

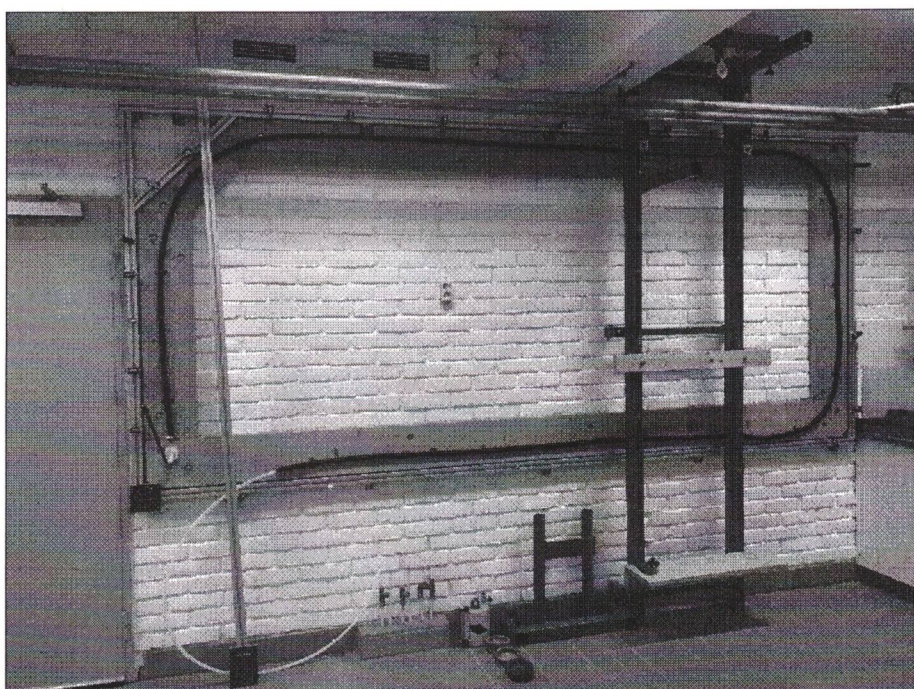
2020:00234 - Restricted

# Test report

## Testing of pipe in tube system for August Kleven ApS – Exchangeability

### Author(s)

Bjørn-Roar Krog



**SINTEF Community**

Address:  
Postboks 124 Blindern  
NO-0314 Oslo  
NORWAY  
Telephone: +47 73593000

<http://www.sintef.no>  
Enterprise /VAT No:  
NO 919 303 808 MVA

# Test report

## Testing of pipe in tube system for August Kleven ApS – Exchangeability

**VERSION**

1

**DATE**

2020-03-05

**AUTHOR(S)**

Bjørn-Roar Krog

**CLIENT(S)**

August Kleven ApS, Fynsvej 59, 5500 Middelfart, Danmark

**CLIENT'S REF.**

Steen Kjølbj

**PROJECT NO.**

102004276-133

**NUMBER OF  
PAGES/APPENDICES**

5

**TEST OBJECT**

See Table 3.1

**TEST OBJECT RECEIVED**

2020-02-26

**TEST PROGRAM**

NT VVS 129

**TEST LOCATION**

Oslo

**DATE OF TEST**

2020-03-05

**ABSTRACT**

SINTEF Community has on behalf of August Kleven ApS carried out testing of exchangeability for a pipe in tube system.

The exchangeability of the pipe in tube system has been tested in accordance with NT VVS 129 "Pipe in tube systems", Clause 6.4.13 and 6.4.14. See Table 4.1 for test results.

Result: Passed

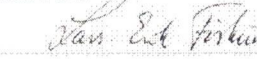
The test results relate only to the items tested

**PREPARED BY**

Bjørn-Roar Krog

**SIGNATURE****APPROVED BY**

Lars-Erik Fiskum

**SIGNATURE****REPORT NO.**

2020:00234

**CLASSIFICATION**

Restricted

## 1. INTRODUCTION

SINTEF Community has on behalf of August Kleven ApS carried out testing of exchangeability for a pipe in tube system.

Bjørn-Roar Krog from SINTEF Community conducted the tests in accordance with NT VVS 129. Test location: Sanitary Laboratory, room no. U47.

## 2. TEST METHOD

The exchangeability of the pipe in tube system has been tested in accordance with NT VVS 129 "*Pipe in tube systems*", Clause 6.4.13 and 6.4.14. See Table 4.1 for test results.

## 3. TEST OBJECT

The tested pipe in tube system consists of wall box, pipe in tube, clamps and special exchangeability tool. See Table 3.1 and Fig. 3.1-3.4 for controlled components.

The controlled components, see Table 3.1, were delivered by post on 2020-02-26; they were selected by the customer and in good condition on arrival.

*Table 3.1: Controlled components*

| Component              | Quantity | Figure | Comment                                           |
|------------------------|----------|--------|---------------------------------------------------|
| August Kleven wall box | 2        | 3.1    | Push fit for pipe with external diameter of 15 mm |
| PEX pipe               | 10 m     | 3.2    | Dimension 15 x 2,5 mm                             |
| Conduit pipe x 2       | 10 m     | 3.2    | Dimension 25/20 mm                                |
| Clamps                 | 25       | 3.3    | Clamps for 25 mm conduit pipe                     |
| Exchangeability tool   | 1        | 3.4    |                                                   |





Fig. 3.1: August Kleven wall box

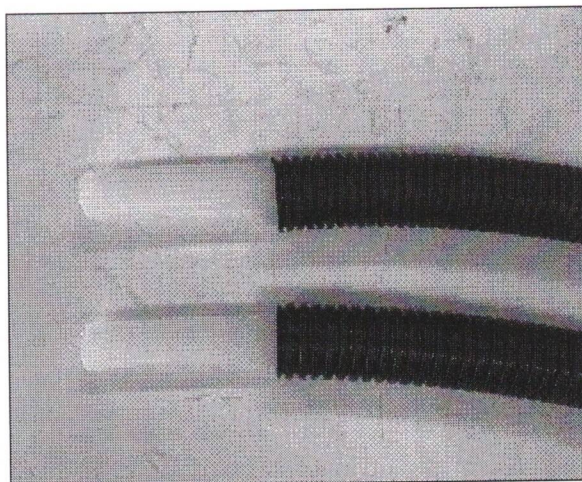


Fig. 3.2: PEX pipes (15x2,5 mm) & conduit pipes (25/20 mm)

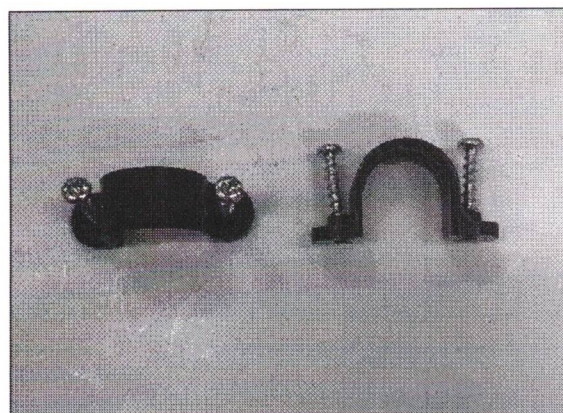


Fig. 3.3: Clamps for conduit pipe (25 mm)

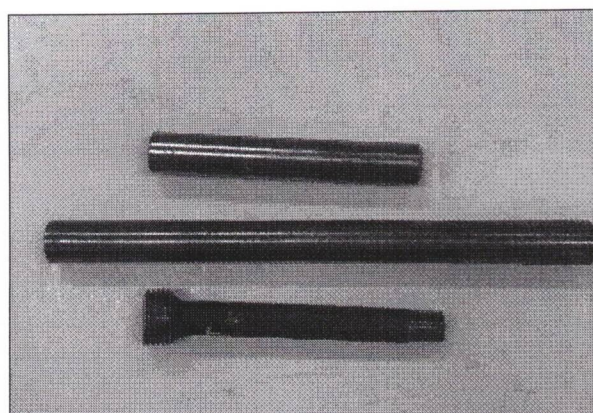


Fig. 3.4: Exchangeability tool

## 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     | 6.4.13     | Exchangeability of the inner pipe                    | 1 x 2                  | x      |    |
| 4.2     | 6.4.14     | Water tightness of the protection tube <sup>1)</sup> | 1 x 2                  | x      |    |

### 4.1 Exchangeability of the inner pipe (NT VVS 129, Clause 6.4.13)

**Method:** The test shall be made at room temperature. A stud partition, like described in Fig. 4.1, is built. One wall box is fixed at a height of 500 mm to a pressed wallboard, and four 90° bends are made on the tube, inclusive the one in the wall box. Two bends of the tube section shall have a radius of 100 mm. Pipe clips are used every 600 mm. The total length of the inner pipe and outer protection tube shall be 10 meters. The exchangeability shall be tested according to the manufacturer's instructions. The withdrawal of the inner pipe starts from the box side. It is often necessary to start the withdrawal with one or two powerful pulls.

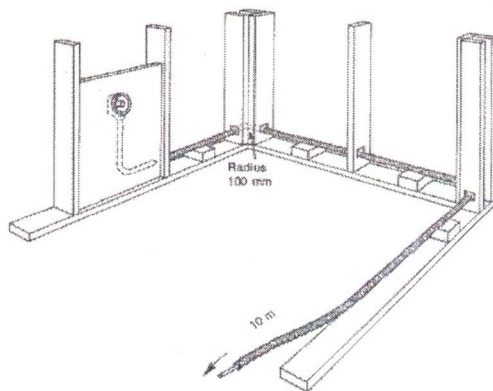


Fig 4.1

**Requirement:** The replacement of the inner pipe shall be possible without damaging the protection tube or arrangement.

**Result:** **Passed**

## 4.2 Water tightness of the protection tube (NT VVS 129, Clause 6.4.14)

Method: After the test, described in 6.4.13, and same arrangement, the end of the outer protection tube is plugged, and the system is filled up with cold water from the box side, and the pressure of 5 kPa shall be kept for 5 minutes.

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

Result: **Passed**



Technology for a better society

[www.sintef.no](http://www.sintef.no)