CLINA RICHTLINIE CR02

FILLING, VENTING AND LEAK TEST

I. FILLING AND VENTING

PRELIMINARY REMARKS

The Clina capillary tube system is a liquid-filled – usually with clear/pure water - pipe system on the basis of capillary tube mats made of polypropylene which has to be filled and put into operation after installation.

The following instructions apply to all applications of the Clina capillary tube system, independent of the installation situation (e.g. in the ceiling, wall and floor or convective components) and function (heating and/or cooling).

It must always be ensured that capillary tube mats made of polypropylene are protected against prolonged UV radiation, as this negatively affects the properties of the material.

Furthermore, the capillary tube mats may only be processed or mechanically stressed if the room and material temperature is at least +5 °C.

Suitable venting possibilities shall be provided at the highest points of the pipe system with dimensions greater than DN 15 or in the distributing area at the separation system and/or the manifold. Here you have to act according to the generally accepted engineering rules and piping engineering rules.

The very thin capillaries of our capillary tube mats with a diameter of 3,4 mm or 4,3 mm are self-venting and so they can be used in any position and alignment. According to our experiences it is assumed that for dimensions less than DN 20 the system can be deaerated in the following steps due to the high flow rate.

The operating pressure in the capillary tube mats should normally not exceed 2,0 bar.
However, depending on the system the operating pressure can also be raised up to 4,0 bar.

Regarding the processing/installation as well as the filling, venting and leak test of the Clina capillary tube mats the accepted/common guidelines according to the state of the art apply subordinate to the applicable factory guidelines.

PRELIMINARY TEST WITH 3 BAR COMPRESSED AIR

After professional installation and before closing the system, which means before finishing the ceiling, wall or floor by plastering, filling, grouting or the like and filling with soil, the system must be subjected to an initial leak test with 3 bar compressed air for at least 1 hour.

This measure prevents avoidable damage to components, the building structure or the soil by leaking system medium if the circuit to be tested is not leak-proof due to inattention or defects.

A duly completed separate test report must be issued on the successful completion of the preliminary test with compressed air (see pages 3 + 4).

FILLING AND VENTING

According to VDI 2035, water in hot water heating installations must be softened depending on the size of the system. This should be done in the same way for the capillary tube system regardless of whether it is used as a heating or cooling system.

Basic procedure when filling and venting:

- Open the shut-off valves of one zone and keep all other zones shut/closed.
- Connect the filling hose to a boiler filling and drain valve (KFE-ball valve) of the separation system or the heating circuit distributor.
- Connect a drain to another boiler filling and drain valve (KFE-ball valve) of the separation system.
- *ATTENTION: Make sure that a short circuit between these two valves is impossible.*
- Fill the zone after thoroughly flushing for approx. 15-20 minutes until no air blowing is visible at the water outlet.
- *ATTENTION: Pay attention to the pressure ranges of the individual components and protect them if necessary.*
- Shut the drain valve and keep on with the filling until the set operating pressure is reached.
- The previous steps have to be repeated for all further zones.
- Upon completion of the filling: Ensure the water circuit in the system by opening one zone valve at a time and switching on the circulation pump.
- Run the pump at its maximum (max. volume flow rate); this way the water in the capillaries and in the pipes of smaller dimensions will be moved at a high flow rate/flow velocity and the air, which is still remaining in the zone, will be carried away. In the area of the separation system or in the pipes of larger dimension the flow rate of the water decreases and the air can move out through venting possibilities which have to be placed in this area.
- If the pressure decreases below 1,5 bar despite the feeding through the expansion tank (primary pressure expansion tank approx. 1 bar), you have to refill further system fluid until the set operating pressure is re-established.
- The previous process has to be repeated for every zone until there is no more pressure loss and until the air which remained in the zone has completely moved out.

Due to the characteristics of the flexible material polypropylene and the fact, that during the start-up, air that still remains in the system can be carried away through the automatic air vents, the pressure in the capillary tube mat systems can still decrease after the start-up, without decreasing completely and without an existing leakage.

In this case the operating pressure of the system (which is normally about 1,5 bar) has again to be set up in a professional manner by repeating the filling process according to the previous instructions.

II. MAIN LEAK TEST WITH 10 BAR LIQUID MEDIUM

After the successful **preliminary test with 3 bar compressed air,** the system has to be filled with the liquid medium (which is normally pure, normal water) and has to be set in a professional manner to a test pressure of 10 bar.

This test condition has to be kept over a period of at least 24 hours and has to be recorded in detail (see page 3 + 4).

After 12 hours at the earliest the following trades can perform their work as described under the point „Preliminary test with 3 bar compressed air".

During the following activities (works) the capillary tube system has to be kept at the above-mentioned test pressure to detect leakages which may be caused by the following trades and to eliminate them right away.

If the following trades do not start their work right after the pressure test, the installation has to be de-pressurized, meaning that the pressure in the system has to be reduced to the set operating pressure. Only when they start performing the following works the pressure has to be risen to 10 bar.

TEST REPORTS

During or after every leak test a test report - according to the example on page 4 in this guideline - has to be issued, indicating clearly the respective participants and persons in charge. Furthermore, you have to prove beyond doubt the position/location of the relevant sections by appropriate documents (pipe system diagrams, floor plans).

The issue of such proper reports on the performed leak tests is a precondition for the 15-year extended warranty by the company Clina for the heating and cooling mats manufactured by them.

The test reports have to be sent to Clina within a reasonable time after the issue.

REQUIREMENTS FOR THE PERIOD UNTIL ACCEPTANCE OF THE INSTALLATION BY THE CLIENT/CONTRACTOR

After completion of the above-mentioned works the pressure in the installation should be adjusted to the set operating pressure.

Verifiable equivalent methods and procedures for the leak test on the part of the performing qualified company are just as permissible as they are analogous, appropriate and the result is conforming.

LEAK TEST REPORT

Report no.:

Preliminary test with compressed air: ☐
Main test with liquid medium for the system: ☐

Construction project: _____ Executing company: _____

Constructor/Client: _____ Project manager: _____

Item no.	Designation zone/section		Date	Time	Pressure	Name of the person in charge	Signature	Remarks
1		Start						
		End						
2		Start						
		End						
3		Start						
		End						
4		Start						
		End						
5		Start						
		End						
6		Start						
		End						
7		Start						
		End						
8		Start						
		End						
9		Start						
		End						
10		Start						
		End						

I herewith declare that the leak test for the above-mentioned zones/sections has successfully been performed according to the Clina guideline CR02 "Filling, venting and leak test".

_____ _____ _____

Name of the signee Date Signature