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	<b>CRITERIA FOR SURFACE VISUAL ASSESSMENT</b>	<b>Introduced:</b> 15-07-2019
		<b>Replaces:</b> NZ010-10:05:2019

## 1. Introduction

### 1.1. Subject of the standard

The standard contains information on acceptable surface quality deviations and presents the criteria for assessing these deviations. This assessment is related to visual inspection of the following surface types:

- lacquered,
- veneered,
- anodized,
- extruded profiles,
- aluminium and steel profiles made in forming processes,
- transparent glazed surfaces (single- or double-glazed panels)

### 1.2. Scope of application

The standard applies to the following types of surfaces:

- veneered „sandwich” type panel surfaces
- veneered surfaces of extruded and bent aluminium profiles
- veneered surfaces of extruded and bent PVC profiles
- painted „sandwich” type panel surfaces
- painted surfaces of extruded and bent aluminium profiles
- painted surfaces of formed aluminium profiles
- painted surfaces of formed steel profiles
- galvanized surfaces of formed steel profiles
- raw surfaces of formed aluminium profiles
- transparent glazed areas in products (sealed glazing units, glazed sections of garage doors, etc.).
- welded and crimped profile surfaces

### 1.3. Surfaces of the products

Types of surfaces described in section 1.2 are featured in KRISPOL/KRISHOME products:

## 2. Assessment criteria

### 2.1. A method of conducting the visual inspection

The assessment should be made by looking at the analysed surface positioned vertically at an angle of 90°, from a distance specified in the table below. The inspection shall be carried out on a closed product in natural daylight, but not in direct sunlight. During the inspection do not use any magnifying devices or sources of strong light (e.g. halogen lamps, flashlights). The analysed surface must be completely dry.

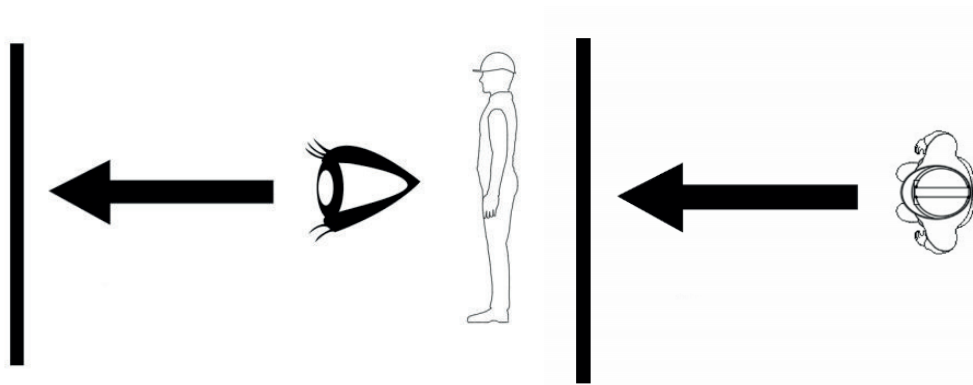


Table with distances of inspected product sample, depending on the surface and product types.						
Type of the surface	K2 R sectional garage doors	RGZ/RGW rolling garage doors	K2 I sectional industrial doors	R1/R2 industrial rolling doors and grates	ALU/FEN joinery ALU/PVC EXT./INT.	R/Z external rollers shutters / blinds
„sandwich“ type veneered panel surfaces	2 m	2 m	2 m	×	1 m / 1 m	×
veneered profile surfaces	2 m	2 m	×	×	2 m / 1 m	2 m
„sandwich“ type painted panel surfaces	3 m	3 m	3 m	3 m	1 m / 1 m	×
painted profile surfaces	3 m	3 m	3 m	3 m	2 m / 1 m	2 m
galvanized surfaces of formed steel profiles	2 m	×	2 m	2 m	2 m	×
raw surfaces of formed aluminium profiles	3 m	×	3 m	3 m	3 m	3 m
of glazed surfaces of the products	2 m	2 m	2 m	2 m	2 m / 2 m	×

All flaws are evaluated using the distances given in the table above.

## 2.2. Criteria for assessing different types of surfaces

### 2.2.1. Veneered surfaces

The surfaces relevant to the visual or utility aspect of the product are subject to assessment. The assessment shall cover abrasions, inclusions, bubbles and excessive matting of veneered coating.

The surfaces which are dark, matted or discoloured, as a result of installation in locations exposed to strong sunlight should not be subject to the assessment.

### 2.2.2. Painted surfaces

The surfaces relevant for the visual or utility aspect of the product are subject to the assessment. The assessment shall cover insufficiently painted areas, chipping, scrapes, inclusions, bubbles, flaking paint, discolouration, excessive matting of lacquered surfaces, excessive roughness, stains and scratches. The coating should have a uniform colour and gloss - visual inspection is allowed, which compares gloss of the sample at the same angle as of a reference sample.

To verify colours, only use the Krispol K5 RAL colour chart or a spectrometer. Colour differences shall be evaluated using the above measuring device in accordance with the guidelines of the following standards:

**PN-EN ISO 3668:2002** - Paints and varnishes - Visual comparison of the colour of paints

**PN-ISO 7724:2003** - Paints and varnishes - Colorimetry - Parts 1-3

**PN-EN ISO 11664:2011** - Colorimetry - Parts 1-5

### 2.2.3. Galvanized surfaces after forming

The surfaces relevant for the visual or utility aspect of the product are subject to the assessment.

The assessment shall not cover the tarnish on galvanized surfaces, which consists mainly of zinc oxide or zinc hydroxide formed as a result of a long-term storage or use in humid conditions. The assessment shall not cover damage resulting from extreme natural phenomena, contact with aggressive media or from external factors such as salts, alkalis, acids.

### 2.2.4. Raw aluminium surfaces after forming

The surfaces relevant for the visual or utility aspect of the product are subject to the assessment.

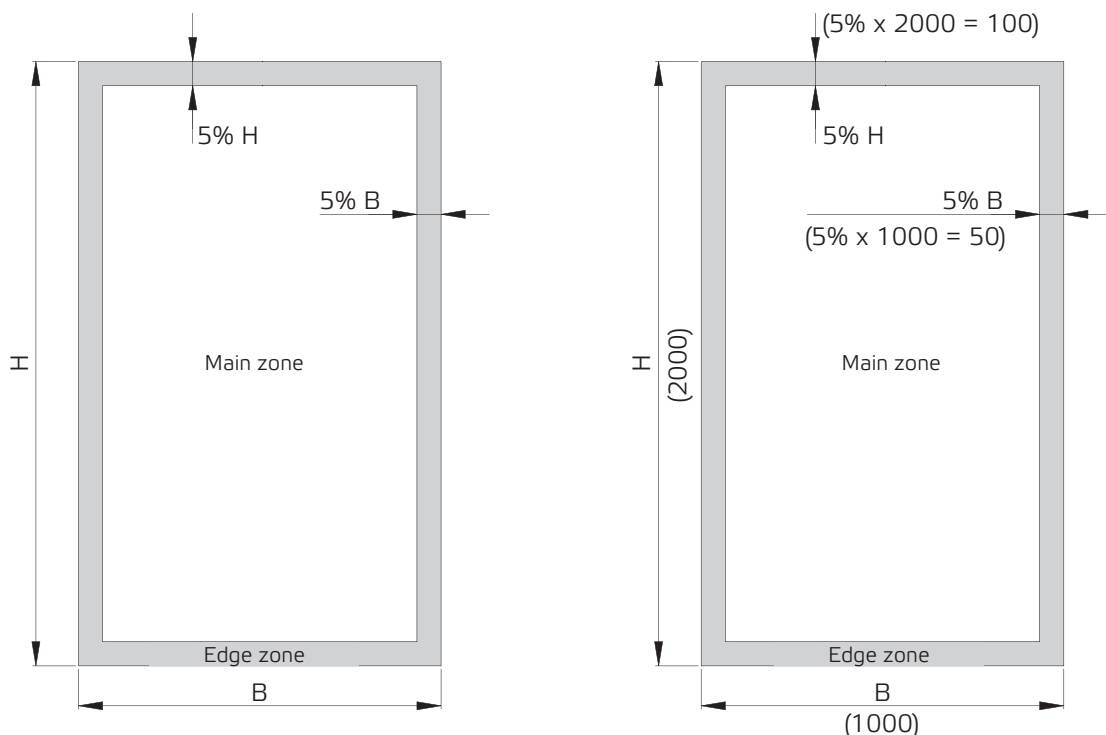
The assessment shall not cover the tarnish on elements, which was formed as a result of a long-term storage or use in humid conditions. The assessment shall not cover damage resulting from extreme natural phenomena, contact with the aggressive media or from external factors such as salts, alkalis, acids.

### 2.2.5. Glazed surfaces

The surfaces relevant for the visual or utility aspect of the product are subject to the assessment. The assessment shall cover scratches, chipping and spot defects with a diameter larger than 2 mm.

The assessment shall not cover cracks resulting from the external thermal or mechanical impacts caused by incorrect installation or operation.

The quality assessment of glazing units is carried out on using the drawing below for each of the zones separately. The main and edge zone must be determined according to the following relations.



**H** - height of the glazing unit  
**B** - width of the glazing unit

**Example:** for a glazing unit with dimensions (B x H) 1000 x 2000 mm, the edge zone is within 50 mm of the vertical edges (towards the centre) and within 100 mm of the horizontal edges (towards the centre).

A correct visual inspection of a glazing unit entails an evaluation from a distance of 2.0 m at a right angle in daylight (without direct incidence of sunlight) or in bright distributed light against a grey screen.

Defect type	Defects in the glazing unit	
	Edge zone	Main zone
	Admissibility of defect	Admissibility of defect
Spot defects in the form of foreign body inclusions	UNACCEPTABLE	UNACCEPTABLE
Spot and linear defects in the form of bubbles: burst and open bubbles	UNACCEPTABLE	UNACCEPTABLE
Spot and linear defects in the form of bubbles: closed bubbles	YES (max. 2 pcs./m with max. dimension of 2 mm)	YES (max. 2 pcs/m with max. dimension of 2 mm)
Spot defects with dimensions $\leq 0.5$ mm	ACCEPTABLE	ACCEPTABLE
Spot defects with dimensions: $> 0.5$ mm $\leq 1.0$ mm	YES (max. 4 pcs. in a circle with diameter $< 200$ mm)	YES (max. 4 pcs. in a circle with diameter $< 200$ mm)
Spot defects with dimensions: $> 1.0$ mm $\leq 2.0$ mm	YES (max. 1 pcs./meter of length)	YES (MAX. 2 PC./M <sup>2</sup> )
Spot defects with dimensions: $> 2.0$ mm	UNACCEPTABLE	UNACCEPTABLE
Line defects in the form of scratches	YES (max. length 25 mm, max. 4 pcs./meter of length)	YES (max. length up to 12 mm, max. 1 pc./m <sup>2</sup> )
Surface / coating defects in the form of smudges, stains, imprints, discolourations	UNACCEPTABLE	UNACCEPTABLE
Defects in the form of chips and nicks on the edges	YES (max. length up to 3 mm)	NOT APPLICABLE
Defects in the form of cracks at the edges	UNACCEPTABLE	UNACCEPTABLE
Break in joining areas of glass inserts	YES (max. 1 mm)	NOT APPLICABLE
Condensation inside the glazing unit	UNACCEPTABLE	UNACCEPTABLE
Condensation outside the glazing unit	ACCEPTABLE	ACCEPTABLE

### 2.2.6. Corner connections

The surfaces relevant for the visual aspect of the product are subject to the assessment. The assessment shall cover defects visible at a distance of not less than 0.5 m. The finished weld must not have any discontinuities or inclusions.

Dimensional deviation of visible, joined surfaces of profiles must not be greater than:

- a) 0.6 mm for welded PVC profiles
- b) 0.2 mm for aluminium crimped profiles

## 3. Acceptable deviations

### 3.1. Veneered surfaces

For bright colours, a single surface abrasion point with a diameter of up to 5 mm is permitted. Should a flaw be noticed, it should be measured with a suitable measuring device (millimetre scale/ rule). Slight colour variations in veneer coatings in the area of the same veneer pattern are permitted. Due to their properties and the mode of distribution of the wood rings, wood-like colours may exhibit minor differences in structure. No flaws of visible surfaces are permitted on patternless veneers. Should a new product be installed close to a product installed earlier, differences in the structure, colour, tone and shine are permitted. If a product is closed, surfaces that are not visible may differ from visible surfaces.

### 3.2. Painted surfaces

A single intrusion – a point defect – is permitted at a diameter up to 1 mm per 2 r. m. of panels. For bright colours, a single surface abrasion point with a diameter of up to 5 mm is permitted. Should a flaw be noticed, it should be measured with a suitable measuring device (millimetre scale/ rule). Component colour differences for various materials or materials manufactured using different technologies are permitted. Differences in colour tone of varnished components are permitted should they stem from different production lots. Should a new product be installed close to a product installed earlier, differences in the structure, colour, tone and shine are permitted. If a product is closed, surfaces that are not visible may differ from visible surfaces.

### 3.3. Galvanized surfaces after forming

Cut edges not secured in the factory or made during installation (ends of lines, opening edges, etc.) situated within a distance of 10 mm from the cutting line are excluded from the assessment. The assessment shall not cover galvanized elements with defects resulting from operation which do not exceed 0.5% of the total surface area. Loss of gloss occurs in direct proportion to exposure to the sun, stains and discolouration is possible (not subject to assessment).

### 3.4. Raw aluminium surfaces after forming

Cut edges not secured in the factory or made during installation (opening edges, etc.) situated within a distance of 10 mm from the cutting line are excluded from the assessment. The assessment shall not cover aluminium elements with defects resulting from operation which do not exceed 0.5% of the total surface area. Loss of gloss occurs in direct proportion to exposure to the sun, stains and discolouration are possible (not subject to assessment).

### 3.5. Glazed surfaces

Condensation of water vapour on outer surfaces of the glazing units is permissible on both surfaces (facing interior and exterior of the building). It is a natural phenomenon occurring at high humidity and when the temperature of the glass is lower than the temperature of ambient air (i.e. dew point). No deformation (concavity / convexity) of glazing elements greater than 5 mm is permitted. Not dirt in the space between glass panes is allowed.

### 3.6. Exclusions from the assessment

Coated surfaces exposed to air temperatures lower than -25°C and higher than +55°C are excluded from the assessment. Painted and veneered surfaces manufactured from different production batches may reveal differences between colour, colour tone, texture and gloss. According to operational characteristics the rolling process of the garage door shell / rolling grille / external roller blind may cause abrasion of the panel / profile coating, which is a natural phenomenon and is not subject to assessment.

During operation of sectional garage doors, due to permitted dimensional deviations of panels, thermal expansion and operational parameters, abrasion of garage door segments is natural in the areas of connecting locks and it shall not be assessed. Due to operational parameters of garage doors, grilles, shutters, windows and doors, their contact surfaces with seals may reveal some abrasions of coats, which is a natural phenomenon and is not subject to assessment. All visual defects which, after installation of the product are not visible shall not be assessed.