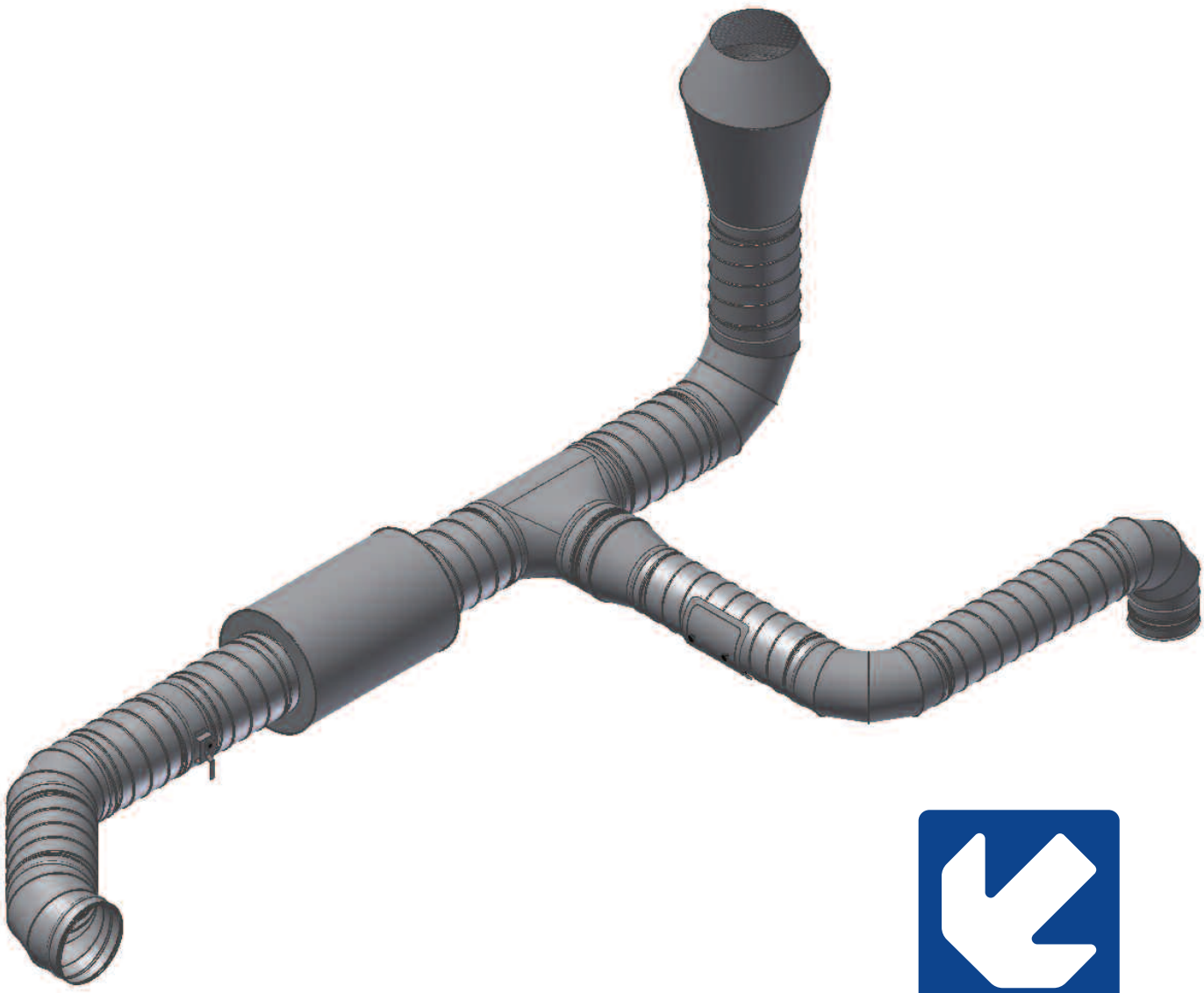
Simduct
Class C and F
2019/2020



GMC

CONSIDER IT DONE

SIMDUCT

Contact:
www.gmc.no

GMC Maritime, avd. HVAC
Tangen 16
N-4072 Randaberg

Tel: 51 84 80 00
E-mail: *gmc.hvac@gmc.no*

Company registration:
NO 996 208 680 MVA

Chapter 1

- GMC HVAC was established in 1988 under the name Marine HVAC AS, and has ever since been a major supplyer to the Norwegian oil and gas industry
- 100% owned by the GMC group since 1997
- Quality and HSE certified according to
- **NS-EN ISO 9001:2015**
- **ISO 14001 - 2004**
- **OHSAS 18001:2007**
- **IMO.RES. A 754 (18)**
- Achilles registration No. 996 208 680 Id. 28718 5

SIMDUCT

Management System

Certificate

To certify conformity with // Godkjent overensstemmelse med
the Management System Requirements of // Styringssystemkravene i henhold til

NS-EN ISO 9001:2008

awarded // tildelt

GMC HVAC AS
Tangen 16, 4070 Randaberg

Manufacturing/supplying following products/services:
for produksjon/leveranse av følgende produkter/tjenester:

Engineering, equipment delivery, installation and commissioning of HVAC systems

Engineering, utstyrsleveranser, installasjon og commissioning av HVAC-systemer

Certificate No // Sertifikat nr.:

797

First issued // Utstedt første gang: 1997-07-04
Valid until // Gyldig til: 2018-09-14
Issued // Utstedt: 2015-06-04
Audit: Annual // Oppfølging: Årlig

Managing Director // Daglig leder

Technical Manager // Teknisk leder

Teknologisk Institutt

NORSK AKKREDITERING MSYS 004

Kabelgata 2, 0580 Oslo

Management System

Certificate

To certify conformity with // Godkjent overensstemmelse med
the Management System Requirements of // Styringssystemkravene i henhold til

OHSAS 18001:2007

awarded // tildelt

GMC Group
Dusavikveien 19, 4007 Stavanger

Manufacturing/supplying following products/services:
for produksjon/leveranse av følgende produkter/tjenester:

Product solutions and services for the marine and offshore market

Produktløsninger og tjenester for marine- og offshoremarkedet

Certificate No // Sertifikat nr.:

1504

First issued // Utstedt første gang: 2015-06-10
Valid until // Gyldig til: 2018-06-10
Issued // Utstedt: 2015-06-10
Audit: Annual // Oppfølging: Årlig

This is a multi-site certificate. The sites are located on the next page
Dette er et flerlokasjons-sertifikat. Lokasjonene er listet på neste side.

Managing Director // Daglig leder

Technical Manager // Teknisk leder

Teknologisk Institutt

NORSK AKKREDITERING MSYS 004

Kabelgata 2, 0580 Oslo

SIMDUCT

GMC
CONSIDER IT DONE

Management System

Certificate

To certify conformity with // Godkjent overensstemmelse med
the Management System Requirements of // Styringssystemkravene i henhold til

OHSAS 18001:2007

awarded // tildelt

GMC Group
Dusavikveien 19, 4007 Stavanger

Manufacturing/supplying following products/services:
for produksjon/leveranse av følgende produkter/tjenester:

Product solutions and services for the marine and offshore market

Produktløsninger og tjenester for marine- og offshoremarkedet

Certificate No // Sertifikat nr.:

1504

GMC HVAC AS	Tangen 16	4070 Randaberg
GMC Engineering AS	Tangen 16	4070 Randaberg
GMC Marine Partner AS	Mekjarvik 13	4070 Randaberg
GMC Yard AS	Nyhavnsveien 7	4077 Hundvåg
GMC Maritime AS	Dusavikveien 19	4007 Stavanger
GMC Elektro AS	Nyhavnsveien 11	4077 Hundvåg

Managing Director // Daglig leder

Technical Manager // Teknisk leder

Teknologisk Institutt

NORSK AKKREDITERING MSYS 004

Side 2 av 2

Kabelgata 2, 0580 Oslo

SIMDUCT

GMC
CONSIDER IT DONE

Management System
Certificate

To certify conformity with // Godkjent overensstemmelse med
the Management System Requirements of // Styringssystemkravene i henhold til

OHSAS 18001:2007

awarded // tildelt

GMC Maritime AS
Clipperveien 2, 4077 Hundvåg

Manufacturing/supplying following products/services:
for produksjon/leveranse av følgende produkter/tjenester:

Product solutions and services for the marine and offshore market

Produktløsninger og tjenester for marine- og offshoremarkedet

Certificate No // Sertifikat nr.:

1504

First issued // Utstedt første gang: 2015-06-10
Valid until // Gyldig til: 2018-06-10
Issued // Utstedt: 2015-12-08
Audit: Annual // Oppfølging: Årlig

Managing Director // Daglig leder

Technical Manager // Teknisk leder

Teknologisk Institutt

NORSK AKKREDITERING MSYS 004

Kabelgata 2, 0580 Oslo

SERTIFIKAT

F-gass forordningen (EF) 842/2006

Sertifikat nr. 30211 **Kategori I**

GMC MARITIME AS
Org.nr. 996 208 680

Bedriftssertifisert ifølge kommisjonsforordning
(EF) 303/2008.

Company certified according to regulation
(EC) 303/2008.

Isovator
Sertifisering

dato
HOKKSUND 04.01.17

LISBETH SOLGAARD

HSE Policy

We will conduct our business in a way that neither people nor property is damaged. In addition, we conduct business with respect and consideration for the environment.

This requires that:

- The organization knows the environmental aspects, objectives, plans and legislation.
- It incorporates the basic attitudes of all employees to comply with the policy.
- The company has a basic desire to improve their environmental performance.
- The corporate owners have a basic attitude that no one will get hurt.
- The organization knows the technology, the routines / procedures and the specifications that apply.
- All employees are motivated and qualified for the work they do.
- Adverse events are recorded and processed.

This is done by:

- We have procedures for identifying and measuring our impact on the environment.
- We have a routine to reduce risk and plan all activities in a safe manner, and to provide a systematic inspection of that the practices work.
- It produces precise and communicable procedures for all operations associated with the risk of harm to people, materials or the environment.
- Recruitment and qualification of personnel is in a systematic manner.
- We continuously focus on communication of environmental issues and the exercise of leadership.
- The organization is kept informed about plans, results and ambient perceptions of the company.
- It incorporates a system for recording and monitoring of adverse events.

22 May 2015

Gunnar M. Christensen jr.
CEO

Quality Policy

We will perform our job efficiently and correctly the first time, and the customer will have a positive experience with us.

GMC
CONSIDER IT DONE

This requires that:

- The organisation knows the expectations and demands in the market.
- We deliver the expected service within the agreed time frame.
- We want our customer to succeed, and we emphasise good customer communication.
- The organisation is familiar with the technology, routines/procedures and applicable formal requirements.
- All employees are motivated and qualified for the job at hand.

This is ensured by:

- Our routines of mapping the way our customers perceive us.
- Developing precise and mutually agreed procedures for all operations being critical to our quality.
- Systematic recruitment and staff qualification.
- Continuously focusing on communication and leadership performance.
- Continuously updating the organisation about results, operational activities, and customer's opinion about us.

14 September 2012

Gunnar M. Christensen jr.
CEO

The trademark «Simduct»

- **The GMC HVAC ducts C, F and P are branded products with registration number 220986, Simduct.**
  - Registrated 2003.10.02, renewed 2013.09.03

- **Development started by Simex AS in 1992. This part of Simex AS was taken over by GMC HVAC in 2004.**
  - The products are developed through many years of modifying and adjustment of production equipment to achieve the best strength, density and fire resistance. All products are produced in stainless steel AISI 316L.
    This material is extremely hard. To achieve the required properties it can not be produced with traditional production equipment.

Unique properties of Class F duct

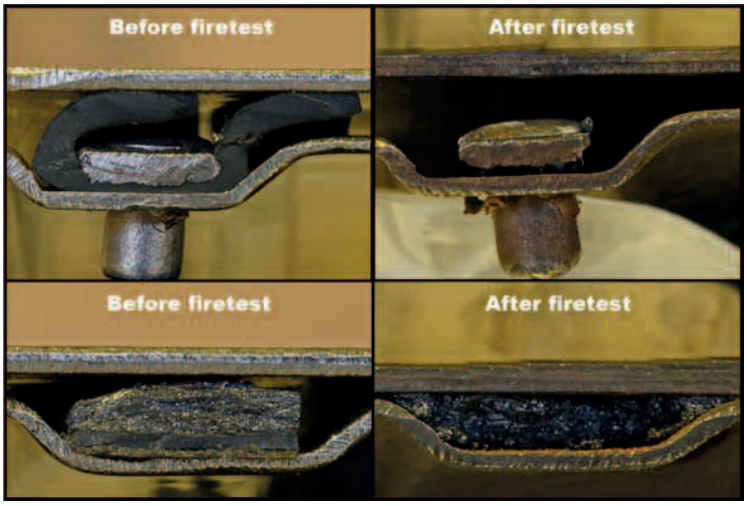
- **Our Class F is tested and approved satisfying fire rating class A-0. Because of this the duct can replace the Class A duct in HVAC systems. This means that the weight of duct system will be reduced with approximately 60%. The main reason for the reduction is that the steel thickness of the ducts will be reduced from 3 mm (Class A) to between 0.8–1.5 mm (Class F) depending on the dimension of the ducts.**

- **Test program to approve fire rating A-0 is done by SINTEF**
  - DNV approved the result of the testing as a 3rd party to look after that the test program was within IMO Res. A.754(18).
  - In addition the test is approved by Sjøfartsdirektoratet and Oljedirektoratet.

- **To satisfy the fire rating A-0, the duct system has to manage 850 degrees Celsius in 60 minutes and still be intact.**

- **Technical report which approves the test is made by DNV. Report No. 2007 – 0816.**
  - Test report is also approved by ABS 26/3 2010.

- **Efficient installation. Class F ducts are far easier to install than Class A ducts.**
  - Less weight to deal with, easier pairing and less volum. Research shows about 35% saving on installation.



A.16 Ducts

A.16.1 Function

Ducting is required to transport air to and from spaces being served by HVAC systems.

A.16.2 Functional requirements

The material of construction shall be suitable for the design life and operating environment, for which stainless steel, coated carbon steel and composites can be suitable.

Duct systems shall be constructed to a recognized standard such as EN 1505 [17], EN 1506 [18], EN 1507 [19] and EN 12237 [22], and may be categorized according to the duct pressure class.

Exhaust systems serving mud tanks and shale shakers shall be suitable for the dirty atmosphere to which they are exposed. Facilities shall be provided that permit access for frequent cleaning of all system components, equipment and the complete ducting systems. Access platforms and/or walkways can be necessary.

The following categories in Table A.2 are types of commonly applied options.

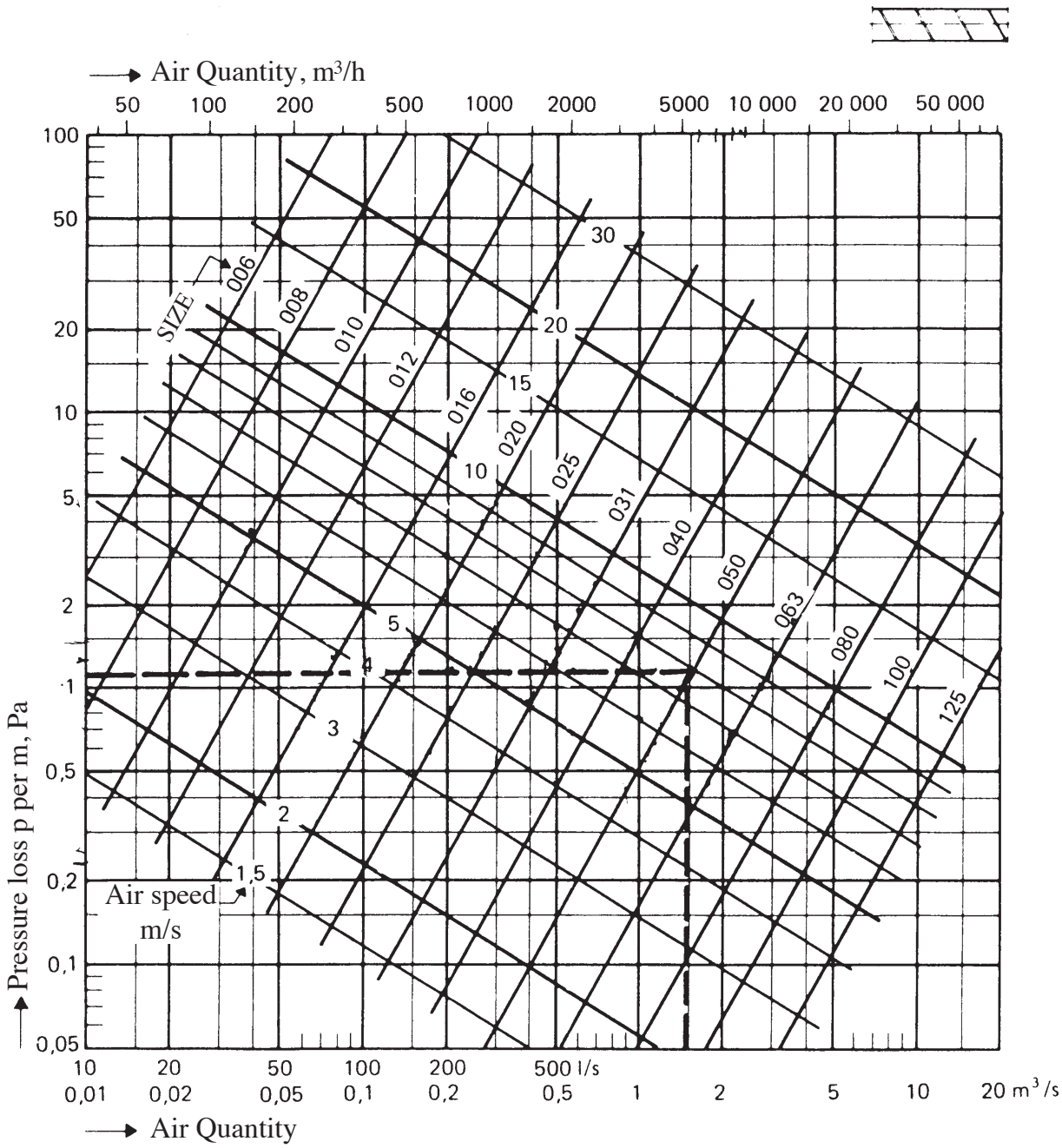
Table A.2 — Duct classes

Duct class	Material	Thickness or dimensions	Operating conditions
A	Stainless steel EN 10088 (all parts) [21] material No. 1.4404 or UNS S31603	3 mm	High-strength duct (plenum chambers) Duct exposed to weather and saliferous atmosphere Fire-rated duct
B	Stainless steel EN 10088 (all parts) [21] material No. 1.4401 or UNS S31600	EUROVENT 2/3 (circular) EUROVENT 2/4 (rectangular)	Internal duct in corrosive environments such as laboratories, battery rooms, paint stores, etc.
C	Stainless steel EN 10088 (all parts) [21] material No. 1.4401 or UNS S31600 EN 10088 (all parts) [21] material No. 1.4404 or UNS S31603	0,8 mm for Ø 80 mm to Ø 200 mm 1,0 mm for Ø 250 mm to Ø 315 mm 1,25 mm for Ø 400 mm to Ø 630 mm 1,5 mm for Ø 800 mm	Internal duct in production and utility areas Duct exposed to weather and saliferous atmosphere and/or mechanical strain
D	Carbon steel painted or hot-dipped galvanized	4 mm	High-strength duct Fire-rated duct
E	Pre-galvanized sheet steel	EUROVENT 2/3 EUROVENT 2/4	Internal duct in controlled environments such as LQs
F	Stainless steel EN 10088 (all parts) [21] material No. 1.4401 or UNS S31600 EN 10088 (all parts) [21] material No. 1.4404 or UNS S31603	0,8 mm for Ø 80 mm to Ø 200 mm 1,0 mm for Ø 250 mm to Ø 315 mm 1,25 mm for Ø 400 mm to Ø 630 mm 1,5 mm for Ø 800 mm	Fire-rated duct (Class C with fire-rated expanding joints/gaskets approved by certifying authority)

* Simduct Class F starts at Ø 125

Chapter 2

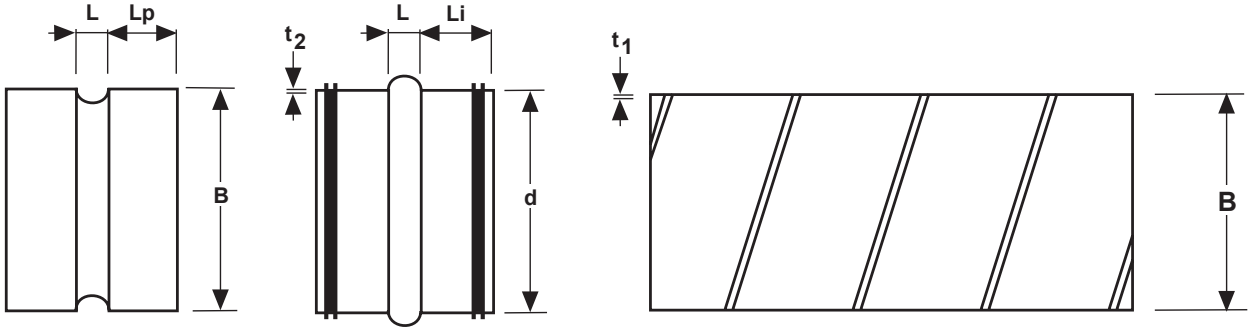
Pressure drop in circular ducts



Dimensions and Tolerances

(According to Eurovent 2/3)

SIMDUCT CLASS B (NORSOK)



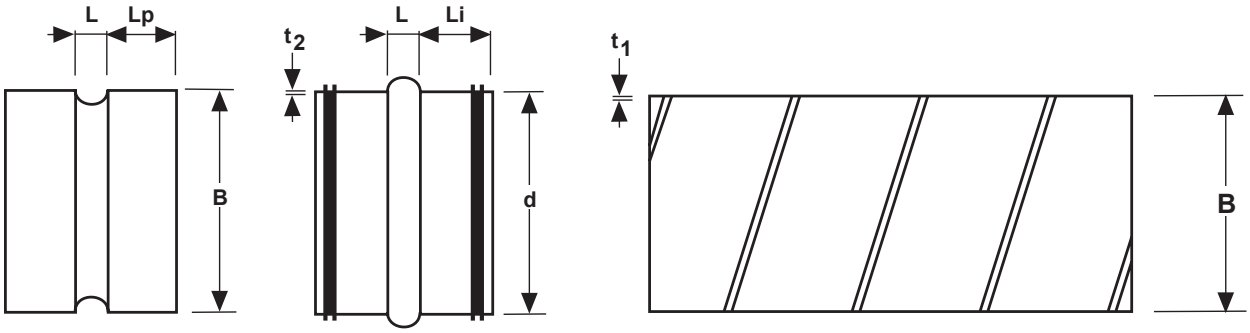
Size design B	B mm Norm. diam.	d mm	A m²	Li Lp mm	t1 pipe mm	t2 det. mm	L
100	100,0 – 100,5	98,8 – 99,3	0,008	60	0,5	≥0,5	10
125	125,0 – 125,5	122,6 – 124,3	0,012				
160	160,0 – 160,6	157,6 – 159,3	0,020				
200	200,0 – 200,7	197,4 – 199,3	0,031				
250	250,0 – 250,8	248,5 – 249,3	0,049		0,6	≥0,6	
315	315,0 – 315,9	313,3 – 314,3	0,078				13
400	400,0 – 401,0	397,9 – 399,3	0,126	70	0,8	≥0,8	
500	500,0 – 501,1	497,9 – 499,3	0,196				
630	630,0 – 631,2	626,8 – 629,3	0,312	80			
800	800,0 – 801,6	796,3 – 799,3	0,502				
1000	1000,0 – 1002,0	996,3 – 999,3	0,785	100	1,0	≥1,0	
1250	1250,0 – 1252,5	1246,5 – 1249,3	1,227				
1500	1500,0 – 1502,5	1494,7 – 1499,3	1,766				
Diameter ND1750 and ND2000 can be fabricated upon request.							

B Inner dia., duct and fittings
d Outer dia., inside fittings
A Duct area
Li Lenght inside
Lp Lenght outside
t_1 Duct thickness
t_2 Fittings thickness
L Lenght collar

Dimensions and Tolerances

(According to Eurovent 2/3)

SIMDUCT CLASS C (NORSOK)



Size design B	B mm Norm. diam.	d mm	A m²	Li Lp mm	t1 pipe mm	t2 det. mm	L
100	100,0 – 100,5	98,8 – 99,3	0,008	60	0,8	≥0,8	10
125	125,0 – 125,5	122,5 – 124,3	0,012				
160	160,0 – 160,6	157,5 – 159,3	0,020				
200	200,0 – 200,7	197,3 – 199,3	0,031				
250	250,0 – 250,8	248,2 – 249,3	0,049		1,0	≥1,0	
315	315,0 – 315,9	313,0 – 314,3	0,078				13
400	400,0 – 401,0	397,8 – 399,3	0,126	70	1,25	≥1,25	
500	500,0 – 501,1	497,6 – 499,3	0,196				
630	630,0 – 631,2	627,0 – 629,3	0,312	80			
800	800,0 – 801,6	795,7 – 799,3	0,502				
1000	1000,0 – 1002,0	995,5 – 999,3	0,785	100	1,5	≥1,5	
1250	1250,0 – 1252,5	1245,7 – 1249,3	1,227				
1500	1500,0 – 1502,5	1494,7 – 1499,3	1,766				
Diameter Ø1750 and Ø2000 can be fabricated upon request.							

B Inner dia., duct and fittings
d Outer dia., inside fittings
A Duct area
Li Lenght inside
Lp Lenght outside
t_1 Duct thickness
t_2 Fittings thickness
L Lenght collar

SIMDUCT CLASS

Stainless steel AISI 316 L (SS2348)

ND SIMDUCT	THICKNESS CLASS-B	THICKNESS CLASS-C	THICKNESS CLASS-F (AO rated)	GMC TOLERANCE PARTS ±
Ø100	0,5 mm	0,8 mm	N/A	10mm
Ø125	0,5 mm	0,8 mm	0,8 mm	10mm
Ø160	0,5 mm	0,8 mm	0,8 mm	10mm
Ø200	0,6 mm	0,8 mm	0,8 mm	10mm
Ø250	0,6 mm	1,0 mm	1,0 mm	10mm
Ø315	0,6 mm	1,0 mm	1,0 mm	10mm
Ø400	0,8 mm	1,25 mm	1,25 mm	15mm
Ø500	0,8 mm	1,25 mm	1,25 mm	15mm
Ø630	0,8 mm	1,25 mm	1,25 mm	15mm
Ø800	0,8 mm	1,5 mm	1,5 mm	20mm
Ø1000	0,9 mm	1,5 mm	1,5 mm	20mm
Ø1250	0,9 mm	1,5 mm	1,5 mm	20mm
Ø1500	0,9 mm	1,5 mm	N/A	20mm

Note: NORSOK DUCT SPEC H-CR-OO1 Rev. 4
ISO 15138

Note: GMC TOLERANCE IS FOR LENGTH ONLY

We can fabricate all ducts, all according to ISO 15138
and we can also fabricate all types of ducts

Sealing system

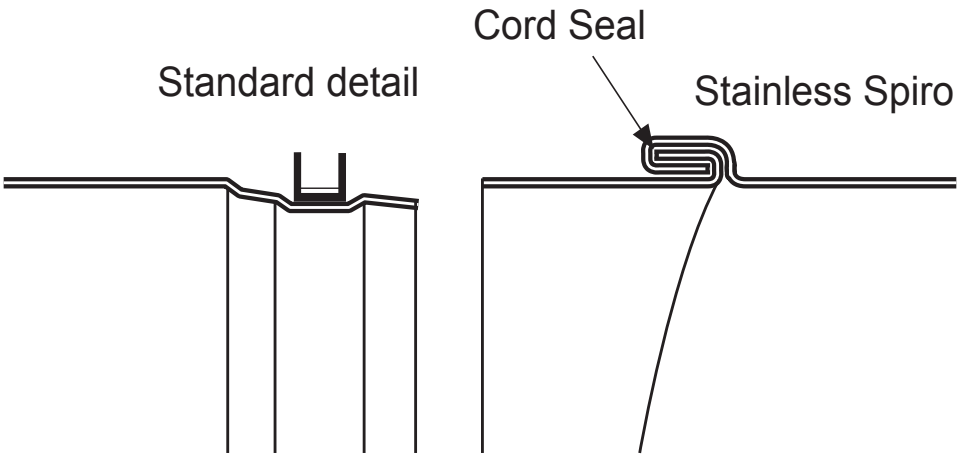
- **Duct parts are delivered with gasket in EPDM-rubber**

- **Stainless steel Spiro ducts are delivered with a cord seal made of EPDM-rubber in the seams.**

Standard: Seal is delivered in EPDM-rubber. Under normal conditions the seal can handle:
-30°C to + 100 °C continous
-50°C to + 120 °C intermittent

Standard Spiral Stainless Steel Duct;
Air tight seal is delivered in EPDM rubber. Under normal operating conditions the seal can handle -30°C to + 100°C continuously. For intermittent conditions - 50°C to + 120°C can be accepted.

Special Spiral Stainless Steel Duct;
On demand for fire-resistant ducts, with possible high temperatures, a special cord seal is used. This gives an A-0 fire rating. On A-60 fire rating, a special gasket is used. This expands at 200°C and at 800°C the gasket transforms into a ceramic condition and complete seals off the joint in the duct.

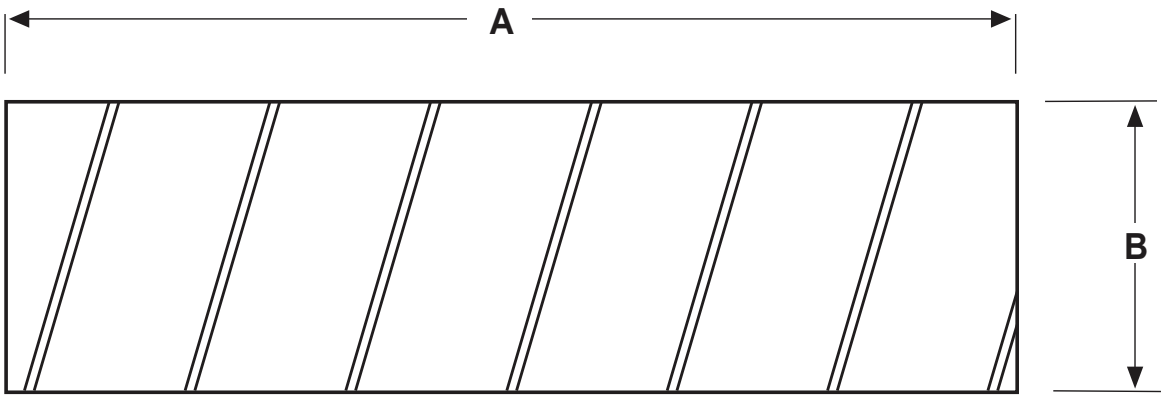


EPDM standard				
Type	**1**	**2**	**3**	**4**
Dim. duct	100 - 315	400 - 500	630 - 800	1000 - 1500

Codes and standards

- NS 3561 Circular ducts made of metal plates.
- NS 3560 Rectangular ducts made of metal plates.
- Swedish standard SS 2609.
- Eurovent standard 2/3.
- Heating and ventilating contractors association:
  Specification for sheet metal ductwork DW 142.
- Ductwork leakage testing DW 143.
- Statoil technical standard:
  Ductwork, grills and diffusers, G-SP-107, oct. 1992, rev. B.
- Norsok standard, H-CR-001. Rev. 3 July 1998.
- NS-EN ISO 15138
- IMO.RES. A 754 (18)

Spiral duct



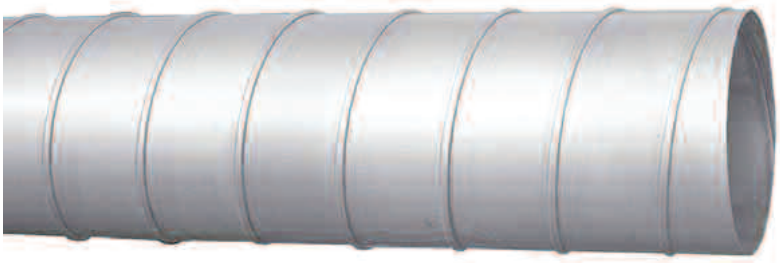
Duct-profile

Dimension 100-500

Dimension 630 > 1500

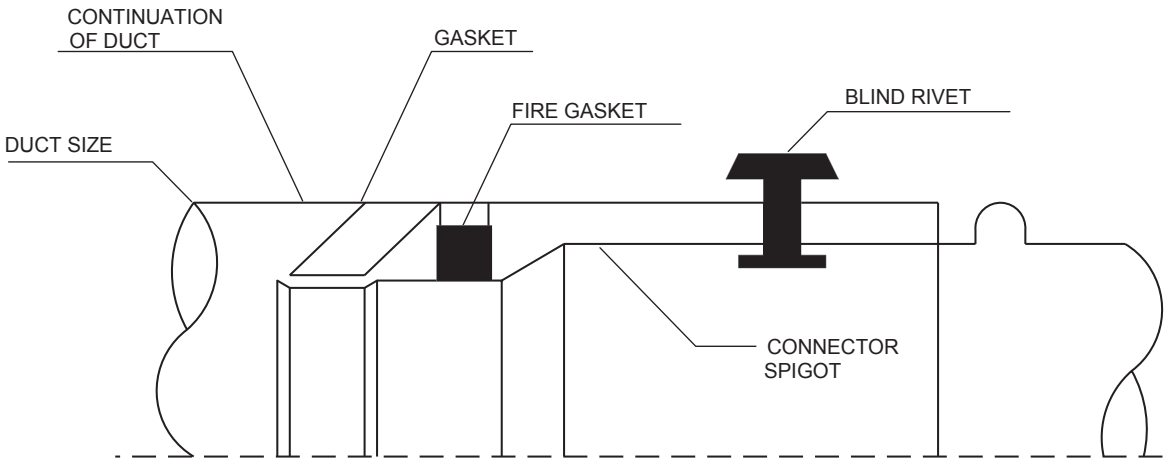
SIMD
100
125
160
200
250
315
400
500
630
800
1000
1250
1500

Standard=
3 meter length



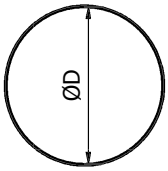
A-0 CONNECTION FOR SIMDUCT

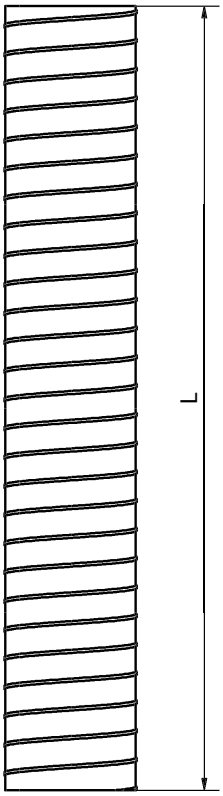
DIAGRAM FOR A-0 CONNECTION WITH SIMDUCT



NOTE:
Blind rivet size 4,8 mm

Chapter 3





Part information

ØD	L (mm)	Thickness (mm)	Kg
100	3000	0,8	7,8
125	3000	0,8	9,6
160	3000	0,8	11,4
200	3000	0,8	18,3
250	3000	1	24
315	3000	1	29,1
400	3000	1,25	45
500	3000	1,25	60
630	3000	1,25	72,3
800	3000	1,5	111,6
1000	3000	1,5	140,4
1250	3000	1,5	176,4
1500	3000	1,5	210,6

GMC CONSIDER IT DONE

TITLE: SIMD-DIM-C Duct

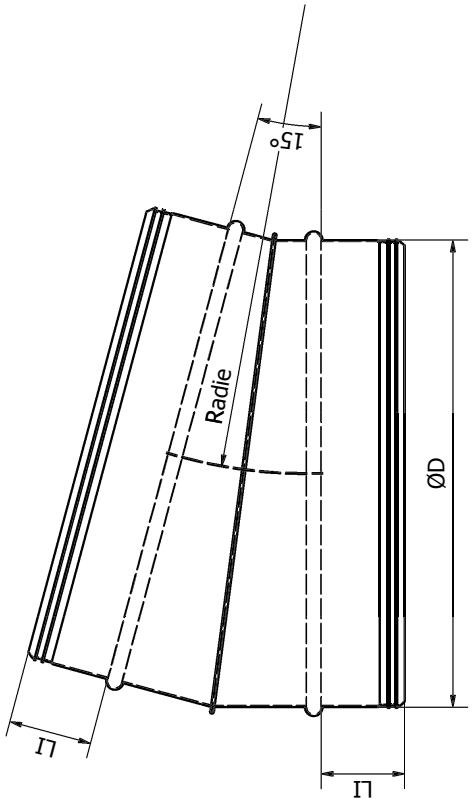
SCALE | DRAWING No. | REV No.
U.M.S. | PROJECT | DISCIPLINE | CODE | SEQUENCE | SHT. NO.

REV.	REASON FOR ISSUE	DRAWN	DATE	CHECKED	APPR.D	APPR.D CLIENT
	For Information	EH	02.02.2009			

REFERENCE DRG. No. | REFERENCE DRAWING TITLE

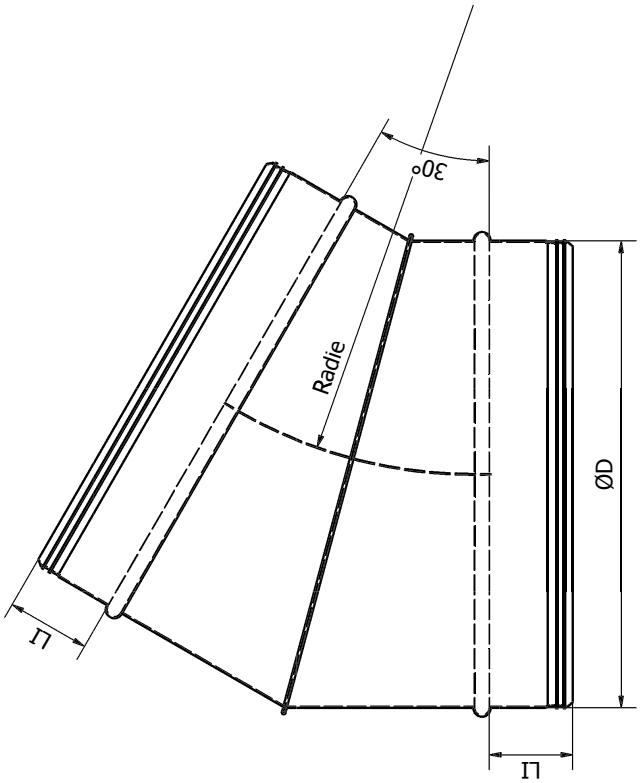
Part information

ØD	LI (mm)	Radie (mm)	Thickness (mm)	Weight Kg
100	60	100	0,8	0,33
125	60	125	0,8	0,45
160	60	160	0,8	0,61
200	60	200	0,8	0,80
250	60	250	1	1,4
315	60	315	1	2
400	70	400	1,25	3,7
500	70	500	1,25	5
630	80	630	1,25	7,7
800	80	800	1,5	13,3
1000	100	1000	1,5	20
1250	100	1250	1,5	28,4
1500	100	1500	1,5	37,7



SIMB-15°-DIM-C
Bend

Part information				
ØD	Ll (mm)	Radie (mm)	Thickness (mm)	Weight Kg
100	60	100	0,8	0,4
125	60	125	0,8	0,53
160	60	160	0,8	0,75
200	60	200	0,8	1
250	60	250	1	1,82
315	60	315	1	2,7
400	70	400	1,25	4
500	70	500	1,25	7,2
630	80	630	1,25	11
800	80	800	1,5	19,8
1000	100	1000	1,5	30,3
1250	100	1250	1,5	44,5
1500	100	1500	1,5	60,9



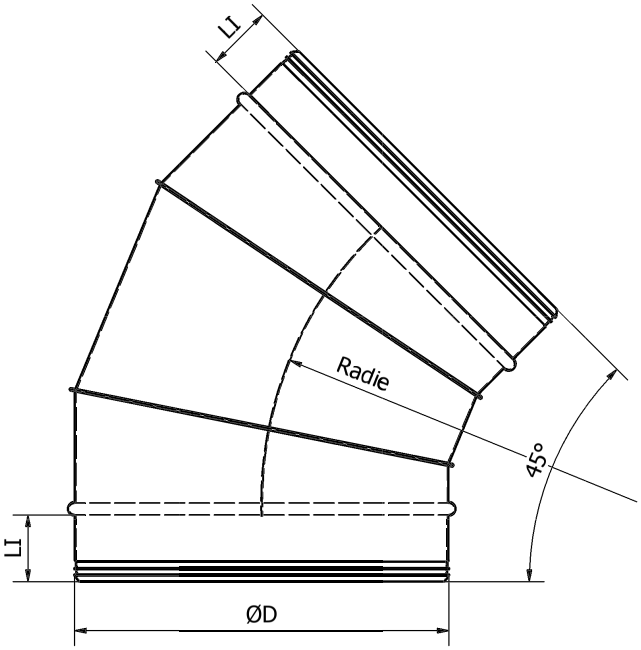
SIMB-30°-DIM-C
Bend

GMC CONSIDER IT DONE

REV.	For Information	DRAWN	DATE	CHECKED	APPR.D	APPR.D CLIENT
	REASON FOR ISSUE	EH	23.10.2015			

REFERENCE DRAWING TITLE

REFERENCE DRG. No.



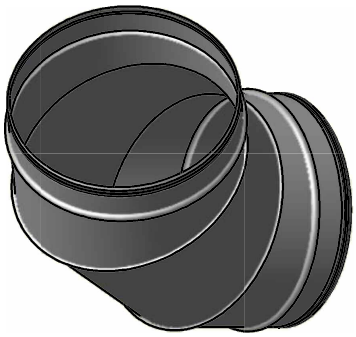
Part information				
ØD	LI (mm	Radie (mm)	Thickness mm	Weight Kg
100	60	100	0,8	0,45
125	60	125	0,8	0,65
160	60	160	0,8	0,93
200	60	200	0,8	1,29
250	60	250	1	2,37
315	60	315	1	3,54
400	70	400	1,25	6,66
500	70	500	1,25	9,6
630	80	630	1,25	14,77
800	80	800	1,5	27
1000	100	1000	1,5	41,2
1250	100	1250	1,5	61,3
1500	100	1500	1,5	84,7

REFERENCE DRG. No.	REFERENCE DRAWING TITLE	REV.	REASON FOR ISSUE	DRAWN	DATE	CHECKED	APPR.D	APPR.D CLIENT
			For Information	EH	12.02.2016			

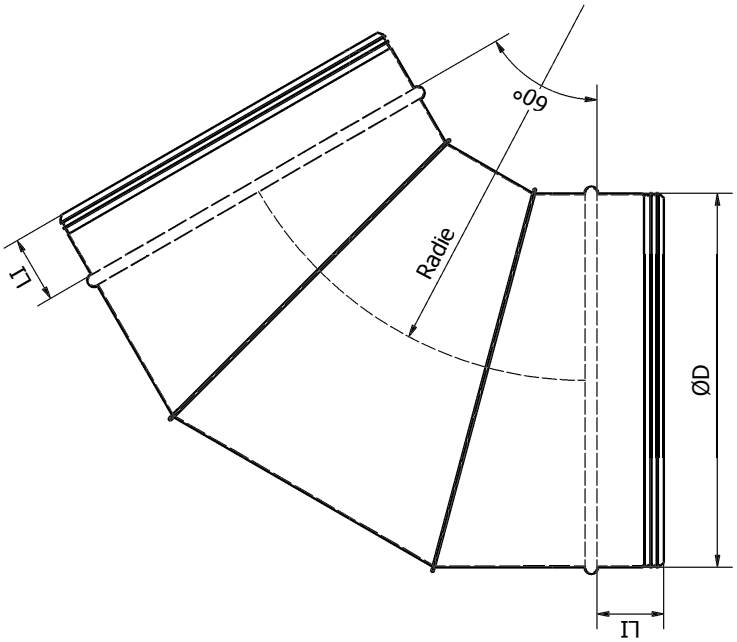
GMC CONSIDER IT DONE

TITLE :
SIMB-45°-DIM-C
Bend

SCALE U.N.O. | DRAWING No. PROJECT DISCIPLINE CODE SEQUENCE SHT. NO. | REV No.

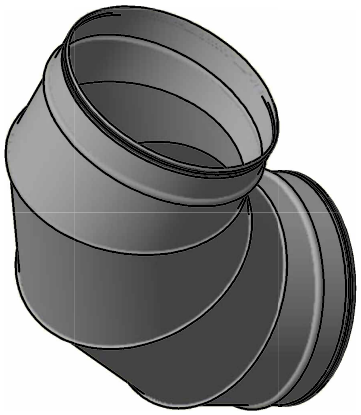


Part information			
ØD	LI (mm)	Radie (mm)	Thickness (mm)	Weight Kg
100	60	100	0,8	0,52
125	60	125	0,8	0,74
160	60	160	0,8	1
200	60	200	0,8	1,5
250	60	250	1	2,8
315	60	315	1	4,2
400	70	400	1,25	8
500	70	500	1,25	11,7
630	80	630	1,25	18,1
800	80	800	1,5	33,6
1000	100	1000	1,5	51,8
1250	100	1250	1,5	77,6
1500	100	1500	1,5	108,3



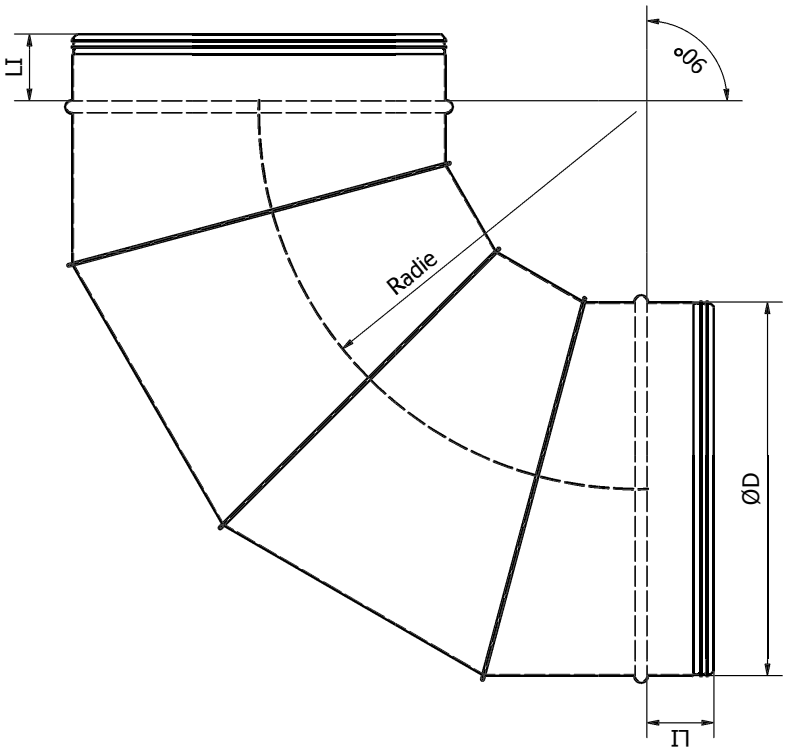
SIMB-60°-DIM-C
Bend

For Information — EH — 9.12.2015



Part information

ØD	LI (mm	Radie (mm)	Thickness (mm)	Weight Kg
100	60	100	0,8	0,6
125	60	125	0,8	0,95
160	60	160	0,8	1,39
200	60	200	0,8	1,99
250	60	250	1	3,79
315	60	315	1	5,7
400	70	400	1,25	10,9
500	70	500	1,25	16,3
630	80	630	1,25	25,3
800	80	800	1,5	47,4
1000	100	1000	1,5	71,7
1250	100	1250	1,5	110,8
1500	100	1500	1,5	155,6



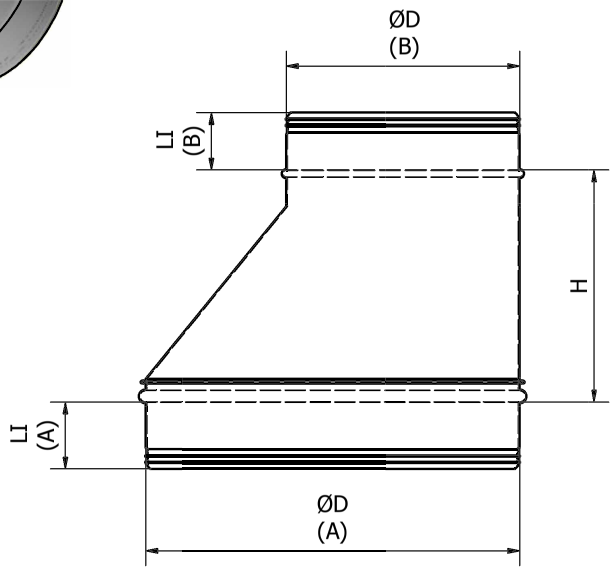
TITLE: SIMB-90°-DIM-C Bend

SCALE: UNIT: mm | DRAWING No. | PROJECT | DESCRIPTION | CODE | SEQUENCE | SHT. NO. | REV No.

GMC CONSIDER IT DONE

REV.	REASON FOR ISSUE	DRAWN	DATE	CHECKED	APPR.D	APPR.D CLIENT
	For Information	EH	2021.10.01			

REFERENCE DRG. No. | REFERENCE DRAWING TITLE



Part information						
ØD(A)	ØD(B)	H (mm)	LI (A)	LI (B)	Thickness (mm)	KG
125	100	210	60	60	0,8	0,7
160	100	210	60	60	0,8	0,9
160	125	210	60	60	0,8	0,98
200	100	210	60	60	0,8	1,1
200	125	210	60	60	0,8	1,2
200	160	210	60	60	0,8	1,3
250	100	210	60	60	1	1,58
250	125	250	60	60	1	1,84
250	160	250	60	60	1	1,99
250	200	250	60	60	1	2,16
315	125	310	60	60	1	2,54
315	160	310	60	60	1	2,7
315	200	250	60	60	1	2,52
315	250	250	60	60	1	2,72
400	160	310	70	60	1,25	4,26
400	200	310	70	60	1,25	4,48
400	250	250	70	60	1,25	4,16
400	315	250	70	60	1,25	4,45
500	200	390	70	60	1,25	6,27
500	250	390	70	60	1,25	6,59
500	315	310	70	60	1,25	6
500	400	250	70	70	1,25	5,75
630	250	480	80	60	1,25	9,66
630	315	390	80	60	1,25	8,9
630	400	320	80	70	1,25	8,36
630	500	260	80	70	1,25	7,7
800	400	390	80	70	1,5	14,9
800	500	390	80	70	1,5	14,72
800	630	320	80	80	1,5	13,9
1000	500	480	100	70	1,5	21
1000	630	480	100	80	1,5	22,3
1000	800	320	100	80	1,5	18
1250	630	530	100	80	1,5	29,54
1250	800	530	100	80	1,5	30,48
1250	1000	390	100	100	1,5	26,54
1500	800	530	100	80	1,5	39,77
1500	1000	530	100	100	1,5	37,7
1500	1250	390	100	100	1,5	32,43

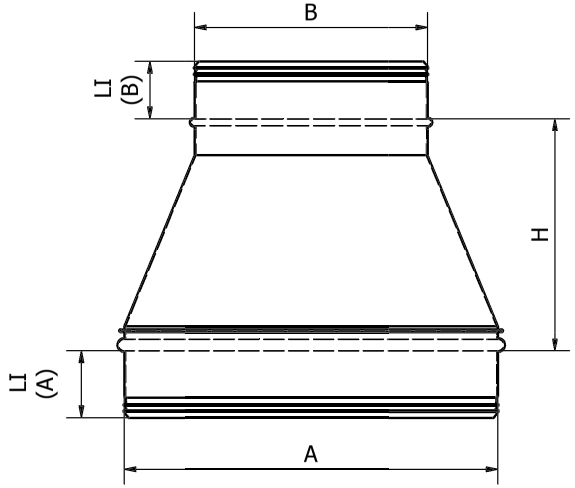
REFERENCE DRG. No. | REFERENCE DRAWING TITLE | REV. | REASON FOR ISSUE | DRAWN | DATE | CHECKED | APPR.D | APPR.D CLIENT

For Information | EH | 12.02.2016

GMC CONSIDER IT DONE

TITLE : SIMOEC-DIM-DIM-C Reducer-Eccentric

SCALE U.N.O. | DRAWING No. PROJECT DISCIPLINE CODE SEQUENCE SHT. NO. | REV No.



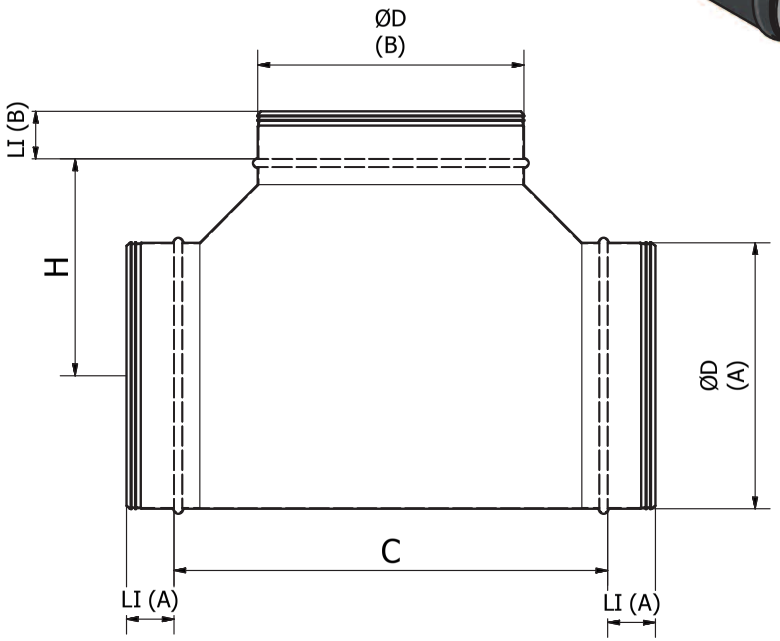
Part information						
ØD (A)	ØD (B)	H (mm)	LI (A)	LI (B)	Thickness (mm)	KG
125	100	210	60	60	0,8	0,7
160	100	210	60	60	0,8	0,9
160	125	210	60	60	0,8	0,98
200	100	210	60	60	0,8	1,1
200	125	210	60	60	0,8	1,2
200	160	210	60	60	0,8	1,3
250	100	210	60	60	1	1,58
250	125	250	60	60	1	1,84
250	160	250	60	60	1	1,99
250	200	250	60	60	1	2,16
315	125	310	60	60	1	2,54
315	160	310	60	60	1	2,7
315	200	250	60	60	1	2,52
315	250	250	60	60	1	2,72
400	160	310	70	60	1,25	4,26
400	200	310	70	60	1,25	4,48
400	250	250	70	60	1,25	4,16
400	315	250	70	60	1,25	4,45
500	200	390	70	60	1,25	6,27
500	250	390	70	60	1,25	6,59
500	315	310	70	60	1,25	6
500	400	250	70	70	1,25	5,75
630	250	480	80	60	1,25	9,66
630	315	390	80	60	1,25	8,9
630	400	320	80	70	1,25	8,36
630	500	260	80	70	1,25	7,7
800	400	390	80	70	1,5	14,9
800	500	390	80	70	1,5	14,72
800	630	320	80	80	1,5	13,9
1000	500	480	100	70	1,5	21
1000	630	480	100	80	1,5	22,3
1000	800	320	100	80	1,5	18
1250	630	530	100	80	1,5	29,54
1250	800	530	100	80	1,5	30,48
1250	1000	390	100	100	1,5	26,54
1500	800	530	100	80	1,5	39,77
1500	1000	530	100	100	1,5	37,7
1500	1250	390	100	100	1,5	32,43

REFERENCE DRG. No.	REFERENCE DRAWING TITLE	REV.	REASON FOR ISSUE	DRAWN	DATE	CHECKED	APPR.D	APPR.D CLIENT
			For Information	EH	12.02.2016			

GMC CONSIDER IT DONE

TITLE :
SIMOS-DIM-DIM-C
Reducer-Centric

SCALE U.N.O. | DRAWING No. PROJECT DISCIPLINE CODE SEQUENCE SHT. NO. | REV No.



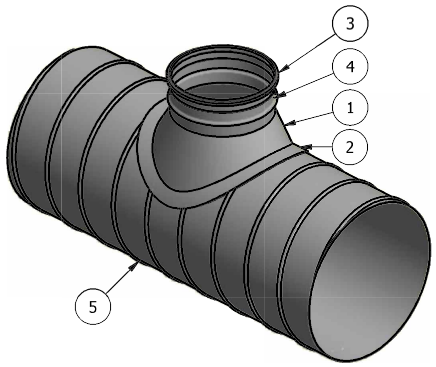
Dimension							
ØD (A)	ØD (B)	C (mm)	H (mm)	LI (A) (mm)	LI (B) (mm)	Thickness (mm)	Weight Kg
125	125	337	171	60	60	0,8	1,58
160	125	337	186	60	60	0,8	1,9
160	160	372	186	60	60	0,8	2,15
200	125	340	207	60	60	0,8	2,31
200	160	375	207	60	60	0,8	2,54
200	200	415	207	60	60	0,8	2,8
250	125	340	232	60	60	1	3,42
250	160	375	232	60	60	1	3,74
250	200	415	232	60	60	1	4,11
250	250	465	232	60	60	1	4,77
315	125	370	282	60	60	1	4,57
315	160	405	282	60	60	1	4,84
315	200	445	282	60	60	1	5,47
315	250	495	282	60	60	1	6,11
315	315	560	277	60	60	1	6,87
400	160	412	329	70	60	1,25	7,7
400	200	452	329	70	60	1,25	8,42
400	250	502	329	70	60	1,25	9,44
400	315	567	324	70	60	1,25	10,5
400	400	652	326	70	70	1,25	12,2
500	200	494	400	70	60	1,25	11,29
500	250	544	400	70	60	1,25	12,5
500	315	609	395	70	60	1,25	13,96
500	400	686	399	70	70	1,25	15,66
500	500	796	399	70	70	1,25	18,7
630	250	560	466	80	60	1,25	16,17
630	315	625	461	80	60	1,25	17,26
630	400	710	463	80	70	1,25	19,8
630	500	810	463	80	70	1,25	22,5
630	630	940	470	80	80	1,25	26,44
800	315	665	566	80	60	1,5	27,6
800	400	750	568	80	70	1,5	30
800	500	850	568	80	70	1,5	34,4
800	630	980	575	80	80	1,5	40,3
800	800	1150	575	80	80	1,5	45,38
1000	400	788	698	100	70	1,5	40,5
1000	500	888	698	100	70	1,5	45,7
1000	630	1018	705	100	80	1,5	52,66
1000	800	1188	705	100	80	1,5	60,18
1000	1000	1388	694	100	100	1,5	68,32
1250	630	1018	830	100	80	1,5	64,35
1250	800	1188	830	100	80	1,5	73,86
1250	1000	1388	819	100	100	1,5	82,94
1250	1250	1638	819	100	100	1,5	98,66
1500	630	958	914	100	80	1,5	72,3
1500	800	1128	914	100	80	1,5	82,46
1500	1000	1328	914	100	100	1,5	96,5
1500	1250	1578	914	100	100	1,5	110,5
1500	1500	1828	914	100	100	1,5	121,3

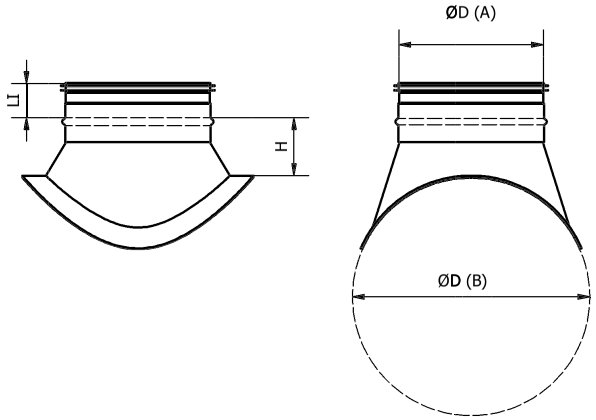
REFERENCE DRG. No.	REFERENCE DRAWING TITLE	REV.	REASON FOR ISSUE	DRAWN	DATE	CHECKED	APPR.D	APPR.D CLIENT
			For Information	EH	22.02.2016			

TITLE :

SIMT-DIM-DIM-C
Tee Tubing

SCALE	DRAWING No.						REV No.
U.N.O.	PROJECT	DISCIPLINE	CODE	SEQUENCE	SHT. NO.		





PARTS LIST		
ITEM	PART	MATERIAL
1	Branch Connections	Stainless Steel 316L
2	Flange 40x3mm	Stainless Steel 316L
3	Gasket	Rubber, EPDM
4	LA-Ø-Diameter	Stainless Steel 316L
5	Simduct Class C	Stainless Steel 316L

Part information					
ØD (A)	ØD (B)	H (mm)	LI (mm)	Thickness (mm)	KG
125	125	100	60	0,8	0,62
125	160	100	60	0,8	0,65
125	200	100	60	0,8	0,68
125	250	100	60	0,8	0,71
125	315	100	60	0,8	0,76
125	400	100	60	0,8	0,79
125	500	100	60	0,8	0,84
125	630	100	60	0,8	0,92
125	800	100	60	0,8	0,96
125	1000	100	60	0,8	0,97
125	1250	100	60	0,8	0,85
160	160	100	60	0,8	0,76
160	200	100	60	0,8	0,89
160	250	100	60	0,8	0,93
160	315	100	60	0,8	0,99
160	400	100	60	0,8	1
160	500	100	60	0,8	1,1
160	630	100	60	0,8	1,15
160	800	100	60	0,8	1,22
160	1000	100	60	0,8	1,3
160	1250	100	60	0,8	1,38
200	200	100	60	0,8	1,19
200	250	100	60	0,8	1,28
200	315	100	60	0,8	1,36
200	400	100	60	0,8	1,42
200	500	100	60	0,8	1,5
200	630	100	60	0,8	1,59
200	800	100	60	0,8	1,83
200	1000	100	60	0,8	2,1
200	1250	100	60	0,8	2,09
250	250	100	60	1	1,9
250	315	100	60	1	2,13
250	400	100	60	1	2.22
250	500	100	60	1	2,33
250	630	100	60	1	2,46
250	800	100	60	1	2,61

Part information					
ØD (A)	ØD (B)	H (mm)	LI (mm)	Thickness (mm)	KG
250	1000	100	60	1	2,52
250	1250	100	60	1	3,16
315	315	100	60	1	2,73
315	400	100	60	1	3,03
315	500	100	60	1	3,18
315	630	100	60	1	3,36
315	800	100	60	1	3,55
315	1000	100	60	1	3,76
315	1250	100	60	1	3,97
400	400	100	70	1,25	4,89
400	500	100	70	1,25	5,48
400	630	100	70	1,25	5,77
400	800	100	70	1,25	6,08
400	1000	100	70	1,25	6,41
400	1250	100	70	1,25	7,76
500	500	100	70	1,25	6,67
500	630	100	70	1,25	7,53
500	800	100	70	1,25	7,93
500	1000	100	70	1,25	8,32
500	1250	100	70	1,25	7,75
500	1500	100	70	1,25	9,32
630	630	100	80	1,25	9,6
630	800	100	80	1,25	10,85
630	1000	100	80	1,25	11,34
630	1250	100	80	1,25	11,85
630	1500	100	80	1,25	12,52
800	800	100	80	1,5	20,79
800	1000	100	80	1,5	18,51
800	1250	100	80	1,5	19,19
800	1500	100	80	1,5	20
1000	1000	100	100	1,5	23,42
1000	1250	100	100	1,5	26,64
1000	1500	100	100	1,5	27,64
1250	1250	100	100	1,5	32,94
1250	1500	100	100	1,5	37,5
1500	1500	100	100	1,5	49,52

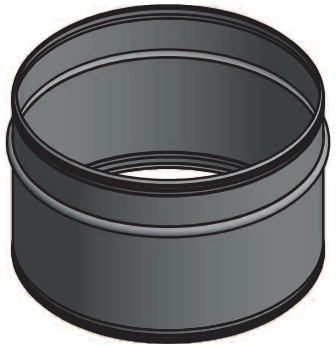
REFERENCE DRG. No.	REFERENCE DRAWING TITLE	REV.	REASON FOR ISSUE	DRAWN	DATE	CHECKED	APPR.D	APPR.D CLIENT
			For Information	EH	12.02.2016			

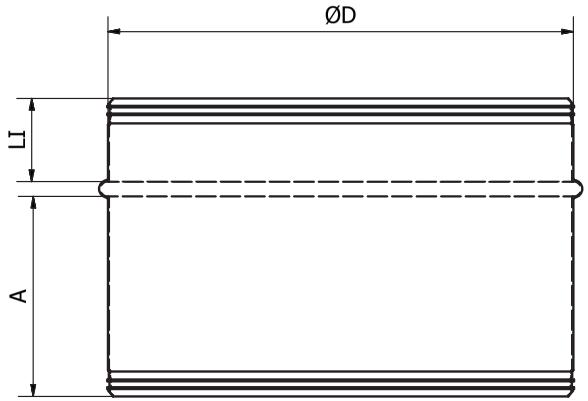
GMC CONSIDER IT DONE

TITLE :

SIMP-Branch Saddle-(Flange)

SCALE U.N.O. | DRAWING No. PROJECT DISCIPLINE CODE SEQUENCE SHT. NO. | REV No.





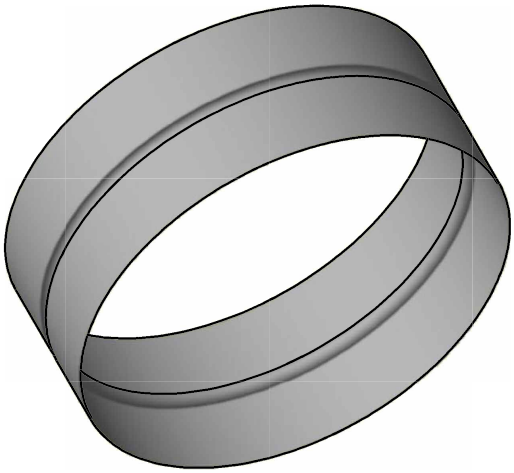
Part information				
ØD	LI (mm)	A (mm)	Thickness (mm)	Weight Kg
100	60	300	0,8	0,74
125	60	300	0,8	0,93
160	60	300	0,8	1,2
200	60	300	0,8	1,5
250	60	300	1	2,3
315	60	300	1	2,9
400	70	300	1,25	4,8
500	70	300	1,25	6
630	80	300	1,25	7,9
800	80	300	1,5	12
1000	100	300	1,5	15,8

REFERENCE DRG. No.	REFERENCE DRAWING TITLE	REV.	REASON FOR ISSUE	DRAWN	DATE	CHECKED	APPR.D	APPR.D CLIENT
			For Information	EH	22.02.2016			

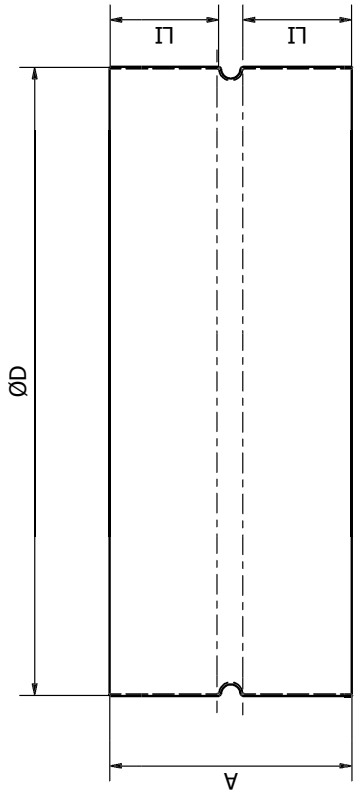
TITLE :

SIMSK-DIM-C
Slide-In Coupler

SCALE	DRAWING No.					
U.N.O.	PROJECT	DISCIPLINE	CODE	SEQUENCE	SHT. NO.	REV No.



Part information				
ØD	LI (mm)	A (mm)	Thickness (mm)	Kg
100	60	136	0,8	0,28
125	60	136	0,8	0,35
160	60	136	0,8	0,45
200	60	136	0,8	0,56
250	60	136	1	0,88
315	60	140	1	1,1
400	70	160	1,25	2
500	70	160	1,25	2,5
630	80	180	1,25	3,6
800	80	180	1,5	5,5
1000	100	220	1,5	8,3
1250	100	220	1,5	10,5
1500	100	220	1,5	12,6



SIMM-DIM-C
Female Coupler

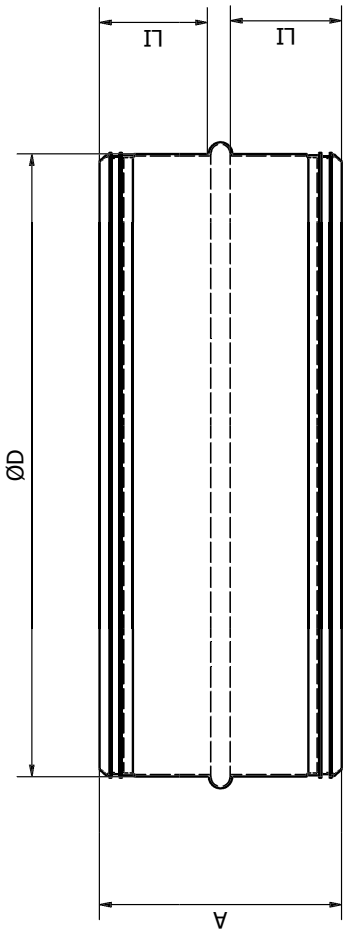
GMC CONSIDER IT DONE

REV.	For Information	DRAWN	DATE	CHECKED	APPR.D	APPR.D CLIENT
	REASON FOR ISSUE	EH				

REFERENCE DRG. No. | REFERENCE DRAWING TITLE

Part information

ØD	LI (mm	A (mm)	Thickness (mm)	Weight
100	60	136	0,8	0,28
125	60	136	0,8	0,35
160	60	136	0,8	0,45
200	60	136	0,8	0,56
250	60	136	1	0,88
315	60	140	1	1,1
400	**70**	**160**	1,25	**2**
500	70	160	1,25	2,5
630	80	180	1,25	3,6
800	80	180	1,5	5,5
1000	100	220	1,5	8,3
1250	100	220	1,5	10,5
1500	100	220	1,5	12,6

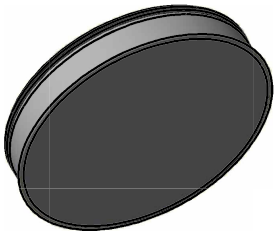


SIMN-DIM-C
Male Coupler

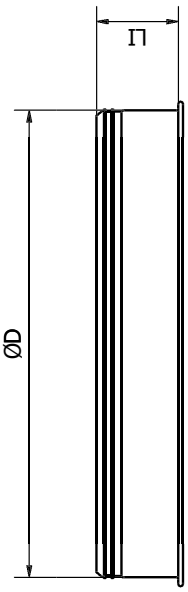
GMC CONSIDER IT DONE

REV.	REASON FOR ISSUE	DRAWN	DATE	CHECKED	APPR.D	APPR.D CLIENT
	For Information	EH	2021-04-06			

REFERENCE DRG. No. | REFERENCE DRAWING TITLE



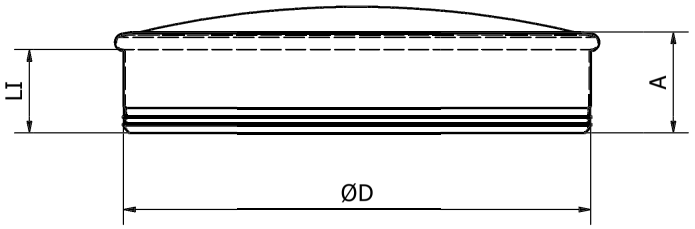
Part information			
ØD	LI (mm)	Thickness (mm)	Weight Kg
100	60	0,8	0,2
125	60	0,8	0,3
160	60	0,8	0,4
200	60	0,8	0,52
250	60	1	0,9
315	60	1	1,3
400	70	1,25	2,5
500	70	1,25	3,4
630	80	1,25	5,2
800	80	1,5	9,5
1000	100	1,5	14,5
1250	100	1,5	21,2
1500	100	1,5	29



SIMEB-DIM-C
End Cap

REV.	REASON FOR ISSUE	DRAWN	DATE	CHECKED	APPR.D	APPR.D CLIENT
	For Information	EH	2021.10.06			

REFERENCE DRG. No. | REFERENCE DRAWING TITLE



Part information					
ØD	A (mm)	LI (mm)	Wiremesh (mm)	Thickness (mm)	KG
100	75	60	10x10x2	0,8MM	0,15
125	75	60	10x10x2	0,8 MM	0,20
160	75	60	10x10x2	0,8 MM	0,25
200	75	60	10x10x2	0,8 MM	0,30
250	75	60	10x10x2	1 MM	0,5
315	80	60	25x25x2,5	1 MM	0,63
400	90	70	25x25x2,5	1,25 MM	1,13
500	90	70	25x25x2,5	1,25 MM	1,7
630	105	80	25x25x2,5	1,25 MM	2
800	105	80	25x25x2,5	1,5 MM	3,2
1000	125	100	25x25x2,5	1,5 MM	4,7
1250	125	100	25x25x2,5	1,5 MM	5,9
1500	125	100	25x25x2,5	1,5	6,5

REFERENCE DRG. No.	REFERENCE DRAWING TITLE	REV.	REASON FOR ISSUE	DRAWN	DATE	CHECKED	APPR.D	APPR.D CLIENT
			For Information	EH	12.02.2016			

GMC CONSIDER IT DONE

TITLE :
SIMWM-DIM-C
Wire Mesh

SCALE U.N.O. | DRAWING No. PROJECT DISCIPLINE CODE SEQUENCE SHT. NO. | REV No.

Flange ISO-15138

Duct size ØD	Bolt circle ØD	Flange	Bolt Hole	Bolt	No of Bolt	KG
100	145	40 x 4	10	M8	4	0,56
125	170	40 x 4	10	M8	4	0,67
160	205	40 x 4	10	M8	4	0,81
200	245	40 x 4	10	M8	8	0,97
250	295	40 x 4	10	M8	8	1,1
315	**360**	**40 x 4**	**10**	**M8**	**8**	**1,44**
355	400	40 x 4	10	M8	8	1,6
400	459	50 x 5	12	M10	12	2,85
450	509	50 x 5	12	M10	12	3,17
500	559	50 x 5	12	M10	12	3,49
560	619	50 x 5	12	M10	16	3,87
630	689	50 x 5	12	M10	16	4,31
710	769	50 x 5	12	M10	16	4,82
800	**859**	**50 x 5**	**12**	**M10**	**24**	5,39
900	959	50 x 5	12	M10	24	6
1000	1059	50 x 5	12	M10	24	6,66
1120	1209	80 x 8	14	M12	24	19,49
1250	1339	80 x 8	14	M12	32	21,6
1400	1489	80 x 8	14	M12	32	24
1500	1598	80 X 8	14	M12	36	25,5

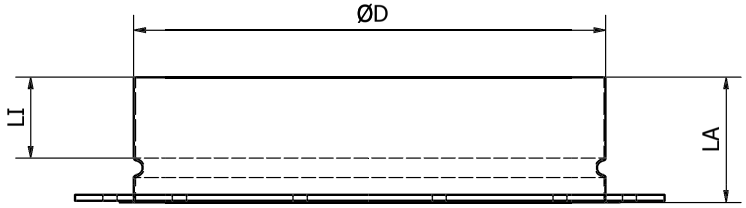
Part information				
ØD	LI (mm)	LA (mm)	Thickness (mm)	Kg
100	60	100	0,8	0,75
125	60	100	0,8	0,92
160	60	100	0,8	1,13
200	60	100	0,8	1,37
250	60	100	1	1,73
315	60	100	1	2,24
400	**70**	**110**	1,25	4,23
500	70	110	1,25	5,19
630	80	130	1,25	6,89
800	80	130	1,5	9,32
1000	100	140	1,5	11,94
1250	100	140	1,5	28,24
1500	100	140	1,5	36

REFERENCE DRG. No.	REFERENCE DRAWING TITLE	REV.	REASON FOR ISSUE	DRAWN	DATE	CHECKED	APPR.D	APPR.D CLIENT
			For Information	EH	12.02.2016			

GMC CONSIDER IT DONE

TITLE : SIMUT-DIM-C Connector

SCALE U.N.O. | DRAWING No. PROJECT DISCIPLINE CODE SEQUENCE SHT. NO. | REV No.



Flange ISO-15138

Duct size ØD	Bolt circle ØD	Flange (mm)	Bolt Hole	Bolt	No of Bolt	KG
100	145	40 x 4	10	M8	4	0,56
125	170	40 x 4	10	M8	4	0,67
160	205	40 x 4	10	M8	4	0,81
200	245	40 x 4	10	M8	8	0,97
250	295	40 x 4	10	M8	8	1,1
315	360	40 x 4	10	M8	8	1,44
355	400	40 x 4	10	M8	8	1,6
400	459	50 x 5	12	M10	12	2,85
450	509	50 x 5	12	M10	12	3,17
500	559	50 x 5	12	M10	12	3,49
560	619	50 x 5	12	M10	16	3,87
630	689	50 x 5	12	M10	16	4,31
710	769	50 x 5	12	M10	16	4,82
800	859	50 x 5	12	M10	24	5,39
900	959	50 x 5	12	M10	24	6
1000	1059	50 x 5	12	M10	24	6,66
1120	1209	80 x 8	14	M12	24	19,49
1250	1339	80 x 8	14	M12	32	21,6
1400	1489	80 x 8	14	M12	32	24
1500	1598	80 X 8	14	M12	36	25,5

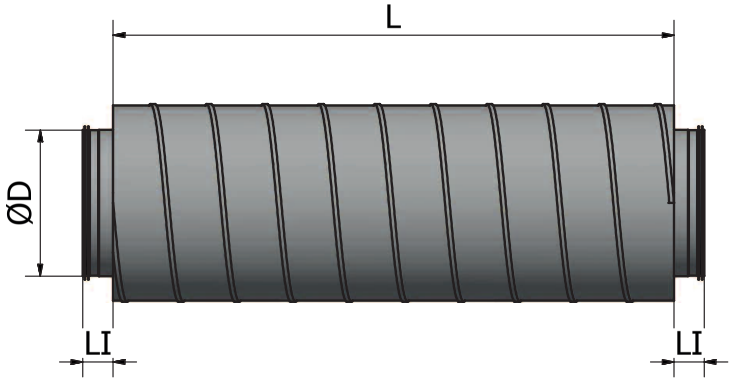
Part information				
ØD	LI (mm)	LA (mm)	Thickness (mm)	Kg
100	60	100	0,8	0,75
125	60	100	0,8	0,92
160	60	100	0,8	1,13
200	60	100	0,8	1,37
250	60	100	1	1,73
315	60	100	1	2,24
400	70	110	1,25	4,23
500	70	110	1,25	5,19
630	80	130	1,25	6,89
800	80	130	1,5	9,32
1000	100	140	1,5	11,94
1250	100	140	1,5	28,24
1500	100	140	1,5	36

REFERENCE DRG. No.	REFERENCE DRAWING TITLE	REV.	REASON FOR ISSUE	DRAWN	DATE	CHECKED	APPR.D	APPR.D CLIENT
			For Information	EH	12.02.2016			

GMC CONSIDER IT DONE

TITLE : SIMUT-M-Female Connector

SCALE U.N.O. | DRAWING No. PROJECT DISCIPLINE CODE SEQUENCE SHT. NO. | REV No.



SIMSA-Sound Attenuator L-600mm					
ØD	L (mm)	LI (mm)	Insulation (mm)	Thickness (mm)	Kg
125	600	60	50	0,8	8,1
160	600	60	50	0,8	10,2
200	600	60	50	0,8	12,0
250	600	60	50	1	15,4
315	600	60	50	1	19,6
400	600	70	50	1.25	27,9
500	600	70	50	1,25	34,0
630	600	80	50	1,25	43,8
800	600	80	50	1,5	61,3
1000	600	100	50	1,5	77,5
1250	600	100	50	1,5	95,7
1500	600	100	50	1,5	113,9

SIMSA-Sound Attenuator L-900mm					
ØD	L (mm)	LI (mm)	Insulation (mm)	Thickness (mm)	Kg
125	900	60	50	0,8	11,3
160	900	60	50	0,8	14,2
200	900	60	50	0,8	16,7
250	900	60	50	1	22,3
315	900	60	50	1	27,0
400	900	70	50	1.25	38,2
500	900	70	50	1,25	46,4
630	900	80	50	1,25	58,9
800	900	80	50	1,5	82,0
1000	900	100	50	1,5	102,7
1250	900	100	50	1,5	127,1
1500	900	100	50	1,5	151,1

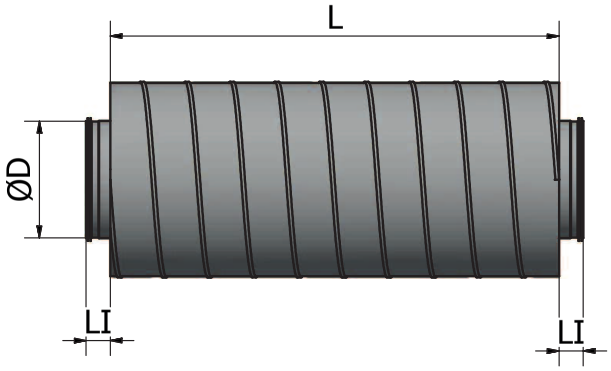
SIMSA-Sound Attenuator L-1200mm					
ØD	L (mm)	LI (mm)	Insulation (mm)	Thickness (mm)	Kg
125	1200	60	50	0,8	14,5
160	1200	60	50	0,8	18,3
200	1200	60	50	0,8	21,5
250	1200	60	50	1	26,9
315	1200	60	50	1	34,7
400	1200	70	50	1.25	48,4
500	1200	70	50	1,25	58,8
630	1200	80	50	1,25	74,3
800	1200	80	50	1,5	102,7
1000	1200	100	50	1,5	128,5
1250	1200	100	50	1,5	158,7
1500	1200	100	50	1,5	188,7

REFERENCE DRG. No.	REFERENCE DRAWING TITLE	REV.	REASON FOR ISSUE	DRAWN	DATE	CHECKED	APPR.D	APPR.D CLIENT
			For Information	EH	24.10.2012			

SIMSA-DIM-ISO-L-CLASS

TITLE :
SIMSA-Sound Attenuator Insulation-50mm

SCALE U.N.O. | DRAWING No. PROJECT DISCIPLINE CODE SEQUENCE SHT. NO. | REV No.



SIMSA-Sound Attenuator L-600mm					
ØD	L (mm)	LI (mm)	Insulation (mm)	Thickness (mm)	Kg
125	600	60	100	0,8	13,3
160	600	60	100	0,8	15,6
200	600	60	100	0,8	18,0
250	600	60	100	1	22,7
315	600	60	100	1	27,6
400	600	70	100	1.25	37,9
500	600	70	100	1,25	45,2
630	600	80	100	1,25	56,7
800	600	80	100	1,5	77,6
1000	600	100	100	1,5	96,4
1250	600	100	100	1,5	118,0
1500	600	100	100	1,5	139,5

SIMSA-Sound Attenuator L-900mm					
ØD	L (mm)	LI (mm)	Insulation (mm)	Thickness (mm)	Kg
125	900	60	100	0,8	15,6
160	900	60	100	0,8	22,0
200	900	60	100	0,8	25,5
250	900	60	100	1	32,5
315	900	60	100	1	38,3
400	900	70	100	1.25	51,7
500	900	70	100	1,25	61,9
630	900	80	100	1,25	77,0
800	900	80	100	1,5	104,3
1000	900	100	100	1,5	128,0
1250	900	100	100	1,5	156,9
1500	900	100	100	1,5	185,7

SIMSA-Sound Attenuator L-1200mm					
ØD	L (mm)	LI (mm)	Insulation (mm)	Thickness (mm)	Kg
125	1200	60	100	0,8	23,9
160	1200	60	100	0,8	28,2
200	1200	60	100	0,8	32,4
250	1200	60	100	1	40,1
315	1200	60	100	1	48,9
400	1200	70	100	1.25	65,7
500	1200	70	100	1,25	78,4
630	1200	80	100	1,25	96,7
800	1200	80	100	1,5	130,5
1000	1200	100	100	1,5	160,7
1250	1200	100	100	1,5	196,5
1500	1200	100	100	1,5	232,3

REFERENCE DRG. No.	REFERENCE DRAWING TITLE	REV.	REASON FOR ISSUE	DRAWN	DATE	CHECKED	APPR.D	APPR.D CLIENT
			For Information	EH	24.10.2012			

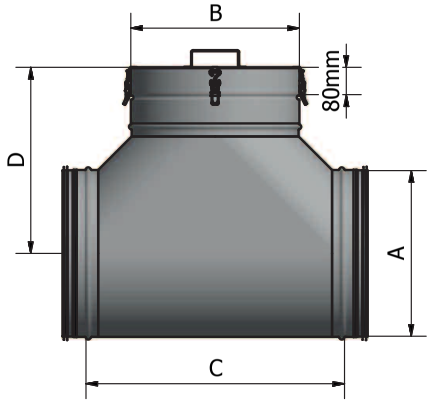
SIMSA-DIM-ISO-L-CLASS

TITLE :

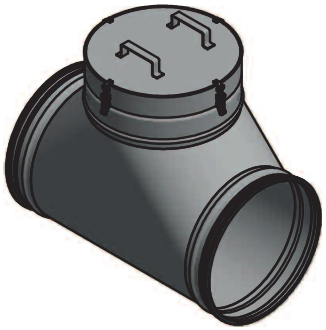
SIMSA-Sound Attenuator Insulation-100mm

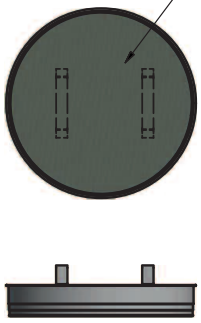
SCALE	DRAWING No.					REV No.
U.N.O.	PROJECT	DISCIPLINE	CODE	SEQUENCE	SHT. NO.	

SIMID-DIM A - DIM B - A60-F



NOTE: 80mm FIRE PROOFING A60 INSULATION INSIDE THE END CAP.





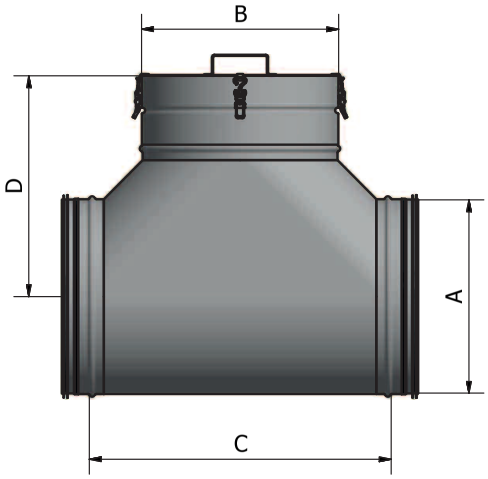
PART INFORMATION					
A	B	C	D	THICKNESS	KG
Dim 160	Dim 160	337	342	0,8MM	2,8
Dim 200	Dim 200	415	363	0,8MM	3,7
Dim 250	Dim 250	465	388	1MM	6,3
Dim 315	Dim 315	560	437	1MM	9,1
Dim 400	Dim 400	652	496	1,25MM	16,2
Dim 500	Dim 500	796	569	1,25MM	23,9
Dim 630	Dim 630	940	650	1,25MM	30,2
Dim 800	Dim 630	980	755	1,5MM	49,2
Dim1000	Dim 630	1018	885	1,5MM	61,6

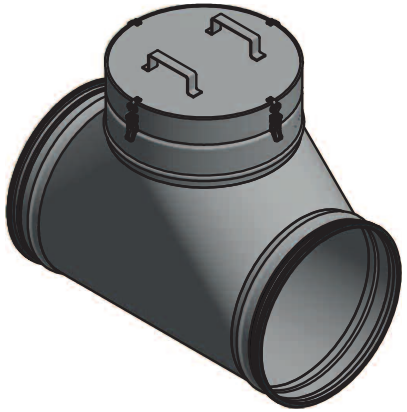
REFERENCE DRG. No.	REFERENCE DRAWING TITLE	REV.	REASON FOR ISSUE	DRAWN	DATE	CHECKED	APPR.D	APPR.D CLIENT
				EH	25.10.2012	TEH		

SIMID-DIM A - DIM B - A60-F

TITLE : Inspection Door (Tee) Class F (Fire proofing insulation A60)

SCALE U.N.O. | DRAWING No. PROJECT DISCIPLINE CODE SEQUENCE SHT. NO. | REV No.





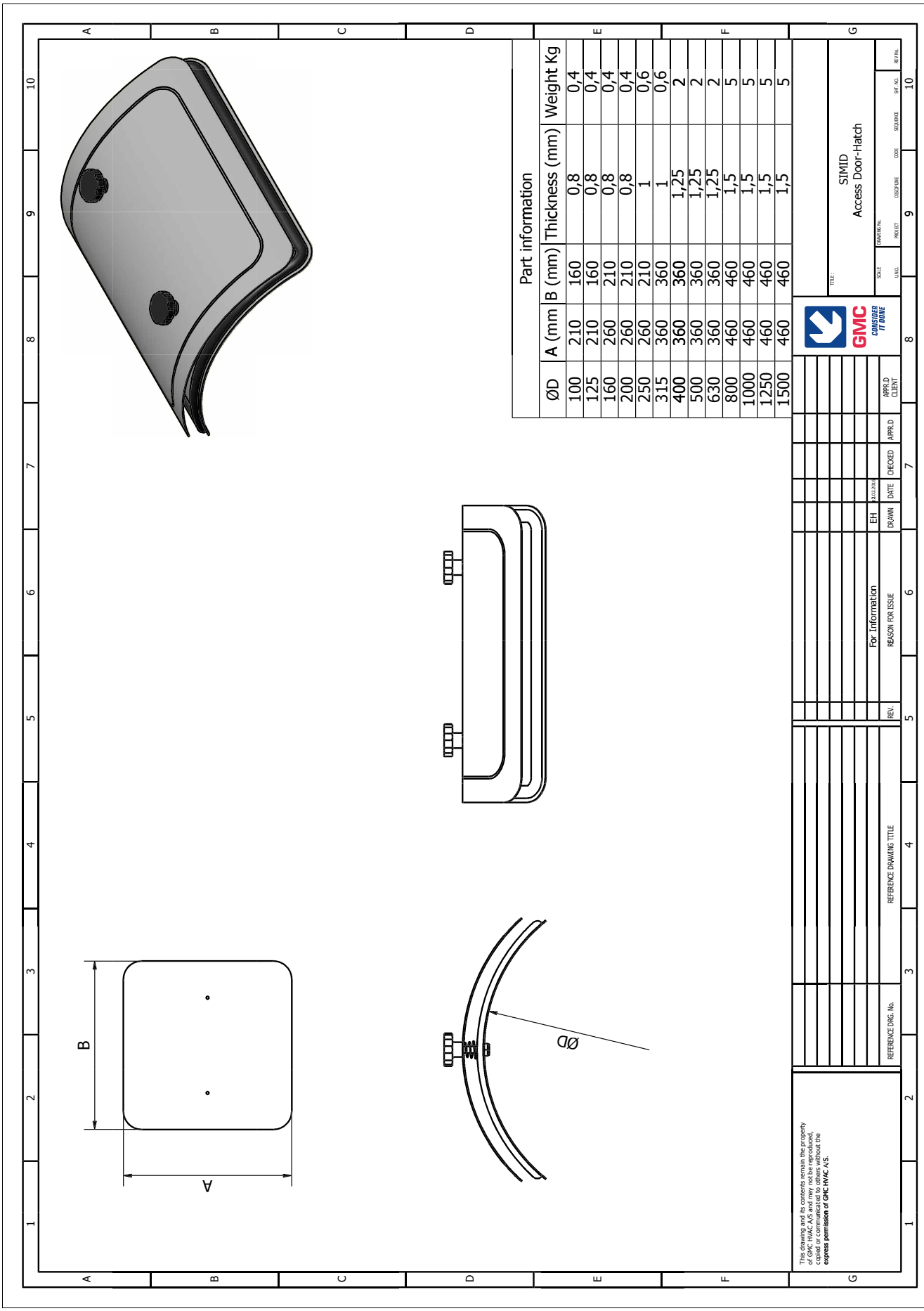
PART INFORMATION					
A	B	C	D	THICKNESS	KG
Dim 160	Dim 160	337	322	0,8MM	2,6
Dim 200	Dim 200	415	343	0,8MM	3,4
Dim 250	Dim 250	465	368	1MM	5,7
Dim 315	Dim 315	560	417	1MM	8,2
Dim 400	Dim 400	652	486	1,25MM	14,7
Dim 500	Dim 500	796	559	1,25MM	21,6
Dim 630	Dim 630	940	650	1,25MM	26,5
Dim 800	Dim 630	980	755	1,5MM	45,5
Dim1000	Dim 630	1018	885	1,5MM	57,9

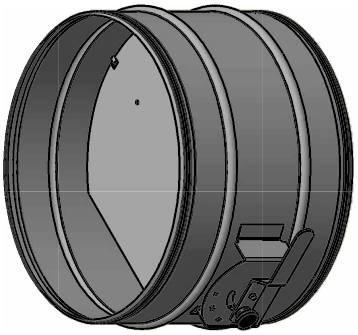
REFERENCE DRG. No.	REFERENCE DRAWING TITLE	REV.	REASON FOR ISSUE	DRAWN	DATE	CHECKED	APPR.D	APPR.D CLIENT
			For Information	EH	25.10.2012	TEH		

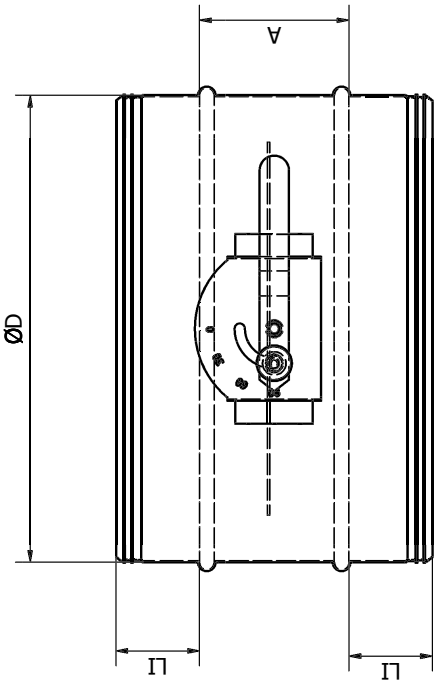
SIMID-DIM A - DIM B - A0-F

TITLE : Inspection Door (Tee) Class F (A0)

SCALE U.N.O. | DRAWING No. PROJECT | DISCIPLINE | CODE | SEQUENCE | SHT. NO. | REV No.


Part information
ØD
A (mm
B (mm)
Thickness (mm)
Weight Kg
100 210 160 0,8 0,4
125 210 160 0,8 0,4
160 260 210 0,8 0,4
200 260 210 0,8 0,4
250 260 210 1 0,6
315 360 360 1 0,6
400 360 360 1,25 2
500 360 360 1,25 2
630 360 360 1,25 2
800 460 460 1,5 5
1000 460 460 1,5 5
1250 460 460 1,5 5
1500 460 460 1,5 5
B
A
ØD
SIMID
Access Door-Hatch
GMC
CONSIDER IT DONE
For Information
REASON FOR ISSUE
REFERENCE DRAWING TITLE
REFERENCE DRG. No.
This drawing and its contents remain the property of GMC HVAC A/S and may not be reproduced, copied or communicated to others without the express permission of GMC HVAC A/S.





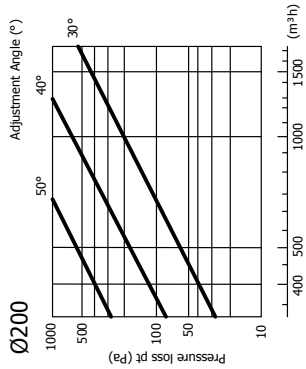
Part information

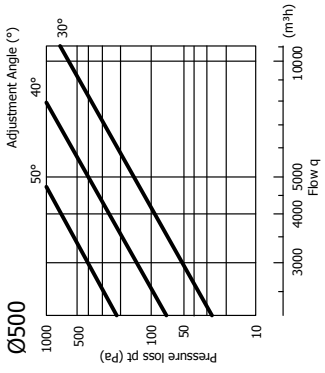
ØD	LI (mm)	A (mm)	Thickness mm	Weight Kg
100	60	90	0,8	0,5
125	60	90	0,8	0,7
160	60	90	0,8	0,9
200	60	90	0,8	1,2
250	60	90	1	1,5
315	60	90	1	1,8
400	70	130	1,25	3,2
500	70	130	1,25	4,7
630	80	130	1,25	6

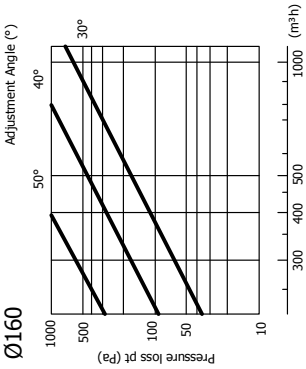
SIMBD-C-DIM-C
Balancing Damper-Circular

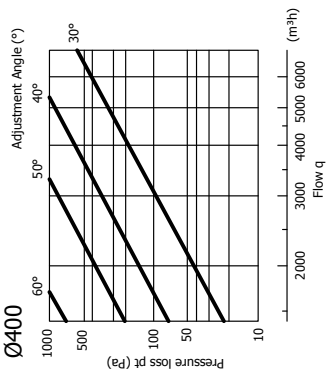
For Information

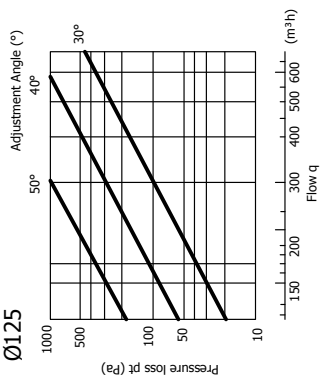
Pressure drop Charts circular Dampers

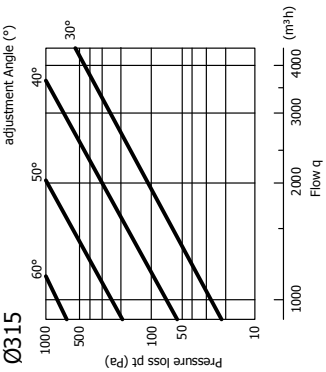


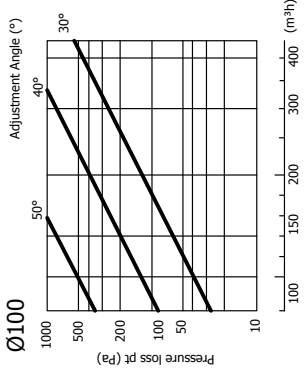


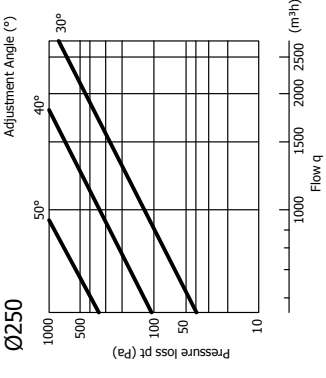


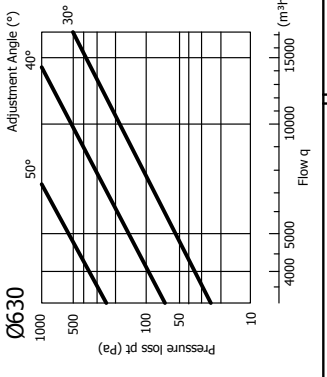








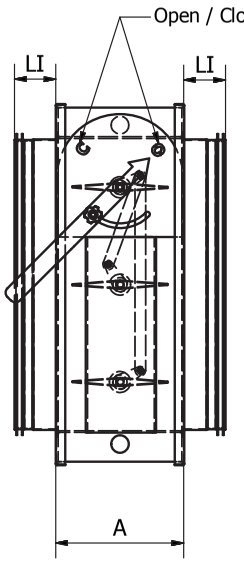


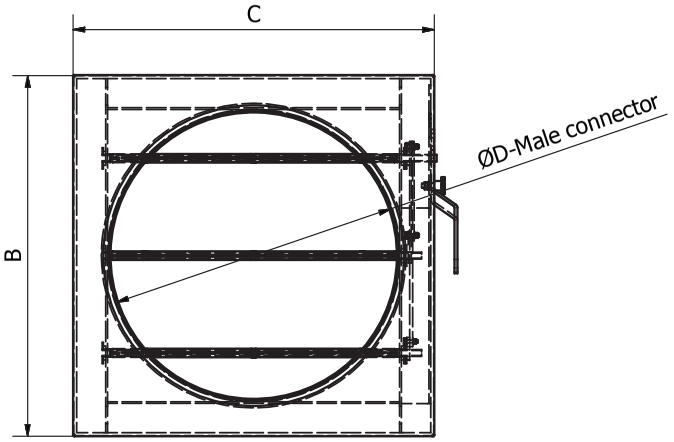


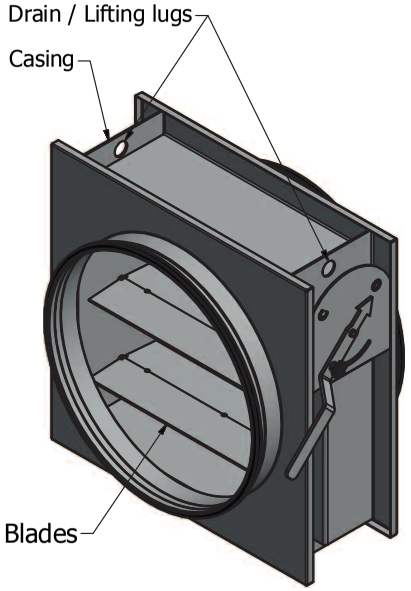
REFERENCE DRG. No.	REFERENCE DRAWING TITLE	REV.	REASON FOR ISSUE	DRAWN	DATE	CHECKED	APPR.D	APPR.D CLIENT
				EH	4.03.2008			

TITLE:
Pressure drop Charts circular Dampers

SCALE | DRAWING No. | PROJECT | DISCIPLINE | CODE | SEQUENCE | SHT. NO. | REV No.







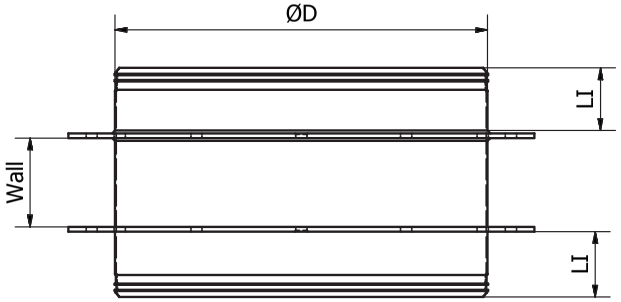
Part information

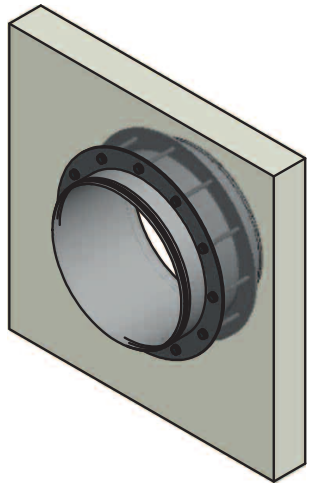
ØD-Male connector	A (mm)	B (mm)	C (mm)	LI (mm)	Casing	Blades	Thickness (mm)	KG
200	220	297,6	297,6	60	3mm	1	0,8mm	10,9
250	220	348	348	60	3mm	2	1,0mm	14,5
315	220	413	413	60	3mm	2	1,0mm	18,2
400	220	518,5	518,5	70	3mm	2	1,25mm	26,3
500	220	618,5	618,5	70	3mm	3	1,25mm	34,2
630	220	748,5	748,5	80	3mm	3	1,25mm	45,6
800	220	919	919	80	3mm	4	1,5mm	64,3
1000	220	1119	1119	100	3mm	5	1,5mm	87,8
1250	220	1429	1429	100	3mm	6	1,5mm	142,4
1500	220	1679	1679	100	3mm	7	1,5mm	182,1

REFERENCE DRG. No.	REFERENCE DRAWING TITLE	REV.	REASON FOR ISSUE	DRAWN	DATE	CHECKED	APPR.D	APPR.D CLIENT
			For Information	EH	16.07.2016			

TITLE :
SIMBD-R-DIM-C
Balancing Damper-Rectangular

SCALE U.N.O. | DRAWING No. PROJECT | DISCIPLINE | CODE | SEQUENCE | SHT. NO. | REV No.





Flange ISO-15138

Duct size	Bolt circle ØE	Flange (mm)	Bolt Hole	Bolt	No of Bolt	KG
100	145	40 x 4	10	M8	4	0,56
125	170	40 x 4	10	M8	4	0,67
160	205	40 x 4	10	M8	4	0,81
200	245	40 x 4	10	M8	8	0,97
250	295	40 x 4	10	M8	8	1,1
315	360	40 x 4	10	M8	8	1,44
355	400	40 x 4	10	M8	8	1,6
400	459	50 x 5	12	M10	12	2,85
450	509	50 x 5	12	M10	12	3,17
500	559	50 x 5	12	M10	12	3,49
560	619	50 x 5	12	M10	16	3,87
630	689	50 x 5	12	M10	16	4,31
710	769	50 x 5	12	M10	16	4,82
800	859	50 x 5	12	M10	24	5,39
900	959	50 x 5	12	M10	24	6
1000	1059	50 x 5	12	M10	24	6,66
1120	1209	80 x 8	14	M12	24	19,49
1250	1339	80 x 8	14	M12	32	21,6
1400	1489	80 x 8	14	M12	32	24
1500	1598	80 X 8	14	M12	36	25,5

NOTE: Length and weight are regulated by the thickness of wall

Part information			
ØD	LI (mm)	Thickness (mm)	Kg
100	60	0,8	Na
125	60	0,8	Na
160	60	0,8	Na
200	60	0,8	Na
250	60	1	Na
315	60	1	Na
400	70	1,25	Na
500	70	1,25	Na
630	80	1,25	Na
800	80	1,5	Na
1000	100	1,5	Na
1250	100	1,5	Na
1500	100	1,5	Na

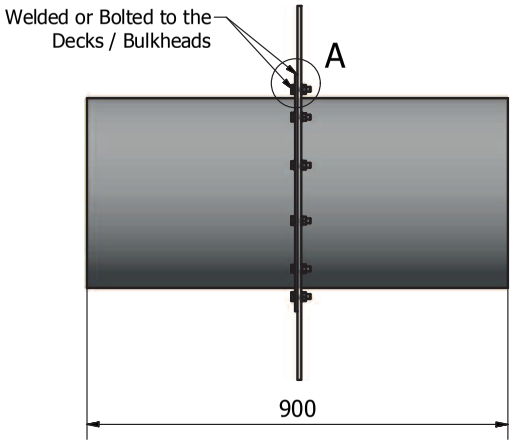
REFERENCE DRG. No.	REFERENCE DRAWING TITLE	REV.	REASON FOR ISSUE	DRAWN	DATE	CHECKED	APPR.D	APPR.D CLIENT
			For Information	EH	22.02.2016			

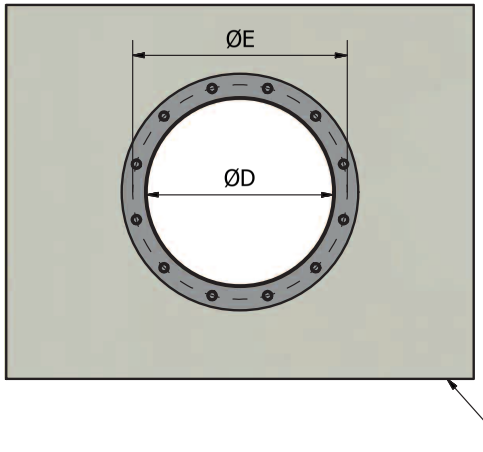
SIMP-DIM-C

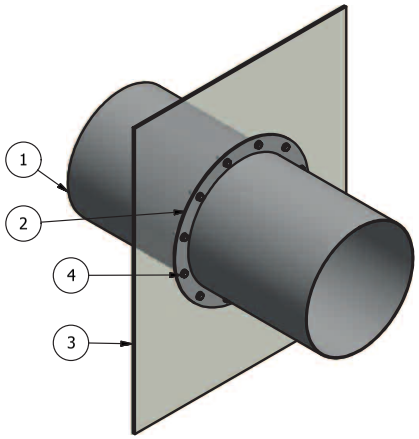
TITLE :

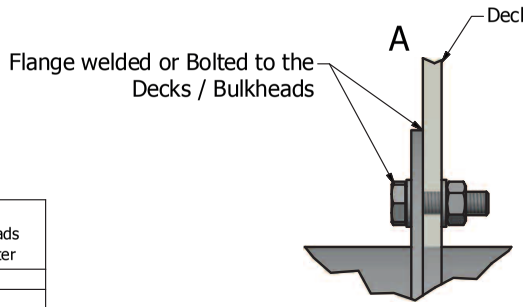
Penetration
Class C

SCALE U.N.O. | DRAWING No. PROJECT | DISCIPLINE | CODE | SEQUENCE | SHT. NO. | REV No.









Flange ISO 15138

Duct Size ØD mm	Bolt Circle ØE mm	Flange	Bolt Hole	Bolt	No of Bolt	KG Penetration	Decks / Bulkheads Cut-out Diameter
100	145	40 x 4mm	10	M8	4	7,5	110
125	170	40 x 4mm	10	M8	4	9,3	135
160	205	40 x 4mm	10	M8	4	11,9	170
200	245	40 x 4mm	10	M8	8	14,8	210
250	295	40 x 4mm	10	M8	8	18,4	260
315	360	40 x 4mm	10	M8	8	23,1	325
400	459	50 x 5mm	12	M10	12	30,4	410
500	559	50 x 5mm	12	M10	12	37,8	510
630	689	50 x 5mm	12	M10	16	47,6	640
800	859	50 x 5mm	12	M10	24	60,4	810
1000	1059	50 x 5mm	12	M10	24	75,3	1010
1250	1339	80 x 8mm	14	M12	32	107,4	1260
1500	1598	80 x 8mm	14	M12	36	128,5	1510

PARTS LIST			
ITEM	MATERIAL	THICKNESS	DESCRIPTION
1	Stainless Steel 316L	3 mm	Duct Class A
2	Stainless Steel 316L	NA	Flange ISO15138
3	NA	NA	Decks / Bulkheads
4	Stainless Steel 316L	NA	Bolt/Nut/Washer

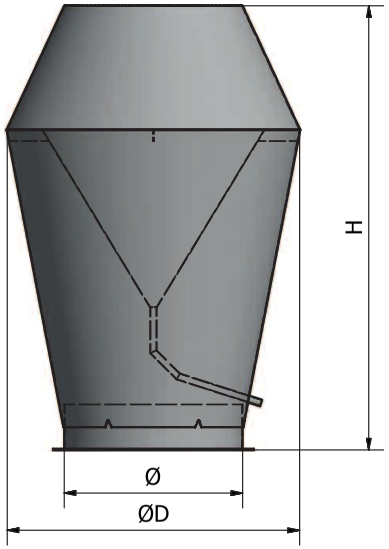
REFERENCE DRG. No.	REFERENCE DRAWING TITLE	REV.	REASON FOR ISSUE	DRAWN	DATE	CHECKED	APPR.D	APPR.D CLIENT
				EH	08.03.2016	TEH		

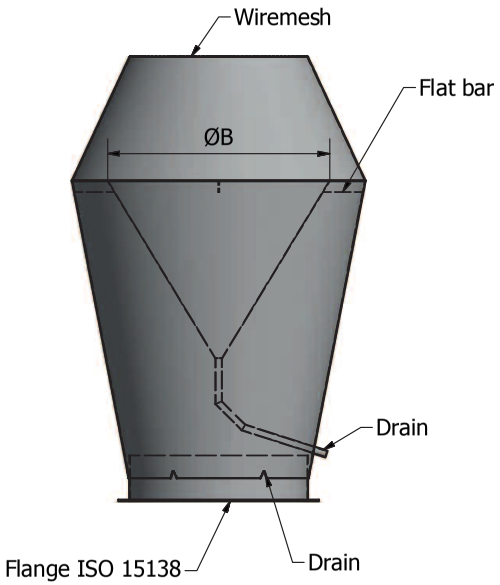
SIMP-DIM-A

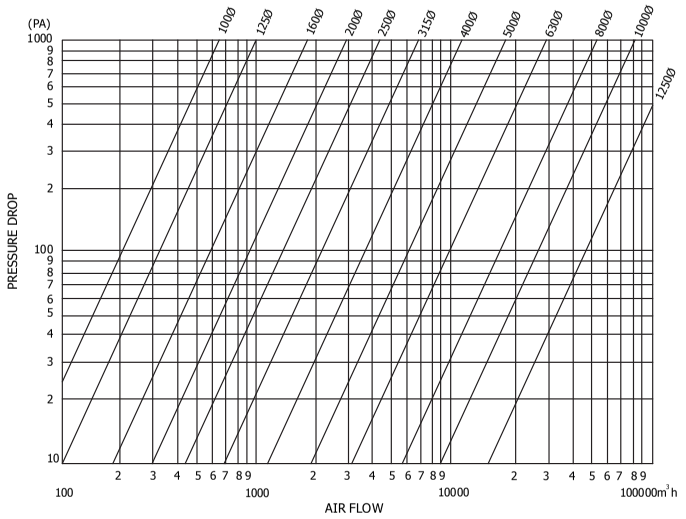
TITLE :

Penetration for Deck and Bulkhead

SCALE	DRAWING No.					REV No.
U.N.O.	PROJECT	DISCIPLINE	CODE	SEQUENCE	SHT. NO.	







Flange ISO-15138					
Duct size	Bolt circle	Flange	Bolt Hole	Bolt	No of Bolt
100	145	40 x 4	10	M8	4
125	170	40 x 4	10	M8	4
160	205	40 x 4	10	M8	4
200	245	40 x 4	10	M8	8
250	295	40 x 4	10	M8	8
315	360	40 x 4	10	M8	8
400	459	50 x 5	12	M10	12
500	559	50 x 5	12	M10	12
630	689	50 x 5	12	M10	16
800	859	50 x 5	12	M10	24
1000	1059	50 x 5	12	M10	24
1250	1339	80 x 8	14	M12	32
1500	1598	80 X 8	14	M12	36

DIMENSJON							
Ø	ØD	ØB	H	Thickness	Wiremesh	Flange	KG
100	165	125	250	0,8mm	10x10x1mm	40x4mm	2,1
125	206	156	312	0,8mm	10x10x1mm	40x4mm	2,8
160	264	200	400	0,8mm	10x10x1mm	40x4mm	3,9
200	330	250	500	0,8mm	10x10x1mm	40x4mm	5,6
250	412	312	625	1mm	10x10x1mm	40x4mm	9,3
315	520	393	787	1mm	25x25x2,5mm	40x4mm	13,5
400	660	500	1000	1,25mm	25x25x2,5mm	50x5mm	28
500	825	625	1250	1,25mm	25x25x2,5mm	50x5mm	41,7
630	1039	787	1575	1,25mm	25x25x2,5mm	50x5mm	63,5
800	1320	1000	2000	1,5mm	25x25x2,5mm	50x5mm	116,5
1000	1650	1250	2500	3mm	25x25x2,5mm	50x5mm	294,8
1250	2062	1562	3125	3mm	25x25x2,5mm	80x8mm	472,6
1500	2475	1875	3750	3mm	25x25x2,5mm	80x8mm	674,6

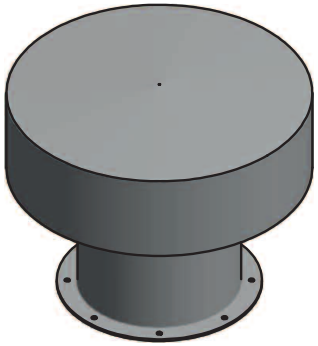
REFERENCE DRG. No.	REFERENCE DRAWING TITLE	REV.	REASON FOR ISSUE	DRAWN	DATE	CHECKED	APPR.D	APPR.D CLIENT
				EH	03.03.2015	TEH		

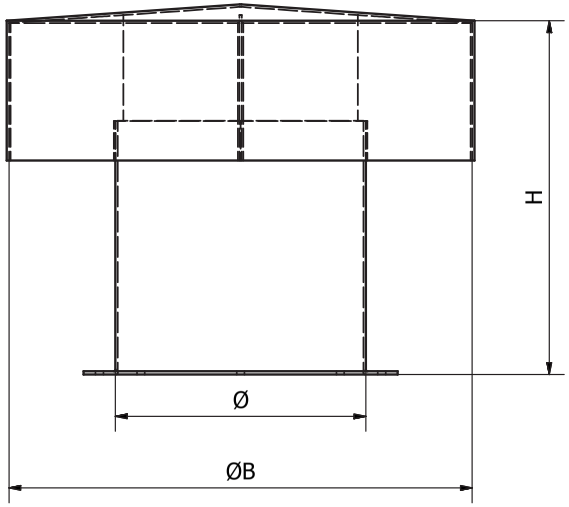
SIMJH-DIM-C

TITLE :

Jet Hood Class C

SCALE U.N.O. | DRAWING No. PROJECT DISCIPLINE CODE SEQUENCE SHT. NO. | REV No.





Flange ISO-15138

Duct size	Bolt circle	Flange	Bolt Hole	Bolt	No of Bolt	KG
100	145	40 x 4	10	M8	4	0,5
125	170	40 x 4	10	M8	4	0,6
160	205	40 x 4	10	M8	4	0,8
200	245	40 x 4	10	M8	8	0,9
250	295	40 x 4	10	M8	8	1,1
315	360	40 x 4	10	M8	8	1,4
400	459	50 x 5	12	M10	12	2,8
500	559	50 x 5	12	M10	12	3,4
630	689	50 x 5	12	M10	16	4,3
800	859	50 x 5	12	M10	24	5,3
1000	1059	50 x 5	12	M10	24	6,6
1250	1339	80 x 8	14	M12	32	21,6
1500	1598	80 X 8	14	M12	36	25,5

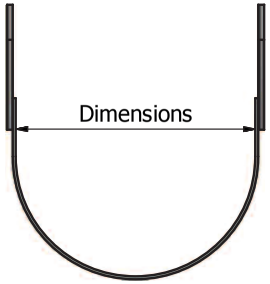
DIMENSJON					
Ø	ØB	H (mm)	Thickness (mm)	Wiremesh (mm)	KG
100	185	140	0,8mm	10x10x1mm	1,2
125	231	175	0,8mm	10x10x1mm	1,6
160	296	224	0,8mm	10x10x1mm	2,4
200	370	280	0,8mm	10x10x1mm	3,5
250	462	350	1mm	10x10x1mm	5,9
315	582	441	1mm	25x25x2,5mm	9
400	740	560	1,25mm	25x25x2,5mm	18,8
500	925	700	1,25mm	25x25x2,5mm	28
630	1165	882	1,25mm	25x25x2,5mm	43,6
800	1480	1120	1,5mm	25x25x2,5mm	84,2
1000	1850	1400	3mm	25x25x2,5mm	247,9
1250	2312	1750	3mm	25x25x2,5mm	392,3
1500	2775	2100	3mm	25x25x2,5mm	553,3

REFERENCE DRG. No.	REFERENCE DRAWING TITLE	REV.	REASON FOR ISSUE	DRAWN	DATE	CHECKED	APPR.D	APPR.D CLIENT
			For Information	EH	22.02.2016	TEH		

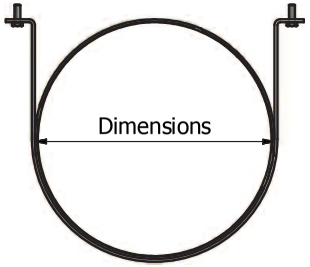
TITLE :
SIMIH-DIM-C
Intake Hood

SCALE U.N.O. | DRAWING No. PROJECT DISCIPLINE CODE SEQUENCE SHT. NO. | REV No.

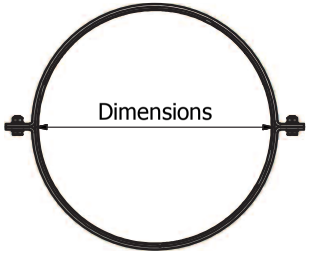
TYPE : A WITH THREADED ROD



TYPE : B



TYPE : C



TYPE : A WITH THREADED ROD			
Dimensions	Flat bar (mm)	Bolt	KG
Ø125	40X4	Ø10	0,3
Ø160	40X4	Ø10	0,4
Ø200	40x4	Ø10	0,5
Ø250	40x4	Ø10	0,7
Ø315	40x4	Ø10	0,8
Ø400	50x5	Ø10	1,6
Ø500	50x5	Ø10	2,0
Ø630	50x5	Ø10	2,5
Ø800	50x5	Ø10	3,0
Ø1000	50x5	Ø10	4,0
Ø1250	80x8	Ø12	13,1
Ø1500	80X8	Ø12	15,8

TYPE : B			
Dimensions	Flar bar (mm)	Bolt	KG
Ø125	40X4	Ø10	0,5
Ø160	40X4	Ø10	0,6
Ø200	40X4	Ø10	0,7
Ø250	40X4	Ø10	0,9
Ø315	40X4	Ø10	1,1
Ø400	50X5	Ø10	2,
Ø500	50X5	Ø10	2,7
Ø630	50x5	Ø10	3,3
Ø800	50x5	Ø10	4,2
Ø1000	50x5	Ø10	5,2
Ø1250	80x8	Ø12	17,1
Ø1500	80x8	Ø12	20,4

TYPE : C			
Dimension	Flat bar (mm)	Bolt	KG
Ø125	40x4	Ø10	0,6
Ø160	40x4	Ø10	0,7
Ø200	40x4	Ø10	9,1
Ø250	40x4	Ø10	1,1
Ø315	40x4	Ø10	1,3
Ø400	50x5	Ø10	2,6
Ø500	50x5	Ø10	3,2
Ø630	50x5	Ø10	4,0
Ø800	50x5	Ø10	5,1
Ø1000	50x5	Ø10	6,3
Ø1250	80x8	Ø12	20,8
Ø1500	80X8	Ø12	24,8

REFERENCE DRG. No. | REFERENCE DRAWING TITLE | REV. | REASON FOR ISSUE | DRAWN | DATE | CHECKED | APPR.D | APPR.D CLIENT

For Information | EH | 22.02.2016

SIMDS-DIM-TYPE A/B/C

TITLE :

SIMDS-DIM
Duct Support

SCALE U.N.O. | DRAWING No. PROJECT DISCIPLINE CODE SEQUENCE SHT. NO. | REV No.

Chapter 4

FOUNDED 1862 ABS

CERTIFICATE NUMBER
15-LD1322753-1-PDA

DATE
10 Apr 2015

ABS TECHNICAL OFFICE
London Engineering Department

CERTIFICATE OF DESIGN ASSESSMENT

This is to certify that a representative of this Bureau did, at the request of

GMC HVAC AS

assess design plans and data for the below listed product. This assessment is a representation by the Bureau as to the degree of compliance the design exhibits with applicable sections of the Rules. This assessment does not waive unit certification or classification procedures required by ABS Rules for products to be installed in ABS classed vessels or facilities. This certificate, by itself, does not reflect that the product is Type Approved. The scope and limitations of this assessment are detailed on the pages attached to this certificate.

Product: **"A-0" Fire Rated Spirally Wound Duct**

Model: **Simduct Class C and Class P Ducts System**

This Product Design Assessment (PDA) Certificate 15-LD1322753-1-PDA, dated 10/Apr/2015 remains valid until 16/Mar/2020 or until the Rules or specifications used in the assessment are revised (whichever occurs first).

This PDA is intended for a product to be installed on an ABS classed vessel, MODU or facility which is in existence or under contract for construction on the date of the ABS Rules or specifications used to evaluate the Product.

Use of the Product on an ABS classed vessel, MODU or facility which is contracted after the validity date of the ABS Rules and specifications used to evaluate the Product, will require re-evaluation of the PDA.

Use of the Product for non ABS classed vessels, MODUs or facilities is to be to an agreement between the manufacturer and intended client.

AMERICAN BUREAU OF SHIPPING

Xiaonan Niu
Engineer

A0258(0110)

GMC HVAC AS
POSTBOKS 4059 TASTA
NO-4092
STAVANGER
Norway
Telephone:
Fax:
Email: gmc.hvac@gmc.no
Web:

Tier: 2 - PDA Issued

Product: **"A-0" Fire Rated Spirally Wound Duct**

Model: **Simduct Class C and Class P Ducts System**

Intended Service:
HVAC Ducts

Description:
SIMDUCT Class C circular ducts with 160, 200, 250, 315, 400, 500, 630, 800 & 1000 mm diameter, made from stainless steel with thickness 0.8, 0.8, 1.0, 1.0, 1.25, 1.25, 1.25, 1.5 & 1.5 mm respectively.

SIMDUCT Class P circular ducts with 200, 250, 315, 400 & 500 mm diameters, made from stainless steel of thickness 0.8, 1.0, 1.0, 1.25, & 1.25 mm respectively. The ducts, bends and fittings are all produced in stainless steel AISI 316L. Fittings (duct joints) are fabricated in 3mm material, Bends are fabricated in 2 mm material and ducts are fabricated in 0.8 – 1.25 mm material according to duct dimension.

Rating:
Fire rating: A-0
Class C circular ducts diameter: 160 mm, 200 mm, 250 mm, 315 mm, 400 mm, 500 mm, 630 mm, 800 mm & 1000 mm (0.8, 0.8, 1.0, 1.0, 1.25, 1.25, 1.25, 1.5 & 1.5 mm thicknesses respectively)
Class P circular ducts with 200 mm, 250 mm, 315 mm, 400 mm & 500 mm (0.8, 1.0, 1.0, 1.25, & 1.25 mm thicknesses respectively)
Class P ducts test pressure is 7 bar and Class P ducts can keep water pressure integrity both internally and externally.

Service Restriction:
Unit Certification is not required for this product. If the manufacturer or purchaser request an ABS Certificate for compliance with a specification or standard, the specification or standard, including inspection standards and tolerances, must be clearly defined

Comments:
The Manufacturer has provided a declaration about the control of, or the lack of Asbestos in this product.

Notes/Drawing/Documentation:
Drawing No. Correspondence, Email from Anfinn Aspenes Confirming to Amend 15-LD1322753-PDA, Revision: 1, Pages: 1
Drawing No. Correspondence, Email from Frank Helland 10-04-15, Revision: 1, Pages: 1
Drawing No. Correspondence, Email from Frank Helland 10-04-15 Confirmation Duct Sizes, Revision: 1, Pages: 1

Terms of Validity:
This Product Design Assessment (PDA) Certificate 15-LD1322753-1-PDA, dated 10/Apr/2015 remains valid until 16/Mar/2020 or until the Rules or specifications used in the assessment are revised (whichever occurs first).

This PDA is intended for a product to be installed on an ABS classed vessel, MODU or facility which is in existence or under contract for construction on the date of the ABS Rules or specifications used to evaluate the Product.

Use of the Product on an ABS classed vessel, MODU or facility which is contracted after the validity date of the ABS Rules and specifications used to evaluate the Product, will require re-evaluation of the PDA.

GMC HVAC AS
POSTBOKS 4059 TASTA
NO-4092
STAVANGER
Norway
Telephone:
Fax:
Email: gmc.hvac@gmc.no
Web:

Tier: 2 - PDA Issued

STANDARDS

ABS Rules:
2015 Rules for Building and Classing Steel Vessels 1-1-4/7.7, 1-1-A3, 1-1-A4;
2015 Offshore Units and Structure 1-1-4/9.7, 1-1-A2, 1-1-A3;
2015 Rules for Building and Classing Mobile Offshore Drilling Units 5-1-1/3

National:
NA

International:
Test method / Standard: IMO 754 (18), EN ISO 15138:2007 Duct Classes.

Government:
SOLAS 1974 Consolidated Edition 2004 Chapter II-2 Regulation 9 section 7.
2009 IMO MODU Code Consolidated edition 2010 Chapter 9.

EUMED:
NA

OTHERS:
NA

lectronically published by ABS London.
Reference T1352600, dated 10-APR-2015.

ABS

GMC HVAC AS
POSTBOKS 4049 TASTA,
STAVANGER,
NO-4092,
NORWAY

Reference: DC/OO/T1322753
Project Number: 2334056
Class Number: N/A

Attention: Mr. Anfinn Aspenes

Product Design Assessment of "A-0" Fire Rated Spiral Wound Duct System
Model: Simduct Class C & Class P Duct Systems
Fire rating: A-0
Class C Circular Ducts Diameter: 160 mm, 200 mm, 250 mm, 315 mm, 400 mm, 500 mm, 630 mm, 800 mm & 1000 mm (0.8, 0.8, 1.0, 1.0, 1.25, 1.25, 1.25, 1.5 & 1.5 mm thicknesses respectively)
Class P Circular Ducts with 200 mm, 250 mm, 315 mm, 400 mm & 500 mm (0.8, 1.0, 1.0, 1.25, & 1.25 mm thicknesses respectively)
Purchase Order No.: 400048-09
Drawings as per the attached list

Gentlemen,

We have your type approval application form dated 28 January 2015, on the above subject, submitting electronic copy of the drawings along with an Asbestos-free declaration for the subject components. Further to your e-mails of 03 March 2015 and 10 April 2015, we are pleased to advise that we have completed the product design assessment phase of the type approval process. Enclosed is your original copy of the **Certificate of Design Assessment**. Your details are published on our web site; www.typeapproval.org and can also be downloaded there.

Please be sure that you understand the scope and conditions of the validity of the certificate. An assessment is not an approval. As applicable, the PDA is a generic assessment of materials, components, products or systems for a specific use in compliance with the Rules, Guides and recognized standards. In essence the final approval is given when an Engineer or Surveyor accepts it for a specific user and installation. Therefore, the PDAs are written assuming that the end user and installation of the product is unknown, and that the manufacturer may not apply for Manufacturing Assessment.

In particular we draw your attention to the pages attached to the PDA and the restrictions that may affect its use.

This Product Design Assessment (PDA) is intended for products to be used on ABS classed vessels, MODUs or facilities which are in existence or under contract for construction on the date of the ABS Rules used to evaluate the Product. The use of the product in a non-ABS classed vessel, MODU or facility is to be mutually agreed between your company and your client.

We recommend that you monitor the ABS Rules, Guides and other standards used in the approval. These Rules, Guides and standards often change on an annual basis, and you must comply with the new Rules, Guides and standards in order for the product to be used on an ABS classed vessel or facility contracted under the new Rules, Guides or standards.

We do caution you that the use of the ABS logo is copyrighted. However, our "Design Assessed" logo may be used as long as your PDA remains valid. A copy of the artwork for the logo may be requested from our email address absta-progams@eagle.org.

ABS EUROPE DIVISION
No. 1 Frying Pan Alley, London, E1 7HR, ENGLAND
TEL: 44-20-7247-3255 FAX: 44-20-7377-2453 EMAIL: abs-eur@eagle.org WEBSITE: www.eagle.org

Electronically published by ABS London.
Reference T1352600, dated 10-APR-2015.

Our Product Type Approval Logo may be used if you are conducting regular audits of your manufacturing process. Should you desire to continue with Product Type Approval, please contact the ABS Office at Oslo, Tel: +47 22403410, Fax: +47 22403411. The office will arrange for the production testing as may be necessary and audit of your quality assurance and control arrangements. To find another office, please use the directory of ABS offices on the ABS Web Site at www.eagle.org. You may also ask the ABS Program staff at Tel. (281) 877-6018, Fax (281) 877-6001, or e-mail absta-programs@eagle.org.
The subject drawings appropriately stamped in association with the foregoing comments will be available for you to download from your My Eagle account in due course.

Please find enclosed our invoice to cover the cost of the design assessment phase of the type approval process.

We appreciate your confidence in ABS Type Approval. If you should have any comments relative to the scope and conditions of the assessment of your product, or if we can be of any further assistance, please do not hesitate to contact us.

Very Truly Yours

Dimitrios G. Kostaras
Vice President of Engineering
ABS Europe Division

By _____

X. Niu
Senior Managing Principal Engineer
Offshore Engineering Department

Drawing List

Drawing No	Revision No	Drawing Title
2007-0816	03	DNV Technical Report

ABS EUROPE DIVISION
No. 1 Frying Pan Alley, London, E1 7HR, ENGLAND
TEL: 44-20-7247-3255 FAX: 44-20-7377-2453 EMAIL: abs-eur@eagle.org WEBSITE: www.eagle.org

TECHNICAL REPORT

GMC HVAC AS

VERIFICATION OF
SIMDUCT CLASS C/CLASS P
FIRE INTEGRITY CLASS A-0 AND DUCT CLASS F
AND
WATER PRESSURE INTEGRITY

REPORT NO. 2007-0816

REVISION NO. 03

DET NORSKE VERITAS

DET NORSKE VERITAS

TECHNICAL REPORT

Date of first issue: 2007-05-22	Project No.: 72590500
Approved by: Per-Gunnar Mosand Head of Department	Organisational unit: EOCNO725 Marine & Process Systems
Client: GMC HVAC AS	Client ref.: Anfinn Aspenes

DET NORSKE VERITAS AS
Maritime Technology and Production Centre
Systems & Components
Veritasveien 1
1322 Høvik
Norway
Tel: +47 67 57 99 00
Fax: +47 67 57 99 11
http://www.dnv.com
Org. No: NO 945 748 931 MVA

Summary:

The objective of this report has been to determine if the product "**Simduct Class C**" can be considered an A-class ventilation duct equivalent to the safety level specified in IMO Res. A.754(18) and thereby also conform to Duct Class F in accordance with ISO 15138:2007(E).

The report has been further expanded to include the results from internal and external pressure testing in order to qualify the duct for use in areas where progressive flooding shall be avoided. The ducts to be used for ventilation of separate buoyancy volumes below the damage waterline are denoted "**Simduct Class P**" and will have special requirements for the joining and attachments.

Main conclusions:

-The tested specimens passed the fire test criteria for A-0 fire rating.
-Leakage testing in accordance with DW/143 test procedure before and after the test indicated no change in leakage rate at pressures exceeding 400 Pa.

-Pressure testing was performed at 7 bar for 30 minutes, both internally and externally. There was no deformation of the Simduct Class P ventilation ducts.

Main limitation:

-The application of these ducts should be verified in each case according to applicable rules and regulations.

- This technical report and the conclusions presented herein are not to be regarded as certification or approvals for specific project applications.

Report No.: 2007-0816	Subject Group:
Report title: Verification of Simduct class C/class P Fire integrity Class A-0 and Duct class F and Water pressure integrity	
Work carried out by: Christian Hertzenberg	
Work verified by: Morten Stensland	
Date of this revision: 2011-04-26 / Rev. No.: 03 / Number of pages: 3	

Indexing terms

Key words	Service Area
	Market Sector

☒ No distribution without permission from the client or responsible organisational unit (however, free distribution for internal use within DNV after 3 years)
☐ No distribution without permission from the client or responsible organisational unit.
☐ Strictly confidential
☐ Unrestricted distribution

Table of Content *Page*

1 INTRODUCTION

1.1 Objective

The objective of this report has been to determine if the product "**Simduct Class C**" can be considered as an A-class ventilation duct, equivalent to the safety level specified in IMO Res. A.754(18) and thereby also conform to Duct Class F in accordance with ISO 15138:2007(E).

The report has been further expanded to include the results from internal and external pressure testing in order to qualify the duct for use in areas where progressive flooding shall be avoided.

1.2 Status of this Technical Report

This technical report and the conclusions presented herein are not to be regarded as certification or approvals for specific project applications.

1.3 Responsibilities and Project Specific Approvals

It is not DNV's responsibility to suggest specific design solutions to be applied in any project. The buying project and the manufacturer of the product must in close cooperation ensure that specific design solutions are in line with test results and with frame conditions for the specific project.

In cases where DNV is formally appointed as the verifying authority in a project, it is DNV's responsibility to verify and approve the proposed design solutions for the specific project in line with our contracted scope of work for the project.

2 BASIS FOR THE ASSESSMENT DOCUMENTED HEREIN

2.1 Description of the product

SIMDUCT Class C circular ducts with 160 mm and 1000 mm diameter, made from stainless steel with thickness 0.8 mm and 1.5 mm respectively.

The tested ducts were straight horizontal 3 meters pieces, incorporating joints and equipment flange fittings (SIMC), and made tight at both ends with end caps (SIMG). The ducts were fitted with T-bends (SIMT) at one end. Ducts of similar size as the horizontal part of the specimen were led from the T-bends through a steel deck by 3 mm steel sleeves and fitted with ordinary galvanised ducts on the "cold" side for leakage testing. The ducts were supported by the specially designed support system (SIMSUP) at intervals of 2 - 2.5 meters.

SIMDUCT Class P circular ducts with 200 mm, 315 mm and 500 mm diameters, made from stainless steel of thicness 0,8 mm, 1,0 mm and 1,25 mm respectively were hydrostatically pressure tested.

The ducts were straight 3 meter pieces, incorporating joints in accordance with drawing No. 51113-H-XD-001 (rev.2)/002(rev.2)/003(rev.1), and blinded off in both ends. Pressure was fed through a connection by a piston pump and monitored by pressure transmitters. For the external

pressure testing the ducts were installed open ended inside larger size pipes. The pipes were blinded off by welded plates at each end and welded around the circumference of the ducts.

All tested ducts comply with the specifications of Duct Class F in accordance with ISO 15138:2007(E).

2.2 Test standard and Test reports

No test standard acknowledged by DNV covers testing of fire integrity properties of ventilation ducts. The acknowledged test standard for fire determining the fire integrity of a fire division is IMO Res. A.754(18). Therefore the resolution has been selected as a reference document for determining A-class properties of the Simduct Class C.

The fire test was performed at SINTEF NBL test facilities at Tiller, in accordance with IMO Res. A.754(18) standard fire test procedure with a few modifications.

For description of the test and for further details and performance of the ducts in the fire test, reference is made to test report no. EA/22N008.05 from SINTEF NBL, Trondheim, dated 2000-08-28.

Leakage testing accordance with DW143 test procedure was performed before and after the fire test by SIMEX AS.

The waterpressure testing was performed by IKM Testing AS at their facilities at Forus. The pieces of ventilation ducts were pressurised to 7 bar and monitored and maintained for a duration of 30 minutes. The test results are described in IKM Testing AS report no. 277864.

3 CONCLUSIONS

- The tested specimens passed the fire test criteria for A-0 fire rating. This implies that the duct construction, including the fire-rated expanding joints/gaskets, conform to Duct Class F in accordance with ISO 15138:2007(E).
- Leakage testing before and after the test indicated no change in leakage rate at pressures exceeding 400 Pa.
- The water pressure testing indicated that the ducts, including joints, can maintain the integrity at water pressures of 7 bar, both internally and externally.

4 LIMITATION

- The application of these ducts should be verified in each case according to applicable rules and regulations.
- The ducts are not to be used where applicable requirements specify a different duct thickness.
- All joints and fittings should have a fire seal by way of "Fiberfrax Brannfugebånd" manufactured by Carborundum in addition to the standard EPDM rubber seal.

DET NORSKE VERITAS

GMC HVAC AS
Att.: Anfinn Aspenes
Postboks 4059
Tasta
4092 STAVANGER

DET NORSKE VERITAS AS
Approval Ship and Offshore
Offshore Safety & Systems
P.O.Box 300
1322 Høvik
Norway
Tel: +47 67 57 99 00
Fax: +47 67 57 99 11
http://www.dnv.com
Org. No: NO 945 748 931 MVA

Your ref.:	Our ref.:	Date:
	TNANO384/WET/725000000-J-856	2012-10-22

Clarification towards DNV technical report 2007-08016

Ref. is made to DNV technical report no. 2007-0816 "Fire and Waterpressure integrity verification of Simduct class C/Class P", dated 2007-05-22.

DNV has received a test report from GMC HVAC AS, issued by IKM Testing AS (IKM sert no. 285651-1).

Based on information from GMC HVAC AS, the test setup was based on the principles in DW/143, containing two pipe sections connected with a flanged connection. The pipe sections were water filled and pressurized at 7 bar for 60 minutes.

According to the test report a leakage of 9 litre/hour was registered during the 60 minutes test.

Based on the assumption that there are a very limited number of flanges in each watertight compartment, DNV consider this leakage to be negligible.

Yours faithfully
for DET NORSKE VERITAS AS

Espen Wetterhus

Espen Wetterhus
Head of Section
Offshore Safety & Systems

Chapter 5

SINTEF

SINTEF Building & environmental engineering
Norway's fire testing laboratory

GMC

TRANSLATION DOCUMENT ONLY

Simex AS
Post Box 5,
4064 Stavanger.
Att.: Anfinn Aspenes.

Your ref.:	Our ref.:	Direct tel.	Trondheim
	EA/22N008.05		2000-08-28

TEST REPORT

Assignment No.	22N008.05
Test method / Standard	IMO 754 (18). See note on page 2
Purpose of test	Fire testing of duct system with penetrations, for 60 minutes for A-0 classification.
Testing carried out by	SINTEF Building & environmental engineering Norway's fire testing laboratory Tiller Bru, Tiller, N-7465 Trondheim, Norway.
Total no. of pages (incl. Attachments)	Test report with 5 attachments, totally 29 pages.
Client	SIMEX AS
Product name	HVAC DUCT
Product type	Ventilation duct with penetrations and various items
Product description	4 No. ducts mounted under a Siporex deck with penetrations in an un-insulated steel deck. Duct descriptions: Norsok Class C (Ø 160mm (internal diameter)) Norsok Class B (Ø 630mm) Norsok Class C (Ø 1000mm) Norsok Class B (Ø 160mm)
Manufacturer	The duct system is produced by SIMEX AS

Test results given in this report are valid only for the tested objects.

Test reports from SINTEF Building & environmental engineering Norway's fire testing laboratory form the basis for fire technical classification, certification and aprroval

SINTEF

TRANSLATION DOCUMENT ONLY

Assembly location	The ducts were assembled and mounted at SINTEF NBL by representatives of the Client.
Arrival of test materials	Test materials arrived at the laboratory 2000-05-25.
Test samples	SINTEF were not involved in the selection of the materials to be tested.
Total number of tests	A single fire test was carried out.
Storage of test material)	Test materials were stored in the laborities test hall from arrival to assembly and testing was performed.
Date of test	2000-08-11
Timescale of test	61 minutes.
Test personnel	Project leader – Eva Andersson Oven operator – Jan Erik Vikøren
Test results	There were no registered failures in integrity for the penetration systems 1, 2, 3 or 4 during the test period of 61 minutes.
Comments / Deviations	Prior to and after the test a pressure test of the ductwork was performed by the Client, this was in accordance with the Standard "Ductwork Leakage testing DW/143" issued by HVCA (Heating & Ventilators Contractors Association). Test specimens were not assembled with respect to IMO Res. A.754 (18), with regard to design and installation of the steel deck. Temperature registration is only shown graphically. Temperature registration at the unexposed side of the test pieces was only of an informative nature. Documentation concerning non combustible materials (IMO Res. A.754 (18) point 3.1) is not included in this report.

SINTEF

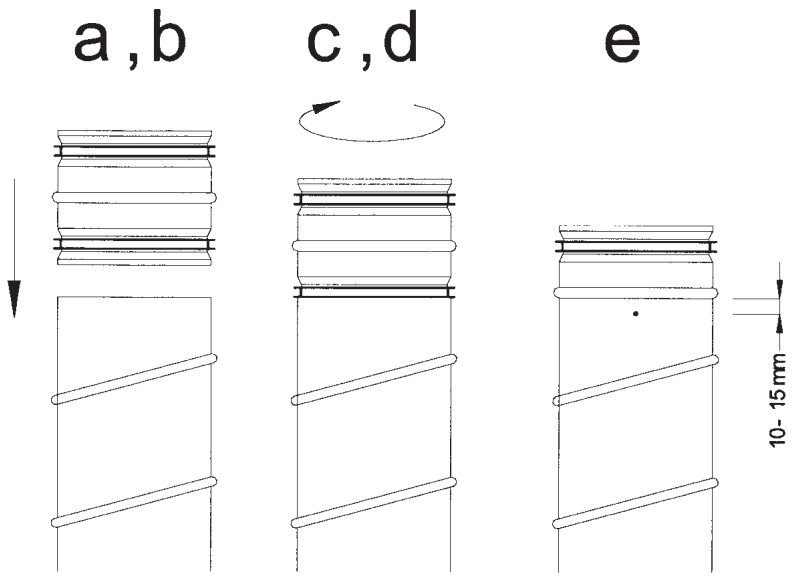
TRANSLATION DOCUMENT ONLY

Attachments:

Attachment I - Tesy results
Attachment II - Build up of test objects
Attachment III -
Attachment IV -
Attachmnet V -

Chapter 6

INSTALLATION INSTRUCTIONS FOR SIMDUCT



Preparation for Installation
Ensure that all required materials are on site ready for installation.
Make sure that site storage of materials is such that accidental damage to ducts and fittings is minimized.
When cutting ducts make sure that these are cut square. After cutting remove all sharp edges to avoid damage to gasket

Screws / rivets.
These are to be positioned equally around the circumference of the duct. As a minimum the total number of fasteners is listed in table 1.
Gaskets for SIMDUCT class F must be replaced if damaged. SIMDUCT fittings are marked **F-DUCT** for A-0 rated ducts

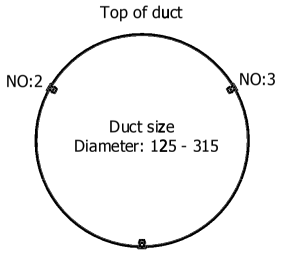
Installation

a. Quickly check fitting and its gaskets for obvious damage.
b. Check that duct is clean internally.
c. Insert fitting into duct making sure that the gasket sits correctly against the cut edge of the duct.
d. Applying an even pressure insert fitting into duct. To ease this a silicon-based lubricant can be applied to the gasket. A rocking motion during insertion can also ease insertion.
e. Fix fitting to spiro duct using blind rivet (sealed type) ref. Clients requirements. These shall be positioned 10-15mm from duct end to avoid damage to gasket.

Duct Ø	100/315	630	800/1500
Number of POP Rivets	3	4	6

4,8mm Pop rivets to be used

Top of duct



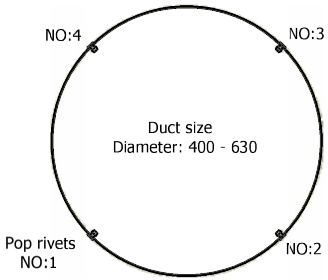
Bottom of duct

Only 3 Pop rivets as indicated above

First start with NO:1, continue with NO:2 and finish with NR:3

4,8mm Pop rivets to be used

Top of duct



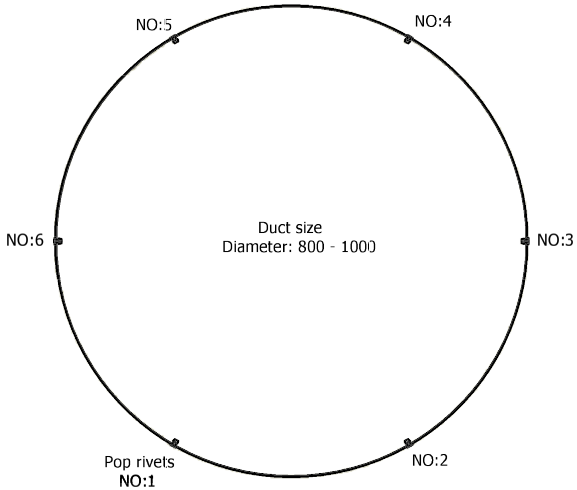
Bottom of duct

Only 4 Pop rivets as indicated above

First start with NO:1, continue with NO:2, NR:3 and finish with NO:4

4,8mm Pop rivets to be used

Top of duct



Bottom of duct

Only 6 Pop rivets as indicated above

First start with NO:1, continue with NO:2, NR:3, NO:4, NO:5 and finish with NO:6

REFERENCE DRG. No.	REFERENCE DRAWING TITLE	REV.	REASON FOR ISSUE	DRAWN	DATE	CHECKED	APPR.D	APPR.D CLIENT
				EH	22.02.2016			

GMC CONSIDER IT DONE

TITLE :

General Arrangement
Installation Guide for Simduct

SCALE	DRAWING No.					REV No.
U.N.O.	PROJECT	DISCIPLINE	CODE	SEQUENCE	SHT. NO.	

SIMDUCT

Comments:

Comments:

Comments:

Comments:

GMC Maritime AS
www.gmc.no

Rev.12/2017