D+H + EURO SHEV

Roof solutions in accordance with DIN EN 12101-2

Introduction

According to DIN EN 12101-2, NSHEVs in the roof area must be tested and operated taking crosswind into consideration. This makes a wind direction-dependent controller for a roof solution unnecessary.
This brochure will give you a brief overview about the EN solutions in the roof tested by D+H Mechatronic AG. We are presenting this clearly structured representation of the tested solutions to help you provide advice efficiently to architects and designers directly at the construction site or in the office.

The solutions listed in the brochure are based on tests of D+H Mechatronic AG passed in the individual classifications of DIN EN 12101-2 and reflect the maximum possible dimensions in a cross-system manner. A certified D+H partner carries out the exact calculation and creates the documents.

It is absolutely necessary to observe and maintain the work guidelines of the various profile system, fitting and glass manufacturers!

Contents

1 EN roof solutions as a D+H individual unit

1.1 Bottom-hung roof vent without wind deflectors

1.1.1 Ridged / pitched roof angle of installation [α] 25° to 60°

Maximum dimensions

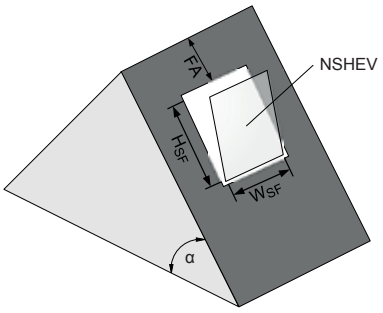
max. inside geometric reference area [A_V]:	3.60 m²
Sash frame height [H_{SF}]:	600 mm to 2500 mm
Sash frame width [W_{SF}]:	600 mm to 2500 mm

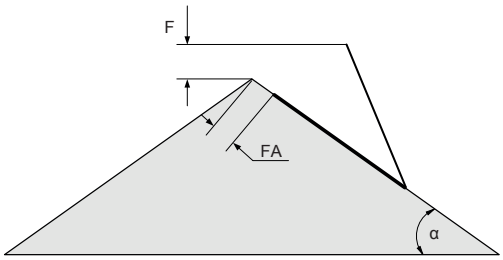
At an angle of installation of [α] 25° to 44°

Distance of the NSHEV to ridge [Dimension FA]:	750 mm ≤ FA ≤ 1500 mm
Distance of the upper edge of flap to the ridge [Dimension F]:	≤ 250 mm

At an angle of installation of [α] 45° to 60°

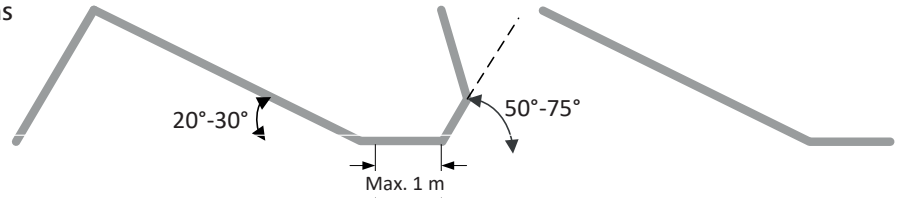
Distance of the NSHEV to ridge [Dimension FA]:	500 mm ≤ FA ≤ 1500 mm
Distance of the upper edge of flap to the ridge [Dimension F]:	≤ 500 mm





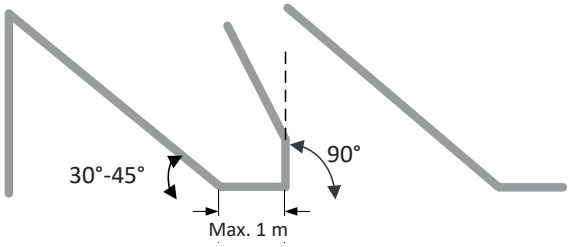
1.1.2 Saw-tooth roof angle of installation 50° to 75° / 20° to 30°

The following boundary conditions apply for the installation:



1.1.3 Saw-tooth roof 90° / 30° to 45°

The following boundary conditions apply for the installation:



1.2 Bottom-hung roof vent with wind deflectors

1.2.1 Ridged / pitched roof angle of installation [α] 2° to 60°

Maximum dimensions

max. inside geometric reference area [A_V]:	3.60 m²
Sash frame height [H_{SF}]:	600 mm to 2500 mm
Sash frame width [W_{SF}]:	600 mm to 2500 mm
Wind deflectors (WD):	max. H_{WD} = 200 mm
Minimum opening angle:	15°

At an angle of installation of [α] 2° to 24°

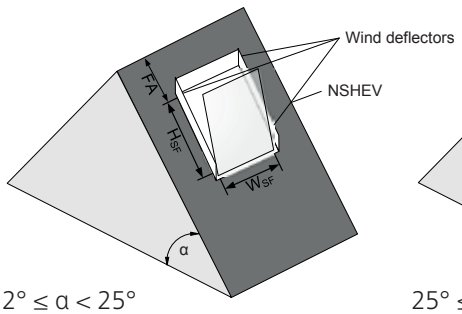
Distance of the sash to ridge [Dimension FA]:	1000 mm ≤ FA ≤ 2000 mm
Distance of the upper edge of flap to the ridge [Dimension F]:	≤ 250 mm
Wind deflector:	three-sided

At an angle of installation of [α] 25° to 44°

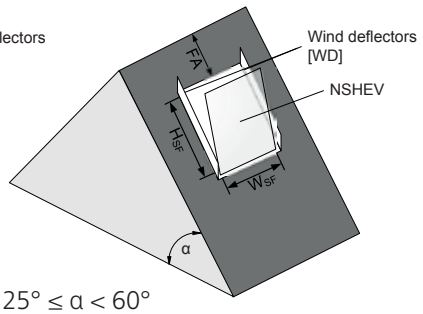
Distance of the NSHEV to ridge [Dimension FA]:	750 mm ≤ FA ≤ 1500 mm
Distance of the upper edge of flap to the ridge [Dimension F]:	≤ 250 mm
Wind deflector:	two-sided

At an angle of installation of [α] 45° to 60°

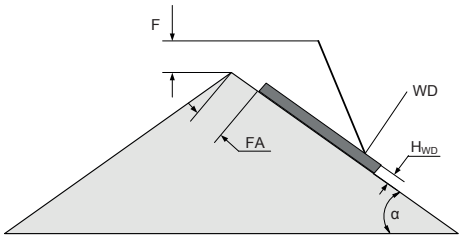
Distance of the NSHEV to ridge [Dimension FA]:	500 mm ≤ FA ≤ 1500 mm
Distance of the upper edge of flap to the ridge [Dimension F]:	≤ 500 mm
Wind deflector:	two-sided

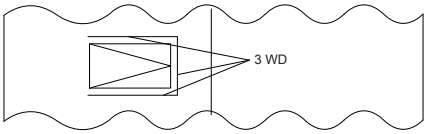


2° ≤ α < 25°

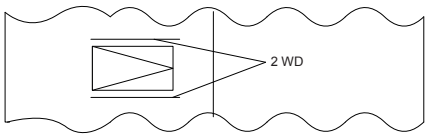


25° ≤ α < 60°





2° ≤ α ≤ 24°



25° ≤ α ≤ 60°

Please ask D+H Sales about the required height of the wind deflectors for your D+H single flap.

1.2.2 Saw-tooth roof angle of installation 50° to 75° / 20° to 30°

See boundary conditions for 1.1.2 on page 4.

1.2.3 Saw-tooth roof 90° / 30° to 45°

See boundary conditions for 1.1.3 on page 4.

1.3 Top-hung roof vent with THREE-SIDED wind deflectors
Angle of installation [α] 2° to 50°

Maximum dimensions

max. inside geometric reference area [A_V]:	3.60 m²
Sash frame height [H_{SF}]:	600 mm to 2500 mm
Sash frame width [W_{SF}]:	600 mm to 2500 mm
Wind deflectors (WD):	max. H_{WD} = 600 mm
Minimum opening angle:	15°

At an angle of installation of [α] 2° to 15°

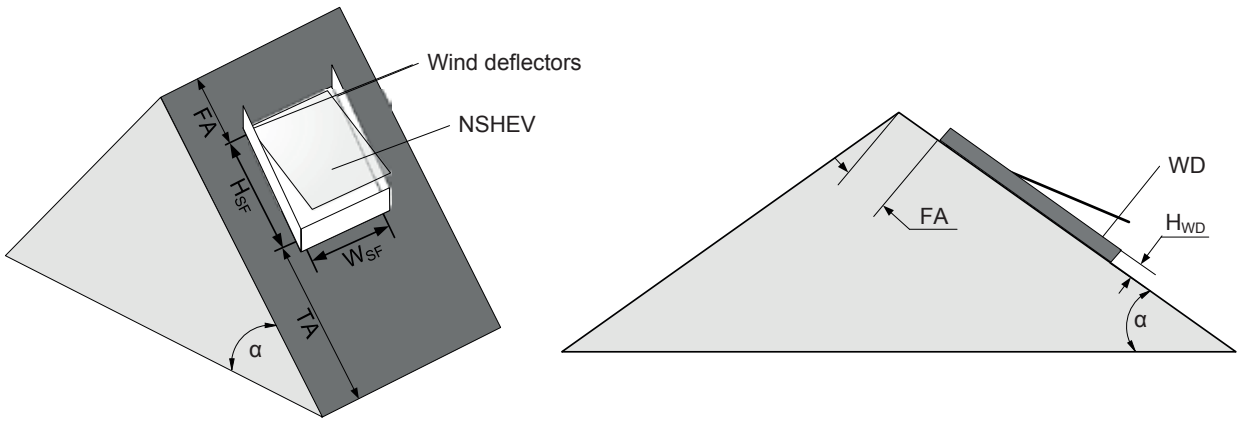
Distance of the NSHEV to the eave [Dimension TA]:	TA ≥ H_{SF}

At an angle of installation of [α] 16° to 30°

Distance of the NSHEV to ridge [Dimension FA]:	FA ≤ 2 H_{SF}max
Distance of the NSHEV to the eave [Dimension TA]:	TA ≥ H_{SF}

At an angle of installation of [α] 31° to 50°

Distance of the NSHEV to ridge [Dimension FA]:	FA ≤ H_{SF}max
Distance of the NSHEV to the eave [Dimension TA]:	TA ≥ H_{SF}



Please ask D+H Sales about the required height of the wind deflectors for your D+H single flap.

Note that three wind deflectors are required for this application!

2 EN roof solutions as a D+H double flap with and without wind deflectors

2.1 Pitched roof

2.1.1 Bottom-hung roof vent and top-hung roof vent
Angle of installation [α] 0° to 15°

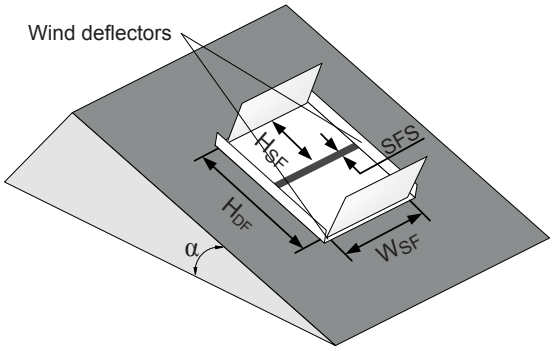
Maximum dimensions

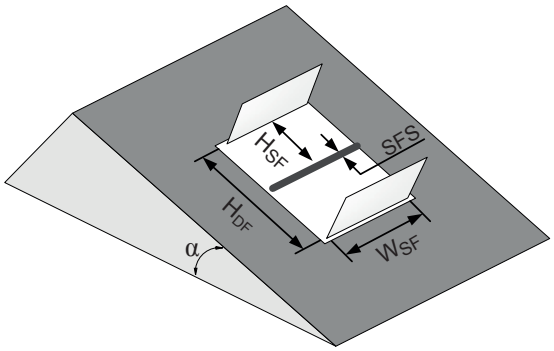
max. inside geometric reference area [A_V]:	7.35 m²
Height of the double flap [H_{DF}]:	1200 mm to 5000 mm
Sash frame width [W_{SF}]:	600 mm to 2500 mm
Sash frame height [H_{SF}]:	600 mm to 2500 mm
Sash frame spacing [SFS]:	20 mm to 300 mm
Wind deflectors (WD):	max. H_{WD} = 600 mm
Minimum opening angle:	40°

2.1.2 Bottom-hung roof vent and top-hung roof vent
Angle of installation [α] 16° to 30°

Maximum dimensions

max. inside geometric reference area [A_V]:	5.76 m²
Height of the double flap [H_{DF}]:	1200 mm to 2500 mm
Sash frame width [W_{SF}]:	600 mm to 2500 mm
Sash frame height [H_{SF}]:	600 mm to 1250 mm
Sash frame spacing [SFS]:	20 mm to 300 mm
W_{SF}/H_{DF}: ≥ 0.5	
Wind deflectors (WD):	max. H_{WD} = 400 mm
Minimum opening angle:	40°

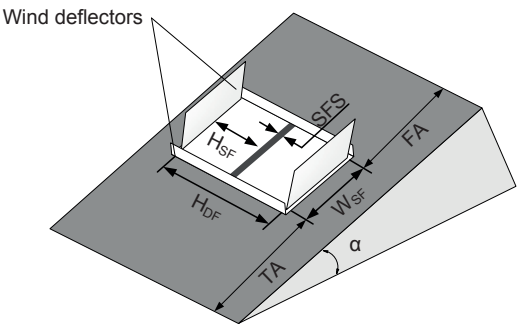


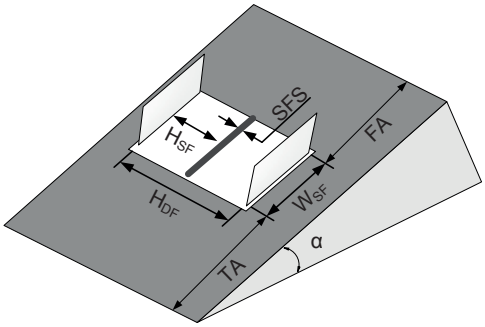


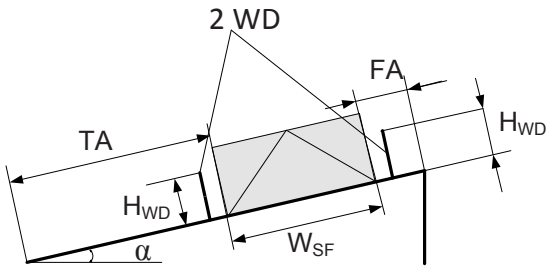
2.1.3 Side-hung roof vent, angle of installation [α] 0° to 20°

Maximum dimensions

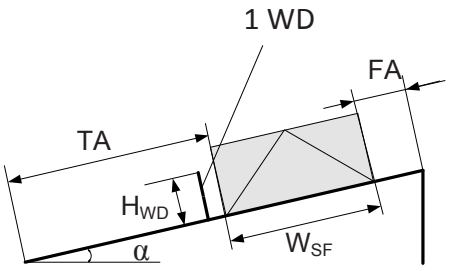
max. inside geometric reference area [A_V]:	7.36 m²
Height of the double flap [H_{DF}]:	800 mm to 5000 mm
Sash frame width [W_{SF}]:	600 mm to 2500 mm
Sash frame height [H_{SF}]:	400 mm to 2500 mm
Sash frame spacing [SFS]:	25 mm to 125 mm
Distance of the NSHEV to ridge [Dimension FA]:	FA ≤ 800
Distance of the NSHEV to the eave [Dimension TA]:	TA ≥ W_{SF}
Wind deflectors (WD):	max. H_{WD} = 240 mm
Minimum opening angle:	30°







0° ≤ α < 10°



10° ≤ α < 20°

2.2 Barrel shaped roof

2.2.1 Bottom-hung roof vent and top-hung roof vent, angle of installation [α] 0° to 15°

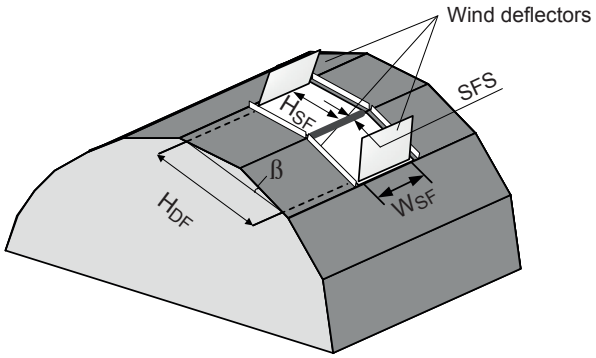
Maximum dimensions

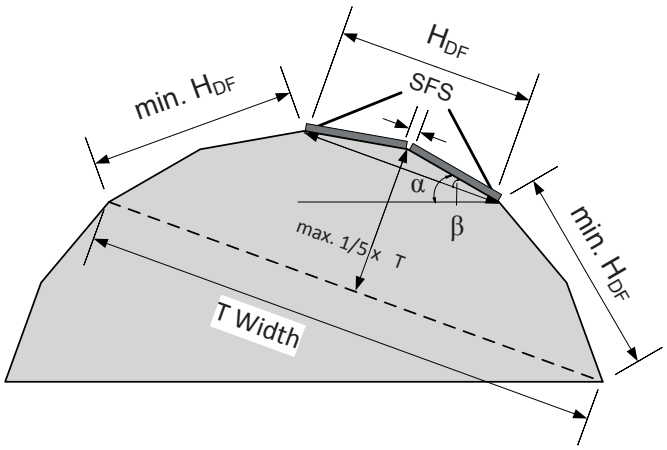
max. inside geometric reference area [A_V]:	7.35 m²
Height of the double flap [H_{DF}]:	1200 mm to 5000 mm
Sash frame width [W_{SF}]:	600 mm to 2500 mm
Sash frame height [H_{SF}]:	600 mm to 2500 mm
Sash frame spacing [SFS]:	20 mm to 300 mm
Wind deflectors (WD):	max. H_{WD} = 600 mm
Minimum opening angle:	40°

2.2.2 Bottom-hung roof vent and top-hung roof vent Angle of installation [α] 16° to 30°

Maximum dimensions

max. inside geometric reference area [A_V]:	5.76 m²
Height of the double flap [H_{DF}]:	1200 mm to 2500 mm
Sash frame width [W_{SF}]:	600 mm to 2500 mm
Sash frame height [H_{SF}]:	600 mm to 1250 mm
Sash frame spacing [SFS]:	20 mm to 300 mm
W_{SF}/H_{DF}:	≥ 0.5
Wind deflectors (WD):	max. H_{WD} = 400 mm
Minimum opening angle:	40°





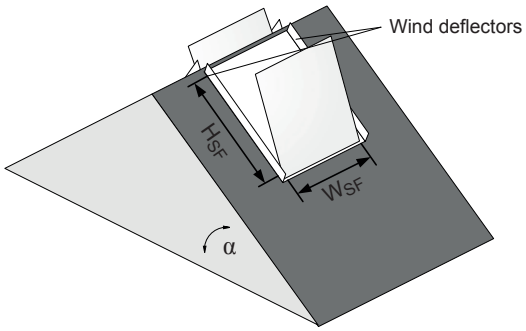
*β - Angle between single and double flap is required for the H_{DF} calculation.
It is absolutely necessary to adhere to the distance [min. H_{SF}]!

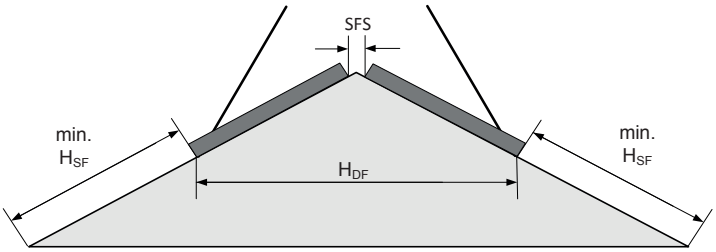
2.3 Ridged roof

2.3.1 Bottom-hung roof vent as a double flap
Angle of installation [α] 2° to 30°

Maximum dimensions

max. inside geometric reference area [A_V]:	7.35 m²
Height of the double flap [H_{DF}]:	1200 mm to 5000 mm
Sash frame width [W_{SF}]:	600 mm to 2500 mm
Sash frame spacing [SFS]:	20 mm to 300 mm
Wind deflectors (WD):	max. H_{WD} = 600 mm
Minimum opening angle:	40°



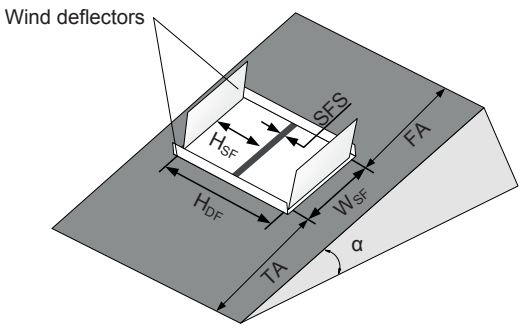


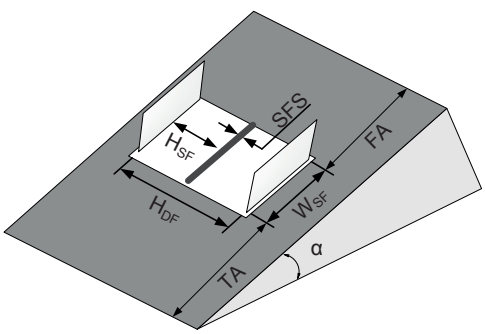
It is absolutely necessary to adhere to the distance [min. H_{SF}]!

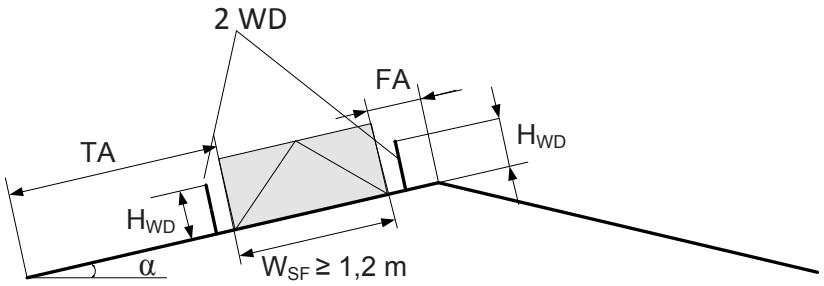
2.3.2 Side-hung roof vent as a double flap
Angle of installation [α] 0° to 20°

Maximum dimensions

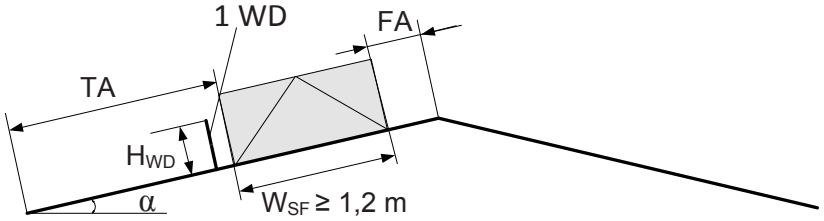
max. inside geometric reference area [A_V]:	7.36 m²
Height of the double flap [H_{DF}]:	800 mm to 5000 mm
Sash frame width [W_{SF}]:	600 mm to 2500 mm
Sash frame height [H_{SF}]:	600 mm to 2500 mm
Sash frame spacing [SFS]:	25 mm to 125 mm
Distance of the NSHEV to ridge [Dimension FA]:	FA ≤ 800 mm
Distance of the NSHEV to the eave [Dimension TA]:	TA ≥ W_{SF}
Wind deflectors (WD):	max. H_{WD} = 240 mm
Minimum opening angle:	30°



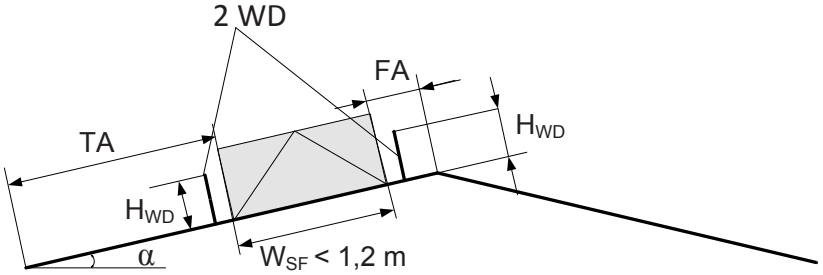




0°≤ α < 15°



15°≤ α ≤ 20°



0°≤ α ≤ 20°

Side-hung roof vent, angle of installation [α] 0° TO 20°

Please ask D+H Sales about the required height of the wind deflectors for your D+H double flap.

3 Sample calculations of the aerodynamically effective opening area

3.1 Sample calculation of D+H individual unit as bottom-hung roof vent with wind deflector

Sample calculation:

W_{SF}: 1375 mm
H_{SF}: 1825 mm
Deduction dimension* [depends on system]: 125 mm (average value)

Calculation of the inside geometric opening area [A_V]

$A_V = W_{clear\ space} \times H_{clear\ space} = (W_{SF} - 125\ mm) \times (H_{SF} - 125\ mm)$
$A_V = (1375\ mm - 125\ mm) \times (1825\ mm - 125\ mm)$

$A_V = 2.13\ m^2$

Calculation of the width/height ratio

$W_{clear\ space}/H_{clear\ space} = (1375\ mm - 125\ mm) / (1825\ mm - 125\ mm)$

$W_{clear\ space}/H_{clear\ space} = 0.74$

The calculated W/H ratio and the opening angle of the flaps is used to determine the flowrate coefficient [CV].
(See diagram in the system-specific aerodynamic report, refer to D+H Sales with questions.)

Calculation of the aerodynamically effective opening area [A_a]

$C_V = 0.48$
$A_a = C_V \times A_V = 0.48 \times 2.13\ m^2$
$A_a = 1.02\ m^2$

* = required for determining the inside sash dimension.

3.2 Sample calculation of D+H double flap as bottom-hung roof vent and top-hung roof vent with wind deflectors

Calculation of the sash height [H_{SF}] from the height of the double flap [H_{DF}]

Pitched roof:	$H_{SF} = (H_{DF} - SFS) / 2$	see S. 7
Barrel shaped roof:	$H_{SF} = (H_{DF} - SFS) / (2 \times \cos \beta)$	see S. 9
Ridged roof:	$H_{SF} = (H_{DF} - SFS) / (2 \times \cos \alpha)$	see S. 10

Calculation of the height of the double flap [H_{DF}] from the sash height [H_{SF}]

Pitched roof:	$H_{DF} = 2 \times H_{SF} + SFS$	see S. 7
Barrel shaped roof:	$H_{DF} = (2 \times H_{SF} \times \cos \beta) + SFS$	see S. 9
Ridged roof:	$H_{DF} = (2 \times H_{SF} \times \cos \alpha) + SFS$	see S. 10

Sample calculation of the aerodynamically effective opening area

W_{SF}: 1375 mm
H_{DF}: 2135 mm
Deduction dimension* [depends on system]: 125 mm (average value)

Calculation of the inside geometric opening area [A_V]

$A_V = W_{clear\ space} \times H_{clear\ space} = (W_{SF} - 125\ mm) \times (H_{DF} - 125\ mm)$
$A_V = (1375\ mm - 125\ mm) \times (2135\ mm - 125\ mm)$

$A_V = 2.51\ m^2$

Calculation of the width/height ratio

$W_{clear\ space}/H_{clear\ space} = (1375\ mm - 125\ mm) / (2135\ mm - 125\ mm)$
$W_{clear\ space}/H_{clear\ space} = 0.62$

The calculated W/H ratio and the opening angle of the flaps is used to determine the flowrate coefficient [CV]. (see diagram in the system-specific aerodynamic report, refer to D+H Sales with questions.).

Calculation of the aerodynamically effective opening area [A_a]

$C_V = 0.51$
$A_a = C_V \times A_V = 0.51 \times 2.51\ m^2$
$A_a = 1.28\ m^2$

Please ask D+H Sales about the required height of the wind deflectors for your D+H double flap.

* = required for determining the inside sash dimension.

4 Keyword

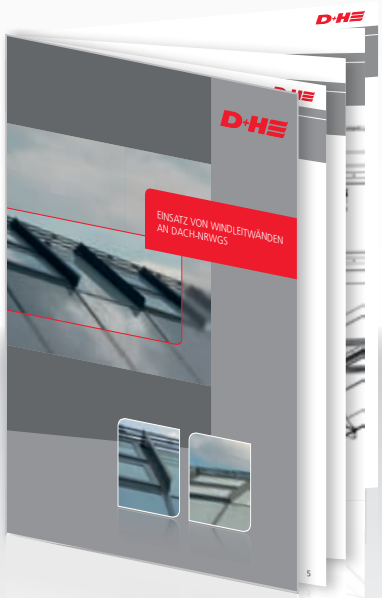
We hope that our brochure will be of help and provide you with effective support for planning your projects. Of course, we are also happy to provide you with any form of support and consultation within the realm of DIN EN 12101-2. You can find a variety of information concerning this topic on our website www.dh-partner.com. There, you can also learn many interesting details about our complete EURO SHEV system solutions!

Do you have any more questions? Our team of experts will be happy to consult with you individually. To find your contact person, refer to www.dh-partner.com.

More detailed information about the D+H Euro SHEV

If you would like more information, refer to our brochures and folders in our download area at www.dh-partner.com/service/download.html.

Brochure
»D+H Euro SHEV«



Brochure
»Use of wind deflectors on roof NSHEVs«

Various D+H Euro SHEV system data sheets

WWW.DH-PARTNER.COM/SERVICE/DOWNLOAD.HTML

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