Test-Report chainflex®

Test No.: 5064

Test Intention:
In test 5064 we want to investigate the lifespan of a CFBUS.PUR.049 in an e-chain with a75mm radius.

Client:		
Name: Christian Mittelstedt	Team: chainflex®	Date: 11.12.2015

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

Technical data		Target & Examination	
e-chain® type:	E6.29.XXX.075.0	Target [strokes]:	Lifespan
e-chain® radius [mm]:	75	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:

1x CFBUS.PUR.049 with the cable marking
02370m igus chainflex CFBUS.PUR.049 (4x2x0,15)C E310776 A cULus AWM Style 20236 VW-1 AWM I/II A/B 80°C 30V FT1 EAC/CTP CE A R/ED DESINA RoHS-II conform www.igus.de

3. Description of the cable construction:

Standard igus chainflex® catalogue cable

4. Remarks:

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.PUR.049	75	7,3	10,3	12,5

Cable no.	Cable type	Counter reading		Effectively tested strokes	Cable okay after … strokes
		… mounting	… demounting		
1.1	CFBUS.PUR.049	42.657.944	60.153.038	17.495.094	17.495.094

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

Date:	11.12.2015	Name:		Name:	C. Mittelstedt

Result

Start report 11.12.2015:
At the 11.12.2015 we started the test 5064 at a counter reading of 42.657.944, we will measure the function with the Fluke DTX-ELT.

Interim report 07.02.2017:
At the 07.02.2017 we demounted the cable no. 1.1 after 17.495.094 strokes, because we want to finalize the test.

The following protocols show the result of the Fluke measurements of the cable.

LINKWARE™ PC
CABLE TEST MANAGEMENT SOFTWARE

Cable ID: 5064-1.1
Date / Time: 12/27/2016 12:33:01 PM
Headroom 9.1 dB (NEXT 36-45)
Test Limit: ISO11801 Channel Class E
Cable Type: Cat 6 F/UTP
NVP: 72.0%

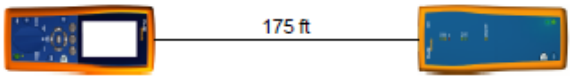
Operator: S.MENNER
Software Version: 2.7700
Limits Version: 1.9400
Calibration Date:
Main (Tester): 08/07/2014
Remote (Tester): 08/07/2014

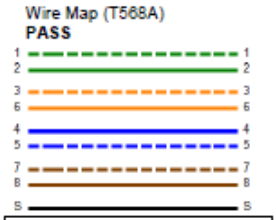
Test Summary: PASS
Model: DTX-ELT
Main S/N: 2863602
Remote S/N: 2863621
Main Adapter: DTX-CHA002
Remote Adapter: DTX-CHA002

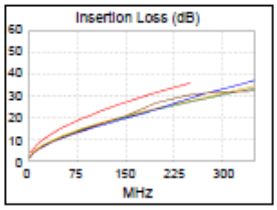
Length (ft)	[Pair 36]	175
Prop. Delay (ns), Limit 555	[Pair 12]	256
Delay Skew (ns), Limit 50	[Pair 12]	9
Resistance (ohms), Limit 25.0	[Pair 36]	23.5
Insertion Loss Margin (dB)	[Pair 78]	5.3
Frequency (MHz)	[Pair 78]	250.0
Limit (dB)	[Pair 78]	35.9

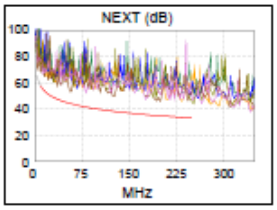
	Worst Case Margin		Worst Case Value	
PASS	MAIN	SR	MAIN	SR
Worst Pair	36-45	36-45	12-36	36-45
NEXT (dB)	9.1	9.6	12.2	11.0
Freq. (MHz)	55.3	150.5	235.5	248.0
Limit (dB)	44.3	36.9	33.6	33.2
Worst Pair	45	36	45	36
PS NEXT (dB)	11.2	11.5	12.8	13.5
Freq. (MHz)	56.0	8.1	200.0	248.0
Limit (dB)	41.4	55.5	31.9	30.2
PASS	MAIN	SR	MAIN	SR
Worst Pair	45-78	12-45	45-78	12-45
ACR-F (dB)	11.0	12.6	11.0	12.6
Freq. (MHz)	203.5	240.0	203.5	240.0
Limit (dB)	17.1	15.7	17.1	15.7
Worst Pair	78	45	78	45
PS ACR-F (dB)	13.6	12.2	15.0	12.2
Freq. (MHz)	203.5	203.5	241.5	203.5
Limit (dB)	14.1	14.1	12.6	14.1
PASS	MAIN	SR	MAIN	SR
Worst Pair	36-45	36-45	36-78	36-45
ACR-N (dB)	8.8	9.3	19.5	18.2
Freq. (MHz)	3.8	3.3	247.5	248.5
Limit (dB)	59.4	60.5	-2.5	-2.7
Worst Pair	36	36	78	78
PS ACR-N (dB)	10.3	10.6	20.5	19.0
Freq. (MHz)	3.6	3.3	247.5	238.0
Limit (dB)	57.2	58.0	-5.5	-4.4
PASS	MAIN	SR	MAIN	SR
Worst Pair	36	36	36	36
RL (dB)	2.6	4.3	11.2	4.3
Freq. (MHz)	9.9	4.4	188.5	4.4
Limit (dB)	19.0	19.0	9.2	19.0

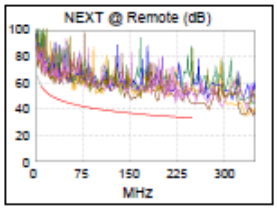
Compliant Network Standards:
10BASE-T, 100BASE-TX, 100BASE-T4, 1000BASE-T, ATM-25, ATM-51, ATM-155, 100VG-AnyLan, TR-4, TR-16 Active, TR-16 Passive

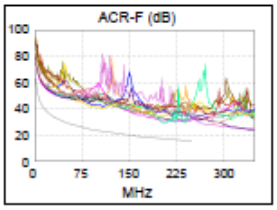


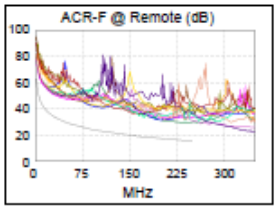


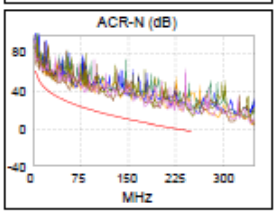


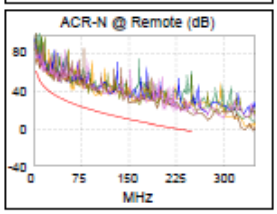


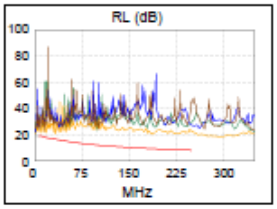


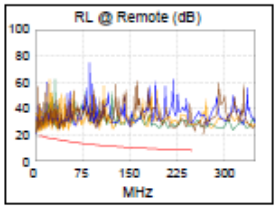












LinkWare™ PC Version 9.6

Project: CHAINFLEX
Untitled1

Site: IGUS

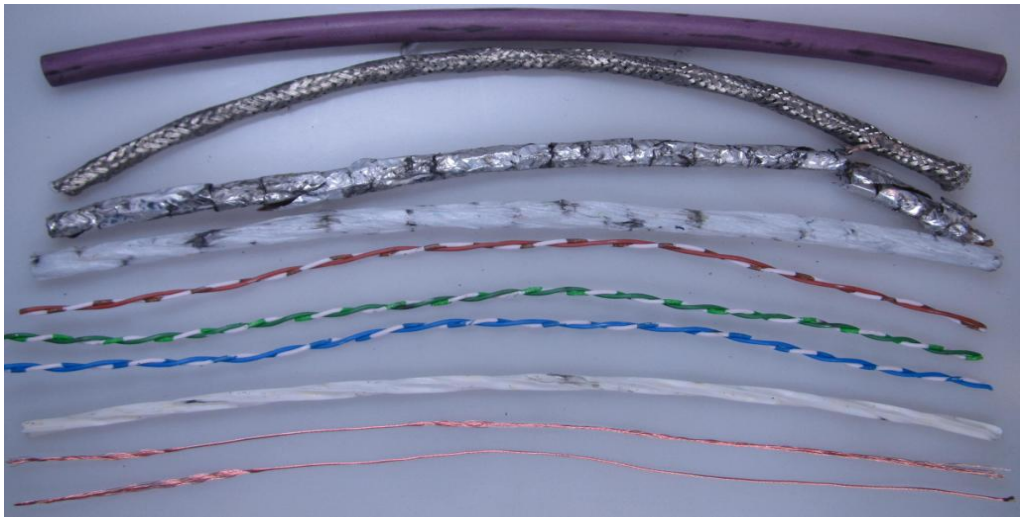
FLUKE networks

Evaluation

Dissection report:

The following pictures show the dissected elements of the cables

The condition of the cable no. 1.1 (CFBUS.PUR.049) after 17.495.094 strokes



Strokes	17.495.094
Condition outer jacket	O.K.
Condition overall shielding	O.K.
Condition banding	Ruptured
Condition centre element	O.K.
Twisted Pair 0,15mm²	
Condition core insulation	O.K.
Condition conductor	O.K.

Name:	R. Thoß	Date:	06.03.2017