# Test-Report chainflex®





Test No.: 5108

| Test Intention: |
|---|
| In test 5108 we want to investigate the lifespan of our CFBUS.LB.049 in an e-chain with a 55mm radius. |

| Client: | | |
|---|---|---|
| Name: Christian Mittelstedt | Team: chainflex® | Date: 04.05.2016 |

| Order-Info: | |
|---|---|
| Customer / No.: igus® GmbH, Spicher Str.1a, 51147 Köln | |
| Series / No: CFBUS.LB | Installation type: horizontal |
| Customer test: Yes ☐ No ☒ | Development test: Yes ☒ No ☐ |

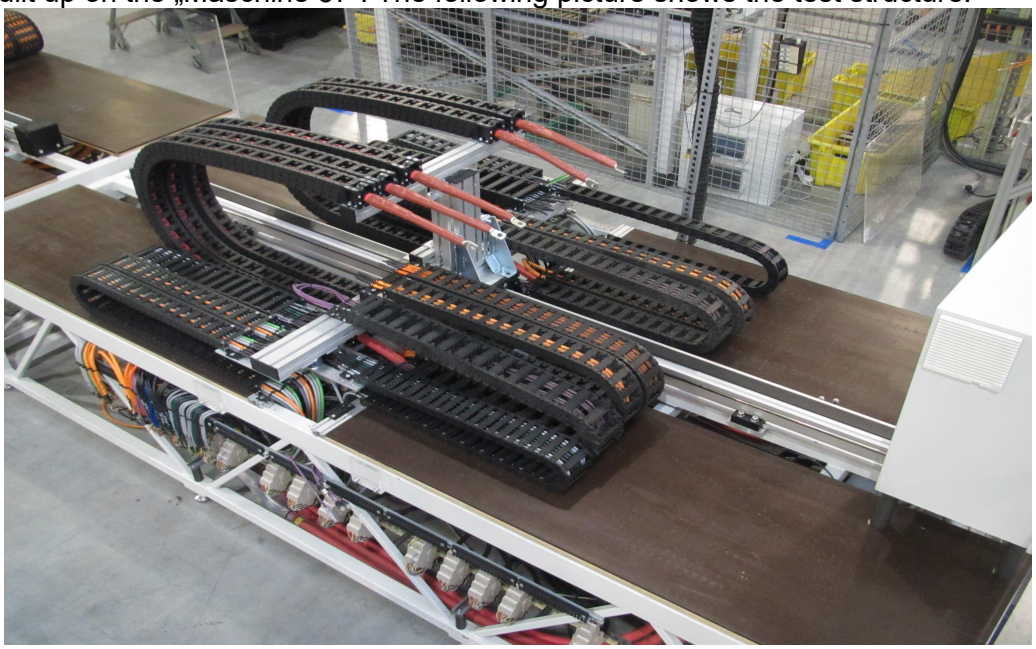
| Technical data | | Target & Examination | |
|---|---|---|---|
| e-chain® type: | EF61.29.100.055.0 | Target [strokes]: | Lifespan |
| e-chain® radius [mm]: | 55 | Optical check: | ☒ |
| Stroke [m]: | 2,1 | Fluke DTX-ELT: | ☒ |
| Cable length [m]: | 50 | Standard measuring: | ☐ |
| Ambient temperature [°C]: | approx. 25°C | AutΩMeS: | ☐ |

**Experimental setup**

**Checklist for the experimental preparations**
☒ additional inscription/label at all wires
☒ strain reliefs at both ends of the chain
☒ correct electrical connection of all wires
☒ radius was marked at the cables and the energy chain

## 1. Construction:

This test is built up on the „Maschine 57“. The following picture shows the test structure:



## 2. Cable and hose packages:

No. 1: **1x CFBUS.LB.049** with the cable marking
*05405m igus chainflex CFBUS.LB.049 (4x(2x0,15))C EAC CE N S/BF DESINA Ethernet/CAT6 conform RoHS-II conform www.igus.de*

## 3. Description of the cable construction:

Standard igus chainflex® catalogue cable

## 4. Remarks:

The cables are harnessed with RJ45 connectors, the function will be checked with the Fluke DTX-ELT.

The following chart gives an overview regarding the test parameters:

| Cable no. | Cable type | e-chain radius [mm] | External diameter [mm] | Bending factor [xd] | Bending factor catalogue [xd] |
|---|---|---|---|---|---|
| 1.1 | CFBUS.LB.049 | 55 | 8,3 | 6,6 | 7,5 |

| Cable no. | Cable type | Counter reading | | Effectively tested strokes | Cable okay after … strokes |
|---|---|---|---|---|---|
| | | … mounting | … demounting | | |
| 1.1 | CFBUS.LB.049 | 45.817.106 | 84.586.625 | 38.769.519 | 38.769.519 |

**Test-order was checked by … [Martin Göllner or Christian Mittelstedt and further employee]**

| Date: | 04.05.2016 | Name: | | Name: | Christian Mittelstedt |
|---|---|---|---|---|---|

## Result

**Start report 04.05.2016:**

At the 04.05.2016 we started the test 5108 at a counter reading of 45.817.106, we will measure the cable regularly through Fluke DTX-ELT.

**Interim report 10.10.2017:**

The following Fluke protocol shows the condition of the cable after 24.228.630 strokes:

LINKWARE™PC
CABLE TEST MANAGEMENT SOFTWARE

**Kabelkennung: 5108**
Datum/Uhrzeit: 10/10/2017 12:30:04
**Reserve 1.4 dB (NEXT 36-45)**
**Grenzwert: ISO11801 Channel Class E**
Kabeltyp: Cat 6 F/UTP
NVP: 67.0%

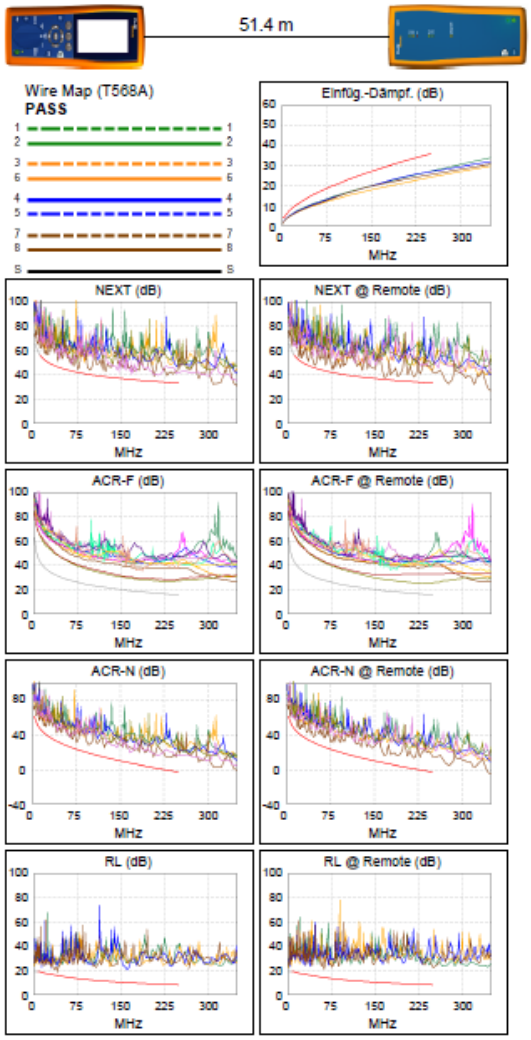
Bediener: T.SCHALLER
Software-Version: 2.7800
Grenzwerte Version: 1.9500
Kalibrierungsdatum:
Hauptgerät (Tester): 02/20/2017
Remote (Tester): 02/20/2017

**Testzusammenfassung: PASS**
Modell: DTX-ELT
Hauptgerät S/N: 2863602
Remote S/N: 2863621
Adapter Hauptgerät: DTX-CHA002
Adapter Remote: DTX-CHA002

| | | |
|---|---|---|
| Länge (m) | [Paar 78] | 51.4 |
| Laufzeit (ns), Grnz. 555 | [Paar 12] | 268 |
| Abweichung (ns), Grnz. 50 | [Paar 12] | 12 |
| Widerstand (Ohm), Grnz. 25.0 | [Paar 45] | 11.7 |
| Einfüg.-Dämpf. Reserve (dB) | [Paar 12] | 8.7 |
| Frequenz (MHz) | [Paar 12] | 250.0 |
| Grenzwert (dB) | [Paar 12] | 35.9 |

| | | Min. Abstand | | Min. Wert | |
|---|---|---|---|---|---|
| **PASS** | MAIN | SR | MAIN | SR |
| Schlechtest Paar | 36-45 | 36-45 | 36-45 | 36-45 |
| **NEXT (dB)** | 2.3 | 1.4 | 4.4 | 1.4 |
| Freq. (MHz) | 75.3 | 166.5 | 207.5 | 166.5 |
| Grenzwert (dB) | 42.0 | 36.1 | 34.5 | 36.1 |
| Schlechtest Paar | 36 | 36 | 45 | 36 |
| **PS NEXT (dB)** | 4.6 | 4.2 | 5.1 | 4.2 |
| Freq. (MHz) | 75.3 | 166.5 | 207.0 | 166.5 |
| Grenzwert (dB) | 39.2 | 33.2 | 31.6 | 33.2 |
| **PASS** | MAIN | SR | MAIN | SR |
| Schlechtest Paar | 36-45 | 36-45 | 36-45 | 36-45 |
| **ACR-F (dB)** | 9.8 | 8.5 | 10.2 | 8.5 |
| Freq. (MHz) | 190.0 | 198.5 | 227.5 | 230.0 |
| Grenzwert (dB) | 17.7 | 17.3 | 16.1 | 16.0 |
| Schlechtest Paar | 45 | 36 | 45 | 36 |
| **PS ACR-F (dB)** | 12.1 | 12.3 | 12.9 | 12.8 |
| Freq. (MHz) | 190.0 | 190.0 | 227.5 | 226.0 |
| Grenzwert (dB) | 14.7 | 14.7 | 13.1 | 13.2 |
| **PASS** | MAIN | SR | MAIN | SR |
| Schlechtest Paar | 36-45 | 36-45 | 36-45 | 36-45 |
| **ACR-N (dB)** | 6.5 | 5.9 | 13.9 | 12.3 |
| Freq. (MHz) | 5.3 | 18.6 | 229.5 | 217.5 |
| Grenzwert (dB) | 56.4 | 43.2 | -0.5 | 0.9 |
| Schlechtest Paar | 45 | 45 | 45 | 45 |
| **PS ACR-N (dB)** | 9.0 | 8.3 | 16.4 | 15.1 |
| Freq. (MHz) | 5.5 | 5.6 | 245.0 | 217.5 |
| Grenzwert (dB) | 53.4 | 53.2 | -5.2 | -2.0 |
| **PASS** | MAIN | SR | MAIN | SR |
| Schlechtest Paar | 78 | 78 | 78 | 78 |
| **RL (dB)** | 3.1 | 6.9 | 3.1 | 6.9 |
| Freq. (MHz) | 39.8 | 62.3 | 39.8 | 62.3 |
| Grenzwert (dB) | 16.0 | 14.1 | 16.0 | 14.1 |

Erfüllte Network Standards:
10BASE-T, 100BASE-TX, 100BASE-T4, 1000BASE-T, ATM-25, ATM-51, ATM-155, 100VG-AnyLan, TR-4, TR-16 Active, TR-16 Passive




LinkWare™ PC Version 9.6

**Final report 7.01.2021:**

The following Fluke protocol shows the condition of the cable after 38.769.519 strokes:

LINKWARE™PC
CABLE TEST MANAGEMENT SOFTWARE

**Cable ID: 5108-1.1**
Date / Time: 01/07/2021 11:36:10 AM
**Headroom 1.9 dB (NEXT 36-45)**
**Test Limit: ISO11801 Channel Class E**
Cable Type: Cat 6 F/UTP
NVP: 70.0%

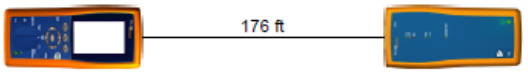
Operator: RT
Software Version: 2.7800
Limits Version: 1.9500
Calibration Date:
Main (Tester): 12/06/2017
Remote (Tester): 12/05/2017

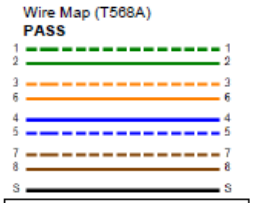
**Test Summary: PASS**
Model: DTX-ELT
Main S/N: 9751011
Remote S/N: 9751012
Main Adapter: DTX-CHA002
Remote Adapter: DTX-CHA002

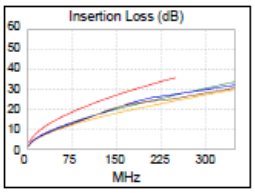
| | | |
|---|---|---|
| Length (ft) | [Pair 78] | 176 |
| Prop. Delay (ns), Limit 555 | [Pair 12] | 267 |
| Delay Skew (ns), Limit 50 | [Pair 12] | 11 |
| Resistance (ohms), Limit 25.0 | [Pair 45] | 15.1 |
| Insertion Loss Margin (dB) | [Pair 45] | 8.5 |
| Frequency (MHz) | [Pair 45] | 250.0 |
| Limit (dB) | [Pair 45] | 35.9 |

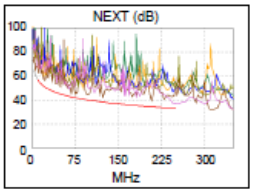
| | Worst Case Margin | | Worst Case Value | |
|---|---|---|---|---|
| **PASS** | MAIN | SR | MAIN | SR |
| Worst Pair | 36-45 | 36-45 | 45-78 | 36-45 |
| **NEXT (dB)** | 2.8 | 1.9 | 3.6 | 1.9 |
| Freq. (MHz) | 75.3 | 166.0 | 250.0 | 166.5 |
| Limit (dB) | 42.0 | 36.2 | 33.1 | 36.1 |
| Worst Pair | 36 | 36 | 45 | 36 |
| **PS NEXT (dB)** | 4.8 | 4.7 | 5.7 | 4.7 |
| Freq. (MHz) | 67.8 | 166.0 | 245.5 | 166.5 |
| Limit (dB) | 40.0 | 33.3 | 30.3 | 33.2 |
| **PASS** | MAIN | SR | MAIN | SR |
| Worst Pair | 36-45 | 36-45 | 36-45 | 36-45 |
| **ACR-F (dB)** | 8.7 | 7.2 | 9.5 | 7.4 |
| Freq. (MHz) | 192.5 | 181.5 | 219.5 | 197.5 |
| Limit (dB) | 17.6 | 18.1 | 16.4 | 17.3 |
| Worst Pair | 45 | 36 | 45 | 36 |
| **PS ACR-F (dB)** | 10.5 | 11.2 | 10.7 | 12.2 |
| Freq. (MHz) | 192.0 | 192.5 | 197.5 | 219.5 |
| Limit (dB) | 14.6 | 14.6 | 14.3 | 13.4 |
| **PASS** | MAIN | SR | MAIN | SR |
| Worst Pair | 36-45 | 36-45 | 45-78 | 36-45 |
| **ACR-N (dB)** | 5.8 | 5.8 | 14.1 | 11.6 |
| Freq. (MHz) | 5.3 | 18.5 | 250.0 | 217.5 |
| Limit (dB) | 56.4 | 43.2 | -2.8 | 0.9 |
| Worst Pair | 45 | 45 | 45 | 45 |
| **PS ACR-N (dB)** | 8.3 | 8.2 | 14.1 | 14.4 |
| Freq. (MHz) | 5.1 | 18.5 | 245.5 | 217.5 |
| Limit (dB) | 54.1 | 40.6 | -5.3 | -2.0 |
| **PASS** | MAIN | SR | MAIN | SR |
| Worst Pair | 78 | 45 | 78 | 78 |
| **RL (dB)** | 3.1 | 2.5 | 3.1 | 6.5 |
| Freq. (MHz) | 40.0 | 4.3 | 40.0 | 62.3 |
| Limit (dB) | 16.0 | 19.0 | 16.0 | 14.1 |

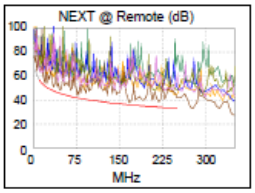
Compliant Network Standards:
10BASE-T, 100BASE-TX, 100BASE-T4, 1000BASE-T, 2.5GBASE-T, 5GBASE-T, ATM-25, ATM-51, ATM-155, 100VG-AnyLan, TR-4, TR-16 Active, TR-16 Passive

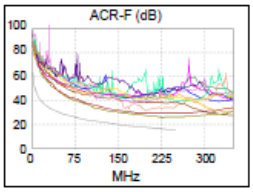


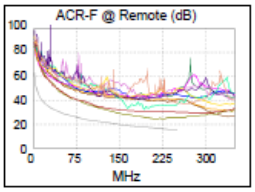



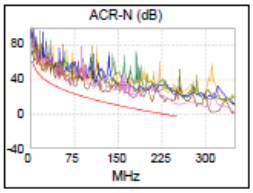



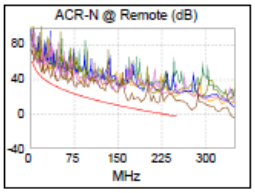



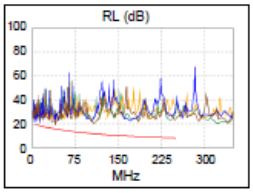



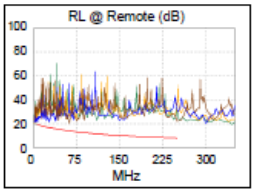

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