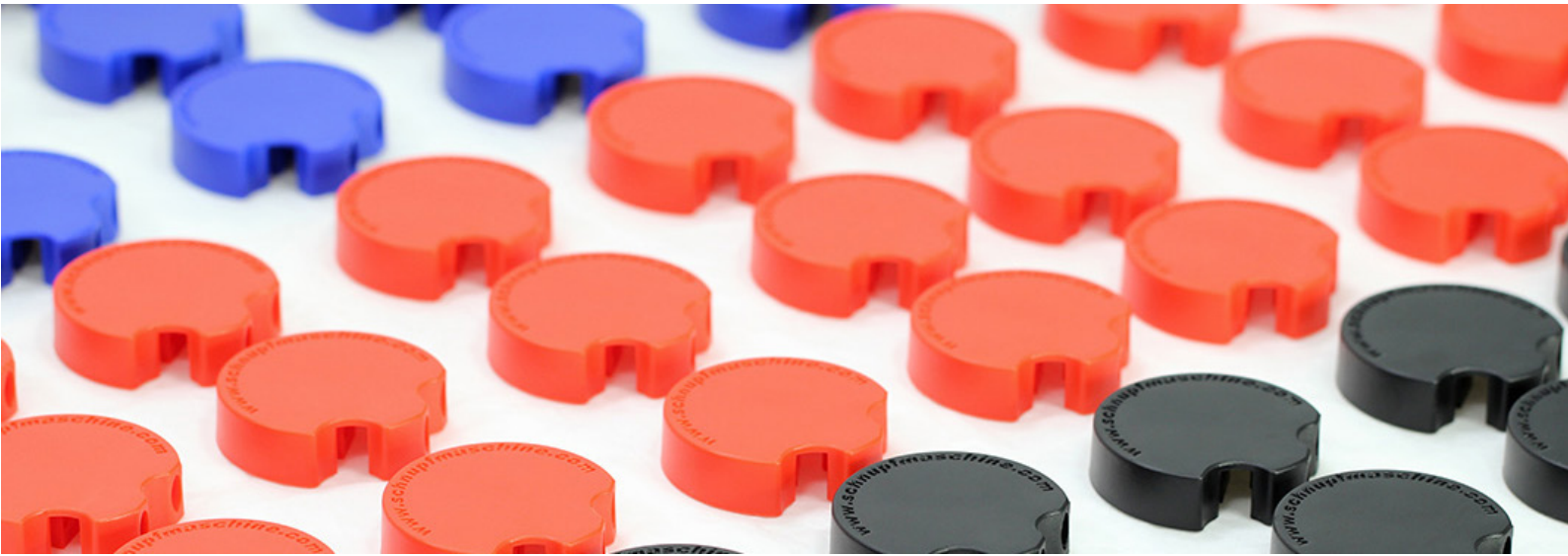# Visual Quality Standards for Plastic Injection Molding

STARPROTOTYPE

Purpose: This Visual Quality Standard has been developed by STAR to create an objective methodology for inspecting finished parts and controlling the consistency of the cosmetic appearance of injection molded parts.

Scope: The scope of this standard covers the surface inspection of injected molded parts. This scope is generally defined by our current production abilities. If the client doesn't have a visual quality standard (VQS), 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 sizes is to define the number of defects that are permissible in a given surface area.
1. S: 1-100mm2
2. M: 100-200mm2
3. L: 200-300mm2
4. XL: >300mm2

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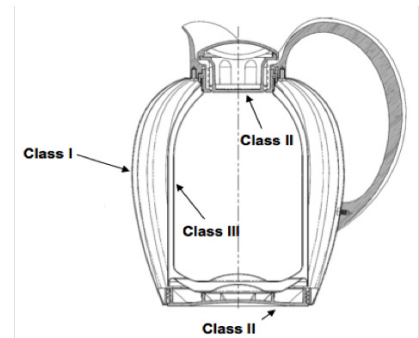
Class I- Direct Visual Surface:
A direct visual surface means that this is the surface most easily seen and judged by the client. This surface will receive the most critical attention and therefore defects on this surface are to be kept at a minimum. If it's a transparent part, then all the surfaces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

Class II- In-direct 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.
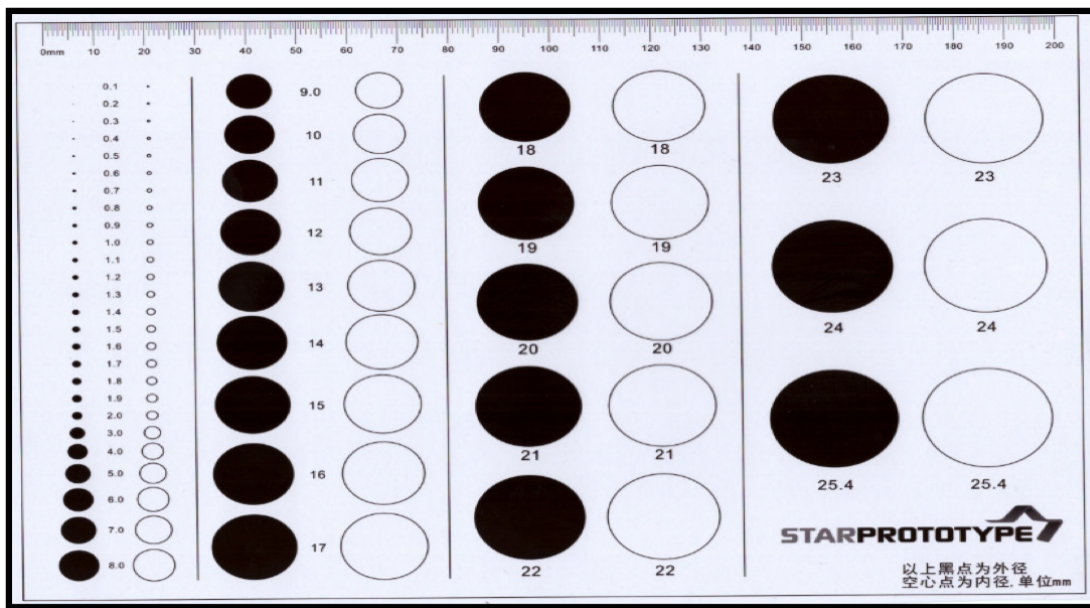
Inspection Method:

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.
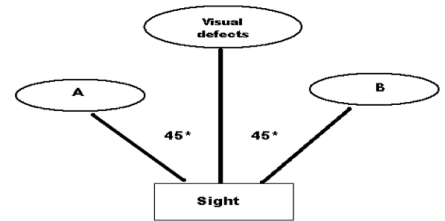
How to measure defects

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 occurence for dimensional defects. For any issues with more than 2 defects, the distance between two defects must be no less than 25 mm.

Several defects allowed if not concentrated to 100m2
Size classes and allowed defects;
S: 0~100mm2   -- max 4 defect
M: 100~200mm2   -- max 8 defects
L: 200~300mm2   -- max 12 defects
XL: >300mm2   -- max 16 defects
Defects not allowed

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

Color Inspection:

Color Spectrophotometer will be used to check color deviation, the result shall be within Δ2.