

MECHANICAL CHARACTERIZATION & TESTING

PRESSURE TEST PROCEDURE

Accessories

Connectors

Client: الوارد من الشركة المصرية للاتصالات لصالح شركة سفن هاندرد للأفكار الصناعية والتطوير الرقمي

Date: 29/02 /2024

Introduction:

As per the Client request for mechanical testing for the microduct accessories

This test is carried out to make sure that all the micro duct connections/endcaps are air tight and it also shows that the tube is air tight and no leakages.

Verifying the Test Result

The pressure test was verified by pressure drop more than 2bars as well as by water dunk tube to determine the leakage and its position. If the pressure drops by less than 2 bars in the first 2 minutes, then this is acceptable. The air pressure slightly expands the tube creating an initial pressure drop. If pressure drops by more than 2 bar before stabilizing, re-pressurize the tube and check to see if a maximum 2 bar drop is established.

Important Notes:

- Pressure test procedures were supplied by client's representatives: SABBOUR Consulting (as attached Pdf document) sent by the client Telecom Egypt Company - الشركة المصرية للاتصالات
- To investigate and determine the position of the leakage; if it is present; we have used the "Water dunk tube" where the microducts with its accessories have



submerged in water under pressure test 9 bar. This way it was easier to pinpoint the leakage and its position. Accessories/Products with air bubbles present around them = leaking area = loss in pressure bar.

Pressure Test Procedure and Parameters

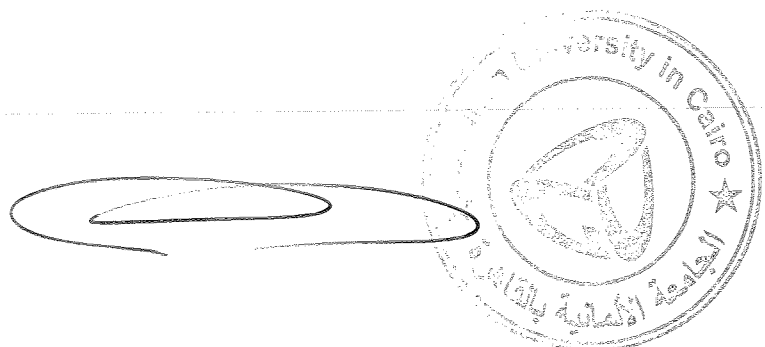
This test is done to ensure that there is no leakage in the tube so that it does not affect the performance of the installation.

- Choose the microduct with its accessories (connector and end cap) to be tested
- Connect the pressure hose to the tube to be tested.
- Connect the pressure indicator.
- Open the air compressor between 7 and 15 bars.
- Stabilize the pressure for 5-10 minutes
- If the pressure drops by less than 2 bars in the first minutes (2min.), this is acceptable, then press again. The tube will drop by and make sure it is stable for 10 minutes.

Once air is flowing along the duct, turn off the air, and allow compressed air to exit before removing any air connections to exit before removing any air connections

Acceptance criteria

If the pressure drops by less than 2 bars in the first 2 minutes, then this is acceptable. Also, no air bubbles appeared around connector and end cap.



Pressure Test 9 bar Results Connectors

#	Connectors	Pressure test 9 bar -10 minutes
1	7/3.5mm	Withstand no leakage

Important Notes on table above:

- The pressure used here is the same as the pressure used to blow the fibre bundle / cable (between 7 & 15 bar, depending compressor availability).
- We followed the same mechanical characterization & testing procedure as received from the client.

Document approved M. Osman Date 3/3/2024

Materials Testing Lab



Prof. Dr. Ahmed Abd El Aziz

تمت هذه الاختبارات للعينات الواردة من العميل دون أدنى مسؤولية على جهة الاختبار



MECHANICAL CHARACTERIZATION & TESTING
CRUSH TEST PROCEDURE
(HDPE) MICRODUCTS
IEC60794-1-21
Accessories
Connectors

Client: الوارد من الشركة المصرية للاتصالات لصالح شركة سفن هاندرد للأفكار الصناعية والتطوير الرقمي

Date: 29/02 /2024

Introduction:

As per the Client request for mechanical testing for the microduct accessories

The tests for the endcap and connectors have been determined to provide optimal blown performance, along with the desired mechanical and environmental properties that face the microducts itself.

We followed the same mechanical characterization & testing procedure of microducts IEC60794-1-21 for the microduct accessories as well.

Verifying the Test Result

Mechanical Test-Crush- was verified by visual inspection and by applying pressure test to the microduct fitted with its accessories for all sizes provided by the client. The verification step with pressure tests ensures there is no leakage into the microducts with its accessories fitted on.

Important Notes:

- a) Pressure test procedures were supplied by client's representatives: SABBOUR Consulting (attached Pdf document) sent by the client Telecom Egypt Company - الشركة المصرية للاتصالات



b) To investigate and determine the position of the leakage after impact test; if it is present; we have used the “Water dunk tube” where the microducts with its accessories have submerged in water under pressure test 9 bar. This way it was easier to pinpoint the leakage and its position. Accessories/Products with air bubbles present around them = leaking area = loss in pressure bar.

Acceptance criteria

Under visual examination, without magnification, there shall be no damage after the test. There shall be no cracks or damage to the micro ducts.

Test Condition and parameters:

- Method E3 IEC60794-1-21
- Sample length: 20 cm of microduct fitted with its accessories endcap and connector
- Test Load: 0.5kN and 2 kN
- Duration of Max. Load: 1min.
- Recovery time: 1hr
- Testing Equipment: Universal Testing Machine Zwick Roell Z100 - compression accessories 2 parallel plates



Mechanical Characterization & Testing Crush Test (2KN) Results Endcap and Connectors

#	Connectors	2 kN Load	Pressure test 9 bar -10 minutes
1	7/3.5mm	Pass	No leakage

Document approved M. OSMAN Date 3/3/2024

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