COMPLIANCY TEST REPORT
300-VELA, AHU-Lab

Report No.:
300-AHU-Lab-19-18 E-AT Coating SC50 - 890901 v2

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Customer:	Company:	E-AT
	Address:	Solvangsvej 16
	City:	4600 Herfølge
	Phone:	4522848868
Component:	Manufacturer:	E-AT
	Type	Coating SC50
Dates:	Component recieved:	2019-10-10
	Component tested:	2019-10-17 + 2019-11-12

Division/Centre: Danish Technological Institute
Energy & Climate
AHU-Lab.: Taastrup

Date: 2020-01-17

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File name:	300-AHU-Lab-19-18 E-AT Coating SC50		

TEST REPORT

Objective:

This test report is revised. Text in oberservations and commentsis added

The objective of this report is to document following:
the tightness of duct system with lindab standard components and a identical duct system which is coated inside with the coating type SC50.
the pressure loss of duct system with lindab standard components and a identical duct system which is coated inside with the coating type SC50.

Description of test

The test object is installed in laboratory at the Danish Technological Institute. The external leakage test was carried out at under and over pressure at a static pressure at three different . The pressure loss test was carried out at three air flows. the air flow was measured with eliptic nozzle on a chamber in accordance to ISO5801.
The test is not accredited but there are used instruments used in accredited laboratories and the test engineer who carried out the measurements is working in accredited laboratories

Observations and comments made by the laboratory during and after the test

The leakage test clearly defines that that the duct system with inner coating is sealing the duct system and minimizes the leakage compared with a standard duct system without coating. The leakage test results indicate a reduction of the leakage at around 85% when a inner coating SC50 is used in duct system.
The pressure loss test indicates that the inner coating SC50 has minimal influence on the pressure loss in a duct system. It actual decrease the pressure loss, but it is minimal. The test indicates that standard values from for the standard duct components can be used for calculation of system pressure if the duct system is coated with SC50

Measurement	Instruments	QA Equip. No.:
Air flow measurement	Elliptic Nozzles in acc. to ISO5801:2009	82623
Air Pressure	TSI VelociCalc	147984 / 132810
Volume flow (leakage rate)	Elster BK-G25T15V12	77146
Barometric pressure	Vaisala PTA 427	308

Signatures:

Mads Peter Rudolph Hansen/ Head of the AHU-Lab

Test objects

Manufacturer	E-AT
Type	Coating SC50
Serial no.	No serial no was found on thew test on the test objects

Description:
Three identical duct systems were assembled by the client before the delivery
The three duct systems are as followed:

1. The system is with standard ventilation duct components and assembled with screws
2. The system is with standard ventilation duct components and assembled with screws. All inner surface is coated with SC50 and all joint links are sealed outside with joint sealant.
3. The system is with standard ventilation duct components and assembled with screws. All inner surface is coated with SC50.


Pictures of the duct system with no coating and duct system with inner coating and joint sealant

Component Type	Diameter [mm]	Length [mm]
End plate	200	---
Straight Duct	200	300
Damper	200	90
Straight Duct	200	300
T-duct	200/100	180
Straight Duct	200	300
Reducer	200/160	---
Straight Duct	160	300
T-duct	160/100	120
Straight Duct	160	300
T-duct	160/100	120
Straight Duct	160	300
Reducer	160/100	---
Straight Duct	100	500
Bending	100	---

Table over the components and dimensions used in the duct system

Test object - pictures

Pictures of the inner coating

The joint sealant used to seal the duct joints outside

Test setup and methods

Leakage test

The duct system was connected to a ventilator via a diaphragm gas meter
The ventilator provided over or under pressure in duct system and the volume meter measured the air volume caused by the leakage in the duct system
The static air pressure was measured at end plate of the duct system

Picture of the leakage test setup

Pressure loss test

The air flow was measured with an elliptic nozzle in accordance to ISO5801
The static pressure was measured with pitot tubes in connected ducts before the duct system inlet and after the duct outlet. This mean that the end plate was dismounted.

Duct system with pitot tube for the static pressure before inlet

Elliptic nozzle used for the air flow measurememt

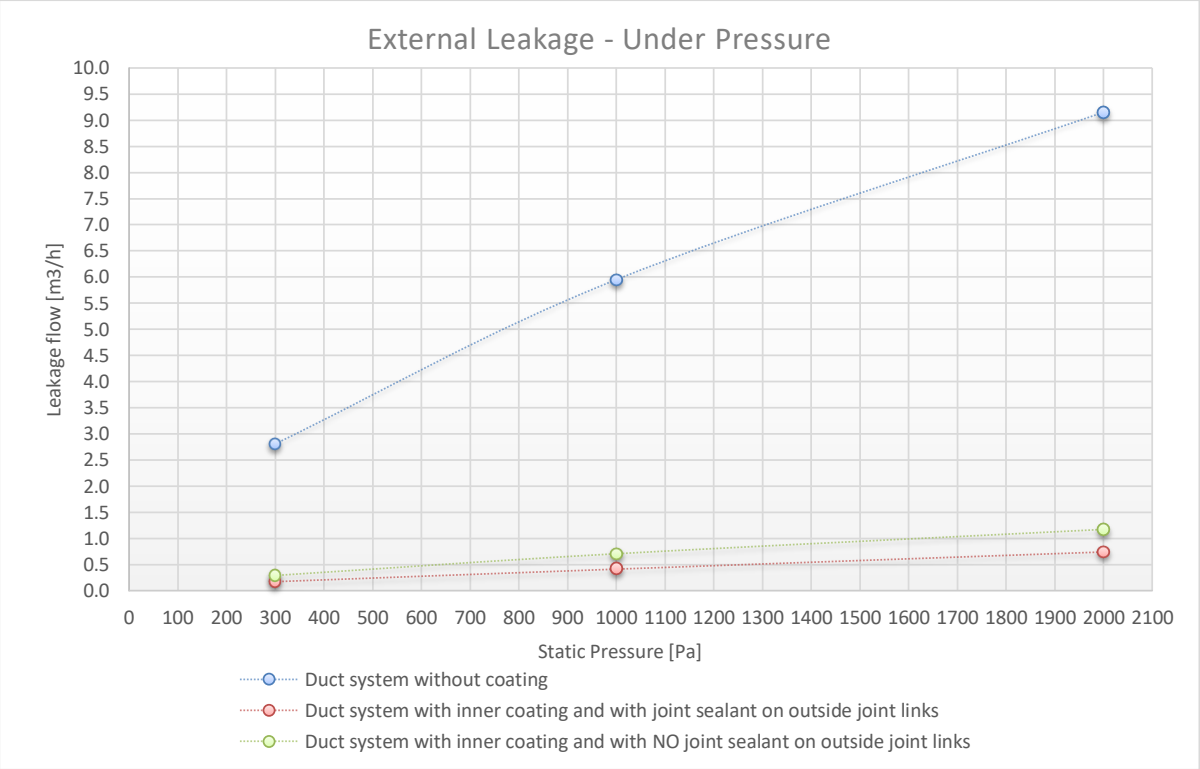
Test Data - External Leakage Test

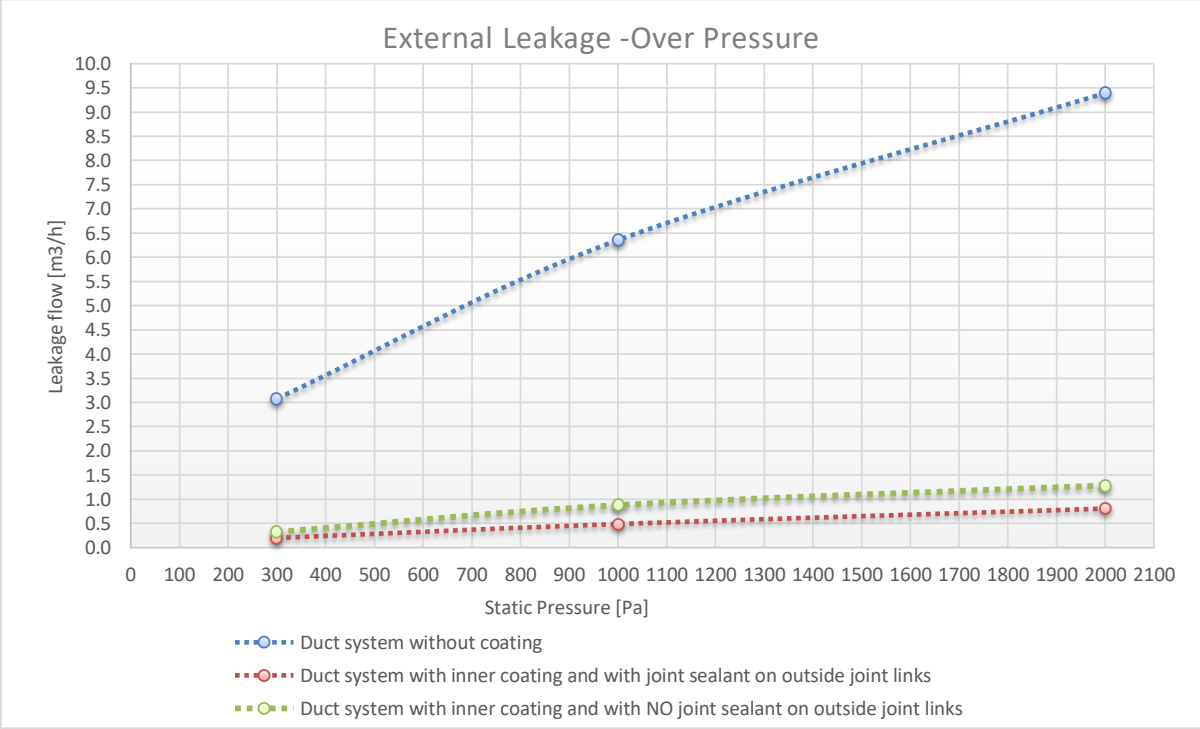
Duct system without coating			
Under pressure			
Barometric pressure	Air Temperature	Static Pressure	Leakage flow
Pa	C	Pa	m^3/h
100355	22.1	300	2.81
100355	22.0	1000	5.95
100355	22.0	2000	9.15
Over pressure			
Barometric pressure	Air Temperature	Static Pressure	Leakage flow
Pa	C	Pa	m^3/h
100355	21.9	300	3.08
100355	21.9	1000	6.35
100355	21.9	2000	9.39

Duct system with inner coating and with joint sealant on outside joint links			
Under pressure			
Barometric pressure	Air Temperature	Static Pressure	Leakage flow
Pa	C	Pa	m^3/h
100073	21.5	300	0.17
100073	21.5	1000	0.41
100073	21.5	2000	0.74
Over pressure			
Barometric pressure	Air Temperature	Static Pressure	Leakage flow
Pa	C	Pa	m^3/h
100355	22.1	300	0.20
100355	22.2	1000	0.49
100355	22.2	2000	0.81

Duct system with inner coating and with NO joint sealant on outside joint links			
Under pressure			
Barometric pressure	Air Temperature	Static Pressure	Leakage flow
Pa	C	Pa	m^3/h
99778	20.4	300	0.29
99778	20.4	1000	0.71
99778	20.4	2000	1.17
Over pressure			
Barometric pressure	Air Temperature	Static Pressure	Leakage flow
Pa	C	Pa	m^3/h
99778	20.5	300	0.32
99778	20.5	1000	0.88
99778	20.5	2000	1.29

Test Data - External Leakage Test





Test Data - External Leakage Test

Duct system without coating				
Under pressure				
Barometric pressure	Air Temperature	Static Pressure	Air velocity (in ø160)	Leakage flow
Pa	C	Pa	m/s	m^3/h
100355	22.1	74.5	3.11	225
100355	22.0	360	6.99	506
100355	22.0	1047	11.88	860

Duct system with inner coating				
Under pressure				
Barometric pressure	Air Temperature	Static Pressure Loss	Air velocity (in ø160)	Leakage flow
Pa	C	Pa	m/s	m^3/h
100355	22.1	74	3.11	225
100355	22.0	355.5	7.01	508
100355	22.0	1035.6	11.97	866