



**catim**

centro de apoio tecnológico à indústria metalomecânica

Rua dos Plátanos, 197 – 4100-414 Porto - Portugal

Telef. 22 615 90 00

Fax 22 617 62 13

TESTING LABORATORY

PROCESS 20194000180

TEST REPORT 20194000180/10en

Page 1 of 4

**TYPE OF PRODUCT:** Circular ducts for HVAC

**TRADE MARK:** WM – CONDUTEK<sup>a)</sup>      **MODEL:** Circular Duct

**STANDARD:** EN 12237:2003 – “Ventilation for buildings. Ductwork. Strength and leakage of circular sheet metal ducts”

**TEST PERFORMED:** Leakage testing, section 5.1

**CUSTOMER:** WM Construções, Lda  
Travessa da Boavista nº15/17  
Distrito da Ingombota - Luanda  
Angola  
NIF: 5402016763

**MANUFACTURER:** WM Construções, Lda  
Travessa da Boavista nº15/17  
Distrito da Ingombota - Luanda  
Angola  
NIF: 5402016763

**DATE OF RECEPTION OF THE PRODUCTS:** 2019-01-07

**DATE OF THE END OF THE TESTS:** 2019-02-04

**DATE OF THE REPORT:** 2019-02-07

**Additional customer information:** a) Conduetek, company brand of WM Construções.

Technician

(Ivan Pereira)


Technical Responsible

(Pedro Castro)


**Note:** The test results refer only to the sample tested

Note: This report may not be reproduced unless fully authorized by the laboratory and refers exclusively to the sample tested.

**1. SAMPLE DESCRIPTION**

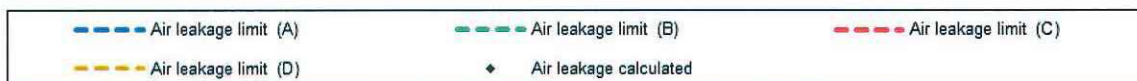
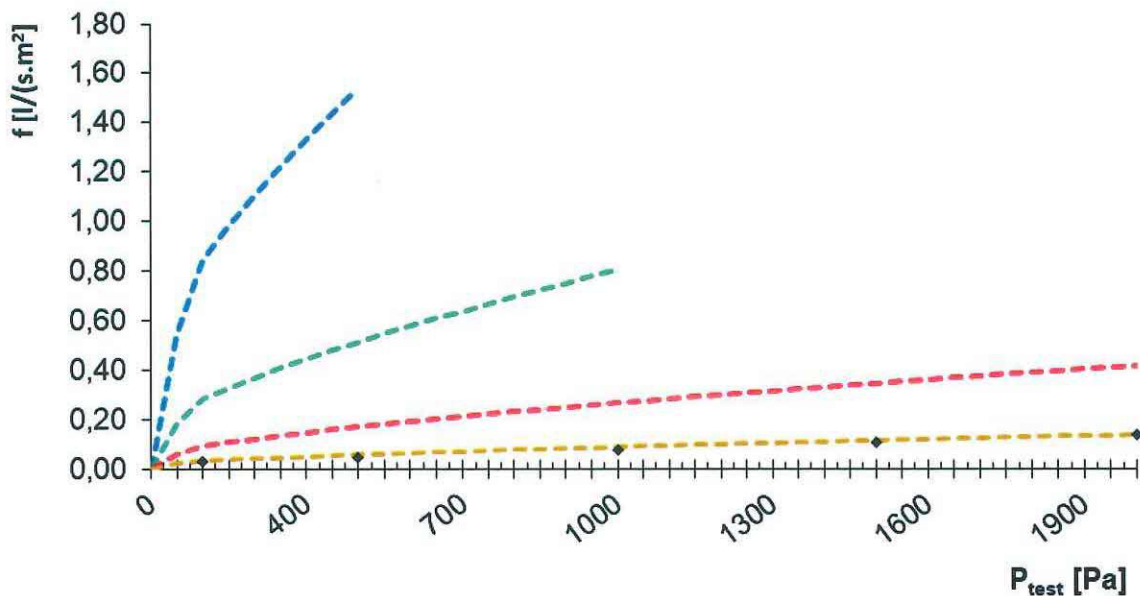
DESCRIPTION
<p>Sample of HVAC duct consisting of:</p> <ul style="list-style-type: none"> <li>- Cap end: Ø 300 mm;</li> <li>- Spiral Duct: Ø300 x 3045 mm;</li> <li>- Reducer: Ø300 – Ø250 mm;</li> <li>- Spiral Duct: Ø250 x 1010 mm;</li> <li>- Bend 90°: Ø250 mm;</li> <li>- Spiral Duct: Ø250 x 1500 mm;</li> <li>- Bend 90°: Ø250 mm;</li> <li>- Spiral Duct: Ø250 x 505 mm;</li> <li>- Reducer: Ø250 – Ø200 mm;</li> <li>- Spiral Duct: Ø200 x 2000 mm;</li> <li>- T reducer: Ø200 – Ø160 – Ø125</li> <li>- Spiral Duct: Ø125 x 1005 mm;</li> <li>- Cap end: Ø 125 mm;</li> <li>- Spiral Duct: Ø160 x 1015 mm;</li> <li>- Bend 90°: Ø160 mm;</li> <li>- Spiral Duct: Ø160 x 1510 mm;</li> <li>- Cap end: Ø 160 mm;</li> </ul> <p>Surface area of the ductwork, <math>A_j</math> calculated: 9,27 m<sup>2</sup>                      Total length of joints, L, calculated: 10,65 m                      Ratio L / <math>A_j</math>: 1,15 m<sup>-1</sup></p>
ADDITIONAL INFORMATION
<ul style="list-style-type: none"> <li>- Assembly of the sample carried out at 29/01/2019. Assembly performed by the manufacturer technician;</li> <li>- Accessories with O-ring rubber on the collars ends;</li> <li>- Attachment between accessory with the use of self-drilling screws;</li> <li>- Sealing with:                             <ul style="list-style-type: none"> <li>*Aluminum tape;</li> <li>*Duct sealant, solvent free – Clim® CLIMA SEAL in the joints and at the Bend and Reducer accessories</li> </ul> </li> </ul>


**Note:** Sealing and size of the sample was manufacturer's responsibility.

Technician : Rubric :  (Ivan Pereira)

## 2. RESULTS

### 2.1 Positive Pressures



$P_{test}$ [Pa]	$T_{test}$ [s]	$t$ [°C]	$P_{atm}$ [Pa]	$q_{v1}^{a)}$ [l/s]	$f_{calculated}$ [l.s <sup>-1</sup> .m <sup>-2</sup> ]	$f_{max}$ Class A [l.s <sup>-1</sup> .m <sup>-2</sup> ]	$f_{max}$ Class B [l.s <sup>-1</sup> .m <sup>-2</sup> ]	$f_{max}$ Class C [l.s <sup>-1</sup> .m <sup>-2</sup> ]	$f_{max}$ Class D [l.s <sup>-1</sup> .m <sup>-2</sup> ]
200	365	16,0	102050	0,262	0,028	0,85	0,28	0,09	0,03
500	312	16,0	102050	0,425	0,046	1,53	0,51	0,17	0,06
1000	323	16,0	102050	0,710	0,077	---	0,80	0,27	0,09
1500	502	15,5	102050	1,000	0,108	---	---	0,35	0,12
2000	324	15,5	102050	1,269	0,137	---	---	0,42	0,14

Notes: a) Corrected Leakage rate for the conditions of air temperature of 20 °C and barometric pressure of 101325 Pa;  
 Results obtained considering the size and accessories included in the sample;  
 Air leakage limit,  $f_{max}$ , in accordance with section 4, Table 2 of EN 12237:2003.

**Air tightness class of the sample: D**

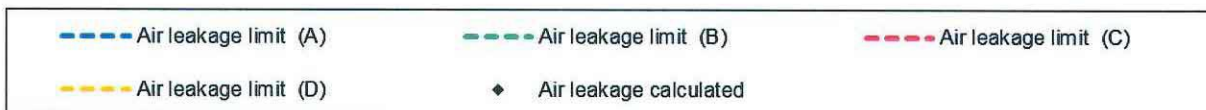
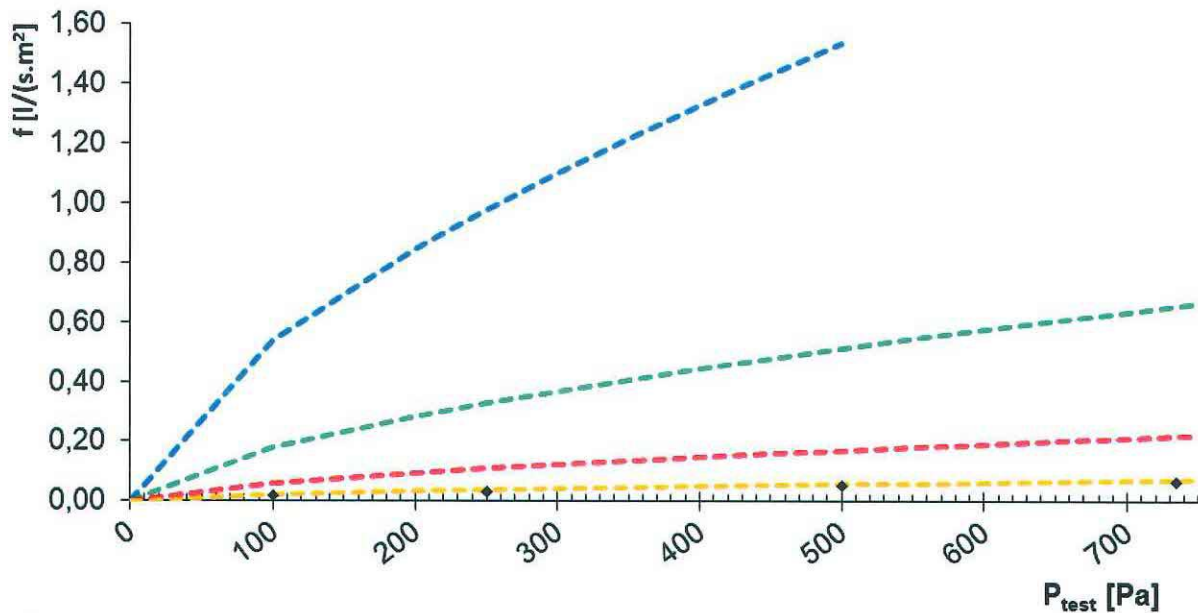
**Static gauge pressure limit: 2000 Pa**

Technician :

Rubric : 

(Ivan Pereira)

## 2.2 Negative pressures



$P_{test}$ [Pa]	$t_{test}$ [s]	$T$ [°C]	$P_{atm}$ [Pa]	$q_{v^{(a)}}$ [l/s]	$f_{calculated}$ [l.s <sup>-1</sup> .m <sup>-2</sup> ]	$f_{max}$ Class A [l.s <sup>-1</sup> .m <sup>-2</sup> ]	$f_{max}$ Class B [l.s <sup>-1</sup> .m <sup>-2</sup> ]	$f_{max}$ Class C [l.s <sup>-1</sup> .m <sup>-2</sup> ]	$f_{max}$ Class D [l.s <sup>-1</sup> .m <sup>-2</sup> ]
100	532	15,0	102080	0,153	0,017	0,54	0,18	0,06	0,02
250	454	15,0	102080	0,292	0,032	0,98	0,33	0,11	0,04
500	394	15,0	102080	0,474	0,051	1,53	0,51	0,17	0,06
735	356	15,0	102080	0,592	0,054	---	0,64	0,22	0,07

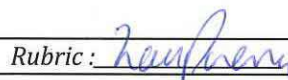
Notes: a) Corrected Leakage rate for the conditions of air temperature of 20 °C and barometric pressure of 101325 Pa;  
 Results obtained considering the size and accessories included in the sample;  
 Air leakage limit,  $f_{max}$ , in accordance with section 4, Table 2 of EN 12237:2003.

**Air tightness class of the sample: D**

**Static gauge pressure limit: - 750 Pa**

Technician :

Rubric :



(Ivan Pereira)