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2019:00455 - Restricted

Test report

Testing of Unopax manifold cabinet for water distribution

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2019-05-23

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VERSION	DATE
1	2019-05-23

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CLIENT(S)	CLIENT'S REF.
Unopax AS, Bjørnstadmyra 7, 1712 Grålum	Ronny Holm

PROJECT NO.	NUMBER OF PAGES/APPENDICES
102004276-118	7

TEST OBJECT	TEST OBJECT RECEIVED
Unopax manifold cabinet, see Table 3.1	2019-03-22

TEST PROGRAM	TEST LOCATION	DATE OF TEST
NT VVS 129	Oslo	April 2019

ABSTRACT

SINTEF Building and Infrastructure, on behalf of Unopax AS, has carried out testing of Unopax manifold cabinet for water distribution.

The tests have been carried out in accordance with relevant clauses in NT VVS 129 "*Pipe in tube systems*". See Table 4.1 for conducted tests.

Result: Passed

The test results relate only to the items tested

PREPARED BY	SIGNATURE
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REPORT NO.	CLASSIFICATION
2019:00455	Restricted

1. INTRODUCTION

SINTEF Building and Infrastructure, on behalf of Unopax AS, has carried out testing of Unopax manifold cabinet for water distribution.

Bjørn-Roar Krog (M. Sc.) from SINTEF Building and Infrastructure conducted the tests in accordance with NT VVS 129. Location: Sanitary Laboratory, room no. U47.

2. TEST METHOD

The tests have been carried out in accordance with relevant clauses in NT VVS 129 "*Pipe in tube systems*". See Table 4.1 for conducted tests.

3. TEST OBJECT

The test object from Unopax AS is a manifold cabinet for water distribution for use in a pipe in tube system.

The cabinet is separated in two independent sections. The top section is for water heating distribution. The bottom section is for drinking water distribution. The bottom section includes a WC cistern also. The back of both cabinet sections has an inspection lid.

See Table 3.1 and Fig. 3.1-3.11 for Unopax manifold cabinet and belonging components for drinking water distribution.

The controlled components, see Table 3.1, were delivered on 2019-03-22; they were in good condition on arrival.

Table 3.1: Controlled components

Component	Dimension	Quantity	Figure
Unopax manifold cabinet – with prefabricated pressed holes for bushings	-	1	3.1 and 3.2
Unopax manifold cabinet – without prefabricated pressed holes for bushings – type 1 single ring	-	1	3.3 and 3.4
Unopax manifold cabinet – without prefabricated pressed holes for bushings – type 2 double ring	-	1	3.3 and 3.5
Unopax manifold cabinet bushings for protection tube	25 and 28 mm	10	3.6
Unopax manifold cabinet bushings for protection tube, type 1	34 mm	10	3.7
Unopax manifold cabinet bushings for protection tube, type 2	34 mm	10	3.8
Protection tubes from LK Systems, Høiax, TECE, Roth, Sanipex and Uponor	25 mm	3 m	3.9
Protection tubes from Høiax, Sanipex (29 mm) and Uponor	28 mm	3 m	3.10
Protection tubes from LK Systems, Roth, Sanipex and Uponor	34 mm	3 m	3.11

Fig. 3.1: Unopax manifold cabinet with prefabricated pressed holes for bushings

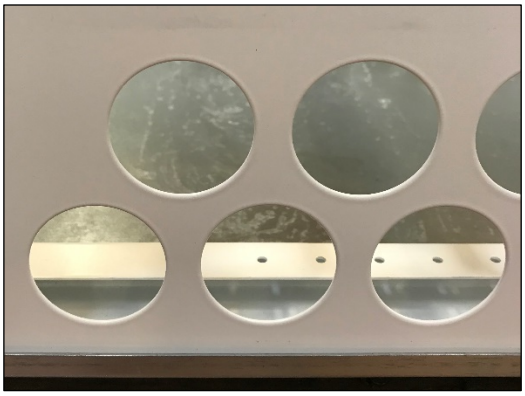

Fig. 3.2: Unopax manifold cabinet with prefabricated pressed holes for bushings

Fig. 3.3: Unopax manifold cabinet without prefabricated pressed holes for bushings

Fig. 3.4: Unopax manifold cabinet with prefabricated pressed holes for bushings; type 1 single ring

Fig. 3.5: Unopax manifold cabinet with prefabricated pressed holes for bushings; type 2 double ring

Fig. 3.6: Unopax manifold cabinet bushings for protection tube; 25 and 28 mm

Fig. 3.7: Unopax manifold cabinet bushings for protection tube; type 1 - 34 mm

Fig. 3.8: Unopax manifold cabinet bushings for protection tube; type 2 - 34 mm

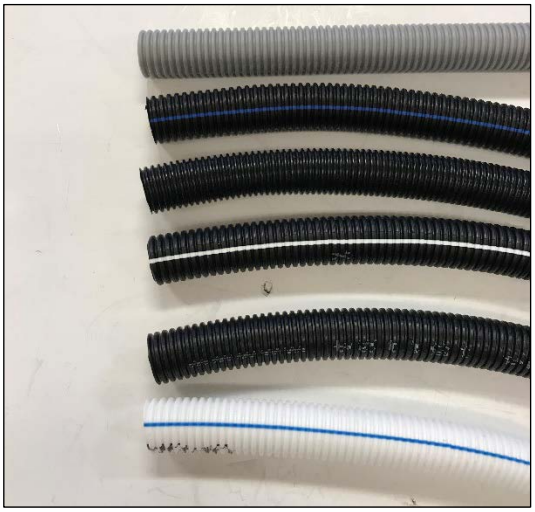

Fig. 3.9: Manifold cabinet bushings for protection tube

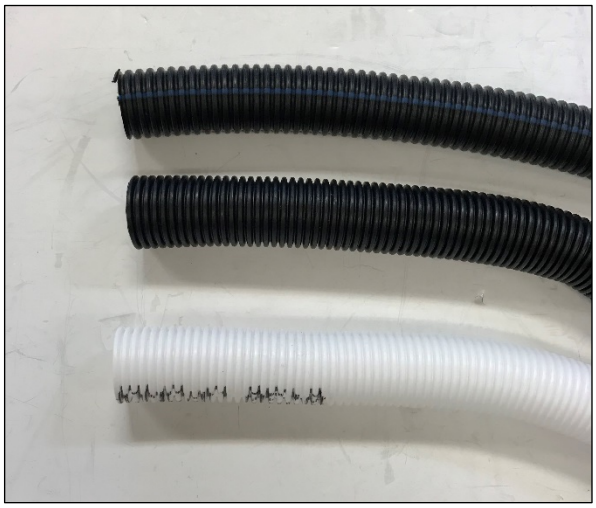

Fig. 3.10: Manifold cabinet bushings for protection tube

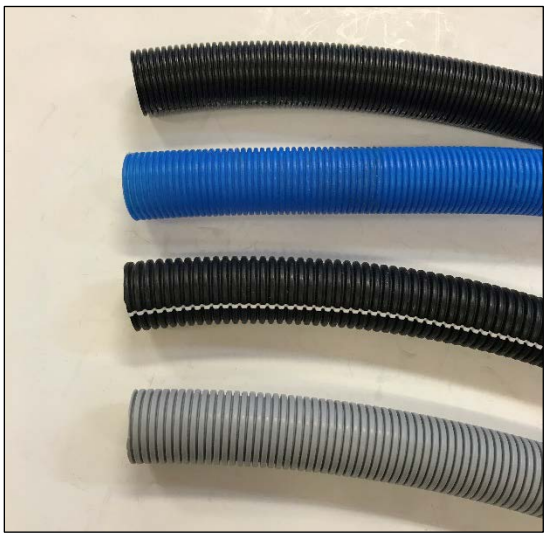

Fig. 3.11: Manifold cabinet bushings for protection tube

4. TESTS, METHODS, REQUIREMENTS AND RESULTS

Table 4.1: Summary of results - NT VVS 129

Chapter	NT VVS 129	Characteristics	Number of tested items	Passed	
				Yes	No
4.1	6.4.10	Watertightness of bushings	10 x 3	x	
4.2	6.4.12	Resistance to pull out of the protection tube	3 x 17	x[1)]	

[1)] See comment in Chapter 4.2

4.1 Watertightness of bushings (NT VVS 129, Clause 6.4.10)

Method: The test shall be made at room temperature, and with at least four bushings for water connection, and the drain bushing mounted in the bottom of the manifold cabinet. Protection tubes and drain tube shall be drawn through the bushings according to the manufacturer's installation instructions. The bottom of the manifold cabinet is filled up with water to 10 mm below the level that causes overflow. An alternation of alignment is made on the protection tube on the underside of the manifold cabinet.

Requirement: No visible leakages shall occur during a period of 5 minutes.

Result: **Passed, see Table 4.2**

Table 4.2

Type of manifold cabinet	Type of bushing	Test result
Unopax manifold cabinet – with prefabricated pressed holes for bushings	Unopax 25 and 28 mm	Passed
	Unopax bushings 34 mm – type 1	Passed
	Unopax bushings 34 mm – type 2	Passed
Unopax manifold cabinet – without prefabricated pressed holes for bushings – type 1 single ring	Unopax 25 and 28 mm	Passed
	Unopax bushings 34 mm – type 1	Passed
	Unopax bushings 34 mm – type 2	Passed
Unopax manifold cabinet – without prefabricated pressed holes for bushings – type 2 double ring	Unopax 25 and 28 mm	Passed
	Unopax bushings 34 mm – type 1	Passed
	Unopax bushings 34 mm – type 2	Passed

4.2 Resistance to pull out of the protection tube (NT VVS 129, Clause 6.4.12)

Method: The test shall be made at room temperature and without the inner pipe. The protection tube, with a length of approximately 300 mm, is mounted to the wall box, according to the producer's description. The box is fixed firmly to a wall, and a force or load of 100 N is applied in the longitudinal direction, to see if the protection tube is firmly fixed to the box.

Requirement: The outer protection tube shall not slip or loosen from the wall box during a period of 5 minutes.

Result: **Passed, see Table 4.3**

Table 4.3

Type of bushing	Type of protection tube	Test result
Unopax bushing 25 and 28 mm	LK Systems 25 mm	Passed
	Høiax 25 mm	Passed
	TECE 25 mm	Passed
	Roth 25 mm	Passed
	Sanipex 25 mm	Passed
	Uponor 25 mm	Passed
	Høiax 28 mm	Passed
	Sanipex 29 mm	Passed
	Uponor 28 mm	Passed
Unopax bushing 34 mm – type 1	LK Systems 34 mm	Passed
	Roth 34 mm	Passed
	Sanipex 34 mm	Passed
	Uponor 34 mm	Passed
Unopax bushing 34 mm – type 2	LK Systems 34 mm	Passed[1)]
	Roth 34 mm	Passed[1)]
	Sanipex 34 mm	Passed[1)]
	Uponor 34 mm	Passed[1)]

[1)] See comment section below

Comment: This Clause is only passed when fixing clamps are used inside the manifold cabinet as described in test report no. 3B040933 dated 06.08.2012 from SINTEF Building and Infrastructure. NRF no. 505 17 89 and 505 17 91.

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