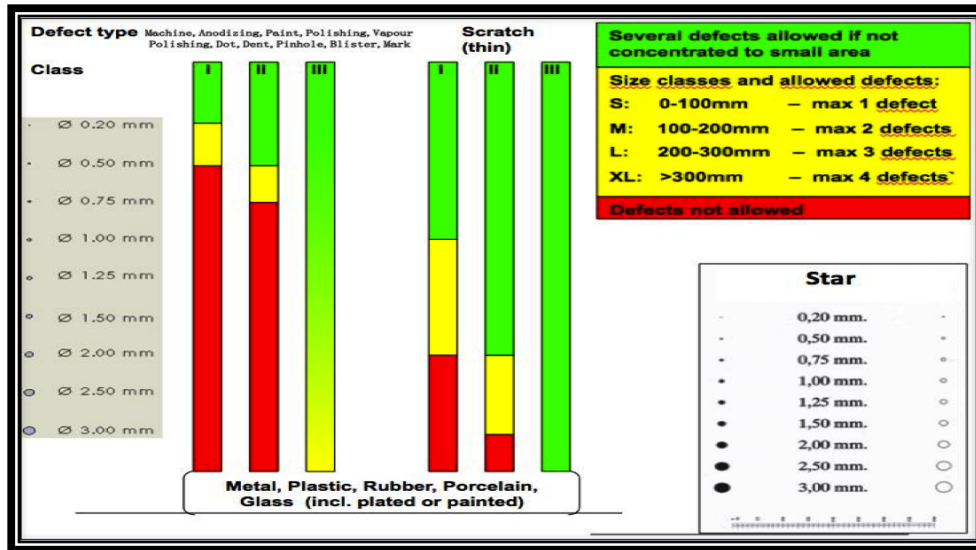
- Visual surface defects must be viewed from more than one angle. All defects will be measured according to the following class tolerance.



**How to measure defects**

Using the Star Prototype defect ruler in the diagram below. The distance between two defects shall be no less than 25 mm.





### Allowable defects in the product

The sizes and allowable occurrence for dimensional defects. For any issues with more than 2 defects, the distance between two defects must be no less than 25 mm.



- Small: 0-100mm
- Medium: 100-200mm
- Large: 200-300mm
- XL: >300mm

### 3.6 Color Inspection:

Color Spectrophotometer will be used to check color deviation, the result shall be within  $\Delta 2$ .