



DATABOOK

Fire & Blast rated window systems





DATABOOK

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1. Introduction

InterDam is a major supplier of blast and passive fire protection products for the global industry, principally walls, doors and window systems. InterDam has experience of providing products in fire resistant classes according to international Standards (UL / NEN / IMO). InterDam also has experience with extreme fire loads on passive fire protection products, for example, Hydrocarbon fire -, Jet fire-, and High-Heat-Flux fire tests.

InterDam windows are of the heavy duty and cover ratings from A0 up to H120 including jet fire requirement and EI-rating. Window units as proposed for your project comply with IMO FTP Code and Norsok (C-002 section 8) requirements. Window framing, glazing and accessories will be supplied separately to be assembled on-site.

The construction and design of the windows will be as per our standard certified design, all as indicated on the standard detail drawings. We will prepare window schedule and general arrangement drawings for all windows involved. Detail drawings are produced to a high standard showing the overall scope of supply and interface details with the main structure.

Interdam windows are of high quality and they will have no need for any spare parts or replacement of sealant as long as the outer frames are kept and treated the same way as the hull to avoid any rust. The optic on the windows are also guaranteed to stay without distortion throughout the life of the project.

This databook provides extensive information on the design, testing, certification, manufacture, installation and maintenance of InterDam's G21 Fire and Blast proof windows. As such we trust that it provides a useful reference source. This databook will be regularly updated in line with ongoing product development. If you have suggestions on additional data or information which could be included in this databook please contact us and we will look to include this in a future update.

1.1 Abbreviations

Abbreviations	Description
DC	Document Control
IDM	InterDam B.V.
MGT	Management
PM	Project Manager
QA	Quality Assurance
QC	Quality Control
FAT	Factory Acceptance Test
ITP	Inspection Test Plan
MM	Millimeters
DFT	Dry Film Thickness
MU	Micrometer
RAL	Painting encoding method

2. Technical datasheets

2.1 IDM-WU-A60 G21 Fire Window

IDM - WU - A60

Window Units

Sheet 7.1.1.0 - Version 23/12/2022

Performances

- Fire resistance A0/A60 in accordance with IMO Resolution MSC.307(88).
In addition, the A60 type is Fire-post-blast® certified.
- Explosion resistance Up to 100 kPa.
- Gas tightness 0,21-0,5 m³/m²/h @50 Pa in accordance with Norsok C-002.
- Air tightness Class 4 in accordance with EN12207.
- Wind tightness Class C4 in accordance with EN12210.
- Water tightness Class 9A in accordance with EN12208.
- Glass thickness 45 mm.

Materials

- Laminated glass elements.
- External frames from steel (Z-frame coated).
- Internal frames from extruded aluminium (coated).
- More options are:
 - Stainless steel for outer frame.
 - Tinted glass.
 - Self-cleaning coating/sun reduction coating.
 - Roller blinds.
 - Bullet proofing.

Overview



3D view



Vertical view



Horizontal view

2.2 IDM-WU-A60 FPB G21 Fire Window

IDM - WU - A60 - FPB

Window Units

Sheet 7.1.1.1 - Version 23/12/2022

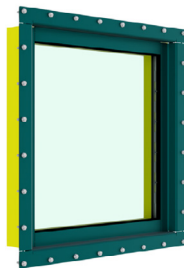
Performances

- Fire resistance A0/A60 in accordance with IMO Resolution MSC.307(88).
In addition, the A60 type is Fire-post-blast® certified.
- Explosion resistance Up to 30 kPa.
- Air tightness 3000 Pa in accordance with EN13116.
- Wind tightness Class AE in accordance with EN12152.
- Water tightness Class RE 1200 in accordance with EN12154.
- Glass thickness 55 mm.

Materials

- Laminated glass elements.
- External frames from steel (Z-frame coated).
- Internal frames from extruded aluminium (coated).
- More options are:
 - Stainless steel for outer frame.
 - Tinted glass.
 - Self-cleaning coating / sun reduction coating.
 - Roller blinds.
 - Bullet proofing.

Overview



3D view



Vertical view



Horizontal view

2.3 IDM-WU0A60/EI60 openable G21 Fire Window

IDM-WU-A60 openable

Window Units

Sheet 8.1.3.0 - Version 29/07/2021

Performances

- | | |
|-----------------------------------|---|
| • Fire Rating | A0/A60 in accordance with IMO Resolution MSC.307(88) |
| • Explosion resistance | Up to 5 kPa |
| • Thermal conductivity value | $U = 0.8 \text{ W} / \text{m}^2\text{K}$ |
| • Weighed sound reduction index | $RW = 41-44 \text{ dB}$ |
| • Maximum Clear Opening | 1000 x 1000 mm |
| • Gas tightness | $0,35 \text{ m}^3/\text{m}^2\text{h}$ @50Pa in accordance with Norsok C-002 |
| • Air tightness | Class 4 in accordance with EN12207 |
| • Wind tightness | Class C2 in accordance with EN12210 |
| • Water tightness | Class 2A in accordance with EN12208 |
| • Glass thickness | 43 mm |
| • Hose Stream test (IMO FTP 2010) | Yes |

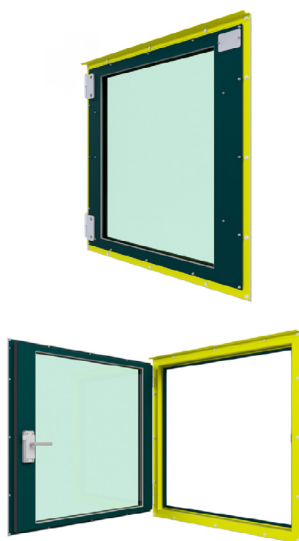
Features

- Tested and certified by Lloyds Register, alternative certifications available upon request.
- Excellent sound reduction.
- Easy and short installation time (welded or bolted).
- Outer steel section (mild steel or stainless steel) of weld on type to either plain or corrugated outer bulkhead.
- The window unit fits any wall partition system.

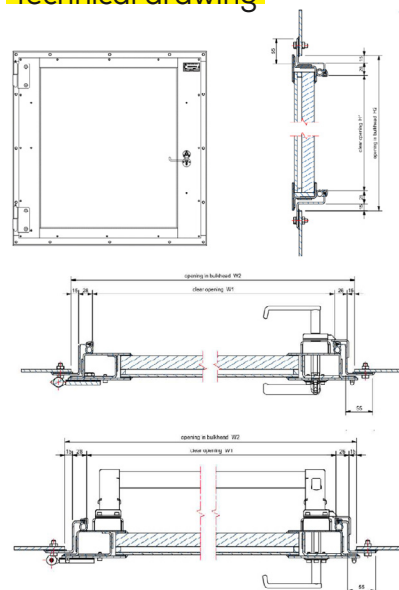
Optional

- Window box.
- Bullet proof glass.
- Lock cylinder.
- Panic bar on the inside.
- Can be supplied with built in roller blind or venetian blind.

Overview



Technical drawing



2.4 IDM-WU-H120 G21 Fire Window

IDM - WU - H120

Window Units

Sheet 7.1.2.0 - Version 23/12/2022

Performances

- Fire resistance H0/H120 in accordance with IMO Resolution MSC.307(88).
- Explosion resistance Up to 250 kPa.
- Gas tightness 0,21-0,5 m³/m²/h @50 Pa in accordance with Norsok C-002.
- Air tightness Class 4 in accordance with EN12207.
- Wind tightness Class C4 in accordance with EN12210.
- Water tightness Class 9A in accordance with EN12208.
- Glass thickness 147 mm.

Features

- Tested and approved by Lloyds, DNV, ABS and USCG.
- Excellent sound reduction.
- Easy and short installation time (welded or bolted).
- Outer steel section (mild steel or stainless steel) of weld on type.
- to either plain or corrugated outer bulkhead.
- Can be supplied with built in roller blind or venetian blind.
- The window unit fits any wall partition system.

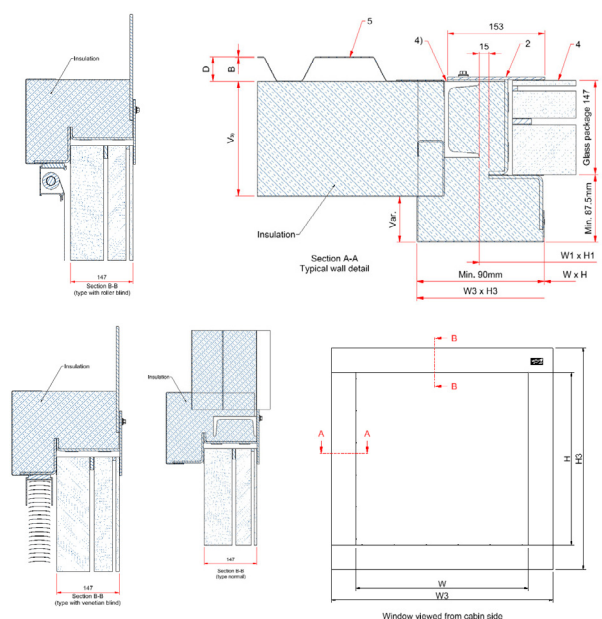
Optional

- Window box.
- Bullet proof.

Overview



Technical drawing



2.5 IDM-WU-EI60/EI90 Window Units

IDM - WU - EI60/EI90

Window Units

Sheet 10.1.4.0 - Version 21/07/2021

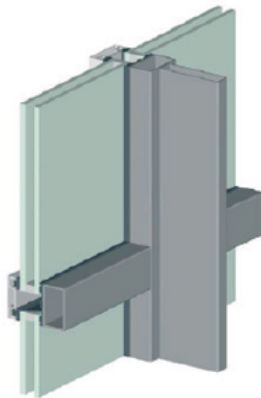
Performances

- Fire resistance Up to EI90 in accordance with EN13501-2
- Blast resistance Up to 1.5 bar
- Sound reduction Up to 40 dB
- Light Transmittance standard 80% (other percentages possible)
- Thermal transmittance $U - 0.6 - 5.1 \text{ Wm}^2\text{K}$

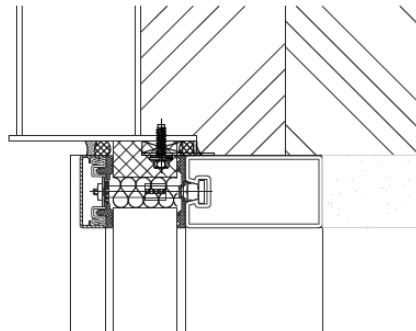
Features

- Glass elements
- External frame made of carbon steel (optional stainless steel 316)
- Internal frames made of carbon steel (optional stainless steel 316)
- More options are:
 - Tinted glass
 - Venetian blinds
 - Roller blinds
 - Bullet proofing
 - Anti splinter foil inside
 - Bullet proofing

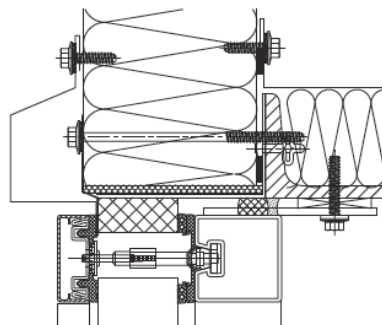
Overview



Technical drawing



Detail in welded wall



Detail in bolted wall

The EI60 windows is of high quality and is designed to last the lifetime of the project. They will have no need for any spare parts or replacement of sealant as long as the outer frames are kept and treated the same way as the hull to avoid any rust. The optic on the windows are also guaranteed to stay without distortion throughout the life of the project.

Because of the thermal insulation the need for an excess use of the HAVAC is less and a build-up of moisture on the windows will be avoided. The low u-value will also help reducing the temperature when the sun is shining straight through the windows and therefore help to maintain a stable temperature inside.

E60, 60 minutes fire resistant according ISO 834
Blast rating: up to 1.5 bar

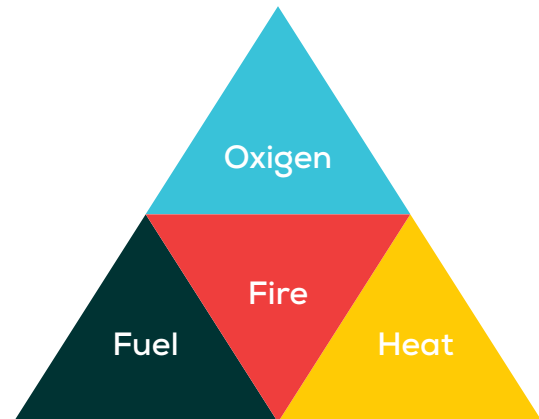
3. Technical Features

3.1 Fire ratings

3.1.1 Fire in the energy industry

Fire is an unwanted or uncontrolled combustion, involving a chemical reaction of a material with oxygen and releasing heat. One of the major accidents in the offshore industry was the Piper Alpha disaster. After this catastrophic event a considerable amount of fire research was undertaken with the principle aim of improving the safety for people offshore while also to reducing environmental and material damage. This research has resulted in several (inter)national standards, which describe the requirements for Passive Fire Protection (PFP). The PFP systems protect people and constructions by several points:

- To guarantee the possibility of escape
- To reduce internal and external spread of the fire
- To maintain structural stability of the structure
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- The petroleum and wind industries recognises two (2) principal types of fire: cellulosic fire and hydrocarbon fire.



3.1.2 Cellulosic Fire

Cellulosic fires are fuelled by combustibles such as wood, paper, cotton, textiles, plastics, etc. Temperature rises at a relatively gradual rate and reaches a temperature of 945°C. Cellulosic fires are typically a risk in 'general' environments such as living areas, utilities, toilets, public rooms, etc.

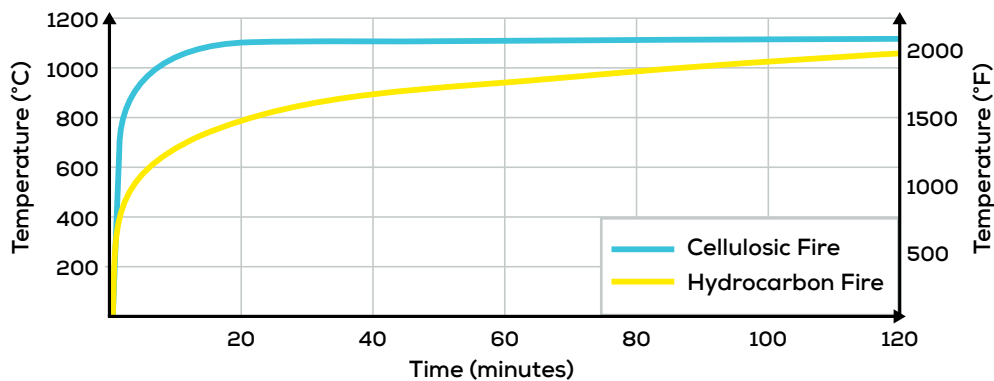
¹Tata Steel UK Limited. (February 2012). Colorcoat HPS200 Ultra® technical details

3.1.3 Hydrocarbon Fire

This type of fire occurs when the combustible material is a hydrocarbon such as oil or gas. This fire is characterized by a higher heat flux and a faster temperature rise than cellulosic fire.

Hydrocarbon fire can occur when a fluid reservoir, such as a petrol tank for a generator, ignites. During a hydrocarbon fire, the generated temperature rises to 1100°C within 20 minutes.

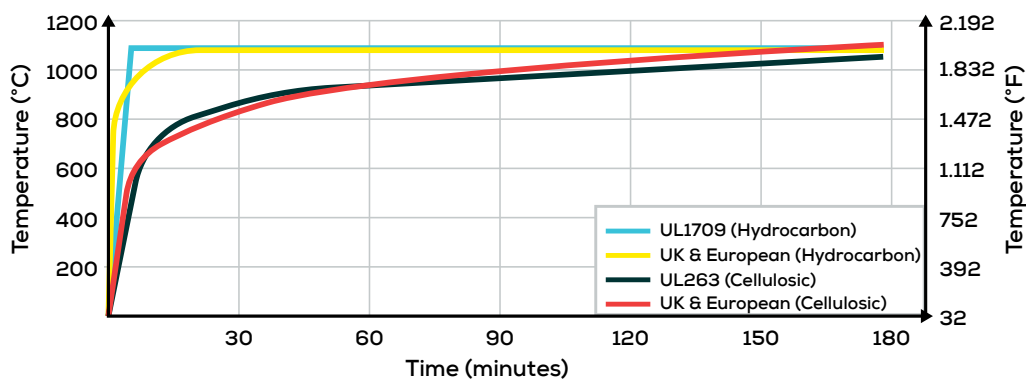
Standard Fire Curves



Standard fire curves

UL (North America) maintain slightly different cellulosic - and hydrocarbon fire curves for fire tests than the European Standards (and IMO), both are shown in the graphic below.

US Standard Fire Curves



3.1.3 Jet Fire

Jet Fire occurs when a pipe, or other equipment containing hydrocarbon gas under pressure ignites. Jet fire is a severe fire scenario, considering the effect of erosion of materials and also the significantly higher rate of burning due to turbulent fuel / air mixing. Temperature rises immediately up to approximately 1200 °C with a fire load flow velocity of min. 160 kms/hr.

A High Heat Flux (HHF) jet fire is the most extreme fire scenario typically found in the Passive Fire Protection industry. The conditions for this type of fire are specific to the individual project.



Figure: J15 HHF test on Norsok approved sliding door

3.1.4 International Standards

To classify the reaction to fire and the fire resistance of products, several (inter-)national standards have been developed by various organizations. The most commonly cited fire rating standards, relevant for structures in the industry sector are:

- IMO: Offshore industry (global)
- EN: Onshore building industry (Europe)
- UL: Onshore building industry (United States)

The figure and tables below show the classification of fire doors according to IMO and EN.

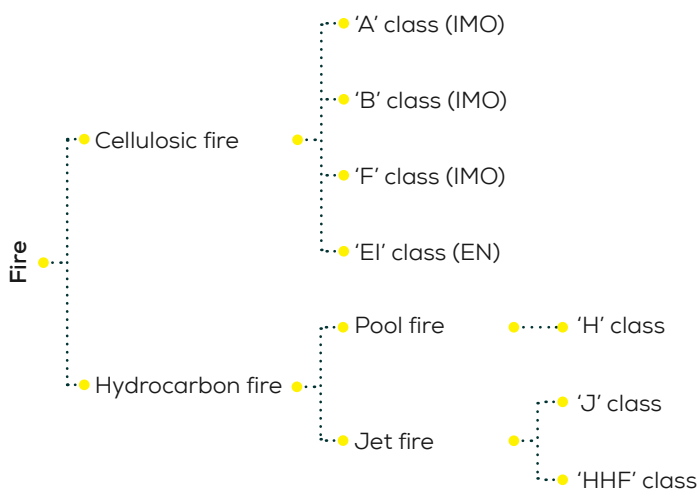


Figure: classification of fire types

	A-0	A-15	A-30	A-60	B-0	B-15	EI-30	EI-45	EI-60	EI-90	EI-120
Cellulosic fires 1 (IMO)	x	x	x	x	x	x					
Cellulosic fire 2 (NEN)							x	x	x	x	x
Integrity (min.)	60				30		30	45	60	90	120
Insulation (min.)	0	15	30	60	0	15	30	45	60	90	190
ΔT max. TC* (C°)	180				225		180				
ΔT ave. TC* (C°)	140				140		140				
Max. furnace temp. (C°)	945						945				
Fire test proc. standard	IMO, 2010 FTP Code						EN 1363-1				

PS* = Project specific
TC* = Termocouples

Table: classification of cellulosic fire ratings for IMO and EN

	H-0	H-60	H-120	J-0	J-30	J-60	HHF
Hydrocarbon fire (IMO)	x	x	x	x	x	x	x
Integrity (min.)	120			60			PS*
Insulation (min.)	0	60	120	0	30	60	PS*
ΔT max. TC* (C°)	180			180			PS*
ΔT ave. TC* (C°)	140			140			PS*
Max. furnace temp. (C°)	1100			PS*			PS*
Fire test proc. standard	IMO, 2010 FTP Code			ISO 22899-1			PS*

PS* = Project specific
TC* = Termocouples

Table: classification of hydrocarbon fire ratings for IMO

3.2 Fire ratings of InterDam Windows

The fire rating of each type of window and type of frame is shown in below table.

	Fire	Frame design
IDM-WU-	H120	Van Dam
	A60	InterDam
	A60 FPB tested	Janssen Viss
	A60 Openable	Van Dam
	EW 60	Janssen Viss

3.3 Blast ratings

If the safety assessment of a project requires facilities to be blast resistant, industry-wide accepted codes can be applied. To fully clarify the impact of different blast ratings, the following table is presented (1 Bar = 14.5 psi (pound per square inch) = 100 kPa (kilopascal):

Damage produced by blast overpressure		
Damage	Pressure (psig)	Pressure (bar)
Annoying noise (137dB), if of low frequency	0.02	0.001
Occasional breakage of large glass windows already under strain	0.03	0.002
Loud noise, occasional glass breakage - 5% window shattering	0.04	0.003
Loud noise (143dB), Sonic boom glass failure	0.04	0.003
Breakage of small windows under strain	0.1	0.007
Typical pressure for glass failure	0.15	0.01
Some damage to ceilings, limit of missiles	0.3	0.02
50% window shattering	0.3-0.35	0.02-0.0025
Limited minor structural damage	0.4	0.03
Large and small windows usually shattered, occasional damage to window frames	0.5-1.0	0.034-0.069
Minor damage to house structures 20 - 50% tiles displaced	0.75	0.05
Roof damage to oil storage tanks	0.9	0.06
Partial demolition of houses, made uninhabitable	1.0	0.07
Total breaking of glass windows	1.0	0.07
Corrugated asbestos shattered	1.0-2.0	0.07-0.14
Corrugated steel or aluminium panels, fastening fail, followed by buckling	1.0-2.0	0.07-0.14
Wood panels (standard housing) fastenings fail, panels blown in	1.0-2.0	0.07-0.14
Steel frame of clad buildings slightly distorted	1.3	0.09
Slight damage to window frames and doors	1.5	0.10
Partial collapse of walls and roofs of houses, Loadbearing brickwork unaffected, 30% trees blown down	2.0	0.14
Lower limit of serious structural damage	2.0	0.14
Some frame distortion of steel framed buildings	2.0-2.5	0.14-0.17

Damage produced by blast overpressure		
Damage	Pressure (psig)	Pressure (bar)
Concrete or cinder brick walls 8 - 12", not reinforced shattered	2.0-3.0	0.14-0.21
90% trees blown down. Steel framed buildings distorted and pulled away from buildings demolished foundations. Frameless, self-framing, steel panel	3.0	0.21
Rupture of oil storage tanks	3.0-4.0	0.21-0.28
Collapse of self-framing steel panel building 0.2 - 0.3	3.0-4.0	0.21-0.28
Ripping of empty out tanks 0.2 - 0.3	3.0-4.0	0.21-0.28
Small deformations on pipe bridge 0.2 - 0.3	3.0-4.0	0.21-0.28
Oil storage tanks distorted	3.5	0.24
Cladding of light industrial buildings ruptured	4.0	0.28
Severe displacement of motor vehicles	4.0-5.0	0.28-0.34
Severe distortion to frames of steel girder framed buildings, paneling torn-off	4.5	0.31
Wooden utility poles snapped	5.0	0.34
Nearly complete destruction of houses	5.0-7.0	0.34-0.48
Total destruction of houses	6.5	0.45
Rail cars overturned	7.0	0.48
Brick panels *8 - 12"), not reinforced, fail by flexure	7.0-8.0	0.48-0.55
Collapse of steel girder framed buildings	7.0-9.0	0.48-0.62
Cars severely crushed	7.0-10.0	0.48-0.69
Movement of round tank, failure of connecting piping	7.0-14.5	0.48-1.0
Brick walls completely demolished	8.0-10.0	0.55-0.69
Heavy damage to industrial machinery	9.0	0.62
Collapse of steel truss type bridges. Loaded train wagons completely demolished	9.0	0.62
Destruction of reinforced concrete walls	10.0	0.69
Heavy machine tools moved and badly damaged	10.0	0.69
Complete destruction of all unreinforced buildings	>10.0	>0.69
18" brick walls completely destroyed	13.0	0.90
Collapse of heavy masonry or concrete bridges	70.0	4.83
Lip of crater	280.0	19.31

Table: Damage estimates for common structures based on overpressure (Clancey, 1972)

Buildings can be designed for blast resistance, following the guidelines as set out in the ASCE publication 'Design of Blast-Resistant Buildings in Petrochemical Facilities', (American Society of Civil Engineers, 2010).

3.3.1 IDM-WU-A60 Window - Fire Post Blast

The window type IDM-WU-A60-FPB is fire tested according to the A60 fire rating. Subsequently after the fire test a full blast test is performed, wherefore this type of window is classified as a Fire post Blast window.

Below pictures show the already blast tested window before the fire test.



Specimen seen from the exposed side at the blast test facility with another type of glass. This picture is used to show the construction of the window frame itself.



Specimen seen from the non-exposed side at the blast test facility with the actual glass panes as used in the fire test.

The fire post blast test of the window can be seen through the following link:

<https://www.youtube.com/watch?v=VvGZciVa1gs&t=5s>

3.3.2 IDM-WU-A60 Window – Maximum allowable dimensions

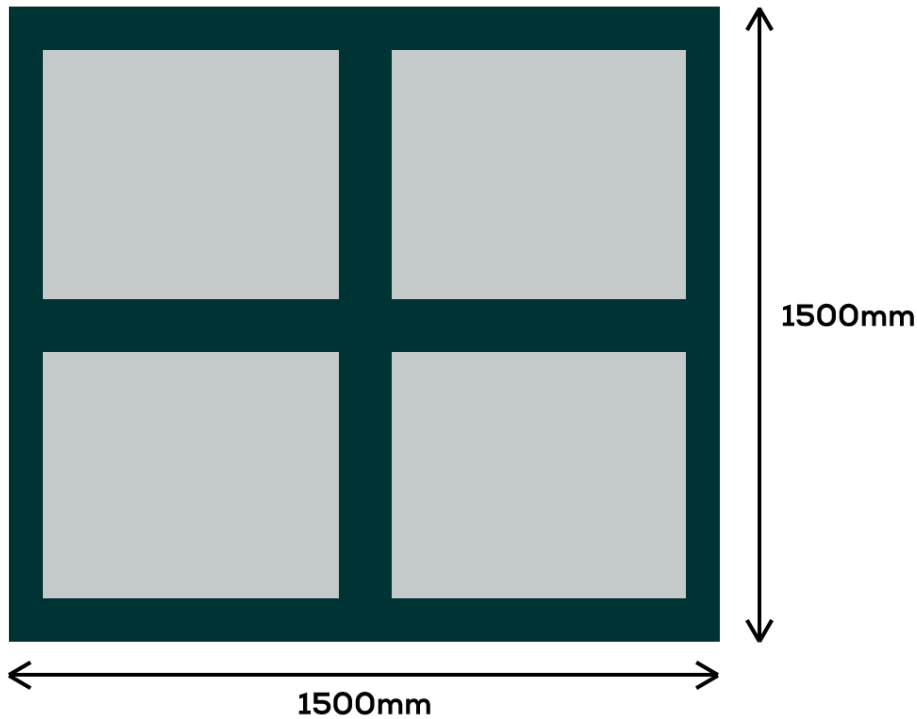
The maximum allowable dimensions as a result of applied blast pressures are shown in below tables. These values are obtained on the basis of the Fire Post Blast test of the IDM-WU-FPB window. There are 8 type of configurations as shown in below tables. The available glass pane thickness of the windows varies from 6 mm to 12 mm. The window frame is for each configuration the same, since the glass pane is the decisive part of the window design. A distinction is made between a pressure wave and a shock wave. The applied blast duration is 100 ms with the glass response category 'NS' (No Splinters).

If larger blast resistant windows are needed for a project, extra supports can be added to the design in order to reduce the windows surface and hence to comply with the maximum allowable dimensions of the blast resistant window.

Configuration 1: 6 mm toughened glass at exposed face with blast shock wave.

		clear view smallest dimension (mm)																	
		300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000
clear view largest dimension (mm)	300	46																	
	400	36	28							Table 1:	6 mm toughened glass at exposed face								
	500	32	23	19							0 mm secondary glass								
	600	30	20	16	14						blast shock wave (kPa)								
	700	29	19	15	12	11					td = 100 ms								
	800	29	19	14	11	10	9				glass response NS								
	900	29	18	13	11	9	8	8											
	1000	29	18	13	10	9	8	7	7										
	1100	29	18	13	10	8	8	7	7	6		checked							
	1200	29	18	13	10	8	7	7	6	6	6								
	1300	29	18	13	10	8	7	6	6	6	5	5							
	1400	29	18	13	10	8	7	6	6	6	5	5	4						
	1500	29	18	13	10	8	7	6	6	5	5	5	4	4					
	1600	29	18	13	10	8	7	6	6	5	5	5	4	4	3				
	1700	29	18	13	10	8	7	6	6	5	5	5	4	4	3	3			
	1800	29	18	13	10	8	7	6	6	5	5	5	4	4	3	3	3		
	1900	29	18	13	10	8	7	6	6	5	5	5	4	4	3	3	3	3	
	2000	29	18	13	10	8	7	6	6	5	5	5	4	4	3	3	3	3	3

For example, the maximum window dimensions for a window with a blast of 20 kPa are 400x600 mm as shown in table above. For a window with the dimensions of 1500x1500 mm is a blast pressure of 20 kPa not possible. In order to resist this blast pressure of 20 kPa, extra supports can be added to the design in order to reduce the windows surface (400x600), as shown in below figure.



Windows with frame support

Configuration 2: 6 mm toughened glass at exposed face with blast pressure wave

		clear view smallest dimension (mm)																					
		300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000				
clear view largest dimension (mm)	300	83																					
	400	66	51							Table 5:	6 mm toughened glass at exposed face												
	500	58	42	35							0 mm secondary glass												
	600	55	37	29	25						blast pressure wave (kPa)												
	700	54	35	27	22	20					td = 100 ms												
	800	54	34	24	20	17	17				glass response NS												
	900	54	33	24	19	16	16	13															
	1000	54	33	23	18	16	14	12	11														
	1100	54	33	23	17	16	12	11	11	11			checked										
	1200	54	33	23	17	15	12	11	11	11	10												
	1300	54	33	23	17	14	11	11	11	10	9	7											
	1400	54	33	23	17	14	11	11	11	10	8	7	6										
	1500	54	33	23	17	14	11	11	11	9	8	6	5	5									
	1600	54	33	23	17	13	11	11	10	8	7	6	5	4	4								
	1700	54	33	23	17	13	11	11	10	8	7	6	5	4	4	3							
	1800	54	33	23	17	13	11	11	9	8	6	6	5	4	4	3	3						
	1900	54	33	23	17	13	11	11	9	7	6	6	5	4	4	3	3	3					
	2000	54	33	23	17	13	11	11	9	7	6	5	5	4	3	3	3	3	2				

3.

Configuration 3: 8 mm toughened glass at exposed face with blast shock wave

		clear view smallest dimension (mm)																					
		300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000				
clear view largest dimension (mm)	300	72																					
	400	56	43							Table 2:	8 mm toughened glass at exposed face												
	500	50	35	29								0 mm secondary glass											
	600	47	31	25	21							blast shock wave (kPa)											
	700	46	29	22	18	16						td = 100 ms											
	800	46	28	21	17	14	13					glass response NS											
	900	46	28	20	16	13	12	11															
	1000	46	28	19	15	12	11	10	9														
	1100	46	28	19	14	12	10	9	9	8			checked										
	1200	46	28	19	14	11	10	9	8	8	7												
	1300	46	28	19	14	11	10	8	8	7	7	7											
	1400	46	28	19	14	11	9	8	7	7	7	6	6										
	1500	46	28	19	14	11	9	8	7	7	6	6	6	6									
	1600	46	28	19	14	11	9	8	7	7	6	6	6	5	5								
	1700	46	28	19	14	11	9	8	7	6	6	6	5	5	5	5							
	1800	46	28	19	14	11	9	8	7	6	6	6	5	5	5	4	4						
	1900	46	28	19	14	11	9	8	7	6	6	5	5	5	5	4	4	4					
2000	46	28	19	14	11	9	8	7	6	6	5	5	5	5	4	4	4	4					

Configuration 4: 8 mm toughened glass at exposed face with blast pressure wave

		clear view smallest dimension (mm)																					
		300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000				
clear view largest dimension (mm)	300	132																					
	400	103	79							Table 6:	8 mm toughened glass at exposed face												
	500	91	65	53							0 mm secondary glass												
	600	86	58	45	38						blast pressure wave (kPa)												
	700	84	54	40	33	29					td = 100 ms												
	800	84	52	38	30	25	25				glass response NS												
	900	84	51	36	28	23	20	19															
	1000	84	51	35	26	23	19	19	17														
	1100	84	51	34	26	21	18	17	14	13			checked										
	1200	84	51	34	25	20	18	15	13	12	12												
	1300	84	51	34	25	19	18	14	12	12	12	12											
	1400	84	51	34	25	19	18	13	12	11	12	12	11										
	1500	84	51	34	25	19	17	13	12	11	12	11	10	9									
	1600	84	51	34	25	19	16	13	11	11	11	10	9	8	7								
	1700	84	51	34	25	19	16	12	11	11	11	9	8	7	7	6							
	1800	84	51	34	25	19	15	12	11	11	10	9	7	7	6	6	5						
	1900	84	51	34	25	19	15	12	11	11	10	8	7	6	6	5	5	4					
	2000	84	51	34	25	19	15	12	11	11	9	8	7	6	6	5	5	4	4				

3.

Configuration 5: 10 mm toughened glass at exposed face with blast shock wave

		clear view smallest dimension (mm)																	
		300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000
clear view largest dimension (mm)	300	104																	
	400	81	62							Table 3: 10 mm toughened glass at exposed face									
	500	72	50	41						0 mm secondary glass									
	600	67	45	35	30					blast shock wave (kPa)									
	700	66	42	31	26	22				td = 100 ms									
	800	65	40	29	23	20	18			glass response NS									
	900	65	39	28	22	18	16	14											
	1000	65	39	27	21	17	15	13	12										
	1100	65	39	26	20	16	14	12	11	10			checked						
	1200	65	39	26	19	15	13	12	10	10	9								
	1300	65	39	26	19	15	13	11	10	9	9	8							
	1400	65	39	26	19	15	12	11	10	9	8	8	7						
	1500	65	39	26	19	15	12	10	9	8	8	7	7	7					
	1600	65	39	26	19	15	12	10	9	8	8	7	7	6	6				
	1700	65	39	26	19	15	12	10	9	8	7	7	7	6	6	6			
	1800	65	39	26	19	15	12	10	9	8	7	7	6	6	6	6	6		
	1900	65	39	26	19	15	12	10	9	8	7	7	6	6	6	5	5	5	
	2000	65	39	26	19	15	12	10	9	8	7	6	6	6	6	5	5	5	5

Configuration 6: 10 mm toughened glass at exposed face with blast pressure wave

		clear view smallest dimension (mm)																	
		300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000
clear view largest dimension (mm)	300	190																	
	400	148	113							Table 7: 10 mm toughened glass at exposed face									
	500	131	92	75						0 mm secondary glass									
	600	123	82	63	54					blast pressure wave (kPa)									
	700	120	76	57	47	41				td = 100 ms									
	800	119	73	53	42	36	31			glass response NS									
	900	119	72	51	39	32	28	27											
	1000	119	71	49	37	30	26	23	21										
	1100	119	71	48	36	29	25	21	21	20			checked						
	1200	119	71	48	35	28	23	20	20	17	15								
	1300	119	71	48	34	27	22	20	18	15	14	13							
	1400	119	71	48	34	26	21	20	17	14	13	13	13						
	1500	119	71	48	34	26	21	20	15	13	12	12	13	13					
	1600	119	71	48	34	26	21	19	15	13	12	12	13	12	11				
	1700	119	71	48	34	26	21	18	14	13	12	12	12	11	10	9			
	1800	119	71	48	34	26	21	18	14	13	12	12	11	10	9	8	7		
	1900	119	71	48	34	26	21	17	14	13	12	12	11	9	8	7	7	6	
	2000	119	71	48	34	26	21	17	14	13	12	12	10	9	8	7	6	6	6

3.

Configuration 7: 12 mm toughened glass at exposed face with blast shock wave

		clear view smallest dimension (mm)																			
		300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000		
clear view largest dimension (mm)	300	140																			
	400	109	83							Table 4:	12 mm toughened glass at exposed face										
	500	96	68	55							0 mm secondary glass										
	600	91	60	46	39						blast shock wave (kPa)										
	700	88	56	41	34	30						td = 100 ms									
	800	88	54	39	31	26	23					glass response NS									
	900	88	53	37	29	24	21	19													
	1000	88	52	36	27	22	19	17	16												
	1100	88	52	35	26	21	18	16	14	13			checked								
	1200	88	52	35	26	20	17	15	13	12	12										
	1300	88	52	35	25	20	16	14	13	12	11	10									
	1400	88	52	35	25	19	16	14	12	11	10	10	9								
	1500	88	52	35	25	19	16	13	12	11	10	9	9	8							
	1600	88	52	35	25	19	15	13	11	10	9	9	8	8	8						
	1700	88	52	35	25	19	15	13	11	10	9	8	8	8	7	7					
	1800	88	52	35	25	19	15	13	11	10	9	8	8	7	7	7	7				
	1900	88	52	35	25	19	15	13	11	10	9	8	7	7	7	6	6	6			
2000	88	52	35	25	19	15	13	11	9	9	8	7	7	7	6	6	6	6			

Configuration 8: 12 mm toughened glass at exposed face with blast pressure wave

		clear view smallest dimension (mm)																		
		300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	
clear view largest dimension (mm)	300	257																		
	400	200	152							Table 8:		12 mm toughened glass at exposed face								
	500	176	124	101								0 mm secondary glass								
	600	166	110	85	72							blast pressure wave (kPa)								
	700	162	102	76	62	54						td = 100 ms								
	800	161	98	70	56	48	42					glass response NS								
	900	161	96	67	52	43	38	33												
	1000	161	96	65	50	40	34	30	29											
	1100	161	96	64	48	38	32	30	25	23			checked							
	1200	161	96	64	47	36	30	27	23	23	22									
	1300	161	97	64	46	35	29	25	23	22	19	17								
	1400	161	97	64	46	35	29	23	23	20	17	15	14							
	1500	161	97	64	45	34	29	23	23	18	16	14	14	14						
	1600	161	97	64	45	34	28	23	22	17	15	14	13	14	14					
	1700	161	97	64	45	34	27	23	21	16	14	13	13	14	13	13				
	1800	161	97	64	45	34	27	23	20	16	14	13	13	13	13	12	10			
	1900	161	97	64	45	34	26	23	19	15	14	13	13	13	12	10	9	9		
	2000	161	97	64	45	34	26	23	18	15	14	13	13	12	11	10	9	8	8	

3.

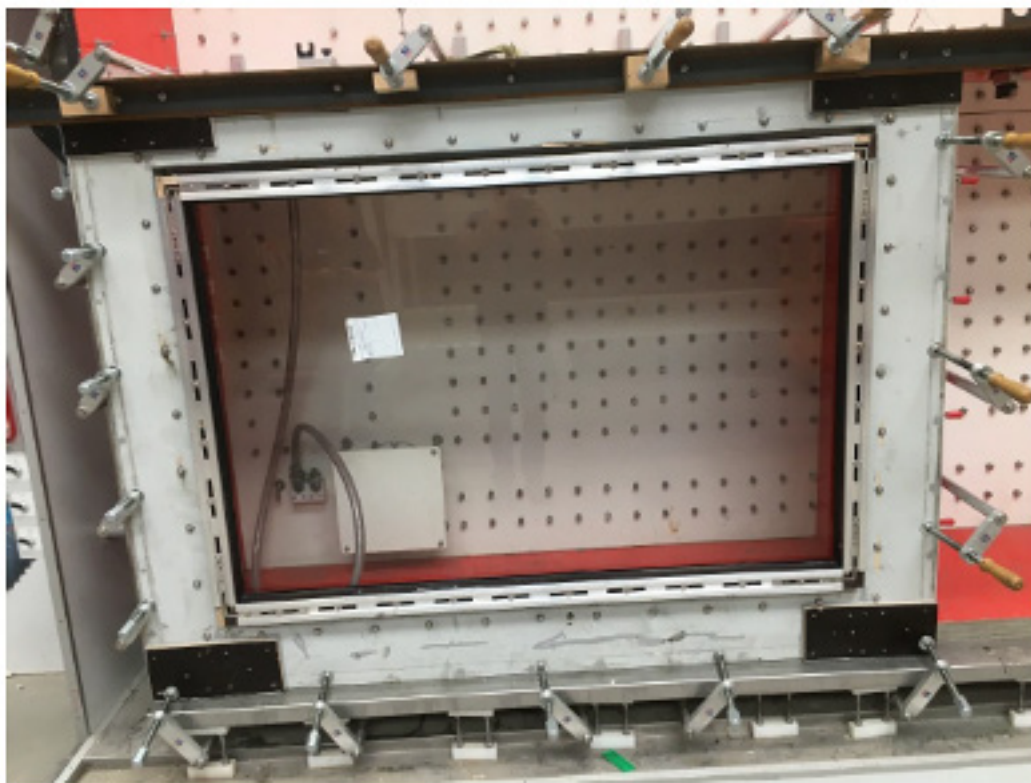
3.4 Gas & Airtightness

Depending on the safety area classification, windows could require to be gas tight in order to maintain positive pressure, usually 50 Pa according to NORSOK C-002 2015 standard. This is done to prevent the ingress of toxic gas or smoke from an external source.

The airtightness of the windows type IDM-WU-A60, IDM-WU-H120, IDM-WU-Openable-A60/EI60 are tested according to EN12207 standard (Class 4).

The IDM-WU-A60-FPB window, on the other hand, is tested according to EN13116 standard with a pressure of 3000 Pa.

The stainless steel window, as tested by SKG-IKOB, (photo below) is of the type: IDM-WU-A60/ EI60.



3.

3 OBSERVATION AND RESULTS

The air leakage was determined at a positive and negative pressure of 50 Pa. The surface of the window was 1.92 m². The results of the air leakage measurements under positive and negative key pressure are shown in table 1.

Pressure in Pa (N/m ²)	Air leakage total m ³ /h	Air leakage m ³ /m ² /h
+ 50	0.41	0.21
- 50	0.62	0.32

Table 1

The tests were performed using a calibrated test rig and measuring equipment (calibrated on 12 April 2018) of SKG-IKOB in Geldermalsen. The ambient temperature during the tests was approximately 21.9 °C. The air pressure was approximately 1016 hPa. The air humidity was approximately 77 %.

4 CONCLUSION

The air leakage of the window at a pressure of 50 Pa. was approximately 0.21 m³/m²/h. This is less than the maximum allowable air leakage of 0,5 m³/m²/h at 50 Pa.

Extract from test report. Source: Gas Tightness Test Report, 18.00483.2

3.5 Weather- and water tightness

Quite often, **weathertightness** and **watertightness** are mixed up in specifications. The key difference is:

- **Weathertight** windows can cope with heavy rain and storm on the external side.
- **Watertight** windows can cope with a water column of a number of metres on the external side.

All external windows should be at least weathertight in order to avoid water ingress. In order to verify weathertightness, each window is tested:

- IDM-WU-A60/EI60 Openable; according to EN12208 standard (Class 2A)
- IDM-WU-A60 & IDM-WU-H120 ; according to EN12208 standard (Class 9A)
- IDM-WU-A60-FPB; according to EN12154 (Class RE1200)

3.6 Sound insulation

InterDam windows have a standard sound insulation with a range of 38 dB till 51 dB. Higher sound reductions can be achieved by applying extra and different glass layers.

3.7 Thermal insulation

Thermal values are generally assigned to complete structures instead of to individual architectural items. However our window types can be considered to have a U of 1.0 W/m²K till 2.8 W/m²K, based on only the glass pane.

3. 3.8 Corrosion protection

Since InterDam doors are often used in harsh and offshore environments, corrosion protection is of critical importance. The ISO-12944 standard distinguishes 5 basic atmospheric corrosivity categories and oil-and-gas offshore projects are to be considered as 'CX' category:

ISO 12944 distinguishes 6 basic atmospheric corrosivity categories:

C1	very low
C2	low
C3	medium
C4	high
C5	very high
CX*	extreme

* new category that covers offshore Part 9

Corrosivity category	Environment examples	
	Exterior	Interior
C1 - very low	-	Heated buildings with a clean atmosphere such as offices, shops, schools, hotels.
C2 - low	Atmospheres contaminated to a small extent, mainly rural regions.	Buildings which are not heated, where condensation may occur e.g. storage facilities, sports halls.
C3 - medium	Industrial and urban atmospheres with a low sulphur oxide (IV) contamination level. Inshore areas of low salinity.	Production halls to facilities humidity and certain air contamination e.g. foodstuff plants, laundries, breweries, dairies.
C4 - high	Industrial areas and inshore areas of medium salinity.	Chemical plants, swimming pools, ship repair yards.
C5 - very high	Industrial areas of high humidity and aggressive atmosphere and inshore areas of high salinity.	Buildings and areas of almost constant condensation and high contamination.
CX* - extreme	Offshore areas of high salinity or industrial areas of extremely high humidity and aggressive atmosphere or subtropical and tropical areas.	Buildings and areas of almost constant condensation and aggressive contamination.

* new category that covers offshore Part 9

3.

3.8.1 Coating systems

As standard, InterDam provides doors with a suitable coating system for the intended operational environment. Two systems from Hempel are available:

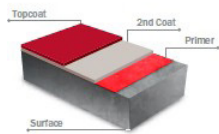
	ST.1 (for external and offshore application) – class CX5M		ST.3 (for internal or onshore external application)	
Primer	Hempadur Mastic 45880 (high build epoxy)	130 µm	Hempadur Mastic 45880 (high build epoxy)	90 µm
Inter-mediate layer	Hempadur Mastic 45880 (high build epoxy)	130 µm	-	-
Topcoat	Hempathane 55610	60 µm	Hempathane 55610	60 µm
		320 µm		150 µm

* new category that covers offshore Part 9

The ST.1 coating system is in full compliance with the offshore standard NORSOK M-501.

When a project coating specification is provided, several coating systems from other brands such as Jotun, International, Carboline and others can be applied.

Lifetime	System no.	System	DFT (µm)	Recommended use
> 15 Years	1	1x Hempadur Mastic 45880/1	130	As a self-primed, surface tolerant paint system or as an intermediate or finishing coat in heavy duty paint systems where low VOC and high film build are required. For immersed areas Hempadur Mastic 45880 is only recommended for minor repairs. Can be specified where extended recoating properties for polyurethane topcoats are requested (typically travel coating). May be used directly on cured zinc silicate (Galvosil products) or spray metallised surfaces to minimise popping.
		1x Hempadur Mastic 45880/1	130	As a self-primed, surface tolerant paint system or as an intermediate or finishing coat in heavy duty paint systems where low VOC and high film build are required. For immersed areas Hempadur Mastic 45880 is only recommended for minor repairs. Can be specified where extended recoating properties for polyurethane topcoats are requested (typically travel coating). May be used directly on cured zinc silicate (Galvosil products) or spray metallised surfaces to minimise popping.
		1x Hempathane HS 55610	60	As a VOC compliant, high building finishing coat for protection of structural steel in severely corrosive environment. May be specified as a one coat "direct to metal" system in environments classified as C2 and C3.
		Total DFT	320	



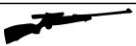






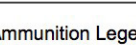
Detailed description of the ST.1 coating system

3. 3.9 Bullet resistance

Where there is a chance of a terrorist or pirate attack on facilities, bulletproof doors might be required to protect people and equipment. InterDam doors can be provided with bullet resistance. Ballistic requirements have been tested according to EN 1522/1523 and as level 'FB7' NS has been achieved. If a project requires bullet-proof doors, the procurement engineer should clearly state what classification is required.

BS EN 1522 1999

Windows, Doors, Shutters and Blinds Test & Classification for Bullet Resistance

	Class Threat Level	Type of Weapon	Calibre	Ammunition	No of Shots	Velocity (m/s)	Test Range (m)	Spacing (mm)
	FB1	Rifle	.22 LR	L/RN	3	360 +/- 10	10	120 +/- 10
	FB2	Hand Gun	9mm Luger	FJ1/RN/SC	3	400 +/- 10	5	120 +/- 10
	FB3	Hand Gun	.357 Magnum	FJ1/CB/SC	3	430 +/- 10	5	120 +/- 10
	FB4	Hand Gun	.44 Rem Magnum	FJ2/FN/SC	3	440 +/- 10	5	120 +/- 10
	FB5	Rifle	5.56x45	FJ2/PB/ SCP 1	3	950 +/- 10	10	120 +/- 10
	FB6	Rifle	7.62x51	FJ1/PB/SC	3	830 +/- 10	10	120 +/- 10
	FB7	Rifle	7.62x51	FJ2/PB/ HC 1	3	820 +/- 10	10	120 +/- 10
	FSG	Shot Gun	12/70	Solid Slug 3	3	420 +/- 20	10	-

Ammunition Legend:

L - lead
CB - coned bullet
FJ - full metal jacket bullet
FN - flat nose
HC1 - steel hard core
PB - pointed bullet
RN - round nose
SC - soft core (lead)
SCP1 - soft core (lead) and steel penetrator (type SS109)

Notes:

- 1) Full Steel Jacket (plated)
- 2) Full Copper Alloy Jacket
- 3) Brenneke 12G solid slug

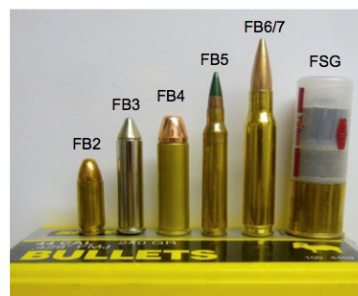
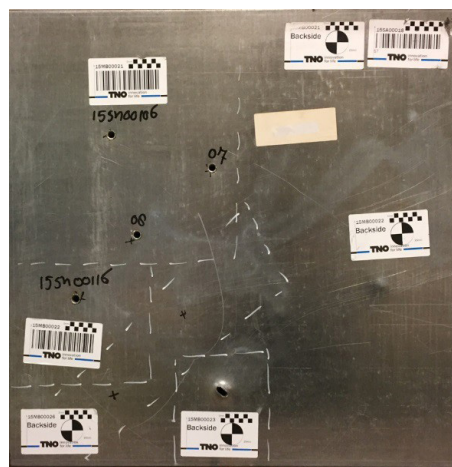


Figure: FB Standard 1-7 (Armour, 1988)



Photo: Bullet test (TNO, 2015)



Bullet resistance windows according to the EN13541 standard can also be supplied, see below datasheet of an ER1-NS type glass pane.

Laminated safety glass in conformance with EN 14449

D A T A S H E E T 

VETROGARD™ BLAST

Blast resistant security glass for interior and exterior application

ER1-NS

CLASSIFICATION



= Blast Resistant

Blast resistant security glass designed to protect people against the effects of explosions like blast waves and flying fragments. A distinction is made between splintering and non-splintering glass.

PRODUCT FEATURES

Laminated safety glass



TECHNICAL SPECIFICATIONS

Reaction (EN 13541)

Maximum Glass Size (max. 13,0 m²)

Thickness tolerance

Length/height tolerance

Impact resistance (EN 12600)

Application Conditions

ER1-NS (no splinters)

≤ 2600 mm x 5000 mm***

±1 mm

±2 mm to 1000 mm, ±3 mm to 2000 mm, ±4 mm over 2000 mm

1 (B) 1 classification

The certification of security glass should only be used as a general guideline of the glazing's suitability for the selected classification. In order to use security glass in buildings the entire security system must be certified according to its specific system standards. For more information and assistance, please contact your local Vetrotech agent and refer to the relevant "Quality Guideline, Application Conditions".

CE certificate No. of conformity

ID-No.

Hazardous material contained

CPD/0497/4882/13 (you can obtain a DoP* from your national sales office) - AoC-Level 1

BS 118-NS

None

Nominal thickness

Weight

Sound reduction Rw (EN 140-3)

Light transmission (EN 410)

Light reflection pL (exterior/interior)

U value, W/m²K (EN 673)

g value

Energy transmission τE

Energy reflection pE (exterior/interior)

18 mm (Planilux®)

40 kg/m²

NPD**

84%

8%/8%

5,3

0,68

60%

6%/6%

18 mm (Diamant® - extra clear)

40 kg/m²

NPD**

88%

8%/8%

5,3

0,77

72%

7%/7%

* Declaration of Performances


** NPD = No Performance Declared

*** Bigger sizes available on request



Bulletproof glass

4. Production and Quality



Bureau Veritas Certification

Certification

awarded to

InterDam B.V

Klompemakerstraat 12, 2984 BB Ridderkerk, The Netherlands

Bureau Veritas Inspection and Certification The Netherlands B.V. declares that the Management System of the above organization has been audited and found to be in accordance with the requirements of the management system standards detailed below.

Standard

ISO 9001:2015

Scope of supply

Developing, testing, engineering, supply and installation of fire and blast resistant products for active and passive safety of persons, industrial systems and facilities.

Original cycle start date: 07 April 2008

Expiry date of previous cycle: 07 April 2020

Certification/Recertification audit date: 20 March 2020

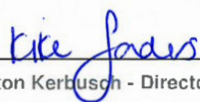
Certification/Recertification cycle start date: 21 April 2021

Subject to the continued satisfactory operation of the organization's Management System, this certificate is valid until: 07 April 2023




Further clarifications regarding the scope of this certificate and the applicability of the management system requirements may be obtained by consulting the organisation.

To check this certificate validity please call: +31 (0)88 450 5500.

Certificate no: **NL022266-001** Version: **2** Revision Date: **21 April 2021**

10. 
Anton Kerbusch - Director Certification Benelux

Managing Office: Bureau Veritas Inspection and Certification The Netherlands B.V Computerweg 2, 3821 AB Amersfoort
Issuing Office: Bureau Veritas Inspection and Certification The Netherlands B.V Computerweg 2, 3821 AB Amersfoort



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BUREAU
VERITAS

Bureau Veritas Certification



Certification

awarded to

Interdam Fabrication B.V.

Klompemakerstraat 12, 2984 BB Ridderkerk, The Netherlands

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Certification/Recertification audit date:	20 March 2020
Certification/Recertification cycle start date:	21 April 2021
Subject to the continued satisfactory operation of the organization's Management System, this certificate is valid until:	07 April 2023

Further clarifications regarding the scope of this certificate and the applicability of the management system requirements may be obtained by consulting the organisation.

To check this certificate validity please call: +31 (0)88 450 5500.

Certificate no: **NL022266-003** Version: **2** Révision Date: **21 April 2021**

10.

Anton Kerbusch

Anton Kerbusch - Director Certification Benelux

Managing Office: Bureau Veritas Inspection and Certification The Netherlands B.V. Computerweg 2, 3821 AB Amersfoort

Issuing Office: Bureau Veritas Inspection and Certification The Netherlands B.V. Computerweg 2, 3821 AB Amersfoort



4.

4.1 Surface treatment

Preparation

Before painting, the steel surfaces are cleaned according to the specification of the paint supplier. Prior to commencement of surface preparation, surface irregularities such as weld spatter, rough capping, undercuts, slag, rough edges, burrs, laminations and laps are removed and made smooth.

Blasting

Steel surfaces are prepared by blast cleaning to ISO 8501-1. Speedblast (Garnwel) grit is used for surface preparation.

After grit blasting and prior to the first coat dust etc. is removed and the surface is checked on blasting or anchor profile by means of replica tape test i.e. Testex method.

Quality control

All painting is carried out per paint supplier recommendation and ISO 19840. Paint supplier procedures and inspections are followed and include the following:

- a. Control and monitoring of the following inspection items as per specification:
 - Visual examination of cleaned surface
 - Surface profile
 - Visual examination of coating
 - Paint film thickness (DFT)
- b. Completion of paint reports with all necessary inspection items.

No painting commences if humidity is above 60% and if the difference of dew point / substrate temperature is less than 3 °Celsius. For other limitations we refer to the latest manufacturers data sheets.

Degreasing

Oil and grease etc. are removed with suitable detergent. Salt and other contaminants are cleaned by (high pressure) fresh water. Zinc salts (white rust) are removed by high pressure hosing combined with rubbing with a stiff nylon brush if necessary.

Painting

Within four hours after grit blasting the first coating layer is applied. Paint is always applied to surfaces that are dry, clean and degreased for every coat. Paint is always applied according to the suppliers specified conditions.

Measurements of dry coating thickness is conducted on the doors and window parts. If a minimum dry coating thickness for the primer layer is stated in the painting specification, measurements of coating thickness is also made of the primer layer, in addition to measurement of coating thickness of the finished paint. The dry film thickness is measured in accordance with the ISO 19840.

A number of measurements of coating thickness are made, for each square meter a minimum of 3 measurements are taken. Measurement of coating thickness is made with an electronic measurement device. All measurements are recorded and reflected in the painting report. The painting report is a general report that is generated per batch of doors/windows that are coated.

4.

Example of a paint report

PAINTREPORT

Ref.No. : 16504736	
Client : InterDam BV	Order no. : 50017834
Project : 16071	Location :

Paintsystem	Paint applied by	Inspection item / standard	Values / standard
1st Epoxy Primer	Airless spray	Pre - blasting cleaning SSPC SP 1	Executed / accepted
Hempadur Mastic 45880		Blasting ISO 8501-1	Sa 2,5
2nd High Build Epoxy	Conventional spray	Blasting profile ISO 8503-5 Testex	69 µm Rt
Hempadur Mastic 45880		DFT as per ISO 19840	Average: 383 micron
3rd Polyurethane Topcoat	Brush *		Min: 298 micron
Hempathane 55610			Max: 781 micron
		Dry film thickness gauge	Elcometer 456 (F/NF certificate no. NH13613-G)

Top colour: RAL 3002

* The missing spots and local low DFT, will be touched up by brush application. The local high DFT will be sanded and touched up by brush application.

Surface preparation method: Blasting Sa 2,5		Standard ISO 8501-1		Abrasive used: Gamet	
---	--	---------------------	--	----------------------	--

Layer	to tape up/ masked	Hempel Coatings					
		1st	1st	2nd	2nd	3rd	3rd
Date	Blasting 28-9-2016	28-9-2016	28-9-2016	29-9-2016	29-9-2016	30-9-2016	30-9-2016
Total av-dft micron		145	145	297	297	383	383
Time	11:40	10:45	12:10	09:15	10:45	08:30	11:30
Ambient Temp. °C	20,6	21,1	20,9	19,9	20,4	20,7	21,1
Rel. humidity %	38,1	40,8	43,0	38,5	40,9	39,2	47,2
Surf. Temp. °C	20,9	21,5	21,7	20,3	20,6	19,8	21,7
Dew point °C	8,2	8,4	8,8	7,9	7,6	7,7	8,0
Δ T / Temp above dew point	12,7	13,1	12,9	12,4	13,0	12,1	13,7

Paint Manufacturer: Hempel Coatings	
Remarks: 4x Door, 3x Frame (3791 till 3793)	
Inspector : S.A. den Hartog	Approved by :
NACE Certified Coating Inspector - Level 2	Approved by :
Date : 3-10-2016	Date :

4.

4.2 Factory Acceptance Test

The factory acceptance procedure is based on the IDM quality management system. The quality management system of IDM is based on the (NEN-) ISO 9001:2015 standard and safety management system based on the VCA* 2017/6.0.

The process starts with the engineering of the doors. In this stage all doors receive a unique number, a so-called sequence number. This door will keep this unique number during its lifetime. This number is engraved on almost all door parts. This makes it possible to track and trace each part in the production process. Additionally, it smoothenes the manufacturing process so that it is clear which item needs to be installed in which door. Furthermore, this traceability system enables IDM to make a cross reference sheet wherein all the material certificates are listed.

After receipt of all the metal sheet parts, engraved with the part number or the ID number (IDM standard part number), in-coming goods control is conducted to see whether it complies with the shop drawings and IDM specifications. In case of any visual damage or measurement errors the material will be rejected. In this stage the so-called traveler card joins in. The traveler card is a card that accompanies the door during the complete manufacturing process and all manufacturing records are noted on this card.

During the following stages the doors will be glued, welded and coated prior to the assembly and packed before it will be shipped out. During this process all manufacturing data is listed on the traveler card. The whole idea of this card is that it works like an ITP system. Whenever the previous deliverable is not completed according to specifications, the door packing will be halted until it can be released. If corrective actions are needed, this will be discussed with the production manager and the foremen. Rework and repair need to be avoided and will only be used when it can be assured that the rework/repair will not affect the quality and/or integrity of the door. Concessions can only be made by the quality manager after consulting the production manager and a formal NCR needs to be drawn up.

The IDM QC department will conduct additional quality checks on a regular basis to check whether the rules are respected. In case of deviation an NCR will be drawn up.

After completion of the door assembly, IDM conducts a quality check / final release according to the IDM standard release notes. All is recorded with photos and a release note and will be signed by the QC department. Final releases of doors may only be done by authorized employees who need to be of the QC department. This stage is a hold point in the process, without a formal release the production may not proceed with the next stage, which is the packaging of the doors. In case the QC Department found some punch items, these need to be corrected prior to door release.

During packaging, IDM QC department will check each box visually, to verify whether there are any damages that have occurred during the packaging stage. If so, this will be recorded on the traveler card accompanied by pictures.

Maximum 2 weeks after delivery of the door (s) IDM will submit the final documentation. Final documentation minimum consists of: (unless otherwise agreed)

1. Final drawings
2. Type approval certificates
3. Material certificates
4. Installation instruction
5. Maintenance instruction

During the FAT IDM QC department will repeat the release of the door together with the client. In appendix 2 are the checking points and the tolerance included. In case of any deviation the door will be rejected and need to be corrected or, in consultation with the client, accepted as is. Additional requirements, unless otherwise agreed, is not part of the FAT and will therefore not be accepted.

If required IDM will check, together with the client, the documentation and if need uncertainties will be clarified.

4.

Example of an Inspection Release Note

IDM Window No.		PROJECT NO.	DATE
		[[[idmprojectnumber]]]	[[[date]]]
Type of Material			
<input checked="" type="checkbox"/> Stainless Steel 316 <input type="checkbox"/> Carbon Steel <input type="checkbox"/>			
Visual Inspection			
Hold Point	Criteria	Accepted	Rejected
Dents	Depth max. 1 mm		
Scratches	Max. length 30 mm depth 10 % of thickness		
Roughness	No spots or corrosion		
Colour Variations	None permitted		
Clearlines	No dirt		
Geometrical Inspection			
Hold Point	Tolerances	Accepted	Rejected
Length	+/- 4 mm		
Width	+/- 4 mm		
Flatness	+/- 1,5 mm per metre		
Edge Squareness	88° - 92° (i.e. +/- 2°)		
Surface Treatment			
Hold Point	Criteria	Accepted	Rejected
Check surface treatment	Windowschedule related to paint report		
Check flatness of coating	Visual check		
Check DFT	Windowschedule / paint report		
Check Colour	Windowschedule / paint report		
Functional Inspection			
Hold Point	Criteria	Accepted	Rejected
Window type correct?	Windowschedule/drawing		
All sealant available	Drawing/Packaginglist		
All screws and fixing available	Drawing/Packaginglist		
Packaging Inspection			
Hold Point	Criteria	Accepted	Rejected
Timber crate/pallet rigid enough?	Visual check, photo		
Windows/Glass are stacked properly?	Visual check, photo		
All loose parts are packed and recorded?	Visual check, photo		
No interference between windows/parts?	Visual check, photo		
No damage occurred during packaging?	Visual check, photo		
INTERDAM AUTHORIZATION			
Name: _____ Title: _____ Signature: _____			

5. Technical datasheets of glass composition

In this chapter you can find all the technical datasheets of the different window types, regarding light, energy, thermal, acoustic and safety properties of the glass composition. In addition, the nominal thickness and weight are also described.

5.1 IDM-WU-A60 (standard product)



Calculated by Jan Liebeton
Personal note composition Interdam

Calculated on 29-4-2021

Country Netherlands

Thermobel Stopray:

① 8 mm Planibel Clearlite Annealed ② 8 mm Air 100% ③ Pyrobel 25 EG Annealed

Glass performance data simulation

☀ Light properties - EN 410

Light transmittance : τ_v [%]	73
External light reflection : p_v [%]	14
Internal light reflection : p_{vi} [%]	13
Colour rendering index : R_a [%]	94

🔥 Energy properties - EN 410

Total solar energy transmittance : g [%]	67
External energy reflection : p_e [%]	11
Internal energy reflection : p_{ei} [%]	9
Direct energy transmission : τ_e [%]	46
Energy absorption glass 1 : α_{e1} [%]	11
Energy absorption glass 2 : α_{e2} [%]	32
Total energy absorption : α_e [%]	43
Shading coefficient : SC	0.77
UV transmission : τ_{uv} [%]	0
Selectivity	1.09

🌡 Thermal properties - EN 673

Thermal transmittance (vertical glazing) : U value [$W/(m^2.K)$]	2.8
--	-----

🔊 Acoustic properties

Direct airborne sound reduction - Interpolated : R_w (C;Ctr) [dB] ¹	41 (-1;-5)
--	------------

🛡 Safety properties

Resistance to fire - EN 13501-2	EI 60
Reaction to fire - EN 13501-1	NPD
Bullet resistance - EN 1063	NPD
Burglar resistance - EN 356	NPD
Pendulum body impact resistance - EN 12600	NPD / 1B1
Explosion resistance - EN 13541	NPD

📏 Thickness and weight

Nominal thickness : [mm]	46.4
Weight : [kg/m^2]	88

¹ The sound reduction indexes are interpolated (no test available). They correspond to glazing with dimensions 1230 mm by 1480 mm according to EN ISO 10140-3. In-situ performances may vary according to the effective glazing dimensions, supporting system, installation, environment, noise sources etc. The accuracy of the given indexes is $\pm 1/2$ dB.

5.

IDM-WU-A60 (thermal alternative, not yet fire tested)



Calculated by **Mari Luijten**

Calculated on **17-5-2021**

Country

Netherlands

Thermobel Advanced:

① 8 mm iplus 1.0 pos.2 Annealed ② 12 mm Argon 90% ③ Pyrobel 25 EG Annealed

Glass performance data simulation

☀ Light properties - EN 410

Light transmittance : τ_v [%]	68
External light reflection : ρ_v [%]	15
Internal light reflection : ρ_{vi} [%]	13
Colour rendering index : R_a [%]	93

🔥 Energy properties - EN 410

Total solar energy transmittance : g [%]	48
External energy reflection : ρ_e [%]	31
Internal energy reflection : ρ_{ei} [%]	13
Direct energy transmission : τ_e [%]	36
Energy absorption glass 1 : α_{e1} [%]	20
Energy absorption glass 2 : α_{e2} [%]	13
Total energy absorption : α_e [%]	33
Shading coefficient : SC	0.55
UV transmission : τ_{uv} [%]	0
Selectivity	1.42

🔥 Thermal properties - EN 673

Thermal transmittance (vertical glazing) : U value [$W/(m^2.K)$]	1.2
--	------------

🔊 Acoustic properties

Direct airborne sound reduction - Interpolated : R_w (C;Ctr) [dB] ¹	42 (-1;-5)
--	-------------------

🛡 Safety properties

Resistance to fire - EN 13501-2	EI 60
Reaction to fire - EN 13501-1	NPD
Bullet resistance - EN 1063	NPD
Burglar resistance - EN 356	NPD
Pendulum body impact resistance - EN 12600	NPD / 1B1
Explosion resistance - EN 13541	NPD

📏 Thickness and weight

Nominal thickness : [mm]	50.4
Weight : [kg/m^2]	88

¹ The sound reduction indexes are interpolated (no test available). They correspond to glazing with dimensions 1230 mm by 1480 mm according to EN ISO 10140-3. In-situ performances may vary according to the effective glazing dimensions, supporting system, installation, environment, noise sources etc. The accuracy of the given indexes is ± 2 dB.

5.

IDM-WU-A60 (acoustic alternative, not yet fire tested)



Calculated by Jan Liebeton Calculated on 29-4-2021 Country Netherlands
Personal note composition 51dB Interdam

Thermobel Top:

① Stratophone 88.2 (8 mm Planibel Clearlite + 0.76 mm Acoustic PVB clear + 8 mm iplus 1.1 pos.2)
Annealed ② 16 mm Argon 90% ③ Pyrobel 25 EG Annealed

Glass performance data simulation

☀ Light properties - EN 410

Light transmittance : τ_v [%]	70
External light reflection : ρ_v [%]	11
Internal light reflection : ρ_{vi} [%]	11
Colour rendering index : R_a [%]	93

🔥 Energy properties - EN 410

Total solar energy transmittance : g [%]	50
External energy reflection : ρ_e [%]	17
Internal energy reflection : ρ_{ei} [%]	10
Direct energy transmission : τ_e [%]	37
Energy absorption glass 1 : α_{e1} [%]	33
Energy absorption glass 2 : α_{e2} [%]	13
Total energy absorption : α_e [%]	46
Shading coefficient : SC	0.57
UV transmission : τ_{uv} [%]	0
Selectivity	1.40

🔥 Thermal properties - EN 673

Thermal transmittance (vertical glazing) : U value [W/(m ² .K)]	1.1
--	-----

🔊 Acoustic properties

Direct airborne sound reduction - Interpolated : R_w (C;Ctr) [dB] 1	51 (-2;-6)
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🛡 Safety properties

Resistance to fire - EN 13501-2	EI 60
Reaction to fire - EN 13501-1	NPD
Bullet resistance - EN 1063	NPD
Burglar resistance - EN 356	P2A
Pendulum body impact resistance - EN 12600	1B1 / 1B1
Explosion resistance - EN 13541	NPD

📏 Thickness and weight

Nominal thickness : [mm]	63.2
Weight : [kg/m ²]	109

1. The sound reduction indexes are interpolated (no test available). They correspond to glazing with dimensions 1230 mm by 1480 mm according to EN ISO 10140-3. In-situ performances may vary according to the effective glazing dimensions, supporting system, installation, environment, noise sources etc. The accuracy of the given indexes is +/- 2 dB.

5.

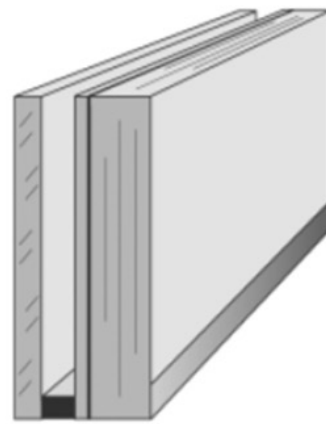
IDM-WU-A60-FPB (standard product)



Pilkington **Pyrostop**® 60-261

Resistance to Fire (EN 13501-2)	EI 60
Application	internal / external
Nominal Thickness	55 mm (16 mm spacer)
Thickness Tolerance	± 2 mm
Weight	90 kg/m ²
Direct Airborne Sound Insulation (EN ISO 140-3)	42 dB
U _g -value (EN 673)	2,4 W/m ² K
Light Transmittance (EN 410)	76 %
g-value (EN 410)	67 %
Light Reflectance out / in (EN 410)	14 % / 14 %
Pendulum Body Impact Resistance out / in (EN 12600)	1(C)2 / 1(B)1
Burglar Resistance out / in (EN 356)	NPD / P2A
Reaction to fire (EN 13501-1)	NPD
Max. allowable temperature	- 40 °C bis + 50 °C

There are no hazardous ingredients.
The maximum size depends on the national / local approval of the glazing system.
Tolerances may occur due to application and manufacturing.
Attention to installing direction.
NPD = No Performance Determined.



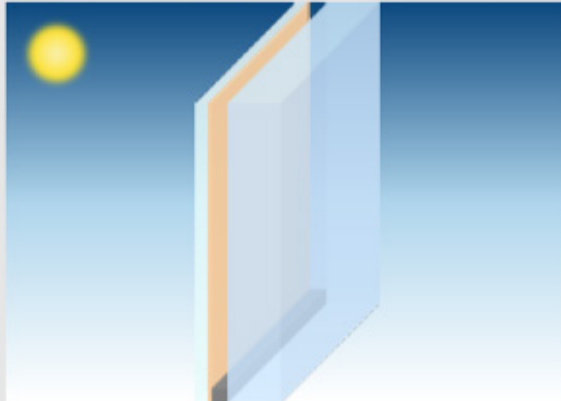
Multilaminated fire resistant glass according to EN 1279-5 of Pilkington **Optiwhite**™ with intumescent interlayers, PVB-layer and 12 mm toughened outer pane.

The pane is covered with a special edge protection tape on all edges.

5. IDM-WU-A60-Openable (standard product)



Calumen III 1.15.
Thursday, April 29, 2021



Pane 1	PLANICLEAR (6 mm) PLANITHERM ULTRA N II
Cavity 1	ARGON (90%) / AIR (10%) / 8 mm
Pane 2	Marine A60 (27 mm)

Vetrotech
Luis de la Cova

luis.delacova@saint-gobain.com

	LUMINOUS FACTORS	CIE (15-2004)
	Light transmission (TL %)	73.6 %
	Outdoor reflection (RLe %)	13.7 %
	Indoor (RLi %)	13.4 %

	SOLAR FACTORS	EN410 (2011-04)
	Solar factor (g)	0.5637
	Shading Coefficient (SC)	0.6479

	COLOR RENDERING	CIE (15-2004)
	Transmission (Ra)	95.7
	Reflection (Ra)	93.9

	ENERGY FACTORS	EN410 (2011-04)
	Transmission (Te)	45.8 %
	Reflection (Ree)	27.0 %
	Indoor (Rel)	14.0 %
	Absorption (AE1)	15.2 %
	Absorption (AE2)	12.0 %

	THERMAL TRANSMISSION	EN673 (2011-04)
	Ug	1.525 W/m².K
	0° related to vertical position	

	MANUFACTURING SIZES	
	Nominal thickness	41.0 mm
	Weight	73.5 kg/m²

	ACOUSTICS	EN12758
	Rw(...)	not available

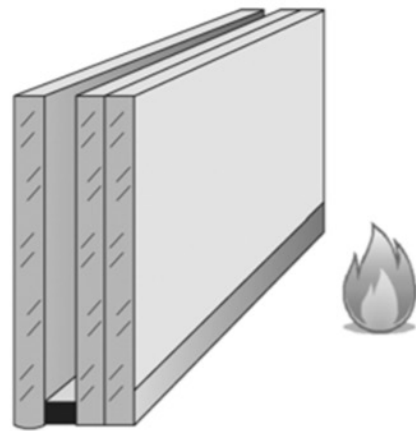
5. IDM-WU-EW60 (standard product)



Pilkington **Pyroclear**® Plus 60-382

Resistance to Fire (EN 13501-2)	EW 60
Application	internal / external
Nominal Thickness	33 mm (16 mm spacer)
Thickness Tolerance	± 2 mm
Weight	41 kg/m²
Direct Airborne Sound Insulation (EN ISO 140-3)	38 dB
Ug-value (EN 673)	1,1 W/m²K (Argon) 1,1 W/m²K (Krypton)
Light Transmittance (EN 410)	75 %
g-value (EN 410)	53 %
Light Reflectance out / in (EN 410)	13 % / 12 %
Pendulum Body Impact Resistance out / in (EN 12600)	1(C)2 / 1(B)1
Burglar Resistance out / in (EN 356)	NPD / P2A
Reaction to Fire (EN 13501-1)	NPD

There are no hazardous ingredients.
The maximum size depends on the national / local approval
of the glazing system.
Tolerances may occur due to application and manufacturing.
Attention to installing direction.
NPD = No Performance Determined.



Fire resistant insulation glass unit according to EN 1279-5 consisting of special toughened and transparent fire resistant outer pane Pilkington **Pyroclear**® Plus S03 with coating on surface 2 and 9 mm (44.2) laminated safety pane Pilkington **Optilam**™.

The pane is covered with a special edge protection tape on all edges.

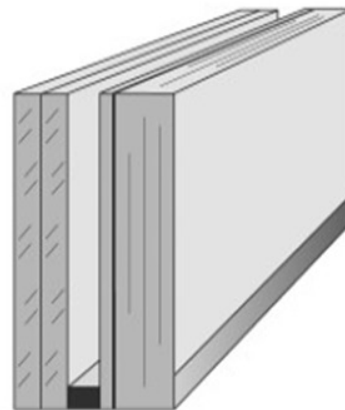
5.

IDM-WU-EW60 (acoustic alternative, not yet fire tested)



Pilkington **Pyrostop**® M 60-371 SCPlus

Resistance to Fire (EN 13501-2)	EI 60
Application	internal / external
Normal Thickness	52 mm (16 mm spacer)
Thickness Tolerance	± 2 mm
Weight	82 kg/m ²
Direct Airborne Sound Insulation (EN ISO 140-3)	50 dB (Krypton)
U _g -value (EN 673)	1,0 W/m ² K (Krypton)
Light Transmittance (EN 410)	77 %
g-value (EN 410)	55 %
Light Reflectance out / in (EN 410)	14 % / 14 %
Pendulum Body Impact Resistance out / in (EN 12600)	1(B)1 / 1(B)1
Burglar Resistance out / in (EN 356)	P2A / P2A
Reaction to fire (EN 13501-1)	D-s1, d2
Max. allowable temperature - 40 °C to + 50 °C	



Multilaminated fire resistant glass according to EN 1279-5 of Pilkington **Optiwhite**™ with intumescent interlayers, sound-control PVB layer and a 9 mm (8.8) laminated safety outer pane Pilkington **Optiphon**™ Therm S3 with coating on surface 2.

The pane is covered with a special edge protection tape on all edges.

There are no hazardous ingredients.
The maximum size depends on the national / local approval of the glazing system.
Tolerances may occur due to application and manufacturing.
Attention to installing direction.

5.

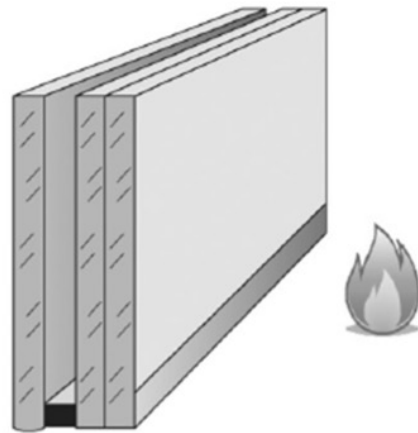
IDM-WU-EW60 (acoustic alternative, not yet fire tested)



Pilkington **Pyroclear**® Plus M 60-372

Resistance to Fire (EN 13501-2)	EW 60
Application	internal / external
Nominal Thickness	33 mm (16 mm spacer)
Thickness Tolerance	± 2 mm
Weight	41 kg/m ²
Direct Airborne Sound Insulation (EN ISO 140-3)	42 dB
Ug-value (EN 673)	1,1 W/m ² K (Argon) 1,1 W/m ² K (Krypton)
Light Transmittance (EN 410)	79 %
g-value (EN 410)	57 %
Light Reflectance out / in (EN 410)	11 % / 11 %
Pendulum Body Impact Resistance out / in (EN 12600)	1(C)2 / 1(B)1
Burglar Resistance out / in (EN 356)	NPD / P2A
Reaction to Fire (EN 13501-1)	NPD

There are no hazardous ingredients.
The maximum size depends on the national / local approval
of the glazing system.
Tolerances may occur due to application and manufacturing.
Attention to installing direction.
NPD = No Performance Determined.



Fire resistant insulation glass unit according to EN 1279-5 consisting of special toughened and transparent fire resistant outer pane Pilkington **Pyroclear**® Plus S03 with coating on surface 2 and 9 mm (8.8) laminated safety pane Pilkington **Optiphon**™.

The pane is covered with a special edge protection tape on all edges.

6. Packing, Storage and Shipment instructions

6.1 Packing, Storage and Shipment instructions

6.1.1 Packing

The windows can be packed as follows:


- Individual, supported by timbers sufficient to support the windows.
The glass pane itself cannot be used as support.
- In boxes – in case the windows will be shipped or reloaded during transport, windows will be packed in boxes instead of crates.
- In containers – windows will be packed in containers in such a way that moving is not possible (sea fastened).

Note:

Depending on the design, IDM supplies the windows including preinstalled window pane or excluding preinstalled window pane.

Packing lists are made per container and besides that all packages have their own package list. Packing list per container contains all the required project information. Format needs to be approved by both parties prior to start shipment.

Marking. All packages are marked with a marking instruction which is suitable for the project. Unless noted otherwise the below label will be used.

<p>CONSIGNEE: PORT OF DESTINATION: PO NUMBER: PROJECT NUMBER: SHIPMENT NO.: BUILDING: DESCRIPTION: NET WEIGHT: GROSS WEIGHT: MEASUREMENT: PACKAGE NUMBER: TOTAL NUMBER OF PACKAGES:</p>	 <p>InterDam KLOMPENMAKERSTRAAT 12 2984 BB RIDDERKERK THE NETHERLANDS</p>
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Note: window packages will be equipped with a tilt indicator.



6.

6.1.2 Storage

During storage contact between stainless steel and mild steel has to be avoided, to prevent contamination with ferrous dust. Therefore keep the boxes/packages closed during storage.

Dry and internal storage is mandatory. For preservation information we refer to paragraph 6.2.5.

6.1.3 Shipment

Pending on packing, as follows:

- a. Crates have to be shipped vertical. Not more than 2 crates on top of each other.
- b. Boxes have to be shipped vertical. Not more than 2 boxes on top of each other.
- c. Containers have to be fixed properly on truck or trailer.

6.2 Unloading, Preservation and Storage instructions

6.2.1 Purpose

To indicate how products should be unpacked, preserved and stored.

6.2.2 Acceptance of goods

Before unloading the goods after delivery, they have to be inspected for any possible damage caused during transport. The recipient should write his name readable in the delivery note. Any damage or defects caused during transport should be written down in the delivery note. InterDam should be immediately informed about the damage or defect. Pictures need to be taken of the goods damaged. Subsequent complaints relating to visible defects will not be dealt with. Reference is made to the tilt indicator as well.

Informing InterDam about damage or defects during transport;

1. Inform InterDam within 24 hours after opening the container for the first time.
2. Damages/defects should be written on the delivery note and signed by recipient (name).
3. Copy of the delivery note + NCR-delivery (see appendix 1) + pictures should be sent to InterDam.

6.2.3 Unloading

Remove pallets/package by means of spread bar and/or slings or by fork lift. Fasten slings on appropriate places. Remove only 1 pallet/package at the time.

- a. Carry out visual inspection during lifting.
- b. On completion of inspection, place pallets/packages in storage area in the same way as during transport.
- c. Products transported vertically to be stored vertically.
- d. Products transported horizontally to be stored horizontally.
- e. During unloading special care to be given to prevent damage of surfaces.
- f. During unloading necessary actions are needed to prevent moisture absorptions by the insulation.
- g. To unload panels mobile or overhead crane with spread bars is preferable.

6.

6.2.4 Storage & preservation

Windows will be transported in ISPM-15 wooden crates as can be seen in example photos below.



Packaging warning icons

Packages are to be stored on a stable, dry and clean supporting area, slightly inclined. Any damage to the crate/package should be repaired immediately. (Special care to be given that products cannot be damaged by work in progress or other goods.) Pallets/packages may be placed on top of each other with a maximum of 2 pallets/crates.

During storage it must be prevented that there will occur contamination with ferrous dust. Refer to paragraph 6.1.2 storage. Dry and internal storage is mandatory, storage temperature min +5 degrees Celsius to max 25 degrees Celsius.

Preservation up to 6 months:

- a. No further requirements on top of the already mentioned instructions in the above paragraphs

Preservation from 6 up to 12 months:

- a. a) Sealant (shelf life of 12 months, to be replaced)

Preservation after installation:

We recommend to apply fire retardant protection boards on the windows during construction phase, to prevent scratches and dents.

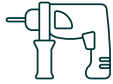







7. Installation & Maintenance procedures

7.1 Procedure

General

Installation of the by InterDam supplied windows requires skilled and experienced personnel. When required, InterDam can assist with the installation (e.g. on-site supervision for guidance or an installation dedicated installation team) please contact the project assigned package manager for the terms and conditions.

It is recommended that all windows are bolted to the structural opening rather than welded. This avoids possible welding distortion and provides flexibility for future window maintenance. If you have any problem with installation please call us for advice. Failure to follow undernoted instructions will invalidate both the fire rating and manufacturer's guarantee.

Activities	Risks	Measures
Drilling and fastening 	<ul style="list-style-type: none"> • Electrocution • Injury by clamping, cutting etc. 	  <ul style="list-style-type: none"> • Personal Protection Equipment (PPE) • Awareness/ Instruction
Crane and lifting 	<ul style="list-style-type: none"> • Falling loads • Collapse • Collide 	  <ul style="list-style-type: none"> • Fixed pointers • Communication • Sustainable surface
Harmful Noise 	<ul style="list-style-type: none"> • Hearing Loss 	 <ul style="list-style-type: none"> • Hearing Protection • Use of proper tools

Preparation

Undernoted tools and equipment are required and must be available prior to the installation:

- Plumb level instrument, manual screwdriver set, electrical screw impact wrench & driver, measuring tape, straight edge, clamp, scaffolding, hammer, sealant device & socket driver set (M8);
- Fixings and fixing accessories, reference is made to the packing list;
- Check if the window matches the opening location and direction;
- Check if the latest (revision) drawings (e.g. window schedule, detail drawings etc.) are available.

Excluded in the delivery: (unless agreed otherwise)

- Shim plates;
- Lifting gear, shackles and wires;
- Ladders, scaffolding;
- Drilling, threading and fastening tools.

7.

7.2 Installation guide

Installation

- a. Check structural opening is correct size (tolerance + 3.0 - 0 mm).
- b. Check that there is no twist of the opening frame or bulkhead (out of plane allowable tolerance of corners ± 2.0 mm)
- c. Check that the opening frame is vertical (tolerance ± 2.0 mm)
- d. Check that the opening frame has straight edges (allowable tolerance ± 2.0 mm at the posts, ± 1.0 mm at the rails).
- e. If any deviation is noted the structural opening must be corrected within the tolerances.
- f. Window frame should be installed as a single unit and should not be dismantled.
- g. Prop the window with wooden battens and shims.
- h. Drill 5.7 mm holes in the structural framing through the holes to suit the self-tapping screws, or fix the window with the self-drilling screws.
- i. Complete the installation by sealing between the window frame and structural frame (if applicable) with a suitable mastic.

General information

- a. Protect the window during commissioning and erection of the platform/module, InterDam advises to cover the window(s) with T-board plates;
- b. Maintenance to be performed according to the IDM maintenance instruction
- c. Consult InterDam when required for further explanation when actual situation differs from the drawings or when tolerances exceeds the allowable tolerances.

Note: if the procedure is not followed InterDam cannot be held responsible for potential quality issues, damages or additional maintenance work.

7.3 Maintenance procedure for windows

Maintenance of the by InterDam supplied windows requires skilled and experienced personnel. When required, InterDam can assist with the maintenance program. (e.g. on-site supervision for guidance or an dedicated maintenance crew).

Please contact the project assigned package manager for the terms and conditions.

Proper and consistent performing of maintenance is necessary, for the InterDam product, to achieve the proposed design lifetime but also to attain the suppliers product Warranty and Certification. Performed

maintenance must subsequently be documented into a log-file and presented to the supplier annually. This enables the supplier to evaluate the condition of the product and to determine if the proposed maintenance is adequate and sufficient.

The advised maintenance procedure and intervals are advised intervals and inspection points, meaning they are recommended, but not limited to the described maintenance intervals and inspections points. InterDam (supplier) cannot be held responsible for not or not properly executed maintenance on the described architectural items.

7.

7.4 General

These instructions are to be used for windows installed on any location in order to maintain correct operation. Advised maintenance interval is yearly. The checklist and frequency are project specific and are subjective to climate, proper installation, conditions etc. After completion/ commissioning all windows must be checked and calibrated or adjusted where needed.

In order to maintain the warranty and quality of the paint, a yearly inspection (including reporting to InterDam, supplier) and clean-up has to be performed. Beware of bird dropping , debris and acids will heavily affect the paint/stainless steel parts of the window and need therefore needs to be removed immediately.

For the inspection of the windows a survey report needs to be completed and addressed to the relevant parties involved, including a copy to InterDam for their records.

Note: All windows are to be checked after platform/buildings are completed and/or installed on the final destination.

7.5 Product Warranty

The minimal maintenance requirements set by Interdam must be met in order to maintain the suppliers product warranty and certification and to keep the product functioning properly throughout the design life.

Minimal requirements:

- Complete product maintenance cleaning according to frequency in section 7.5. To conserve the quality of the paint, and to ensure functioning of the mechanisms, a complete product cleaning is needed to prevent dirt from accumulating.
- Regular cleaning. Beware that bird droppings , debris and acids will heavily affect the paint/stainless steel parts of the window and need to be removed immediately. This is a responsibility of the product owner and should be considered independently from the complete product cleaning and maintenance programme.
- Annual inspection using the maintenance survey. All defects should be documented and repaired.
- Annual reporting to InterDam (supplier). InterDam shall evaluate the effectiveness of the maintenance programme and modify it when required.

7.

7.6 Inspection Points

The following checklist needs to be checked with the frequency determined in section 7.5. All windows to be checked after a platform has been completed/commissioned.

#	Description of maintenance	Replacement criteria	Replacement interval
1	Presence of identification plate to be checked	Poor readability and damaged, replacement to be advised	-
2	Window seals to be checked and to be replaced in case of damage.	Rubber damaged/cracked, rubber replacement Rubber older then 5yr, rubber replacement	5yr
3	Earthing when applicable to be checked and replaced when rusted.	Earthing wire rusted or cracked, earthing replacement Earthing older than 5 yr, earthing replacement	5yr
4	All fixing materials to be checked and to be tightened if necessary.	EPDM sealing damaged, cracked or rusted fixings, install new screws/ bolts.	-
5	Coating to be checked on damages, scratches & corrosion	Partially rusted, window frame not affected, repair to be done. No rust/scratch/damage, no action required	-
6	Glass. Checks to be performed on cracks, chips and other mechanical damages. Furthermore to be checked whether the spacer is still tight (no condensation allowed between the panes).	Condensation between the glass sheets means that the window pane leaks. Window pane needs to be replaced. Same applies for cracks.	-

1. Small damages to be repaired directly.
2. All maintenance to be executed by skilled personnel.

7.7 Other Maintenance Information

Reference is made to the latest revision of the window schedule and G.A. drawing for the relevant ID numbers, quantities to be assessed on a project specific base.

#	Item description	Delivery time (weeks)	Recommended number of spares	Price/each
1	Mastic (storage life of 12 months)	3 weeks	-	TBA
2	Earthing boss	3 weeks	-	TBA

7.8 Coating system windows

Reference is made to the window schedule. Repair to be done according to the paint supplier datasheets.

8. Certification

8.1 Fire resistance type approvals

All window units come with fire approvals, as InterDam has executed over 25 fire tests over the past 10 years. Most fire tests are according to IMO and EI standards. But also USCG tests and other region specific tests have been executed.

Based on the knowledge gained from extensive testing InterDam is able to request verification bodies such as Lloyds and DNV to issue project based Design Appraisal Documents, where project specific requirements are addressed and approved.

InterDam aims to have repetitive questions included in new versions of the type approvals.

Lloyds Register IDM-WU-H120



CERTIFICATE OF FIRE APPROVAL



This is to certify that

The product detailed below will be accepted for compliance with the applicable Lloyd's Register Rules and Regulations and with the International Convention for the Safety of Life at Sea, (SOLAS), 1974, as amended, for use on ships and offshore installations classed with Lloyd's Register, and for use on ships and offshore installations when authorised by contracting governments to issue the relevant certificates, licences, permits etc.

Manufacturer	Van Dam B.V.
Address	Plaza 16 4782 SK Moerdijk The Netherlands
Type	H-120 WINDOW (HYDROCARBON FIRE TEST)
Description	Fire Resisting Rectangular Window – Type: "Van Dam Window H120"
Specified Standard	UK Department of Energy Hydrocarbon Time/Temperature Relationship IMO Res. MSC.307(88) – (2010 FTP Code) Performance Criteria

The attached Design Appraisal Document forms part of this certificate.

This certificate remains valid unless cancelled or revoked, provided the conditions in the attached Design Appraisal Document are complied with and the equipment remains satisfactory in service.

Date of issue	30 October 2018	Expiry date	29 October 2023
Certificate No.	SAS F180267	Signed	 
Sheet No	1 of 3	Name	J. M. Evans Surveyor to Lloyd's Register EMEA A Member of the Lloyd's Register Group

Note:

This certificate is not valid for equipment, the design or manufacture of which has been varied or modified from the specimen tested. The manufacturer should notify Lloyd's Register of any modification or changes to the equipment in order to obtain a valid Certificate.

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Lloyd's Register EMEA (Southampton)

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DESIGN APPRAISAL DOCUMENT

Date 4 October 2018	Quote this reference on all future communications UKITSO/SFS/TA/JE/WP33760395
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ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. SAS F180267

This Design Appraisal Document forms part of the Certificate.

APPROVAL DOCUMENTATION

BRE Global, Bucknalls Lane, Watford, United Kingdom; Test Report No. 287186 dated 21st August 2013.

CONDITIONS OF CERTIFICATION

1. When fitted in a steel bulkhead with an approved H-120 insulation system; suitable for a fire risk on the external side of the window
2. Maximum window dimensions: 1700mm high x 1700mm wide (outer frame size)
3. Maximum glass clear view dimensions: 1396mm high x 1396mm wide
4. Window consists of: on external fire exposed side, glass panel unit manufactured by Vetrotech Saint-Gobain containing multiple glass and gel layers and an outer pressure glass with air gap, with an overall thickness of 59mm; an 8mm air gap between glass units; on internal non-exposed side, glass panel unit manufactured by Vetrotech Saint-Gobain, containing multiple glass and gel layers, with an overall thickness of 78mm
5. Glass units contained within a steel window frame unit consisting of from the external, fire-exposed side: 5mm thick steel base frame, fibrous seal, 59mm glass unit, fibrous seal, spacer bar, fibrous seal, 78mm glass unit, fibrous seal, 5mm thick steel frame lid, 1mm thick steel lid cover. Gap between frame lid and cover filled with insulation type 'Firemaster Marine FM plus Blanket'. Base frame and frame lid secured together with M8 steel bolts at 360mm maximum spacing. Base frame secured to bulkhead with 6.3mm self-tapping screws at 360mm maximum spacing
6. Composition, application and installation of sub components, including glass, adhesives, seals and any fire retardants, to be maintained in production and use in accordance with originally tested composition formula and method of application and installation, and manufacturer's instructions
7. Production items are to be manufactured in accordance with a quality control system which shall be maintained to ensure that items are of the same standard as the approved prototype

NOTES

1. The window was also subjected to a Hose Stream Test immediately after the fire test and maintained integrity in accordance with MSC 307(88) Annex 1 Part 3, Appendix 2, A.I, Section 5
2. The window was also subjected to a Thermal Radiation Test during the fire test, in accordance with MSC 307(88) Annex 1 Part 3, Appendix 3, and a Heat Flux of 0.1 kW/m² was reported. (An A-60 window is considered acceptable by this test if the heat flux does not exceed 2.34 kW/m² at 60 mins)



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DESIGN APPRAISAL DOCUMENT

Date 4 October 2018	Quote this reference on all future communications UKITSO/SFS/TA/JE/WP33760395
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ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. SAS F180267

PLACE OF PRODUCTION

NSBC Polska Sp. Z o.o Sp.k UL Hoza 66/68 00-682 Warszawa Poland	Karbonas S. Lozoraicio str. 39 LT-53228 Garliava Kaunas distr Lithuania
--	---



Jessica Evans
Senior Specialist
Fire & Safety, Statutory Discipline Team
UK&I Technical Support Office, Marine & Offshore
Lloyd's Register EMEA

Supplementary Type Approval Terms and Conditions

This certificate and Design Appraisal Document relates to type approval, it certifies that the prototype(s) of the product(s) referred to herein has/have been found to meet the applicable design criteria for the use specified herein, it does not mean or imply approval for any other use, nor approval of any products designed or manufactured otherwise than in strict conformity with the said prototype(s).

Lloyd's Register IDM-WU-A60-Openable



CERTIFICATE OF FIRE APPROVAL

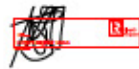
This is to certify that

The product detailed below will be accepted for compliance with the applicable Lloyd's Register Rules and Regulations and with the International Convention for the Safety of Life at Sea, (SOLAS), 1974, as amended, for use on ships and offshore installations classed with Lloyd's Register, and for use on ships and offshore installations when authorised by contracting governments to issue the relevant certificates, licences, permits etc.

Manufacturer	Van Dam B.V.
Address	Plaza 16 4782 SK Moerdijk The Netherlands
Type	A-60 DOOR SINGLE LEAF HINGED
Description	Fire Resisting Single Leaf Door - Type: "Van Dam Escape Hatch (A-60)"
Specified Standard	IMO Res. MSC.307(88) - (2010 FTP Code) Annex 1 Part 3

The attached Design Appraisal Document forms part of this certificate.

This certificate remains valid unless cancelled or revoked, provided the conditions in the attached Design Appraisal Document are complied with and the equipment remains satisfactory in service.

Date of issue	14 March 2017	Expiry date	13 March 2022
Certificate No.	SAS F170061	Signed	
Sheet No	1 of 3	Name	J. M. Evans Surveyor to Lloyd's Register EMEA A Member of the Lloyd's Register Group

Note:

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DESIGN APPRAISAL DOCUMENT

Date	Quote this reference on all future communications
14 March 2017	SOUTSO/SFS/JE/WP27928236

ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. SAS F170061

This Design Appraisal Document forms part of the Certificate.

APPROVAL DOCUMENTATION

Exova Warringtonfire, Holmesfield Road, Warrington, WA1 2DS, United Kingdom, Fire Test Report No. 361955 Issue 2 dated 2nd June 2016.

CONDITIONS OF CERTIFICATION

1. When fitted in an approved A Class steel bulkhead
2. Escape hatch door leaf consisting of: 3mm thick steel 'Z' profile and 20mm wide × 3mm thick (compressed to 2mm thick) glass edge seal type 'Kerafix 200uhn GmbH, retaining glass unit type 'CONTRAFLAM Marine A60' manufactured by Vetrotech Saint-Gobain', clear glass size 960mm high × 960mm wide, composed of, from fire exposed side: (27mm thick 'Contraflam' glass sheet + 8mm air gap + 6mm thick 'Planitheim Ultra' glass sheet). Glazing unit retained between profiles with M5 steel screws
3. Glass unit lined with graphite based intumescent seals type 'Promaseal PL' manufactured by Promat BV and sealed with silicone mastic type 'Promaseal-S' manufactured by Promat BV
4. Maximum door leaf size: 1070mm high × 1135mm wide × 51mm thick
5. Maximum clear opening size: 980mm high × 1049mm wide
6. Door leaf fitted with 2 steel hinges, steel handle and steel hand grip pull ring
7. Door frame consisting of 3mm thick steel secured to bulkhead with 6.3mm diameter steel screws, 5 screws per side of frame
8. Composition, application and installation of sub components, including adhesives, seals and any fire retardants, to be maintained in production and use in accordance with originally tested composition formula and method of application and installation, and manufacturer's instructions
9. Production items are to be manufactured in accordance with a quality control system which shall be maintained to ensure that items are of the same standard as the approved prototype

NOTE

The glass unit was subjected to the Hose-Stream Test and maintained integrity



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DESIGN APPRAISAL DOCUMENT

Date	Quote this reference on all future communications
14 March 2017	SOUTSO/SFS/JE/WP27928236

ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. SAS F170061

PLACE OF PRODUCTION

Van Dam B.V.
Plaza 16
4782 SK Moerdijk
The Netherlands

Van Dam B.V.
S. Lozoraicio str. 39
LT-53228 Garliava
Kaunas distr
Lithuania

Van Dam B.V.
ul. Olszynowa 1
PL 62-070 Zakrzewo
Poland



Jessica Evans
Senior Surveyor
Statutory Fire & Safety
Southampton Technical Support Office, Marine & Offshore
Lloyd's Register EMEA

Supplementary Type Approval Terms and Conditions

This certificate and Design Appraisal Document relates to type approval, it certifies that the prototype(s) of the product(s) referred to herein has/have been found to meet the applicable design criteria for the use specified herein, it does not mean or imply approval for any other use, nor approval of any products designed or manufactured otherwise than in strict conformity with the said prototype(s).

Lloyd's Register IDM-WU-A60-Openable (Module B)



EC TYPE EXAMINATION (MODULE B) CERTIFICATE

This is to certify that:

LLOYD'S REGISTER VERIFICATION LIMITED (LRV), designated as a "notified body" under the terms of the Merchant Shipping (Marine Equipment) Regulations 2016 (S.I. 2016 No.1025), did undertake the relevant type approval procedures for the equipment identified below which was found to be in compliance with the essential Fire protection requirements of Marine Equipment Directive (MED) 2014/90/EU subject to any conditions in the Design Appraisal Document attached hereto.

Manufacturer	Van Dam B.V.
Address	Plaza 16 4782 SK Moerdijk The Netherlands
Annex A1 Item	A.1/3.16 - FIRE DOORS
Product Type	A-60 DOOR SINGLE LEAF HINGED
Product Description	Fire-Resisting 'A' Class Door - Type "Van Dam Escape Hatch (A-60)"
Specified Standard	IMO Res. MSC.307(88) - (2010 FTP Code) Annex 1 Part 3

The attached Design Appraisal Document (schedule) forms part of this certificate.

This certificate remains valid unless cancelled or revoked, provided the conditions in the attached schedule are complied with and the equipment remains satisfactory in service.

Date of issue	14 March 2017	Expiry date	13 March 2022
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Certificate No.	MED 1750045	Signed	 
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Sheet No.	1 of 3	Name	J. M. Evans For and on behalf of Lloyd's Register Verification LRV EC Distinguishing No. 0038
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Note:

This certificate is issued under the authority of the MCA.

This certificate is not valid for equipment; the design or manufacture of which has been varied or modified from the specimen tested. The manufacturer should notify the notified body named on this certificate of any modification or changes to the equipment in order to obtain a valid Certificate.

Lloyd's Register Verification Limited (Reg. no. 4929226) is a limited company registered in England and Wales. Registered office: 71 Fenchurch Street, London, EC3M 4BS, UK. A subsidiary of Lloyd's Register Group Limited.

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DESIGN APPRAISAL DOCUMENT

Date 14 March 2017	Quote this reference on all future communications SOUTSO/SPS/TA/JE/WP27982455
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ATTACHMENT TO EC TYPE EXAMINATION (MODULE B) CERTIFICATE No. MED 1750045

The undernoted documents have been appraised for compliance with the relevant requirements of International Conventions and European Union legislation for the EC Type Examination of Marine Equipment for use on Merchant Ships Registered in the European Economic Area.

This Design Appraisal Document (schedule) forms part of the Certificate.

APPROVAL DOCUMENTATION

Exova Warringtonfire, Holmesfield Road, Warrington, WA1 2DS, United Kingdom, Fire Test Report No. 361955 Issue 2 dated 2nd June 2016.

CONDITIONS OF CERTIFICATION

1. When fitted in an approved A Class steel bulkhead
2. Escape hatch door leaf consisting of: 3mm thick steel 'Z' profile and 20mm wide x 3mm thick (compressed to 2mm thick) glass edge seal type 'Kerafix 200uhm GmbH, retaining glass unit type 'CONTRAFLAM Marine A60' manufactured by Vetrotech Saint-Gobain', clear glass size 960mm high x 960mm wide, composed of, from fire exposed side: (27mm thick 'Contraflam' glass sheet + 8mm air gap + 6mm thick 'Planitrium Ultra' glass sheet). Glazing unit retained between profiles with M5 steel screws
3. Glass unit lined with graphite based intumescent seals type 'Promaseal PL' manufactured by Promat BV and sealed with silicone mastic type 'Promaseal-S' manufactured by Promat BV
4. Maximum door leaf size: 1070mm high x 1135mm wide x 51mm thick
5. Maximum clear opening size: 980mm high x 1049mm wide
6. Door leaf fitted with 2 steel hinges, steel handle and steel hand grip pull ring.
7. Door frame consisting of 3mm thick steel secured to bulkhead with 6.3mm diameter steel screws, 5 screws per side of frame
8. Composition, application and installation of sub components, including adhesives, seals and any fire retardants, to be maintained in production and use in accordance with originally tested composition formula and method of application and installation, and manufacturer's instructions
9. Production items of the subject equipment are to be manufactured in accordance with either an approved Production Quality Assurance system (Module D), a Product-Quality assurance system (Module E) or a Product Verification Process (Module F). The wheelmark cannot be affixed to the product until a conformity assessment module is in place
10. Each item, batch or lot of the equipment is to be issued with a "Declaration of Conformity" and have the "Mark of Conformity" affixed after a conformity assessment module is in place

NOTE

The glass unit was subjected to the Hose-Stream Test and maintained integrity.



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DESIGN APPRAISAL DOCUMENT

Date	Quote this reference on all future communications
14 March 2017	SOUTSO/SFS/TA/JE/WP27982455

ATTACHMENT TO EC TYPE EXAMINATION (MODULE B) CERTIFICATE No. MED 1750045

PLACES OF PRODUCTION

Van Dam B.V.
Plaza 16
4782 SK Moerdijk
The Netherlands

Van Dam B.V.
S. Lozoraicio str. 39
LT-53228 Garliava
Kaunas distr
Lithuania

Van Dam B.V.
ul. Olszynowa 1
PL 62-070 Zakrzewo
Poland



Jessica Evans
Senior Specialist
Statutory Fire & Safety
Southampton Technical Support Office, Marine & Offshore
For and on behalf of Lloyd's Register Verification
LRV EC Distinguishing No. 0038

Lloyd's Register IDM-WU-A60 (Canada)



Transport
Canada
Safety and Security



CERTIFICATE OF TYPE APPROVAL ISSUED ON BEHALF OF TRANSPORT CANADA

This is to certify that

The product detailed below will be accepted for compliance with the applicable Lloyd's Register Rules and Regulations with regards to the International Convention for the Safety of Life at Sea, (SOLAS), 1974, as amended, for use on ships and offshore installations classed with Lloyd's Register, and for use on ships and offshore installations when authorised by Transport Canada to issue the relevant certificates, licences, permits etc.

Manufacturer	InterDam Holding BV
Address	Waldijk 135 2988 AW Ridderkerk The Netherlands
Type	A-60 WINDOW (STANDARD FIRE TEST)
Description	Fire Resisting Rectangular Window - Type: "IDM-WU-A60"
Specified Standard	IMO Res. MSC.307(88) - (2010 FTP Code) Annex 1 Part 3

The attached Design Appraisal Document forms part of this certificate.

This certificate remains valid unless cancelled or revoked, provided the conditions in the attached Design Appraisal Document are complied with and the equipment remains satisfactory in service.

Date of issue	26 July 2018	Expiry date	17 July 2023
Certificate No.	LRTC 0000216/M1	Signed	
Sheet No	1 of 3	Name	J.M. Evans Surveyor to Lloyd's Register EMEA A Member of the Lloyd's Register Group

Note:

This certificate is not valid for equipment, the design or manufacture of which has been varied or modified from the specimen tested. The manufacturer should notify Lloyd's Register of any modification or changes to the equipment in order to obtain a valid Certificate.

Lloyd's Register Group Limited, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as the 'Lloyd's Register'. Lloyd's Register assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless that person has signed a contract with the relevant Lloyd's Register entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.



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Document number
LRTC 0000216/M1
Issue number
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DESIGN APPRAISAL DOCUMENT

Date	Quote this reference on all future communications
26 July 2018	SOUTSO/SFS/TA/JE/WP32927879

ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. LRTC 0000216/M1

This Design Appraisal Document forms part of the Certificate

APPROVAL DOCUMENTATION

Efectis Nederland, Brandpuntlaan Zuid 16, 2665 NZ Bleiswijk, The Netherlands, Fire Test Reports No. 2018-Efectis-R000586 dated 1st May 2018.

CONDITIONS OF CERTIFICATION

1. **Restricted Application:** When fitted in a steel bulkhead with an A-60 approved insulation system; suitable for a fire risk on the external side of the window
2. When fitted in an approved steel bulkhead
3. Glass panel unit consisting of: 'Thermobel Silicone' compound glass unit manufactured by AGC, comprising 8mm thick toughened 'Pl Clearlite' pane, a 8mm air gap and 29mm thick 'Pyrobel 25 EG' incl PVB multi pane glass unit. Overall thickness: 45mm. Orientation in installation to be as per tested unit
4. Maximum glass size: 1834mm wide × 2034mm high × 45 mm thick
5. Maximum clear glass size: 1792mm wide × 1992mm high
6. Glass panes fitted within aluminium pressure plate and rods on non fire exposed side. Promatex-H border fitted to perimeter of glass pane. Pressure plates covered with 0.75mm thick galvanised steel flashing filled with Skamol Skamopro 300 calcium silicate core. Fitted with gasket type '455-501' manufactured by Jansen Art, and intumescent strips type 'Promaseal PL' manufactured by Promat and 'Ceramic Fire Tape' manufactured by Bloem sealants
7. Window frame fitted to steel 'Z' pieces bolted to the bulkhead with M10 screws
8. Glass fitted in windows and side scuttles for external use should, in addition to the required fire resisting ability, as appropriate, be of toughened quality and suitable to satisfy the operational requirements of the location in which the glass is fitted. For example, consideration should be given to the 1966 Load Line Convention Regulation 20 - side scuttles
9. Composition, application and installation of sub components, including window glass, adhesives, seals and any fire retardants, to be maintained in production and use in accordance with originally tested composition formula and method of application and installation, and manufacturer's instructions
10. Production items are to be manufactured in accordance with a quality control system which shall be maintained to ensure that items are of the same standard as the approved prototype
11. All instructions or markings that accompany life-saving appliances or are printed directly on the appliances must be both in English and French, as per Canadian procedures for approval of life-saving appliances and fire safety systems, equipment and products document no. TP 14612E (05/2011) paragraph 2.2.1.3. However independent signage can be accepted in lieu of the instructions or markings required in paragraph 2.2.1.3 if it is in both English and French, highly visible (size, colour, posting location), water and weather proof and posted at each muster station and where the appliance is stored



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Lloyd's Register EMEA

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LRTC 0000216/M1
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1

DESIGN APPRAISAL DOCUMENT

Date	Quote this reference on all future communications
26 July 2018	SOUTSO/SFS/TA/JE/WP32927879

ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. LRTC 0000216/M1

PLACE OF PRODUCTION

InterDam BV
Benedenrijweg 186
2987 VB Ridderkerk
The Netherlands



Jessica Evans
Senior Surveyor
Statutory Fire & Safety
Southampton Technical Support Office, Marine & Offshore
Lloyd's Register EMEA

Supplementary Type Approval Terms and Conditions

This certificate and Design Appraisal Document relates to type approval, it certifies that the prototype(s) of the product(s) referred to herein has/have been found to meet the applicable design criteria for the use specified herein, it does not mean or imply approval for any other use, nor approval of any products designed or manufactured otherwise than in strict conformity with the said prototype(s).

Lloyd's Register IDM-WU-A60-Openable (Module B)



EC TYPE EXAMINATION (MODULE B) CERTIFICATE

This is to certify that:

LOYD'S REGISTER VERIFICATION LIMITED (LRV), designated as a "notified body" under the terms of the Merchant Shipping (Marine Equipment) Regulations 2016 (S.I. 2016 No.1025), did undertake the relevant type approval procedures for the equipment identified below which was found to be in compliance with the essential Fire protection equipment requirements of Marine Equipment Directive (MED) 2014/90/EU and Commission Implementing Regulation (EU) 2018/773 indicating design, construction and performance requirements and testing standards for marine equipment, subject to any conditions in the Design Appraisal Document attached hereto.

Manufacturer (Applicant)	InterDam Holding B.V
Address	Waalwijk 135 2988 AW Ridderkerk The Netherlands
Reference	Regulation (EU) 2018/773
Regulation Item (No & Item designation)	MED/3.25 'A' AND 'B' CLASS FIRE PROOF WINDOWS AND SIDE SCUTTLES
Product Type	A-60 WINDOW (STANDARD FIRE TEST)
Product Description	Fire Resisting Rectangular Window - Type: "IDM-WU-A60"
Specified Standard	IMO Res. MSC.307(88) - (2010 FTP Code) Annex 1 Part 3

The attached Design Appraisal Document (schedule) forms part of this certificate.

This certificate remains valid unless cancelled or revoked, provided the conditions in the attached schedule are complied with and the equipment remains satisfactory in service.

Date of issue	26 July 2018	Expiry date	17 July 2023
Certificate No.	MED 1850146/M1	Signed	
Sheet No.	1 of 3	Name	J.M. Evans For and on behalf of Lloyd's Register Verification LRV EC Distinguishing No. 0038

Note:

This certificate is issued under the authority of the MCA.

This certificate is not valid for equipment; the design or manufacture of which has been varied or modified from the specimen tested. The manufacturer should notify the notified body named on this certificate of any modification or changes to the equipment in order to obtain a valid Certificate.

Lloyd's Register Verification Limited (Reg. no. 4929226) is a limited company registered in England and Wales. Registered office: 71 Fenchurch Street, London, EC3M 4BS, UK. A subsidiary of Lloyd's Register Group Limited.

Lloyd's Register Group Limited, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as the 'Lloyd's Register'. Lloyd's Register assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless that person has signed a contract with the relevant Lloyd's Register entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.



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DESIGN APPRAISAL DOCUMENT

Date 26 July 2018	Quote this reference on all future communications SOUTSO/SPS/TA/JE/WP32927879
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ATTACHMENT TO EC TYPE EXAMINATION (MODULE B) CERTIFICATE No. MED 1850146/M1

The undernoted documents have been appraised for compliance with the relevant requirements of International Conventions and European Union legislation for the EC Type Examination of Marine Equipment for use on Merchant Ships Registered in the European Economic Area.

This Design Appraisal Document (schedule) forms part of the Certificate.

APPROVAL DOCUMENTATION

Efectis Nederland, Brandpuntlaan Zuid 16, 2665 NZ Bleiswijk, The Netherlands, Fire Test Reports No. 2018-Efectis-R000586 dated 1st May 2018.

CONDITIONS OF CERTIFICATION

1. Restricted Application: When fitted in a steel bulkhead with an A-60 approved insulation system; suitable for a fire risk on the external side of the window
2. Glass panel unit consisting of: 'Thermobel Silicone' compound glass unit manufactured by AGC, comprising 8mm thick toughened 'PI Clearlite' pane, a 8mm air gap and 29mm thick 'Pyrobel 25 EG' incl PVB multi pane glass unit. Overall thickness: 45mm. Orientation in installation to be as per tested unit
3. Maximum glass size: 1834mm wide x 2034mm high x 45 mm thick
4. Maximum clear glass size: 1792mm wide x 1992mm high
5. Glass panes fitted within aluminium pressure plate and rods on non fire exposed side. Promatect-H border fitted to perimeter of glass pane. Pressure plates covered with 0.75mm thick galvanised steel flashing filled with Skamol Skamopro 300 calcium silicate core. Fitted with gasket type '455-501' manufactured by Jansen Art, and intumescent strips type 'Promaseal PL' manufactured by Promat and 'Ceramic Fire Tape' manufactured by Bloem sealants
6. Window frame fitted to steel 'Z' pieces bolted to the bulkhead with M10 screws
7. Glass fitted in windows and side scuttles for external use should, in addition to the required fire resisting ability, as appropriate, be of toughened quality and suitable to satisfy the operational requirements of the location in which the glass is fitted. For example, consideration should be given to the 1966 Load Line Convention Regulation 20 - side scuttles
8. Composition, application and installation of sub components, including window glass, adhesives, seals and any fire retardants, to be maintained in production and use in accordance with originally tested composition formula and method of application and installation, and manufacturer's instructions
9. Production items of the subject equipment are to be manufactured in accordance with either an approved Production Quality Assurance system (Module D), a Product-Quality assurance system (Module E) or a Product Verification Process (Module F). The wheelmark cannot be affixed to the product until a conformity assessment module is in place
10. Each item, batch or lot of the equipment is to be issued with a "Declaration of Conformity" and have the "Mark of Conformity" affixed after a conformity assessment module is in place



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DESIGN APPRAISAL DOCUMENT

Date 26 July 2018	Quote this reference on all future communications SOUTSO/SPS/TA/JE/WP32927879
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ATTACHMENT TO EC TYPE EXAMINATION (MODULE B) CERTIFICATE No. MED 1850146/M1

PLACE OF PRODUCTION

InterDam BV
Benedenrijweg 186
2987 VB Ridderkerk
The Netherlands



Jessica Evans
Senior Specialist
Statutory Fire & Safety
Southampton Technical Support Office, Marine & Offshore
For and on behalf of Lloyd's Register Verification
LRV EC Distinguishing No. 0038

Lloyd's Register IDM-WU-A60



CERTIFICATE OF FIRE APPROVAL


This is to certify that

The product detailed below will be accepted for compliance with the applicable Lloyd's Register Rules and Regulations and with the International Convention for the Safety of Life at Sea, (SOLAS), 1974, as amended, for use on ships and offshore installations classed with Lloyd's Register, and for use on ships and offshore installations when authorised by contracting governments to issue the relevant certificates, licences, permits etc.

Manufacturer	InterDam Holding BV
Address	Waaldijk 135 2988 AW Ridderkerk The Netherlands
Type	A-60 WINDOW (STANDARD FIRE TEST)
Description	Fire Resisting Rectangular Window – Type: "IDM-WU-A60"
Specified Standard	IMO Res. MSC.307(88) – (2010 FTP Code) Annex 1 Part 3

The attached Design Appraisal Document forms part of this certificate.

This certificate remains valid unless cancelled or revoked, provided the conditions in the attached Design Appraisal Document are complied with and the equipment remains satisfactory in service.

Date of issue	26 July 2018	Expiry date	17 July 2023
Certificate No.	SAS F180205/MI	Signed	
Sheet No	1 of 3	Name	J. M. Evans Surveyor to Lloyd's Register EMEA A Member of the Lloyd's Register Group

Note:

This certificate is not valid for equipment, the design or manufacture of which has been varied or modified from the specimen tested. The manufacturer should notify Lloyd's Register of any modification or changes to the equipment in order to obtain a valid Certificate.

Lloyd's Register Group Limited, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as the 'Lloyd's Register'. Lloyd's Register assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless that person has signed a contract with the relevant Lloyd's Register entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.



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DESIGN APPRAISAL DOCUMENT

Date 26 July 2018	Quote this reference on all future communications SOUTSO/SFS/TA/JE/WP32927879
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ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. SAS F180205/M1

This Design Appraisal Document forms part of the Certificate.

APPROVAL DOCUMENTATION

Efectis Nederland, Brandpuntlaan Zuid 16, 2665 NZ Bleiswijk, The Netherlands, Fire Test Reports No. 2018-Efectis-R000586 dated 1st May 2018.

CONDITIONS OF CERTIFICATION

1. Restricted Application: When fitted in a steel bulkhead with an A-60 approved insulation system; suitable for a fire risk on the external side of the window
2. Glass panel unit consisting of: 'Thermobel Silicone' compound glass unit manufactured by AGC, comprising 8mm thick toughened 'PI Clearlite' pane, a 8mm air gap and 29mm thick 'Pyrobel 25 EG' incl PVB multi pane glass unit. Overall thickness: 45mm. Orientation in installation to be as per tested unit
3. Maximum glass size: 1834mm wide × 2034mm high × 45 mm thick
4. Maximum clear glass size: 1792mm wide × 1992mm high
5. Glass panes fitted within aluminium pressure plate and rods on non fire exposed side. Promatect-H border fitted to perimeter of glass pane. Pressure plates covered with 0.75mm thick galvanised steel flashing filled with Skamol Skamopro 300 calcium silicate core. Fitted with gasket type '455-501' manufactured by Jansen Art, and intumescent strips type 'Promaseal PL' manufactured by Promat and 'Ceramic Fire Tape' manufactured by Bloem sealants
6. Window frame fitted to steel 'Z' pieces bolted to the bulkhead with M10 screws
7. Glass fitted in windows and side scuttles for external use should, in addition to the required fire resisting ability, as appropriate, be of toughened quality and suitable to satisfy the operational requirements of the location in which the glass is fitted. For example, consideration should be given to the 1966 Load Line Convention Regulation 20 – side scuttles
8. Composition, application and installation of sub components, including window glass, adhesives, seals and any fire retardants, to be maintained in production and use in accordance with originally tested composition formula and method of application and installation, and manufacturer's instructions
9. Production items are to be manufactured in accordance with a quality control system which shall be maintained to ensure that items are of the same standard as the approved prototype



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DESIGN APPRAISAL DOCUMENT

Date	Quote this reference on all future communications
26 July 2018	SOUTSO/SFS/TA/JE/WP32927879

ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. SAS F180205/M1

PLACE OF PRODUCTION

InterDam BV
Benedenrijweg 186
2987 VB Ridderkerk
The Netherlands



Jessica Evans
Senior Surveyor
Statutory Fire & Safety
Southampton Technical Support Office, Marine & Offshore
Lloyd's Register EMEA

Supplementary Type Approval Terms and Conditions

This certificate and Design Appraisal Document relates to type approval, it certifies that the prototype(s) of the product(s) referred to herein has/have been found to meet the applicable design criteria for the use specified herein, it does not mean or imply approval for any other use, nor approval of any products designed or manufactured otherwise than in strict conformity with the said prototype(s).

Lloyd's Register IDM-WU-A60 (Fire Post Bast - Canada)



Transport
Canada
Safety and Security



CERTIFICATE OF TYPE APPROVAL ISSUED ON BEHALF OF TRANSPORT CANADA

This is to certify that

The product detailed below will be accepted for compliance with the applicable Lloyd's Register Rules and Regulations with regards to the International Convention for the Safety of Life at Sea, (SOLAS), 1974, as amended, for use on ships and offshore installations classed with Lloyd's Register, and for use on ships and offshore installations when authorised by Transport Canada to issue the relevant certificates, licences, permits etc.

Manufacturer	InterDam Holding B.V
Address	Waaldijk 135 2988 AW Ridderkerk The Netherlands
Type	A-60 WINDOW (STANDARD FIRE TEST)
Description	Fire Resisting Window - Type: "IDM-WU-A60" fire post blast window
Specified Standard	IMO Res. MSC.307(88) - (2010 FTP Code) Annex 1 Part 3

The attached Design Appraisal Document forms part of this certificate.
This certificate remains valid unless cancelled or revoked, provided the conditions in the attached Design Appraisal Document are complied with and the equipment remains satisfactory in service.

Date of issue	27 March 2017	Expiry date	20 March 2022
Certificate No.	LRTC 0000135/M1	Signed	 Southern Europe & Africa Lloyd's Register EMEA
Sheet No	1 of 3	Name	J. M. Evans Surveyor to Lloyd's Register EMEA A Member of the Lloyd's Register Group

Note:

This certificate is not valid for equipment, the design or manufacture of which has been varied or modified from the specimen tested. The manufacturer should notify Lloyd's Register of any modification or changes to the equipment in order to obtain a valid Certificate.

Lloyd's Register Group Limited, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as the 'Lloyd's Register'. Lloyd's Register assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless that person has signed a contract with the relevant Lloyd's Register entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.



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DESIGN APPRAISAL DOCUMENT

Date	Quote this reference on all future communications
27 March 2017	SOUTSO/SFS/TA/JE/WP28398324

ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. LRTC 0000135/M1

This Design Appraisal Document forms part of the Certificate.

APPROVAL DOCUMENTATION

Efectis Nederland, Brandpuntlaan Zuid 16, 2665 NZ Bleiswijk, The Netherlands, Fire Test Report No. 2016-Efectis-R001694 dated January 2017

CONDITIONS OF CERTIFICATION

1. Restricted Application: When fitted in a steel bulkhead with an A-60 approved insulation system; suitable for a fire risk on the external side of the window
2. Two window sections, each consist of from non-exposed side: 27mm thick 'Pyrostop 60-261' glass panel followed by 16mm gap followed by 12mm thick thermally toughened glass on exposed side. Glass manufactured by Pilkington. Total thickness 55mm
3. Maximum glass panel dimensions: 1128mm high x 653mm wide
4. Maximum window clear opening dimensions: 1200mm high x 1400mm wide
5. Window panels fitted between two steel profiles bolted together with M10 bolts, and secured to the bulkhead with M10 bolts
6. Glass fitted in windows and side scuttles for external use should, in addition to the required fire resisting ability, as appropriate, be of toughened quality and suitable to satisfy the operational requirements of the location in which the glass is fitted. For example, consideration should be given to the 1966 Load Line Convention Regulation 20 - side scuttles
7. Composition, application and installation of sub components, including adhesives, seals and any fire retardants, to be maintained in production and use in accordance with originally tested composition formula and method of application and installation, and manufacturer's instructions
8. Production items are to be manufactured in accordance with a quality control system which shall be maintained to ensure that items are of the same standard as the approved prototype
9. All instructions or markings that accompany life-saving appliances or are printed directly on the appliances must be both in English and French, as per Canadian procedures for approval of life-saving appliances and fire safety systems, equipment and products document no. TP 14612E (05/2011) paragraph 2.2.1.3. However independent signage can be accepted in lieu of the instructions or markings required in paragraph 2.2.1.3 if it is in both English and French, highly visible (size, colour, posting location), water and weather proof and posted at each muster station and where the appliance is stored



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DESIGN APPRAISAL DOCUMENT

Date	Quote this reference on all future communications
27 March 2017	SOUTSO/SFS/TA/JE/WP28398324

ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. LRTC 0000135/M1

NOTE

The window was fire tested after previously being tested to blast test in accordance with EN13124-1:2001 with peak reflected pressure of shock wave of 30kPa. TNO Report 16EBP/174 dated 22nd December 2016 refers

PLACE OF PRODUCTION

InterDam BV
Benedenrijweg 186
2987 VB Ridderkerk
The Netherlands



Jessica Evans
Senior Surveyor
Statutory Fire & Safety
Southampton Technical Support Office, Marine & Offshore
Lloyd's Register EMEA

Supplementary Type Approval Terms and Conditions

This certificate and Design Appraisal Document relates to type approval, it certifies that the prototype(s) of the product(s) referred to herein has/have been found to meet the applicable design criteria for the use specified herein, it does not mean or imply approval for any other use, nor approval of any products designed or manufactured otherwise than in strict conformity with the said prototype(s).

Lloyd's Register IDM-WU-A60 (Fire Post Blast - Module B)



Notified Body authorised by the MCA



EC TYPE EXAMINATION (MODULE B) CERTIFICATE

This is to certify that:

LLOYD'S REGISTER VERIFICATION LIMITED (LRV), designated as a "notified body" under the terms of the Merchant Shipping (Marine Equipment) Regulations 2016 (S.I. 2016 No.1025), did undertake the relevant type approval procedures for the equipment identified below which was found to be in compliance with the essential Fire protection requirements of Marine Equipment Directive (MED) 2014/90/EU subject to any conditions in the Design Appraisal Document attached hereto.

Manufacturer (Applicant) Address	InterDam Holding B.V Waldijk 135 2988 AW Ridderkerk The Netherlands
Reference/Regulation Item (No & Item designation)	MED/3.25 'A' AND 'B' CLASS FIRE PROOF WINDOWS AND SIDE SCUTTLES
Product Type	A-60 WINDOW (STANDARD FIRE TEST)
Product Description	Fire Resisting Window - Type: "IDM-WU-A60" fire post blast window
Specified Standard	IMO Res. MSC.307(88) - (2010 FTP Code) Annex 1 Part 3

The attached Design Appraisal Document (schedule) forms part of this certificate.

This certificate remains valid unless cancelled or revoked, provided the conditions in the attached schedule are complied with and the equipment remains satisfactory in service.

Date of issue 27 March 2017 Expiry date 20 March 2022

Certificate No. MED 1750051/M1 Signed



Sheet No. 1 of 3 Name J. M. Evans
For and on behalf of Lloyd's Register Verification
LRV EC Distinguishing No. 0038

Note:

This certificate is issued under the authority of the MCA.

This certificate is not valid for equipment; the design or manufacture of which has been varied or modified from the specimen tested. The manufacturer should notify the notified body named on this certificate of any modification or changes to the equipment in order to obtain a valid Certificate.

Lloyd's Register Verification Limited (Reg. no. 4929226) is a limited company registered in England and Wales. Registered office: 71 Fenchurch Street, London, EC3M 4BS, UK. A subsidiary of Lloyd's Register Group Limited.

Lloyd's Register Group Limited, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as the 'Lloyd's Register'. Lloyd's Register assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless that person has signed a contract with the relevant Lloyd's Register entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.



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DESIGN APPRAISAL DOCUMENT

Date 27 March 2017	Quote this reference on all future communications SOUTSO/SFS/TA/JE/WP28398324
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ATTACHMENT TO EC TYPE EXAMINATION (MODULE B) CERTIFICATE No. MED 1750051/M1

The undernoted documents have been appraised for compliance with the relevant requirements of International Conventions and European Union legislation for the EC Type Examination of Marine Equipment for use on Merchant Ships Registered in the European Economic Area.

This Design Appraisal Document (schedule) forms part of the Certificate.

APPROVAL DOCUMENTATION

Efectis Nederland, Brandpuntlaan Zuid 16, 2665 NZ Bleiswijk, The Netherlands, Fire Test Report No. 2016-Efectis-R001694 dated January 2017

CONDITIONS OF CERTIFICATION

1. Restricted Application: When fitted in a steel bulkhead with an A-60 approved insulation system; suitable for a fire risk on the external side of the window
2. Two window sections, each consist of from non-exposed side: 27mm thick 'Pyrostop 60-261' glass panel followed by 16mm gap followed by 12mm thick thermally toughened glass on exposed side. Glass manufactured by Pilkington. Total thickness 55mm
3. Maximum glass panel dimensions: 1128mm high x 653mm wide
4. Maximum window clear opening dimensions: 1200mm high x 1400mm wide
5. Window panels fitted between two steel profiles bolted together with M10 bolts, and secured to the bulkhead with M10 bolts
6. Glass fitted in windows and side scuttles for external use should, in addition to the required fire resisting ability, as appropriate, be of toughened quality and suitable to satisfy the operational requirements of the location in which the glass is fitted. For example, consideration should be given to the 1966 Load Line Convention Regulation 20 - side scuttles
7. Composition, application and installation of sub components, including adhesives, seals and any fire retardants, to be maintained in production and use in accordance with originally tested composition formula and method of application and installation, and manufacturer's instructions
8. Production items of the subject equipment are to be manufactured in accordance with either an approved Production Quality Assurance system (Module D), a Product-Quality assurance system (Module E) or a Product Verification Process (Module F). The wheelmark cannot be affixed to the product until a conformity assessment module is in place
9. Each item, batch or lot of the equipment is to be issued with a "Declaration of Conformity" and have the "Mark of Conformity" affixed after a conformity assessment module is in place



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DESIGN APPRAISAL DOCUMENT

Date	Quote this reference on all future communications
27 March 2017	SOUTSO/SFS/TA/JE/WP28398324

ATTACHMENT TO EC TYPE EXAMINATION (MODULE B) CERTIFICATE No. MED 1750051/M1

NOTE

The window was fire tested after previously being tested to blast test in accordance with EN13124-1:2001 with peak reflected pressure of shock wave of 30kPa. TNO Report 16EBP/174 dated 22nd December 2016 refers

PLACE OF PRODUCTION

InterDam BV
Benedenrijweg 186
2987 VB Ridderkerk
The Netherlands



Jessica Evans
Senior Specialist
Statutory Fire & Safety
Southampton Technical Support Office, Marine & Offshore
For and on behalf of Lloyd's Register Verification
LRV EC Distinguishing No. 0038

Lloyd's Register IDM-WU-A60 (Fire Post Blast)



CERTIFICATE OF FIRE APPROVAL



This is to certify that

The product detailed below will be accepted for compliance with the applicable Lloyd's Register Rules and Regulations and with the International Convention for the Safety of Life at Sea, (SOLAS), 1974, as amended, for use on ships and offshore installations classed with Lloyd's Register, and for use on ships and offshore installations when authorised by contracting governments to issue the relevant certificates, licences, permits etc.

Manufacturer	InterDam Holding B.V
Address	Waaldijk 135 2988 AW Ridderkerk The Netherlands
Type	A-60 WINDOW (STANDARD FIRE TEST)
Description	Fire Resisting Window - Type: "IDM-WU-A60" fire post blast window
Specified Standard	IMO Res. MSC.307(88) - (2010 FTP Code) Annex 1 Part 3

The attached Design Appraisal Document forms part of this certificate.

This certificate remains valid unless cancelled or revoked, provided the conditions in the attached Design Appraisal Document are complied with and the equipment remains satisfactory in service.

Date of issue	27 March 2017	Expiry date	20 March 2022
Certificate No.	SAS F170067/M1	Signed	 
Sheet No	1 of 3	Name	J. M. Evans Surveyor to Lloyd's Register EMEA A Member of the Lloyd's Register Group

Note:

This certificate is not valid for equipment, the design or manufacture of which has been varied or modified from the specimen tested. The manufacturer should notify Lloyd's Register of any modification or changes to the equipment in order to obtain a valid Certificate.

Lloyd's Register Group Limited, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as the 'Lloyd's Register'. Lloyd's Register assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless that person has signed a contract with the relevant Lloyd's Register entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.



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Issue number 1

DESIGN APPRAISAL DOCUMENT

Date 27 March 2017	Quote this reference on all future communications SOUTSO/SF5/TA/JE/WP28398324
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ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. SAS F170067/M1

This Design Appraisal Document forms part of the Certificate.

APPROVAL DOCUMENTATION

Efectis Nederland, Brandpuntlaan Zuid 16, 2665 NZ Bleiswijk, The Netherlands, Fire Test Report No. 2016-Efectis-R001694 dated January 2017

CONDITIONS OF CERTIFICATION

1. Restricted Application: When fitted in a steel bulkhead with an A-60 approved insulation system; suitable for a fire risk on the external side of the window
2. Two window sections, each consist of from non-exposed side: 27mm thick 'Pyrostop 60-261' glass panel followed by 16mm gap followed by 12mm thick thermally toughened glass on exposed side. Glass manufactured by Pilkington. Total thickness 55mm
3. Maximum glass panel dimensions: 1128mm high x 653mm wide
4. Maximum window clear opening dimensions: 1200mm high x 1400mm wide
5. Window panels fitted between two steel profiles bolted together with M10 bolts, and secured to the bulkhead with M10 bolts
6. Glass fitted in windows and side scuttles for external use should, in addition to the required fire resisting ability, as appropriate, be of toughened quality and suitable to satisfy the operational requirements of the location in which the glass is fitted. For example, consideration should be given to the 1966 Load Line Convention Regulation 20 - side scuttles
7. Composition, application and installation of sub components, including adhesives, seals and any fire retardants, to be maintained in production and use in accordance with originally tested composition formula and method of application and installation, and manufacturer's instructions
8. Production items are to be manufactured in accordance with a quality control system which shall be maintained to ensure that items are of the same standard as the approved prototype

NOTE

The window was fire tested after previously being tested to blast test in accordance with EN13124-1:2001 with peak reflected pressure of shock wave of 30kPa. TNO Report 16EBP/174 dated 22nd December 2016 refers



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Register

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Document number
SAS F170067/M1
Issue number
1

DESIGN APPRAISAL DOCUMENT

Date	Quote this reference on all future communications
27 March 2017	SOUTSO/SFS/TA/JE/WP28398324

ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. SAS F170067/M1

PLACE OF PRODUCTION

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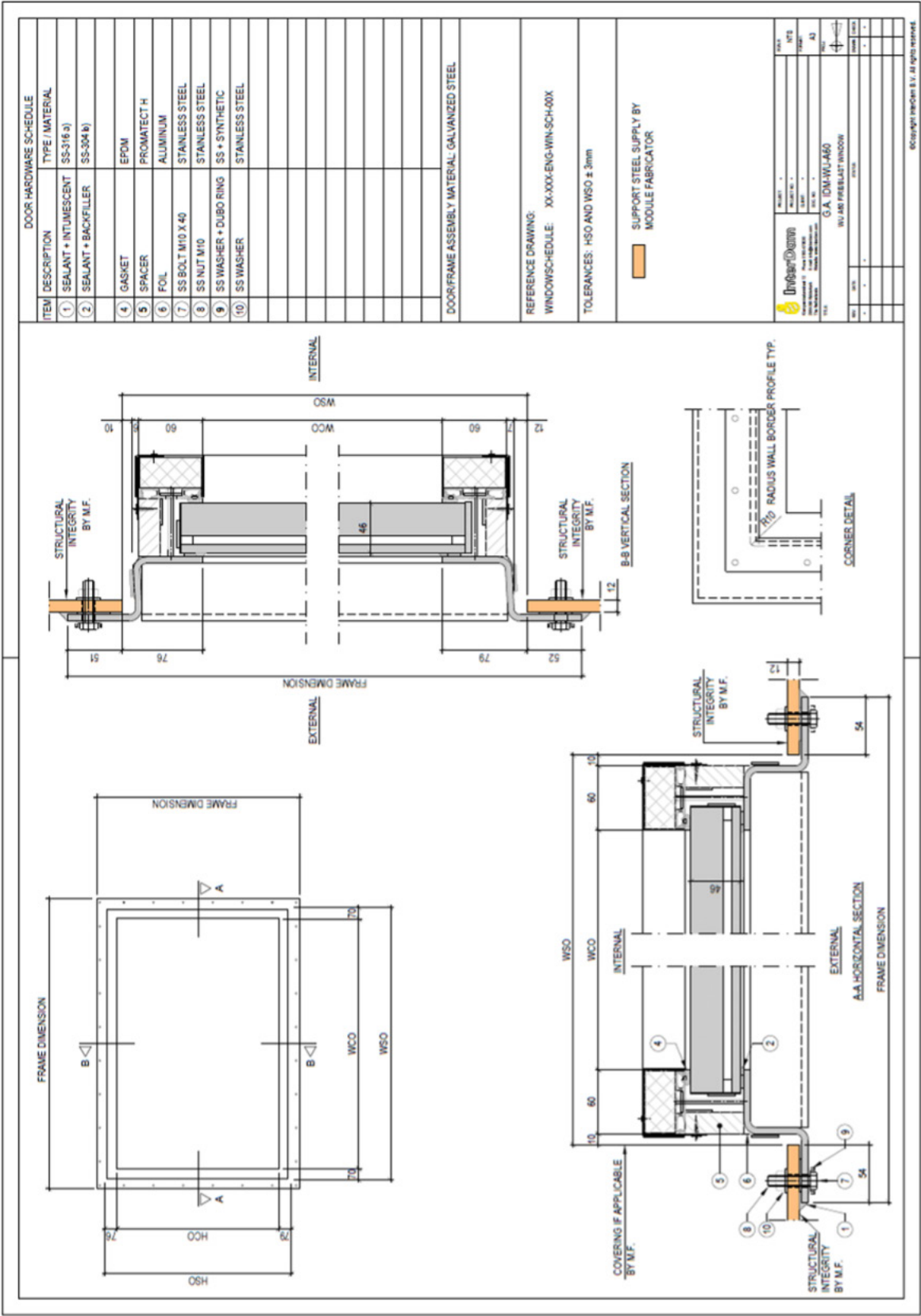
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Supplementary Type Approval Terms and Conditions

This certificate and Design Appraisal Document relates to type approval, it certifies that the prototype(s) of the product(s) referred to herein has/have been found to meet the applicable design criteria for the use specified herein, it does not mean or imply approval for any other use, nor approval of any products designed or manufactured otherwise than in strict conformity with the said prototype(s).

9. Standard general arrangement drawings

General arrangement drawing of A60 window (bolted)



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10. Reference projects

				
Reference list InterDam projects 2000-2022				
Year	End customer	Project name	Market segment	Product(s)
2022	TenneT	HKW-B	Wind Energy	Complete architectural package with internal fire rated walls, external/internal fire doors, windows and insulation
2022	KOC	JPF-4/5 WIP	LNG	H120 double and single hinged external doors, windows
2022	TenneT	Borwin 5	Wind Energy	A0 / A60 openable windows
2022	Woodside	Scarborough LQ	Offshore O&G	H60 and A60 G21 External Blast wall panels including A60 and H60 firer rated external and internal doors and windows
2021	Orsted	GodeWind 3 OSS	Wind Energy	Internal fire rated wall panels, external/internal fire doors and windows
2021	TenneT	Hollandse Kust West Alpha HVDC	Wind Energy	Complete architectural package with internal fire rated walls, external/internal fire doors, windows and insulation
2021	Éolien Maritime France (EMF)	Courseulles sur mer	Wind Energy	Internal fire rated wall panels, external/internal fire doors and windows
2021	AM Lux TP - Besix	Dupont Tyvek Line8	Petrochemical	Fire rated and blast rated doors and windows
2021	Arctic region	LNG project	LNG	Internal fire rated wall panels, external/internal fire doors and windows
2021	Sabic	BR Shelter	Petrochemical	Complete architectural package with internal fire rated walls, external/internal fire doors, windows and insulation
2021	Arctic region	Honeywell shelters	LNG	Complete architectural package with internal fire rated walls, external/internal fire doors, windows and insulation
2021	Parkwind	Arcadis Ost 1 OSS	Wind Energy	Full architectural scope including external/internal fire rated walls, external/internal fire doors, ceilings and windows
2021	Arctic region	Lun-A & PAB	Offshore O&G	Fixed platforms, engineering study windows
2020	TenneT	Dolwin 6 HVDC	Wind Energy	A60 fire rated openable window, A60 fire rated internal wall panels and windshield cladding
2020	Arctic region	LNG project	LNG	Full architectural scope including external/internal wall panels, external/internal single and double doors and windows
2020	Orsted	Greater Changhua 1+2 OSSs	Wind Energy	Internal fire rated wall panels, external/internal fire doors and windows
2020	Venture Global LNG	Calcasieu Pass LNG	LNG	External/internal fire and blast rated single/double hinged doors and windows
2020	Iberdrola	Saint Brieuc OSS	Wind Energy	Full architectural scope including external/internal fire rated walls, external/internal fire doors, windows and insulation
2020	Iberdrola	Baltic Eagle OSS	Wind Energy	Full architectural scope including external/internal fire rated walls, external/internal fire doors, windows and insulation
2020	TenneT	Hollandse Kust Noord HVDC	Wind Energy	Doors, walls, windows fire rated A0/A60
2020	Balearia	Bahama Mama	Shipping	Ro-ro ferry vessel, windows fire rating upgrade
2019	Total	Tyra Redevelopment Project - LQ	Offshore O&G	A60 fire and blast rated windows
2019	Inpex	Ichthys Venturer	FPSO	Window renewal
2018	Shell	Onshore module	Onshore O&G	Single hinged 60 minutes fire rated, 8 psi/100 msec peak reflected overpressure 1.3 bar blast rated doors and A60 fire rated windows
2018	Elia	Offshore Switch Yard Project (OSY)	Wind Energy	Fire Rated Doors, Fire Rated Windows, Fire rated Wall panels - Complete Architectural FitOut
2018	DuPont de Nemours	Spin Cell Module	Petrochemical	Pre-Fabricated Floor, Wall & Roof Panels, Spin Cell Doors and Windows
2018	Husky Energy	West White Rose Project	Offshore O&G	Fire Rated Blast Windows
2018	ENI	ZOHR Project	Offshore O&G	Gadam 1H, Gadam 2H Fire Rated Blast Doors, Fire Rated Windows, Gadam 2 Fire Rated Doors



Reference list InterDam projects 2000-2022

Year	End customer	Project name	Market segment	Product(s)
2018	EnBW	Hohe See OSS	Wind Energy	Internal A0/A60 fire rated panels, internal and external A0/A60 fire rated single/double hinged doors and A60 fire rated windows
2018	Elicio	Norther OSS	Wind Energy	Internal A0/A60 fire rated panels, internal and external A0/A60 fire rated single/double hinged doors and A60 fire rated windows
2018	SOCAR	Sumgayit	Onshore O&G	120 minutes fire resistant and 0.5 bar blast resistant single/double hinged doors and windows
2018	Kuraray Eval	QC labo	Petrochemical	0.5 bar blast rated double hinged doors and windows
2018	Chevron	Chevron Phillips Chemical	Onshore O&G	115 mbar blast rated single/double hinged doors and windows
2018	Northland Power	Deutsche Bucht OSS	Wind Energy	Internal A60 fire rated panels, external and internal A0/A60 fire rated single/double hinged doors, windows and insulation works
2018	Qatar Gas	North Field Alpha	Offshore O&G	A60 fire rated single/double hinged doors and windows
2018	Gunvor	Gunvor refinery	Onshore O&G	120 minutes fire rated and blast rated single/double hinged doors and windows
2018	TenneT	Borssele Alpha & Bèta HVDC	Wind Energy	Complete architectural package with external and internal fire rated panels, external and internal fire rated doors, windows and insulation works
2018	ExxonMobil	Onshore building	Onshore O&G	A60 fire rated window
2017	KNPC	Al Zour	Onshore O&G	H60 Fire Rated Panels, UL Fire Rated Doors, Fire Rated Walls (Generation III & IV), Fire Rated Blast Windows - Complete Architectural Fit-Out
2017	Kuwait Oil Company	Lower FARS Heavy Oil Project (LFHO)	Offshore O&G	Fire & Blast Rated Bullet Proof Windows, Fire Rated Windows
2017	Dong Energy	Hornsea Z11/Z12/Z13 RCS	Wind Energy	Internal and external A0/A60/H60 fire rated panels, external A0/H60 fire rated single/double hinged doors, internal A60 fire rated single hinged doors and A0 fire rated windows
2017	Dong Energy	Borkum Riffgrund 2 OSS	Wind Energy	Complete architectural package with external and internal fire rated panels, external and internal fire rated doors, windows and insulation works
2016	Kuwait Oil Company	Modular Building Project	Onshore O&G	Gadam 2H Fire Rated Blast Doors & Windows
2016	Total	Centro Olii Tempa Rossa	Onshore O&G	Gadam 1 and 2 Fire Rated Blast Doors & Windows
2016	Dong Energy	Burbo Bank OSS	Wind Energy	Internal and external A0/A60/H60 fire rated panels, internal and external A0/H60 fire rated single/double hinged doors, A60 fire rated window and underdeck cladding
2016	Tengizchevroil	Future Growth Project	Onshore O&G	Complete architectural package for onshore buildings with external fire and blast rated wall panels, roof panels, external fire and blast rated double hinged doors and fire and blast rated window units
2015	Reliance Industries	J3 Project at Jamnagar	Onshore O&G	Gadam 2H Doors H120 fire rated Windows
2015	Total	Kaombo	Offshore O&G	Gadam 1 and 2 Fire Rated Blast Doors & Windows, Fire Rated Walls (Generation III)
2015	Energinet DK	Horns Rev C substation	Wind Energy	A60 fire rated panels, external and internal A0/A60 fire rated single/double hinged doors and A0 fire rated windows
2015	Novatek	Arctic LNG	LNG	Complete architectural package for arctic modules with external and internal fire panels, roofing panels, windows, louvres, external fire and blast doors (incl. heattracing) and internal fire doors
2014	Zadco	UZ750	Onshore O&G	A30 Fire Rated Windows
2014	ADMA OPCO	Al Byleh	Offshore O&G	Fire Rated Doors and Windows



Reference list InterDam projects 2000-2022

Year	End customer	Project name	Market segment	Product(s)
2013	Arctic region	LQ Upgrade	Offshore O&G	H120 Fire Rated Blast Walls (Generation II) & Windows Gadam 1H & Wadam 2H Blast Door Complete Architectural Fit-Out
2013	Atlantic LNG	Point Fortin LNG Facility	LNG	Gadam 1H & 2H Blast Doors H120 Blast Rated Windows
2013	Atlantic LNG	P354 Modules	Offshore O&G	H120 Blast Rated Windows H120 Blast Rated (Pneumatic Operated) Doors
2013	ADMA OPCO	SARB 6 Project	Offshore O&G	Gadam 1 and 2 Doors / A60 Windows
2013	TenneT	Helwin Beta HVDC	Wind Energy	Full architectural scope including external/internal fire rated walls, doors, windows and EMC Cage
2012	VattenFall	Dan Tysk OSS	Wind Energy	Generation III-F Fire Walls Fire Rated Doors Fire Rated Windows
2012	Arctic region	Platform Upgrade	Offshore O&G	Gadam 3 and 5 Fire Doors / Fire Rated Windows
2012	PTTEP	Zawtika Project	Offshore O&G	Gadam 1, 2 and 3 Doors Internal A60 Fire Rated Doors Fire Rated Windows
2012	ExxonMobil	IPH buildings	Onshore O&G	External fire rated and blast resistant doors and fire rated and blast resistant window units
2012	Talisman	Montrose	Offshore O&G	A60 fire and blast resistant windows
2011	EWE	Riffgat OSS	Wind Energy	Fire Walls (Generation III) Fire Rated Doors, Fire Rated Windows
2011	Bien Dong Petroleum	Bien Dong/ Hai Trach Project	Offshore O&G	Internal & External Doors / Windows / Ceiling Panels / H60 Insulation package / Complete
2011	Nabors Drilling	P16-75-LQ Drilling Rig	Offshore O&G	H60 Fire Rated Windows
2011	Total	K6P Extension Modules	Offshore O&G	Fire Walls (Generation III) Fire Rated Windows Fire Rated Doors
2011	TenneT	Dolwin Alpha HVDC	Wind Energy	Full architectural scope including external/internal fire rated walls, external/internal doors, windows and EMC Cage
2011	ExxonMobil	Refinery Antwerp	Onshore O&G	External A60 fire rated and blast rated hinged doors and A60 fire rated windows
2010	ONGC	B-22 Field Development	Offshore O&G	Internal Wall Panels Ceiling Panels Windows Louvers
2010	ONGC	RS-12 Field Development	Offshore O&G	Internal Wall Panels Ceiling Panels Windows Louvers
2010	BP	North Star	Onshore O&G	Total enclosure consisting H60 fire rated and blast resistant garage doors, H60 fire rated and blast resistant personnel doors, H60 fire rated and blast resistant windows and external walls
2010	ExxonMobil	Pier 3	Petrochemical	Fire rated and blast resistant doors and window units
2010	BP	Pipeshop	Onshore O&G	Louvres and window units
2009	Total	K5CU	Offshore O&G	H60 fire rated IDM ProPanel, H60 fire rated single leaf sliding doors, blast relief cladding, windshield cladding and H60 fire rated windows
2008	ONGC	NQP	Offshore O&G	Brandam Doors Fire rated windows
2006	Shell / Amec	LUN-A and PA-B	Offshore O&G	Blast / Fire / Winterising Walls / Cladding (Generation II & Generation III), Doors and Windows
2005	Petro Canada	De Ruyter Field	Offshore O&G	Blast Walls (Generation II), Fire Walls, Wind Shield Cladding (Generation III) Gadam1H and 2H and Wadam 3 doors, windows A60
2004	NAM	K14 LQ	Offshore O&G	Windows
2003	Statoil	Kristin Helideck	Offshore O&G	Fire Rated Walls (Generation II & Generation III) Roof Cladding B15 Windows
2002	AIOC	Azerbaijan Phase 1	Offshore O&G	Fire rated walls / wind shield cladding (Generation III) Windows / Doors and removable panels
2002	BP	Q4C	Offshore O&G	Fire Rated Walls / Wind Shield Cladding (Generation III) Gadam 1, 2 and 3 doors / Windows and louvers

Please contact our sales office if you are interested in our general reference list.

11. Photos



InterDam G21 Fire Window during blast test



InterDam G21 Fire Window during fire post blast test