Certificate No:
TAS00001Y4

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Watertight Door

with type designation(s)
FMA, FD, N

Issued to
IMS Technologies AS
Akland, **Norway**

is found to comply with
DNV-OS-C301 – Stability and watertight integrity, Edition July 2020 (Amended August 2021)
DNV rules for classification – Ships

Application :

Product(s) approved by this certificate is/are accepted for installation on all vessels/units classed by DNV.

Issued at **Høvik** on **2022-03-14**
This Certificate is valid until **2027-03-13**.
DNV local station: **Kristiansand S**

Approval Engineer: **Tomasz Kapella**

for **DNV**

Arild Rogne
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.

Product description

Watertight doors covered by the type approval are made of steel and are of the sliding type.

Door types are described by:

- type of drive (FMA, FD, N),
- type of sill/installation (F12, MR, AH, N).

FMA and FD type doors are delivered with the following sill/installation types:

- F12 [12mm sill].
- MR for machine room.
- AH sill height adapted to achieve flush sill on floating floors

N type doors are a threshold solution doors.

- N200: 200mm threshold height
- N280: 280mm threshold height

FMA doors

FMA-1 to FMA-10 are hydraulic- or electric driven

Door and dwg number	*Plate thickness* t mm	*Door blade stiffeners* Sx Qty	*Cleats front* gx Qty	*Cleats back* gx Qty	Calculation doc number	Door clear opening. H x W (Height x Width)						
							W [mm]						
							1000	1050	1200	1400	1600	1800	2000
						H [mm]	Design pressure [kN/m²]						
3562FMA-1-F/B	6 (Stiffener: 120x80x8)	5	2	2	3562FMA-1-C	2000	82		79	70	52	36	24
						2200	70		66	64	50	33	22
						2400	62		57	55	47	30	20
3562FMA-2-F/B	6 (Stiffener: 120x80x8)	7	3	3	3562FMA-2-C	2000	139		119	103	75	50	37
						2200	127		108	94	71	50	33
						2400	117		100	87	65	45	31
3562FMA-3-F/B	6 (Stiffener: 120x80x8)	7	4	4	3562FMA-3-C	2000	178		155	111	75	50	37
						2200	147		142	101	71	50	33
						2400	123		123	97	65	45	31
3562FMA-4-F/B	6 (Stiffener: 120x80x8)	9	4	4	3562FMA-4-C	2000	182		155	135	95	67	49
						2200	167		142	124	87	61	45
						2400	154		131	114	79	56	41
3562FMA-5-F/B	6 (Stiffener: 120x80x8)	11	5	5	3562FMA-5-C	2000	224		191	166	114	77	57
						2200	205		175	152	104	75	52
						2400	189		161	140	99	70	50
3562FMA-6-F/B	8 (Stiffener: 120x80x8)	7	4	4	3562FMA-6-C	2000	243		189	125	82	58	42
						2100	233		180	121	78	55	40
						2150	228	218	176	118	76	54	39
						2200	223		174	115	75	52	38
3562FMA-7-F/B	8 (Stiffener: 120x80x8)	9	9	9	3562FMA-7-C	2000	373		238	153	104	75	52
						2100	355		227	150	100	73	50
						2150	350	313	222	150	100	72	50
						2200	350		217	146	99	70	50
3562FMA-8-F/B	8 (Stiffener: 120x80x12)	11	11	11	3562FMA-8-C	2000	500		319	208	150	102	75
						2100	500		304	200	143	100	75
						2150	488	428	300	200	140	100	73
						2200	477		300	200	137	97	72
3562FMA-9-F/B	8 (Stiffener: 120x80x12)	13	8	8	3562FMA-9-C	2000	454		386	249	171	123	87
						2100	435		350	238	163	117	83
						2150	426	408	350	232	159	114	81
						2200	418		348	227	156	112	79
3562FMA-10-F/B	8 (Stiffener: 150x100x12)	11	11	11	3562FMA-10-C	2000	550		500	332	231	168	125
						2100	550		477	316	220	160	119
						2150	550	537	465	309	215	156	116
						2200	550		455	302	210	152	114

FD doors

FD-1 to FD-6 are electrically driven

Door and dwg number	*Plate thickness* t mm	*Door blade stiffeners* Sx Qty	*Cleats front* gx Qty	*Cleats back* gx Qty	Calculation doc number	Door clear opening. H x W (Height x Width)							
							W [mm]						
							1000	1200	1400	1500	1600	1800	2000
						H [mm]	Design pressure [kN/m²]						
3564-FD-1-F/B	6 (Stiffener: 120x80x8)	4+MD*	3	3	3564FD-01-C	2000	85	73	64	55	48	32	22
						2200	76	66	58	50	43	29	20
						2400	69	60	53	49	39	26	18
3564-FD-2-F/B	6 (Stiffener: 120x80x8)	6+MD*	4	4	3564FD-02-C	2000	125	108	95	76	67	48	34
						2200	113	97	86	75	60	43	30
						2400	103	89	78	68	54	39	27
3564-FD-3-F/B	6 (Stiffener: 120x80x8)	6+MD*	5	5	3564FD-03-C	2000	163	141	96	76	67	48	33
						2200	147	127	86	75	60	43	30
						2400	135	116	78	68	54	39	27
3564-FD-4-F/B	6 (Stiffener: 120x80x8)	8+MD*	6	5	3564FD-04-C	2000	196	169	123	100	82	59	50
						2200	181	156	110	91	75	53	48
						2400	168	145	100	83	73	50	44
3564-FD-5-F/B	6 (Stiffener: 120x80x8)	8+MD*	6	5	3564FD-05-C	2000	196	169	149	141	133	100	75
						2200	181	156	137	130	123	91	69
						2400	168	145	128	120	114	82	62
3564-FD-6-F/B	6 (Stiffener: 120x80x8)	8+MD*	6	5	3564FD-06-C	2000	196	169	149	141	133	120	97
						2200	181	156	137	130	123	111	87
						2400	168	145	128	120	114	103	79

* - MD - middle U-profile

N doors
N-1 to N-10 are hydraulic driven doors

Door and dwg number	*Plate thickness* t mm	*Door blade stiffeners* Sx Qty	*Cleats front* gx Qty	*Cleats back* gx Qty	Calculation doc number	Door clear opening. H x W (Height x Width) **H** [mm]	**W** [mm] 800	1000	1200	1400	1600
							Design pressure [kN/m²]				
3562N-01-F / 3562N-01-B	6 (Stiffener: 120x80x8)	5	2	2	3562N-01-C	1800	97	89	77	67	55
						2000	84	76	71	69	50
						2200	74	66	61	59	49
3562N-02-F/B	6 (Stiffener: 120x80x8)	7	3	3	3562N-02-C	1800	188	155	132	115	75
						2000	161	141	120	104	74
						2200	135	128	109	95	68
3562N-03-F/B	6 (Stiffener: 120x80x8)	7	4	4	3562N-03-C	1800	197	197	175	117	75
						2000	161	161	160	106	74
						2200	135	134	134	100	68
3562N-04-F/B	6 (Stiffener: 120x80x8)	10	6	6	3562N-04-C	1800	377	311	247	159	108
						2000	341	282	224	150	100
						2200	303	257	204	138	93
3562N-05-F/B	6 (Stiffener: 120x80x8)	11	11	9	3562N-05-C	1800	549	415	259	175	120
						2000	449	389	249	160	109
						2200	374	355	227	150	100
3562N-06-F/B	8 (Stiffener: 120x80x8)	5	2	2	3562N-06-C	1800	167	138	118	93	62
						1900	159	131	112	88	59
						2000	148	125	106	84	56
3562N-07-F/B	8 (Stiffener: 120x80x8)	7	4	4	3562N-07-C	1800	335	277	199	127	86
						1900	316	263	189	125	82
						2000	286	250	180	121	78
3562N-08-F/B	8 (Stiffener: 120x80x8)	10	6	6	3562N-08-C	1800	503	415	266	175	123
						1900	478	395	252	172	117
						2000	455	376	250	164	111
3562N-09-F/B	8 (Stiffener: 120x80x12)	11	11	9	3562N-09-C	1800	550	500	336	219	150
						1900	550	500	319	208	150
						2000	550	500	304	200	143
3562N-10-F/B	8 (Stiffener: 150x100x12)	11	11	9	3562N-10-C	1800	550	550	500	350	244
						1900	550	550	479	332	231
						2000	550	536	456	316	220

Application/Limitation

The doors have been Type Approved with respect to watertightness only.

These doors may be fitted in watertight bulkheads where the use of watertight doors is accepted.

The watertight doors are found to comply with DNV-RU-SHIP Pt.3 Ch.12 Sec.3 (July 2021) and DNV-OS-C301 Ch.2 Sec.2 par.3 (July 2021) for maximum design pressures as specified above.

Dimensions of the watertight doors can be smaller than shown on the drawings, as long as the distance between the cleats and the spacing of the stiffeners is equal to or less than values shown on listed drawings.

The Type Approval does not cover the supporting structure of the doors, which is subject to approval. Interface showing door frame and bulkhead shall be submitted for case-by-case approval by yard/end user.

Due consideration to installation shall be given if door is to be located in highly stressed areas or in areas critical to fatigue.

Installation procedures

To be in accordance with manufacturer's procedures.

Type Approval documentation

Basis for Type Approval are the drawings submitted by manufacturer listed in table below.

Title	Drawing No	Revision
Door frame for watertight door 6-5-7-6	3564FD-1-F	0
Door blade for F-12, MR, AH watertight door 6-4-6	3564FD-1-B	0
Door frame for watertight door 6-6-8	3564FD-2-F	0
Door blade for F-12, MR, AH watertight door 6-6-8	3564FD-2-B	0
Door frame for watertight door 6-6-10	3564FD-3-F-3	0
Door blade for F-12, MR, AH watertight door 6-6-10	3564FD-3-B	0
Door frame fo watertight door 6-8-11	3564FD-4-F	0
Door blade for F-12, MR, AH watertight door 6-8-11	3564FD-4-B	0
Door blade for watertight door	3562N-01-B.07	0
Door frame for watertight door	3562N-01-F.08	0

Door blade for watertight door	3562N-02-B.07	0
Door frame for watertight door	3562N-02-F.08	0
Door blade for watertight door	3562N-03-B.07	0
Door frame for watertight door	3562N-03-F.08	0
Door blade for watertight door	3562N-04-B.07	0
Door frame for watertight door	3562N-04-F.08	0
Door blade for watertight door	3562N-05-B.07	0
Door frame for watertight door	3562N-05-F.08	0
Door blade for watertight door	3562N-06-B.07	0
Door frame for watertight door	3562N-06-F.08	0
Door blade for watertight door	3562N-07-B.07	0
Door frame for watertight door	3562N-07-F.08	0
Door blade for watertight door	3562N-08-B.07	0
Door frame for watertight door	3562N-08-F.08	0
Door blade for watertight door	3562N-09-B.07	0
Door frame for watertight door	3562N-09-F.08	0
Door blade for watertight door	3562N-010-B.07	0
Door frame for watertight door	3562N-010-F.08	0
Door blade for watertight door	3562FMA-01-B.08	0
Door frame for watertight door	3562FMA-01-F.08	0
Door blade for watertight door	3562FMA-02-B.08	0
Door frame for watertight door	3562FMA-02-F.08	0
Door blade for watertight door	3562FMA-03-B.08	0
Door frame for watertight door	3562FMA-03-F.08	0
Door blade for watertight door	3562FMA-04-B.08	0
Door frame for watertight door	3562FMA-04-F.08	0
Door blade for watertight door	3562FMA-05-B.08	0
Door frame for watertight door	3562FMA-05-F.08	0
Door blade for watertight door	3562FMA-06-B.08	0
Door frame for watertight door	3562FMA-06-F.08	0
Door blade for watertight door	3562FMA-07-B.08	0
Door frame for watertight door	3562FMA-07-F.08	0
Door blade for watertight door	3562FMA-08-B.08	0
Door frame for watertight door	3562FMA-08-F.08	0
Door blade for watertight door	3562FMA-09-B.08	0
Door frame for watertight door	3562FMA-09-F.08	0
Door blade for watertight door	3562FMA-010-B.08	0
Door frame for watertight door	3562FMA-010-F.08	0
Rail welding	2022-02-11	0

Tests carried out

Test report dated 2010-02-16, 2014-11-13 and 2018-09-24, witnessed by DNV Kristiansand.

Each door, intended to be installed on ships, is to be tested for tightness through hydrostatic testing at the design pressure according to DNV-RU-SHIP Pt.2 Ch.4 (July 2021), at the manufacturer.

For offshore units/installations the door must be tested for a pressure equal to design pressure + 50 kN/m².

The complete installation is to be tested onboard.

The tests are to be witnessed by a DNV surveyor.

Marking of product

The product is to be marked with:

- Manufacturer's name or brand
- DNV Type Approval Certificate No. TAS00001Y4
- Type designation
- Design pressure

Periodical assessment

DNV surveyor has the permission to perform Certification Retention Survey at any time during the validity period of this certificate.

Periodical assessment will be required after two years (+/- 90 days) and after 3.5 years (+/- 90 days) to verify that the conditions for the approval are complied with. Reference is made to DNV-CP-0338.