

Viewing angles

Is it a quality defect or not? It can be hard to decide, but using these established guidelines and standards will help everyone to view work from the same starting point when checking for defects.

BY TREVOR PRINGLE ANZIA, BRANZ PRINCIPAL WRITER

QUALITY IS SUBJECTIVE, and it pays to clearly define what parameters will be used to assess the quality of materials and surface finishes. How we view a surface can be influenced by:

- how close we are to that surface
- the light conditions acting on that surface
- whether or not strong artificial light is introduced.

The MBIE *Guide to tolerances, materials and workmanship in new residential construction 2015*, along with other documents and industry organisations, specifies how a surface should be viewed when checking for defects.

Inspect work from normal position

Variations in texture, colour, transparency, reflectivity and finish should be observed and assessed while in a normal viewing position.

A normal viewing position for a person 1.5-1.8 m tall is:

- standing at a distance of 2 m or more from surfaces (see Figure 1)
- standing at a distance of 600 mm or more from fixtures and fittings
- an unobstructed viewing angle of 45° or more

- under uniform non-critical lighting of 500 lux - a typical indoor light level.

Beware critical lighting imperfections

One of the main causes of visible imperfections is side lighting that is almost parallel with the wall. Generally, imperfections that are only visible under critical lighting do not indicate unacceptable workmanship.

Critical lighting occurs naturally for a short period each day, typically 30-60 minutes in the early morning and late afternoon when the sun is low in the sky.

It is common practice to use high-output lighting to accentuate areas requiring attention during construction, but this is not suitable for performing a subjective visual inspection of interior surfaces.

Glass viewing requirements

Glass quality is defined by AS/NZS 4667:2000 *Quality requirements for cut-to-size and processed glass*, which sets out the allowable tolerances for thickness, size, squareness, flatness, bow, surface imperfections and internal imperfections.

The Glass Association of New Zealand (GANZ) technical data sheet *Glass quality* sets out steps for inspecting glass:

1. Clean with a proprietary glass cleaner.
2. Stand 3 m from the glass and at 90° (square on) to the glass (AS/NZS 4667:2000 says to stand at a distance of ≥2 m).
3. View in normal daylighting conditions - there should be no visible imperfections.
4. If faults are evident, clean the surface again to see if they can be removed.
5. Re-examine and mark any remaining visible faults.

Glass quality also identifies items that may occur as a result of manufacture and may not be considered a defect.

Viewing powder-coated aluminium

The Window Association of New Zealand (WANZ) standard *Powder coating surface finishing - appearance in situ* gives the following criteria when assessing finish quality.

View powder-coated aluminium from a minimum of 2 m. Further distance may be allowed depending on the use of the product and its in situ viewing distances.

A significant defect is a defect that is visible from 2 m and has an outside diameter more than 1.5 mm. From 2 m, the coating on the primary visible internal and external surfaces shall be of uniform appearance,

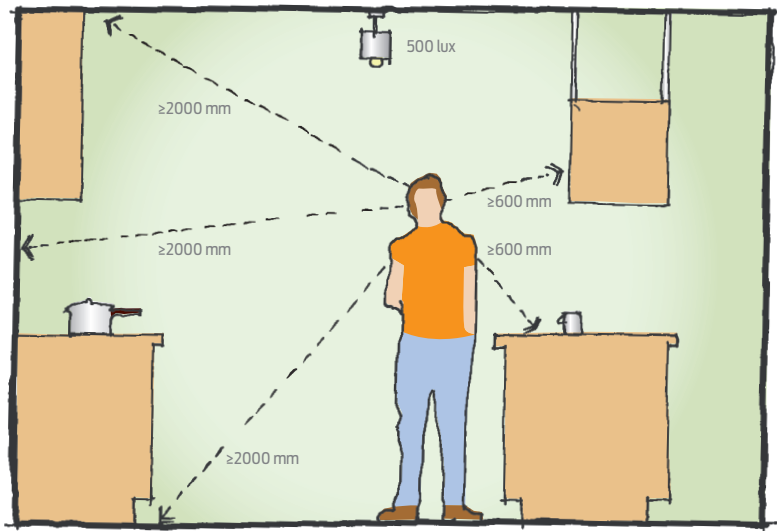


Figure 1: The normal viewing positions for checking workmanship.

colour and texture and be free from significant defects.

However, the coating may contain one minor defect as defined in section 3 of the WANZ standard for every 1 m of extruded length. A minor defect may be visible from 2 m and has an outside diameter of up to and including 1.5 mm.

Anodised aluminium viewing

Visual inspection of anodising after manufacture should be done from a distance of not less than 2 m in daylight, but not direct sunlight. This is according to the Window Association of New Zealand Anodising Standard SFA 3503-03:2005.

It is sometimes possible to observe, on close inspection or from certain viewing angles, variations in brightness, banding, streaming and other visual effects on the significant surfaces. These seldom impair the performance of the anodised aluminium and should not be grounds for rejecting the product on a performance basis.

Other viewing distances

The MBIE *Guide to tolerances, materials and workmanship in new residential construction 2015* gives the following viewing distances:

- Fixtures, fittings and benchtops - standing at a distance of ≥ 600 mm.
- Bathroom and kitchen cabinetry - standing at a distance of 600 mm to 1 m.
- Non-concrete floor finishes (including decking) - standing at a distance of ≥ 2 m.
- Tiled surfaces - standing at a distance of ≥ 2 m.
- Painted non-concrete surfaces - standing at a distance of ≥ 2 m (AS/NZS 2311:2009 *Guide to the painting of buildings*).
- Concrete or asphalt - standing at a distance of 3 m (NZS 3114:1987 *Specification for concrete surface finishes*).
- Roofs - standing at a distance of ≥ 3 m (recommended by the Roofing Association of New Zealand).
- Internal and external exposed architectural masonry feature walls - standing not less than 6.1 m away in diffuse lighting (ASTM C90-15 (2015) - *Standard specification for loadbearing concrete masonry units*).
- Timber decks - standing at a distance of 2 m. ◀

For more ▶ See AS/NZS 2589:2007 *Gypsum linings – Application and finishing*, particularly Appendix C, and visit www.awci.org.nz/ critical-light.