NORWEGIAN DOOR AND WINDOW CONTROL

NDVK Rules

NDVK

NORSK DØR- OG VINDUSKONTROLL

SERTIFISERT

REQUIREMENTS FOR DOORS AND WINDOWS

Updated: March 2018

NDVK MARKING RULES

These rules were revised in March 2018 and adopted by the AGM of Norwegian Door and Window Control on 17 April 2018.

The rules replace in their entirety
"REQUIREMENTS FOR DOORS AND WINDOWS – RULES FOR GRANTING THE RIGHT TO THE NDVK SEAL OF APPROVAL" from May 2012.

Points whose contents have been amended partly or wholly are marked by a vertical line in the left margin.

Please also note that heading numbering may have changed from the previous edition of the rules.

Content:

INTRODUCTION

This document, NDVK Rules, specifies the allocation rules for the NDVK Seal and the minimum requirements that windows and doors must meet. The NDVK Rules also specify the requirements imposed on the manufacturer's quality system and rules for the certification of a manufacturer's quality system. NDVK Rules is prepared on the basis of previous technical guidelines, adopted NS-EN standards and the Norwegian Building Code.

NDVK Rules is divided into the following sections:

PART 0: GENERAL INFORMATION
PART 1: WINDOWS, BALCONY/PATIO DOORS AND AIR VENTS
PART 2: EXTERIOR DOORS
PART 3: WINDOWS AND EXTERIOR DOORS: REQUIREMENTS FOR BASIC MATERIALS USED IN FINISHED PRODUCTS
PART 4: PLASTIC WINDOWS AND DOORS
PART 5: WINDOWS AND EXTERIOR DOORS: REQUIREMENTS FOR COMPONENTS USED
PART 6: LABELLING RULES
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PART 0: GENERAL INFORMATION

0.1 Purpose

NDVK Rules provide a basis on which to document essential properties of windows, balcony/patio doors and exterior doors. The rules have been adapted to current Norwegian and European standards wherever possible. In the long term, it is assumed that NDVK Rules will have to be adopted to new standards and regulations in the EEA area.
The publication's target group comprises Norwegian manufacturers of windows, balcony/patio doors and exterior doors. Manufacturers are also defined as buyers of semi-finished products who perform the final workflows in the manufacturing process. Membership of NDVK is voluntary.

0.2 Technical product requirements and test methods

0.2.1 Adaptation to standards

As new relevant national or international standards come into force, these will normally replace the corresponding standards or rules in NDVK Rules. This is done pursuant to a decision made by the NDVK board.

0.2.2 Product requirements and prototyping of ready-to-install windows and exterior doors

As a prerequisite for being able to label a product with the "NDVK Seal", the product must meet the minimum requirements stipulated in NDVK Rules and these properties must be documented through type testing pursuant to specified test methods or by means of calculation according to specified calculation methods.

0.3 Rules for the manufacturer's quality management

To be approved as a NDVK-certified manufacturer, the manufacturer's quality system must meet the requirements stipulated in NDVK Rules, on the basis of a third-party assessment: "Rules for Certification and Inspection Visits".
The manufacturer has the opportunity to use recognised Lean principles in its quality management system, provided that the intentions and regulations in "Rules for Certification and Inspection Visits" are met.

PART 1: WINDOWS, BALCONY/PATIO DOORS AND AIR VENTS

1.0 Requirements

Specific requirements apply to complete products including the required operating mechanism and, if relevant, a trickle vent. Necessary operating mechanisms and trickle vents, if relevant, must be mounted and closed during testing.

1.0.1 Reference dimensions

As reference dimensions for specifying different types of functional characteristics, such as air permeability, water tightness, resistance to wind load and thermal insulation capacity, characteristics which relate to such alternate dimensions are specified:

Product	Dimensions
Window	1200 x 1200* / 1230 x 1480
Balcony/patio door (single)	900 x 2100*/1230 x 2180
Balcony/patio door (double)	1500 x 2100*
Sliding door	2000 x 2100
Trickle vent	No reference dimensions

* Other approved dimensions will be -100% + 50% (surface area). "Air Permeability and Water Tightness" will apply.

Optional dimensions apply to resistance to wind load.

Weight and dimensions must not exceed the recommendations of the operating-mechanism manufacturer.

1.1 Test methods and functional requirements.

1.1.1 Basic requirements (mandatory, regular testing):

In order for a window and/or balcony/patio door to be certifiable, the product must meet the following minimum requirements:

Functionality requirements	***Classification/value***				***NDVK requirements:***
1.1.1.1. Air flow					
Class	***1***	***2***	***3***	***4***	**4**
Maximum testing pressure (Pa)	150	300	600	600	

Testing standard: NS-EN 1026
Classification standard: NS-EN 12207
Requirements: Meets requirements for **class 4**

Functionality requirements	***Classification/value***										***NDVK requirements:***
1.1.1.2. Water tightness											
Class: Non-shielded, top (A)	***1 A***	***2 A***	***3 A***	***4 A***	***5 A***	***6 A***	***7 A***	***8 A***	***9 A***	***E***	***9A***
Testing pressure (Pa)	(0)	(50)	(100)	(150)	(200)	(250)	(300)	(450)	(600)	(>600)	
Class: With top shielding (B)	***1 B***	***2 B***	***3 B***	***4 B***	***5 B***	***6 B***	***7 B***				
Testing pressure (Pa)	(0)	(50)	(100)	(150)	(200)	(250)	(300)				

Testing standard: NS-EN 1027, Method A
Classification standard: NS-EN 12208

Functionality requirements	*Classification/value*	*NDVK requirements:*
1.1.1.3. Thermal insulation (U value)	Pursuant to applicable regulatory requirements.	
U_D *(W/m² x K)*	*Documented value*	**-**

The thermal transmission coefficient (U value) must be documented and specified for windows with dimensions of 1230 x 1480 (or 1200 x 1200) and for balcony/patio doors with dimensions of 1230 x 2180, (or 900 x 2100).
The U value can be documented by referring to a table approved by NDVK, by calculation or by measurement.
One or more of the following standards may also be used as documentation:

- NS-EN ISO 10077-1 Thermal performance of windows, doors and shutters – Calculation of thermal transmittance – Part 1: Simplified method
- NS-EN ISO 10077-2 Thermal performance of windows, doors and shutters – Calculation of thermal transmittance – Part 2: Numerical method for frames
- "NS-EN ISO 12567-1 Thermal performance of windows and doors – Determination of thermal transmittance by hot box method – Part 1 Complete windows and doors.
- At inspection, it must be possible to present documented calculations for each product included in the certification. It is possible to demand that calculations be verified by an approved third party. For new products, these calculations must always be verified by a third party.*)
- Quotations/customer orders must specify the U value of each product and for the entire consignment as a whole. It is permitted to excluded uncertified products (e.g. basement/garage windows and doors) from the overall calculation.
- Deliberate or wilful use of incorrect U values will automatically lead to tighter control, cf. point 1.1.6. of the NDVK Certification Rules. Repeated violations will lead to forfeiture of the right to use the NDVK Seal.

*) NB!
Please note that if the U values are to be used for CE marking, this requires compliance with EN 14351-1 and, thus, also with the European Construction Products Regulation. If the documentation is not prepared by a "designated regulatory body", it will not be possible to use this as a basis for CE marking.

1.1.2 Additional requirements (voluntary tests):

Functionality requirements	*Classification/value*						*NDVK requirements:*
1.1.2.1 Resistance to wind load							
Class	***1***	***2***	***3***	***4***	***5***	***E***	***3C***
Test pressure P1 (PA)	(400)	(800)	(1200)	(1600)	(2000)	*(> 2000)*	
Class	***A***		***B***		***C***		
Deflection of frame??	(≤ 1/150)		(≤ 1/200)		(≤ 1/300)		

Testing standard: NS-EN 12211
Classification standard: NS-EN 12210. The results will apply to all underlying dimensions of the tested product.

Functionality requirements	*Classification/value*	*NDVK requirements:*

1.1.2.2 Resistance to forced entry							
Resistance class ***See NS-EN 1627 for the requirements.***	***1***	***2***	***3***	***4***	***5***	***6***	**2**

- Classification pursuant to NS-EN 1627
- Static loading pursuant to NS-EN 1628
- Dynamic loading pursuant to NS-EN 1629
- Manual attempts pursuant to NS-EN 1630

NB! The requirements apply to balcony/patio doors used on the first and/or second floor.

Functionality requirements	***Classification/value***	***NDVK requirements:***
1.1.2.3 Child-proofing	*Pursuant to building code requirements.*	**-**

Functionality requirements	***Classification/value***				***NDVK requirements:***
1.1.2.4 Mechanical stability (vertical load and torsion resistance)					
Class E	***1***	***2***	***3***	***4***	
Torsion (vertical load) (N)	*200*	*400*	*600*	*800*	**2**
Static torsion (N)	*200*	*250*	*300*	*350*	

Testing standard, vertical load: NS EN 14608
Testing standard, torsion: NS EN 14609
Classification standard: NS-EN 13115

Functionality requirements	***Classification/value***				***NDVK requirements:***
1.1.2.5 Repeated opening and closing					
Class	***1***	***2***	***3***	***4***	**3***
Number of cycles	*5,000*	*10,000*	*20,000*	*50,000*	**4****

Testing standard: NS-EN 1191
Classification standard: NS-EN 12400
*Window Requirements
**Balcony/patio door requirements

Functionality requirements	***Classification/value***					***NDVK requirements:***
1.1.2.6 Resistance to heavy impact						
Class	***1***	***2***	***3***	***4***	***5***	**1**
Fall height (mm)	*200*	*300*	*450*	*700*	*950*	

Testing and classification standard: NS-EN 13049

Functionality requirements	*Classification/value*		*NDVK require-ments:*
1.1.2.7 Operating force			
Class	***1***	***2***	
a) Frame	*100 N*	*30 M*	
b) Fittings			**1**
1) Hand-operated fasteners	*100 N or 10 Nm*	*30 N or 5 Nm*	
2) Finger-operated fasteners	*50 N or 5 Nm*	*20 N or 2 Nm*	

Testing standard: NS EN 12046-1
Classification standard: NS-EN 13115

1.1.3 Compulsory requirements:

1.1.3.1 General strength requirements

It must be possible for the window structure to absorb all forces impacting the window plane and transfer these to the building mass' load-bearing structure.
The window must be designed so that it is not damaged during transport, storage or mounting in a finished building.

1.1.3.2 Joints and corner structures

Joints and corner structures must be designed and secured using adhesives and sealants so that they meet air-permeability and water-tightness requirements and have sufficient mechanical stability.

1.1.3.3 Constructive wood preservation

Frames must be designed to ensure that rainwater drains away from the exterior surface of the building. Weather-exposed parts/surfaces on horizontal profiles that are accessible to precipitation must have a minimum gradient of 1:8.

1.1.3.4 Priming

The products must have a water-repellent treatment that provides temporary protection so they can withstand limited storage at a construction site and brief impact of rain without this leading to harmful absorption of moisture.

1.1.3.5 Handling and mounting description

Written instructions must be enclosed with the product, and these shall contain necessary information about how to transport, receive, store, handle and protect the product during the period of construction, as well as instructions in how to mount the window in a wall and how to adjust and align it.

1.1.3.6 Maintenance description

A written description of how to maintain the window must be enclosed with the consignment.
The current template – drafted by the Technical Forum for the Association of Norwegian Door and Window Manufacturers for FDV documentation – can be used.

PART 2: EXTERIOR DOORS

2.0 Requirements

Specific requirements apply to complete products including required operating mechanism and, if relevant, a mail/letter slot. Necessary operating mechanisms and any mail/letter slots must be mounted and closed during testing.
Skylights and side lights integrated into a door frame are defined as exterior doors.

2.0.1 Reference dimensions

As reference dimensions for documenting properties such as air permeability, water tightness, resistance to wind load and thermal insulating capacity, the specified characteristics must apply to products with modular dimensions:

Product	Dimensions
Exterior door (single)	1000 x 2100* / 1230 x 2180

*) Other approved dimensions will be: -100%/+20% (area)
Weight and dimensions must not exceed the recommendations of the operating-mechanism manufacturer.

2.0.2 Functional requirements and test methods

In order for an exterior door to be certifiable, the product must meet all the current minimum requirements:

2.1 Test methods and functional requirements

2.1.1 Basic requirements (mandatory, regular testing):

In order for a door to be certifiable, the product must meet the following minimum requirements:

Functionality requirements	*Classification/value*				*NDVK require-ments:*
2.1.1.1 Air flow					
Class	***1***	***2***	***3***	***4***	**4**
Maximum testing pressure (Pa)	150	300	600	600	

Testing standard: NS-EN 1026
Classification standard: NS-EN 12207

Functionality requirements	*Classification/value*										*NDVK re-quire-ments:*
2.1.1.2 Water tightness											
Class: Non-shielded, top (A)	***1 A***	***2 A***	***3 A***	***4 A***	***5 A***	***6 A***	***7 A***	***8 A***	***9 A***	***E***	***7A***
Testing pressure (Pa)	(0)	(50)	(100)	(150)	(200)	(250)	(300)	(450)	(600)	(>600)	**or**
Class: With top shielding (B)	***1 B***	***2 B***	***3 B***	***4 B***	***5 B***	***6 B***	***7 B***				**7B**
Testing pressure (Pa)	(0)	(50)	(100)	(150)	(200)	(250)	(300)				

Testing standard: NS-EN 1027
Classification standard: NS-EN 12208

Functionality requirements	*Classification/value*	*NDVK require-ments:*
2.1.1.3. Thermal insulation (U value)	Pursuant to applicable regulatory requirements.	
U_D *(W/m² x K)*	*Documented value*	**-**

The thermal transmission coefficient (U value) must be documented and specified for a door with reference dimensions of 1000 x 2100 or 1230 x 2180.

For documentation, one or more of the following standards may also be used:

- NS-EN ISO 10077-1 Thermal performance of windows, doors and shutters – Calculation of thermal transmittance – Part 1: Simplified method
- NS-EN ISO 10077-2 Thermal performance of windows, doors and shutters – Calculation of thermal transmittance – Part 2: Numerical method for frames
- "NS-EN ISO 12567-1 Thermal performance of windows and doors – Determination of thermal transmittance by hot box method – Part 1 Complete windows and doors.
- At inspection, it must be possible to present documented calculations for each product included in the certification. It is possible to demand that calculations be verified by an approved third party. For new products, these calculations must always be verified by a third party.*)
- Quotations/customer orders must specify the U value of each product and for the entire consignment as a whole. It is permitted to excluded uncertified products (e.g. basement/garage windows and doors) from the overall calculation.
- Deliberate or wilful use of incorrect U values will automatically lead to tighter control, cf. point 1.1.6. of the NDVK Certification Rules. Repeated violations will lead to forfeiture of the right to use the NDVK Seal.

*) NB!
Please note that if the U values are to be used for CE marking, this requires compliance with EN 14351-1 and, thus, also with the European Construction Products Regulation. If the documentation is not prepared by a "designated regulatory body", it will not be possible to use this as a basis for CE marking.

2.1.2 Additional requirements (voluntary tests):

Functionality requirements	***Classification/value***						***NDVK requirements:***
2.1.2.1 Resistance to wind load							
Class *Test pressure P1 (PA)*	***1*** (400)	***2*** (800)	***3*** (1200)	***4*** (1600)	***5*** (2000)	***E*** *(> 2000)*	***1A***
Class *Frame deflection*	***A*** (≤ 1/150)		***B*** (≤ 1/200)		***C*** (≤ 1/300)		

Testing standard: NS-EN 12211
Classification standard: NS-EN 12210. The results will apply to all underlying dimensions of the tested product.

Functionality requirements	***Classification/value***						***NDVK requirements:***
2.1.2.2. Resistance to forced entry							
Resistance class ***See NS-EN 1627 for the requirements.***	***1***	***2***	***3***	***4***	***5***	***6***	**2**

- Classification pursuant to NS-EN 1627
- Static loading pursuant to NS-EN 1628
- Dynamic loading pursuant to NS-EN 1629
- Manual attempts pursuant to NS-EN 1630

NB! Applies to exterior doors used on all floors where the doors are directly accessible from the outside of the building.

Functionality requirements	*Classification/value*			*NDVK requirements:*
2.1.2.3 Behaviour between two different climates				
Class	***1***	***2***	***3***	
Permitted deformation	≤ 4 mm	≤ 4 mm	≤ 2 mm	***2***
Test climate	(x)*	(x)*	(x)*	

Testing standard: NS-EN 1121
Classification standard: NS-EN 12219***:** Test climate (a, b, c, d or e) must be described

Functionality requirements	*Classification/value*				*Functionality requirements*
2.1.2.4 Mechanical strength					
Class	***1***	***2***	***3***	***4***	
Vertical load (N)	*400*	*600*	*800*	*1000*	
Static torsion (N)	*200*	*250*	*300*	*350*	**3**
Soft and heavy body impact (J)	*30*	*60*	*120*	*180*	
Hard impact (J)	*1.5*	*3*	*5*	*8*	

Testing standard, vertical load: NS-EN 947
Testing standard, static torsion: NS-EN 948
Testing standard, soft and heavy body impact: NS-EN 949
Testing standard, hard, heavy body impact: NS-EN 950
Classification standard: NS-EN 1192

Functionality requirements	*Classification/value*				*Functionality requirements*
2.1.2.5 Repeated opening and closing					
Class	***1***	***2***	***3***	***4***	
Number of cycles	*5,000*	*10,000*	*20,000*	*50,000*	**4**

Testing standard: NS-EN 1191
Classification standard: NS-EN 12400

Functionality requirements	*Classification/value*				*NDVK requirements:*
2.1.2.6 Operating force					
Class	***1***	***2***	***3***	***4***	
Closing power, maximum value (N)	*75*	*50*	*25*	*10*	
Hand-operated fasteners:					
- *Maximum torsion (Nm)*	*10*	*5*	*2.5*	*1*	**2**
- *Maximum power (N)*	*100*	*50*	*25*	*10*	
Finger-operated fasteners:					
- *Maximum torsion (Nm)*	*5*	*2.5*	*1.5*	*1*	
- *Maximum force (N)*	*20*	*10*	*6*	*4*	

Testing standard: NS-EN 12046-2
Classification standard: EN 12217

2.1.3 Compulsory requirements:

2.1.3.1 General strength requirements

It must be possible for the door structure to absorb all forces impacting the door plane and transfer these to the building mass' load-bearing structure.
The door must be designed so that it is not damaged during transport, storage or mounting in a finished building.

2.1.3.2 Joints and corner structures

Joints and corner structures must be designed and secured using adhesives and sealants so that they meet air-permeability and water-tightness requirements and have sufficient mechanical stability.

2.1.3.3 Constructive wood preservation

Frames must be designed to ensure that rainwater drains away from the exterior surface of the building. Weather-exposed parts/surfaces on horizontal profiles that are accessible to precipitation must have a minimum gradient of 1:8. The glazing rebate in exterior doors is exempt from this requirement by means of a simplified insertion of an insulating pane. This requires the simplified insertion to be done pursuant to SINTEF Building Details 533.202.

2.1.3.4 Priming

The products must have a water-repellent treatment that provides temporary protection so they can withstand limited storage at a construction site and brief impact of rain without this leading to harmful absorption of moisture.

2.1.3.5 Handling and mounting description

Written instructions must be enclosed with the product, and these shall contain necessary information about how to transport, receive, store, handle and protect the product during the period of construction, as well as instructions in how to mount the product in a wall and how to adjust and align it.

2.1.3.6 Maintenance description

A written description of how to maintain the door must be enclosed with the consignment.
The current template – drafted by the Technical Forum for the Association of Norwegian Door and Window Manufacturers for FDV documentation – can be used.

PART 3: WINDOWS AND EXTERIOR DOORS: REQUIREMENTS FOR BASIC MATERIALS USED IN FINISHED PRODUCTS

3.1 Timber

(NB! Portions of this chapter will be changed when new rules for laminated items become available)

3.1.1 Orientation

These provisions contain basic requirements for wooden components and timber in ready-made windows, balcony/patio doors, air vents and exterior doors.
Metal-plated products and other combinations of metal are also defined as window and doors.
The requirements are based on NS-EN 13307 and are primarily intended for spruce and pine but may also apply to other types of wood.

3.1.2 Dimensioning

After being processed into a finished profile, the timber must good resistance against rot, mildew and blue stain, and also have good mechanical durability.

3.1.3 Definitions

- **Visible components:** Components and surfaces that are visible during normal use in a closed state, e.g. the sides of a door or window facing indoors or outdoors.
- **Concealed components:** Parts and surfaces that are not visible during normal use but which are visible when the window/door is open.
- **Hidden components:** Components and surfaces that are built-in, e.g. the sides of the frame facing the wall and sections plated with metal.

Wood defects, definitions of type, etc.:
Please refer to the book: "**Nordic quality language for the forestry industry –** conifers".

3.1.4 Finished lumber requirements

Immediately after being sawn, the finished lumber must be dried to approximately 20%, and preferably dried without interruption to a final moisture content of 12% (±3%), cf. Receiving inspection.
After the completion of drying, the finished lumber must be conditioned, as long as the moisture content and tension are maintained. - Dimensioning rules pursuant to "**Nordic quality language for the forestry industry –** conifers"

3.1.5 Requirements for materials used in finished products

Requirements for materials used in ready-made windows, balcony/patio doors, air vents and exterior doors are specified in Table 3.1.

Table 3.1.5 Requirements for wood used in finished windows, balcony/patio doors, air vents and exterior doors

Type of defect	Requirements/explanation
Cross grain	Maximum 1:10
Rate of growth (ring width)	Mean value: ≤ 4.0 mm, calculated at the widest part of a cross-section across the rings. If the pith is visible, then the ten innermost rings are not included. The permitted deviation from the requirement in the centre-most lamina of laminated structures is ≤ 5.0 mm.
Moisture content	12% (±3%) in spruce and pine, and a similar average moisture content for other types of timber. The moisture content must be uniform in all parts of the window/door. 95% of the measurements of samples taken must not deviate more than the permitted deviation of ±3%. Under no circumstances may the moisture content fall below 9% or exceed 16% for spruce and pine.
Spring	Maximum 2 mm/m
Twist	Maximum 2 mm/dm/m

Type of defect	Requirements/explanation
Impermissible material defects	See Table 3.2
Checks	See Table 3.3
Knots	Dimensions and number permitted pursuant to Table 4a: Windows, balcony/patio doors and air vents Table 4b: Exterior doors

Table 3.2 Impermissible material defects

Type of defect
Blue stain is permitted to a certain extent: - Untreated: Concealed surfaces - Treated: Opaque treatment covering the entire surface
Mildew
Rot
Insect damage
Sap stain on visible and concealed components Permitted on concealed surfaces: max. length ≤ 150 mm. Must not extend to or touch exterior corners/mortise joints.
Water damage
Resin pockets on visible and concealed parts: Acceptable in glazing rebate and surfaces facing walls, provided that this does not weaken the construction or have the potential to cause leaks.
Resinous pinewood
Waterline??: permissible provided that it is not visible once the product is mounted in a wall

Table 3.3 Restrictions on checks in timber

Product part	Requirement
Concealed casing components (facing the wall)	Not deeper than half the thickness of the profile. Acceptable along the entire length of the frame but not continuously
Surfaces exposed to weather*)	Only microcracks allowed**)
Concealed parts and glazing rebate of frame*)	200 mm/< 2 mm width 300 mm/< 1.5 mm width
Visible frame surfaces, door leaf, interior surfaces of a window frame	Only microcracks allowed**)

*) Weather-exposed surfaces are defined as all parts of the window where driving rain can reach the profile surface (normally 15 mm from the exterior surface of the structure), as well as the bottom glazing rebates and glazing beads in exterior frames.

* *) Microcracks are defined as minute cracks that are difficult to detect before surface treatment.

Table 3.4.a Knots in windows, balcony/patio doors and air vents. Permissible dimensions and quantity (per running metre)

	Casing	Frame/ Post/transom	Mullions and glazing beads	Threshold	Panel surface
Max. knot diameter (in relation to the component's side dimensions)	50% of visible part (according to NS-EN 942)		-	-	-
40 mm	1	-	-	-	-
30 mm	1	1	-	-	-
20 mm	2	2	-		
10 mm	5	5	-	2	Unlimited
Pin knots	Unlimited	Unlimited	2	2	Unlimited

Of the above mentioned, the following quantity of solid dry knots are allowed	6 per 10 mm	Unlimited number of pin knots are permitted	-	-	-
NB!				Arris knots are not permitted in visible corners	Arris knots and spike knots are not permitted

Table 3.4.b Knots in exterior doors. Permissible dimensions and quantity (per running metre)

	Casing	Door frame	Mullions and glazing beads	Threshold	Door leaf
Max. knot diameter (in relation to the component's side dimensions)	50% of visible part (cf. NS-EN 942)	50%	-	-	(In veneer, the number and size may be unlimited)
40 mm	1	-	-	-	-
30 mm	1	1	-	-	-
20 mm	2	2	-		
10 mm	5	5	-	2	Unlimited
Pin knots	Unlimited	Unlimited	2	2	Unlimited
NB!		Arris knots and spike knots are not permitted	Arris knots are not permitted	Arris knots are not permitted in visible corners	

Supplementary requirements for Tables 3.4 A and 3.4 B:
The minimum distance between knots is twice the knot diameter.
Loose, dry knots are not permitted
For other measurement rules, please refer to the book: "**Nordic quality language for the forestry industry –** conifers".

3.5. Plugging and repairing material defects

Wood plugs are considered knots. Instead of plugs, an NDVK-approved repair compound/hot-melt adhesive can be used.
Plugging must not be done on surfaces exposed to weather in the bottom section of frame or sash, nor up to 300 mm on the bottom section of vertical components.
The following applies to the plugging of surfaces:

- The grain must be parallel to the wood profile
- The diameter of round wooden plugs must not exceed 30 mm.
- Wooden plugs must be glued using an adhesive that complies with Bonding Class 1.
- The moisture content of wooden plugs must not deviate from that of the wood profiles by more than +0–2%.
- The drilling depth must be more than 5 mm below the finished profile. In terms of the repair compound for plugging
- and gluing wooden plugs in surfaces exposed to weather, the glue must meet the requirements of Bonding Class 2.
- Two-thirds (2/3) of the wooden plug's diameter must be firmly attached after processing
- Two or more plugs inside one another are not permitted.
- Boat plugs may be used, as these are not considered repairs. The use of multiple boat plugs in one other is not permitted.

Note: There are several types of boat-plugs in terms of both width and length (with either two or three "boat keels" (profiles)). It is important to use equipment suitable for milling grooves, gluing and pressing to ensure good results.

3.6 Glued wooden materials/components (Will be changed according to new Nordic rules in 2018.)

Components may be produced from solid wood or glulam. Finger jointing is permitted.

For glued /semi-finished components purchased from other manufacturers, the same requirements apply to adhesives and workmanship as specified in Chapter 4.5, and pursuant to a report (1.1.93) of the Control Council on glulam timber: "Glulam materials for windows and exterior doors – Nordic provisions for production and control", or NS-EN 13307-2.
Adhesive for finger joints must meet the requirements of Bonding Class 1. If the surface of the finger joint is exposed to the outdoors, select an adhesive in Bonding Class 2.
When using System2Øko, the percentage of heartwood used must be verified and logged upon receiving the materials. The log is checked during the annual NDVK inspection.

3.7 Fibreboard

Requirements for fibreboard used in exterior doors are specified in Tables 3.7a and 3.7b below.
The type of adhesive used is critical to product quality.

Table 3.7a Requirements for exterior fibreboard: HDF (high density fibreboard)

Testing standard	Characteristics	Unit	Product requirements	
			Min./max. value	Tolerance
NS-EN 323	Density	kg/m^3	Min. 850.00	±5%
NS-EN 317	Swelling, thickness (24h)	%	Max. 14.00	
NS-EN 318	Dimensional change, length/width	%	Max. 0.40	
NS-EN 318	Dimensional change, thickness	%	Max. 6.00	
NS-EN 319	Tensile/perpendicular strength	N/mm^2	Min. 1.50	
NS-EN 1087-1	Tensile strength after boiling test V100	N/mm^2	Min. 0.15	
--	Moisture content upon receipt	%	Max. 8.00	
NS-EN ISO120	Formaldehyde vapourisation	mg/100g	Must comply with E1 norm	

Table 3.7b Interior fibreboard requirements, 8–19 mm: MDF (medium density fibreboard)

Testing standard	Characteristics	Unit	Product requirements	
			Min./max. value	Tolerance
NS-EN 323	Density	kg/m^3	Min. 650.00	±5%
NS-EN 317	Swelling, thickness (24h)	%	Max. 10.00	
NS-EN 318	Dimensional change, length/width	%	Max. 0.40	
NS-EN 318	Dimensional change, thickness	%	Max. 7.00	
NS-EN 319	Tensile/perpendicular strength	N/mm^2	Min. 1.50	
NS-EN 1087-1	Tensile strength after boiling test V100	N/mm^2	Min. 0.15	
NS-EN ISO120	Formaldehyde vapourisation	mg/100g	Must comply with E1 norm.	

3.8 Measuring rules and definitions

Pursuant to "Nordic quality language for the forestry industry – conifers".

PART 4: PLASTIC WINDOWS AND DOORS

4.1. Dimensioning and securing

Large openable windows can entail a risk of malfunction. Therefore, an effort should be made to limit openable windows to maximum area of 1.7 m² and maximum edge length of 1.5 m. If these dimensions are exceeded, special account should be taken of factors such as frame dimension, attachment of fittings, hinge function and the number of locking points. For side-hung windows, the relationship/ratio between length and height should also be assessed in more detail. The profile manufacturer's recommendations and guarantees in terms of dimensioning limits must be followed carefully.

When determining the exterior dimensions, adequate consideration must be taken of the movement of plastic caused by temperature. This is particularly true of dark-coloured products, wide products or in cases where multiple products are built together side by side.

If climatic or other conditions indicate a need to document of wind-resistance capacity, this must be documented by testing pursuant to EN 12211.
The classification must be specified pursuant to EN 12210.

NDVK's recommended classification for normal Norwegian climate conditions:

Class 3C for windows, balcony doors and sliding doors (see section 1.1.2.1).
Class 1A for exterior doors (see section 2.1.2.1).

Tightness testing of plastic windows and doors must be carried out pursuant to EN 1027 for water tightness and EN 1026 for air permeability. Classification must be specified pursuant to EN 12208 for water tightness and EN 12207 for air permeability.

NDVK's classification requirement for normal Norwegian climate conditions:

Water tightness Class 9A for windows, balcony doors and sliding doors (see section 1.1.1.2).
Water tightness Class 7A or 7B for exterior doors (see section. 2.1.1.1).

Air permeability Class 4 for windows, balcony doors, sliding doors and exterior doors (see sections 1.1.1.1 and 2.1.1.1).

NDVK requirements and recommendations for the classification of products are assessed based on normal Norwegian climate conditions. It is recommended that requirements for product performance be assessed in relation to the specific use of these, including geographical location.

4.2 Requirements for profile material

PVC profiles used in the production of doors and windows must comply with requirements pursuant to NS-EN 12608, Profiles of polyvinyl chloride without softener (PVC-U) for the production of doors and windows. Classification requirements and testing methods. *The profiles must satisfactorily meet requirements for climate class M – moderate climate*.

Table 4.2.1. Requirements for PVC profiles for the manufacture of doors and windows

Property	Testing standard	Requirement
Impact resistance	NS-EN 12608	Class 1: Falling mass 1000 g and falling height 100 mm
Dimensional stability after heating	NS-EN 479	Dimensional change ±2%
Dimensional stability after heating to 150°C	NS-EN 478	No defects
Weather resistance	NS-EN 513	Requirements for the maximum change

		of impact resistance and colour specified in NS-EN 12608
Resistance to falling loads	NS-EN 477	Damage to wall for only one of the test objects
Weldability	NS-EN 514	Requirement for minimum voltage level specified in NS-EN 12608

Moreover, the profile material must comply with applicable Norwegian environmental legislation in effect at any time.

The profile manufacturer must be able to prove that production quality is monitored by a system pursuant to the ISO 9000 series.

As minimum documentation for compliance with requirements, the window/door manufacturer's data sheet must be enclosed with the profile manufacturer's specifications for the profile material.

Based on a more subjective evaluation, the following requirements are also stipulated:

- When the profiles are viewed from a distance of 1.5 m or more, the visual impression must not be marred by scratches, extrusion markings or other visual surface defects.

- Hinges or other fittings with a similar load must be attached with screws, which are fixated through at least two layers of material. In other words, two layers of plastic or at least one layer of plastic plus one layer of metal inlay. Other fixation methods which cannot be proven to be stable can be used, e.g. screw threads.

- The reinforcement of products made of profiles that are dyed in the grain, white, or light grey must comply with the profile supplier's instructions, also in cases where it is necessary to mount fittings or attach the product to the wall.
  Strengthening/reinforcement of casing and/or frame can be replaced by "structural gluing" of the insulating glass unit to the casing or frame pursuant to the instructions of the profile supplier, provided that this is approved/prescribed by the profile supplier.

- Products of made of dark-coloured dyed-in-the-grain profiles must have strengthening/reinforcement regardless of the product dimensions. Products made of profiles which are darkly coloured on the exterior surface only must be reinforced/strengthened in accordance with the instructions of the profile supplier.

4.3 Workmanship requirements

4.3.1 Profile processing

Visible surfaces, edges or corners must not show unintentional marks or other traces left by tools or traces of handling during manufacture, packing or storage.

Outward-opening frame corners which can come in contact with users must not be pointed and/or sharp to an extent that it feels uncomfortable to touch them. The height of the sash rebate for weather stripping must not exceed 0.5 mm.

If, during production, holes are drilled in the product to enable it to be mounting in a wall, the hole distance must conform to the manufacturer's mounting description. The mounting description must also be included with all consignments.

Dimensional tolerances (at 15°C)
Exterior casing dimensions: ± 2 mm, for nominal dimensions < 2 m
± 3 mm, for nominal dimensions > 2 m

Frame dimensions: Frame size, internal rebate: (2 x the specified clearance) ±2 mm

4.3.2 Corner joints

Corner joints on frames and casings must be welded. Transoms and mullions may be scribed together and fixated with a bracket developed for the profile system. The corner joints and/or connecting sections to transom/mullion must be completely airtight and watertight.
The manufacturer's product data sheet must include a brief description of the method used to assemble the corner joints. Welding instructions must include information about the profile supplier's guidelines for temperature, time and pressure during contact with the welding mirror, as well as time and pressure for compression after welding.

Each ordinary inspection will control measurement of the weld mirror temperature and the profile's contact time with the weld mirror, in order to verify that it is consistent with what the company's instruments indicate and the profiles provider's Specifications.

It must be possible for the manufacturer to provide documentation of the strength of welded corner joints. The strength must be documented by means of testing in accordance with the pressure/bending test method specified in NS-EN 514.

For corner joints, the minimum fracture strength (F) must be 2.5 kN.

If the manufacturer regularly performs documented testing of the corner joints' strength, externally accredited testing must be conducted every other year.
If the manufacturer does not do the testing, accredited testing must be conducted every year.

Bottom sections of frames and casing must be drilled with drain holes at the factory to ensure that any rain and or condensation water is led outdoors. The minimum diameter of the drain holes must be Ø8 mm or an opening of 5 x 20 mm. The number and position of drain holes must be such that all water is drained off. Under no circumstances may the drain holes be connected to cavities with inlaid reinforcement.

The reinforcement mullions must either perfectly fit the plastic profile or be attached with screws on concealed surfaces. The distance between screws must not exceed 250 mm and the screws must be at most 60 mm from the ends of the profile. If the profile supplier prescribes other screw distances, these must be complied with.

4.3.3. Bonding

Additional profiles, such as a drip groove, can be attached by gluing, provided that a glue recommended by the profile supplier is used.

4.3.4. Surface treatment

The use of painted profiles is permitted, as long as the finish treatment is done on a suitable industrial facility. However, this expressly requires the buyer to be notified in all instances that the products are painted. Plastic profiles that are visible on a product in both open and closed position must have a uniform sheen or matt finish.

Foiling can be used provided that the suppliers' (foil and profile) instructions are followed.

The manufacturer's maintenance description must specify how the surface must be cleaning and the specific cleaning agents that can be used. Similarly, they must also specify any solvents that must not be used to cleanse/clean the surface.

PART 5: WINDOWS AND EXTERIOR DOORS: REQUIREMENTS FOR COMPONENTS USED

5.1 Orientation

These provisions contain basic requirements for additives, semi-finished products and components for control-labelled windows, balcony/patio doors, air vents and exterior doors.
Aluminium-clad products and other combinations of materials are also defined as windows and exterior doors.

5.2 Minimum requirements

NDVK requires certified manufacturers of windows and exterior doors to only use approved materials and components for which documentation exists that the requirements have been met.

5.3 Insulating glass units (IGU)

Insulating glass units, approved pursuant to NS-EN 1279-5, glass in building – Insulating glass units – Part 5: Evaluation of compliance must be used and applied pursuant to the supplier's description.
Insulating glass units are to be mounted according to NS-EN 12488 or the IGU manufacturer's mounting instructions. CE-marking of IGUs is mandatory.
Specialised glass solutions, e.g. fire-resistant glass, can overrule these provisions.
For exterior doors, a simplified solution for glass insertion is accepted according to "**Byggdetaljblad 533.202"** (in Norwegian only).

5.4 Fittings

5.4.1 General information

Here, the manufacturer must be able to document compliance with requirements for Class 3 fittings, based on NS-EN 1670 Building hardware – Corrosion resistance – Requirements and test methods.

5.5 Glue and gluing:

5.5.1 General information

In terms of all gluing, the adhesive manufacturer's instructions concerning mixing ratios, open time (time from application of the adhesive to joining of the surfaces), closed time (time from joining until pressure is applied), compression, temperature exposure and compliance with pressing time must be observed. For the admixture of hardener, the adhesive manufacturer's specification of mixing ratios must be complied with. This can be specified as either weight or volume parts, and it is important to distinguish between these.

5.5.2 Requirements for glues:

For gluing where grains are parallel or across the grain, only glue that has been tested and approved by an accredited test authority may be used.

Bonding Class 1: The glue joints are not exposed to the outdoors. The moisture content and temperature of the wood may exceed 20% and 50°C respectively for short periods of time.

Bonding Class 2: The glue joints can be exposed to the outdoors. The moisture content and temperature of the wood may exceed 20% and 50°C respectively for prolonged periods of time.

Glue for Bonding Class 1 – joints not exposed to the outdoors
The glues must be tested and approved pursuant to the Resistance Class D4 in the standard NS-EN 204/205 (thermoplastics).
Examples of glue types: PVAc, PVAC w/hardener (polyvinyl acetate), PUR (polyurethane), EPI (emulsion polymer isocyanate) tested pursuant to NS-EN 204/205, as well as glue approved for use for Bonding Class 2.

Glue for Bonding Class 2 – joints exposed to the outdoors
The glues must have been tested and approved pursuant to the highest Resistance Class (C4) in the standard
NS-EN 12765 (Thermosetting), NS-EN 15425 (PUR) or be included on the Nordic list of approved structural adhesives tested pursuant to NS-EN 301/302 (condensation resins).
This list also includes certain EPI adhesives that are approved according to their own testing procedures.
The list can be found on the website of the Norwegian Institute of Technology's website www.treteknisk.no
Examples of glue types: PRF (phenol-resorcinol formaldehyde), RF (resorcinol formaldehyde), MUF (melamine-urea formaldehyde), MF (melamine-formaldehyde), PUR and EPI.

Comments: NS-EN 12765 and NS-EN 204 use the same definition of the resistance classes, which means that wording in C4 and D4 is identical.
Glue types tested according to the first-mentioned normally tolerate a higher degree of strain than thermoplastic types. Therefore, C4 glue should be placed in Bonding Class 2.
If something is to be glued to a proofed material, the glue supplier must be able to document that this is possible.

5.5.3 Gluing parallel to the grain direction:

The adhesive must be evenly applied so that the entire surface is covered. For conifers, one-sided application is normally used. For hardwoods or wood that is deemed difficult to glue, a two-sided application must be used.

5.5.4 Gluing of corner joints

To achieve satisfactory requirements for water tightness, the glue must fill the entire gap in the joint. If the mortises are fully or partly coated with a surface finish, then a glue that adheres to this coating must be used (e.g. EPI adhesives). A sealant is recommended in addition to glue to ensure adequate sealing of grooves for glazing seals and/or weather stripping and sealing of the corner joint as a whole.
The manufacturer must regularly, and at least every two weeks, test the water tightness of the corner joints by means of "blue-dye testing" (liquid bath). The results are to be logged and verified at annual inspections. See Appendix 2.

5.5.5 Gluing in connection with plugging:

It is possible to use for glue approved for Bonding Class 1. The glue can be applied on one side at the bottom and on the sides so that the gap between the plug and the hole's wall is completely filled with glue.

5.6 Weather stripping and glazing seals

The manufacturer must be able to document that the weather stripping and glazing seals used are suitable for the purpose.
In this respect, the data sheet "NBI Technical Approval: weather stripping and choice of materials 573.105" can be helpful.

5.7 Putty, joint fillers and joint strips

The manufacturer must be able to document that the putty, joint fillers or joint strips used are suitable for the purpose.
In this respect, the data sheet "NBI Technical Approval: Joint fillers – Properties and choice of materials 573.104" can be helpful.

5.8 Trickle vents

The maximum permissible leakage in a closed position is 2.4 m3/h at an overpressure of 600 Pa. The product (window/door) can be tested using a standard vent.

5.9 Cladding, metal profiles

Metal profiles and associated fastening hardware must be made of corrosion-resistant or corrosion-protected material. Steel details must be stainless or insulated from aluminium components to prevent the risk of contact corrosion.
The distance between the metal profile and wood must be sufficiently large to ensure adequate drainage and ventilation between the profile and wood (recommended to be at least 5 mm). The gap between the metal profile and the wood must be ventilated to the outdoors and be executed so that rainwater is prevented to the greatest possible extent from penetrating into parts that are not designed to become wet. All profiles must have a shape/design that ensures adequate drainage. It is advisable to add a surface finish before mounting retaining clips. The requirements for the distance between aluminium and wood and for surface finish before mounting of retaining clips can be reduced if the construction is waterproofed or if heartwood is used, cf. point 5.10.5, or is protected against the ingress of water by means of seals and/or by other satisfactory structural details. This must be verified through satisfactory documentation and drawings and be approved by NDVK. Testing can be required in cases of doubt.
For horizontal surfaces that are accessible to water from precipitation and for structural details where condensation water can collect, the requirements for profile design pursuant to points 1.1.12 for windows and 2.1.13. for doors shall apply.
In this context, the standard NS-EN 13420 Windows: "Behaviour between different climates" can be used.

5.10 Finish

5.10.1. Minimum surface finish/priming

NDVK does not require the manufacture to add a surface finish to products, except that the product must be given a waterproofing treatment that provides temporary protection and enables products to withstand a limited storage at a construction site and a short-term impact of rain without the wood moisture content exceeding 18%. In practice, dip-coat/flow-coat priming is sufficient. *However, NDVK recommends that a complete surface finish be added before the product is delivered to a construction site.*
If the finish entails restrictions on subsequent surface treatment, this should be specified in the manufacturer's mounting and maintenance descriptions. The paint supplier's recommendation must be followed at all times.

5.10.2. Technical requirements for surface treatment

If the manufacturer delivers ready-to-use surface-treated products, the requirements of this chapter apply.
All products must be surface treated. However, it is permissible that delimited areas which are concealed in both an open or closed position can remain untreated and used for labelling the product as part of the manufacturer's production management system. Particularly cross-grain wood exposed to the outdoors requires good surface treatment to prevent it from absorbing moisture. If necessary, apply additional sealer to vulnerable areas. Exterior parts of concealed glazing rebate, a minimum of 15 mm from the external edge of the glazing rebate, must be treated. Bottom rails must be treated in every instance. The cross grains of exterior glazing beads of wood must be treated. Surface treatment requirements do not apply to the side of the casing facing the wall.
The surface treatment should be applied as soon as possible after processing to achieve a satisfactory chemical binding power of the substrate. Visible grain structure through an opaque finish must be accepted.
Knots that are not permitted must be removed in different ways. See tables 3.4a and b and point 3.1.5.
The finish on the exterior side must be vapour permeable to ensure good drying possibilities for the wood.
To reduce malfunction caused by the movement of moisture in exterior doors, the door leaf must normally be given a vapour barrier to prevent moisture being conveyed from the warm, damp side to the cold side. For most of the year, the conveyance direction will be inside out, but in summer, this direction can reverse.

Table 5.10.3. Finish applied to windows, balcony/patio doors and exterior door frames

Characteristic	Within the weather stripping		External	
	Transparent finish	Stain finish	Exposed surfaces, including bottom frame[1)]	Non-exposed surfaces
Knot discolouration	n/a	Knot sealant must be used[2)] See the manufacturer's guarantee provisions.		
Fillers and hot-melt adhesives	Hot-melt adhesives are permitted pro-	Only permitted where visible as a smooth finish. Must be polished.		

	vided that a good colour match is ensured.			
Visible grain structure	Permitted	Must be accepted. Grain structure is most highly visible through dark colours.		
Colour differences	---	---	Permitted to only a certain extent.	Permitted
Surface roughness	Minimal roughness allowed, as long as the grain structure can be felt.		Some roughness is permitted. A rougher finish than on the interior surface is recommended.	
Seeping	Not permitted.		Permitted in only one spot on the product.	Permitted
Stickiness	Not permitted.			
Colour bleeding	Bright colours will bleed when using vapour-permeable stains.			

1) Applies also to side frame on the lock side of doors
2) Door frames can be finished without the prior use of knot sealants

Table 5.10.4. Surface finishes of door leaves (exterior doors). Assumes that the same surface finish is used outside and inside

Characteristic	**HDF/MDF**	**Veneer**		**Solid wood, framing timber and panelling**	
		Transparent	**Stain**	**Transparent**	**Stain**
Knot	-	See Table 3.4.b Knots in exterior doors			
Knot discolouration	-			Knot sealant should be used. See the manufacturer's guarantee provisions.	
Plugs	-			Not permitted.	
Fillers and hot-melt adhesives	Only permitted where visible as a smooth finish. Must be polished.	Permitted provided that a good colour match is ensured.	Only permitted where visible as a smooth finish. Must be polished.	Permitted provided that a good colour match is ensured.	Only permitted where visible as a smooth finish. Must be polished.
Visible grain structure	It is permitted that panels, decorative moulding and milled profiles have slightly different textures.	Permitted	Must be accepted. Grain structure is most highly visible through dark colours.	Permitted	Must be accepted. Grain structure is most highly visible through dark colours.
Colour variations		n/a		n/a	
Surface roughness	Smooth	Oiled:[1)] as an untreated surface Lacquered: Smooth	Smooth		
Orange-peel texture	Not permitted.				
Seeping	Not permitted.				
Stickiness	Not permitted.				
Colour bleeding	Bright colours will bleed when using vapour-permeable stains.				

1) Oiling is a temporary treatment. A final finish must be applied to the product as soon as it has been mounted in the wall.

5.10.5 Proofing

Windows, balcony/patio doors and frames for exterior doors must be given satisfactory protection against mould and rot through a form of pretreatment process. Current methods are vacuum proofing, dip-coat,

flow-coat or by using at least 90% heartwood from the inner beading edge to the outer edge for outward-opening windows and balcony/patio doors.
For inward-opening products, the requirement for vacuum proofing or at least 90% heartwood applies to all surfaces exposed to the outdoors. In its product information, the manufacturer must specify the type of proofing which has been used.

5.10.6. System 2ØKO

NDVK allows the use of this Danish system, provided that 90% heartwood is used from the inside beading edge to the outer edge of the item. The supplier's reference to key prerequisites for proper use of the system must be followed carefully. It must be possible to document the correct use and application volume on an ongoing basis and this must be checked at the annual NDVK inspection.

5.10.7. Complaints

Transport and other handling can result in minor damage to doors and windows. These can be repaired according to the manufacturer's instructions in the maintenance description.
It is important to be aware of the provisions of NS 3409, which govern the relationship between seller and buyer in a professional relationship and the Norwegian Sale of Goods Act (*kjøpsloven*) which governs business-to-consumer relationships. The buyer must be imposed with an obligation to notify if a product has faults or defects. It is too late to file a complaint after a product has been mounted if the fault or defect should have been discovered earlier. NDVK's members must not accept such complaints.
Any complaints/customer complaints that incur costs on the manufacturer must be registered, manually or digitally.

PART 6: LABELLING RULES

6.1 Product labelling

The following must be specified in the labelling:

NDVK Seal/logo
Manufacturer's name
Product identification
CE marking for each product with specific characteristics. The characteristics must be documented in a separate "Declaration of Performance", which must be available to the customer (online or accompanying the product).

NB! Special (customer-specified) products must not be marked.

6.2 Brochures, offers

The NDVK Seal/logo must be used in all relevant contexts and with the following subheading:

"The company's manufacturing process is quality assured pursuant to the certification rules of NDVK".

The NDVK Seal/logo may not be used for products that are not included in the certification scheme, neither by the manufacturer or by the manufacturer's market segments. Violation will lead to forfeiture of the right to use the seal on certified products.

PART 7: REFERENCES

Overview of standards referred to:

NS 8409.....General contract provisions for the purchase of building materials

NS-EN 317.....Particle board and fibreboard: Swelling, thickness (24h)
NS-EN 318.....Fibreboard: Measuring rules regarding changes in relative humidity
NS-EN 319.....Particle board and fibreboard: Tensile strength
NS-EN 323.....Wood-based panels: Density
NS-EN 356.....Glass in building – Security glazing – Testing and classification of resistance against manual attack
NS-EN 477.....Poly(vinyl)-chloride (PVC)-based profiles for windows and doors – Determination of the resistance to impact of profiles by falling weight
NS-EN 478.....Poly(vinyl)-chloride (PVC)-based profiles for windows and doors – Determination of the appearance after exposure at 150^0 C – Testing method
NS-EN 479.....Poly(vinyl)-chloride (PVC)-based profiles for windows and doors – Determination of heat reversion
NS-EN 513.....Poly(vinyl)-chloride (PVC)-based profiles for windows and doors – Climate impact
NS-EN 514.....Poly(vinyl)-chloride (PVC)-based profiles for windows and doors – Welded corners and T-joints
NS-EN 942.....Timber in joinery – Classification of timber quality
NS-EN 947.....Hinge doors or pivoted doors – Determination of the resistance to vertical load
NS-EN 948.....Hinge doors or pivoted doors – Determination of the resistance to static torsion
NS-EN 949.....Windows and curtain walling, doors, blinds and shutters. Determination of the resistance to soft and hard body impact
NS-EN 950.....Door leaves – Determination of the resistance to hard body impact
NS-EN 1026.....Doors and windows – Air permeability – Test method
NS-EN 1027.....Doors and windows – Water tightness – Test method
NS-EN 1121.....Behaviour between two different climates – Test method
NS-EN 1087-1.....Particle board: Tensile strength after boiling test V100
NS-EN 1191.....Windows and doors – Resistance to durability repeated opening and closing – Test method
NS-EN 1192.....Doors – Classification of strength requirements
NS-EN 1279-5.....Glass in building – Insulating glass units (IGU) – Part 5: Compliance evaluation
NS-EN 1670.....Building hardware – Corrosion resistance – Requirements and test methods
NS-EN 12046-1.....Operating forces – Test method – Part 1: Windows
NS-EN 12046-2.....Operating forces – Test method – Part 2: Doors
NS-EN 12207.....Windows and doors – Air permeability – Classification
NS-EN 12208.....Windows and doors – Water tightness – Classification
NS-EN 12210.....Windows and doors – Resistance to wind load – Classification
NS-EN 12211.....Windows and doors – Resistance to wind load – Test method
NS EN 12217.....Doors – Operating force – Requirements and classification
NS-EN 12219.....Doors – Climate influences – Requirements and classification
NS-EN 12400.....Windows and doors – Mechanical resistance – Requirements and classification
NS-EN 12608.....Poly(vinyl)-chloride (PVC)-based profiles for windows and doors – Classification
NS-EN 13049.....Windows – Soft and heavy body impact – Test method, requirements for security and classification
NS-EN 13115.....Windows – Classification of mechanical properties – Racking, torsion and operating forces
NS-EN 13307.....Sawn and semi-finished timber for the wood industry
NS-EN 13420.....Windows – Test method for different climates
NS-EN 14351.....Product standard, properties – Part 1: Windows and exterior doors
NS-EN 14608.....Windows – Determination of the bearing capacity by exerting vertical and horizontal load on the window frame.
NS-EN 14609.....Windows – Determination of resistance to torsion

NS-EN ISO 8990.....Heat insulation – Determination of stationary heat transfer properties
NS-EN ISO 12567-1 Thermal performance of windows and doors – Determination of thermal transmittance by hot box method – Part 1 Complete windows and doors.
NS-EN ISO 10077-1.Calculation method – Part 1 Simplified method
NS-EN ISO 10077-2 Thermal performance of windows, doors and shutters – Calculation of thermal transmittance – Part 2: Numerical method for frames

NS-EN 1627.....Classification – Break in
NS-EN 1628.....Static load – Break in
NS-EN 1629.....Dynamic load – Break in
NS-EN 1630.....Manual testing – Break-in

NS-EN 12488.....Glass in building – Mounting rules

Nordic quality language for the forestry industry – conifers

This is a book which defines concepts applied to wooden materials.
Can be ordered at Norwegian Institute of Wood Technology **:** www.treteknisk.no

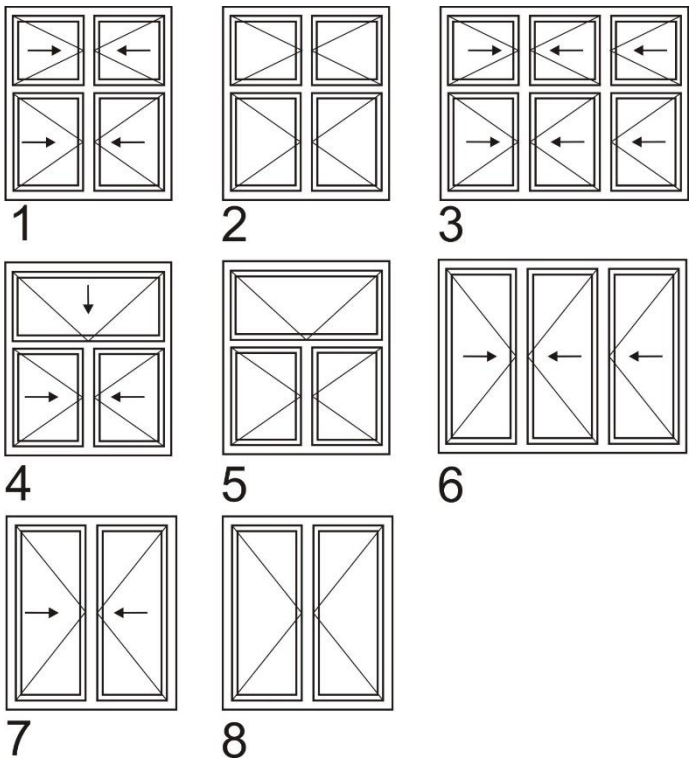
PART 8: APPENDICES

Appendix 1: Drawings of multi-sash windows

Details

The symbols are pursuant to NS-EN 12519 Windows and pedestrian doors – Terminology

Multi-sash window (viewed from the exterior facade)



Legend	
1	2-sash, 4-frame window, opening outwards, vertical side swing
2	2-sash, 4-frame window, opening outwards, side hung
3	3-sash, 6-frame window, opening outwards, vertical side swing
4	2-sash, 3-frame T-transom window, lower sash opening outwards, vertical side swing, upper sash opening outwards, horizontal side swing
5	2-sash, 3-frame, T-transom window, side hung, opening outwards, top sash top-hung, opening outwards
6	3-sash window, opening outwards, vertical side swing
7	2-sash window, opening outwards, vertical side swing
8	2-sash window, opening outwards, side-hung

Layout sketches of various types of multi-sash windows (sash proportions and dimensions may vary).

Appendix 2: Dye penetration inspection of corner joints

Cf. point 5.5.4. Gluing of corner joints

The manufacturer must regularly, and at least every two weeks, test the water tightness of the corner joints by means of "blue-dye testing" (liquid bath). The results are to be logged and verified at annual NDVK inspections.
Sketch and description of the individual equipment:

- The test is to be conducted using an adapted adjustable tub, in which each corner of the frame is in turn placed on its tip (i.e. at a 45-degree angle), so the inside corner can be filled with a liquid dye (blue or other dark colour) at a minimum liquid height of 60 mm.
- Each corner must be immersed in the liquid for at least 45–60 minutes after which it is left to dry until the surface is free of liquid.
- The corner joints are then cut diagonally so that all of the pegs and slots in the cut become visible.
- Result requirements: No visible penetration of liquid into the corner joint.

Sample equipment: