

Test Intention:

In test 4866 we want to investigate the lifespan of our CFBUS.060 in an e-chain with a 63mm radius.

Client:

Name: Christian Mittelstedt	Team: chainflex®	Date: 17.09.2013
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Order-Info:

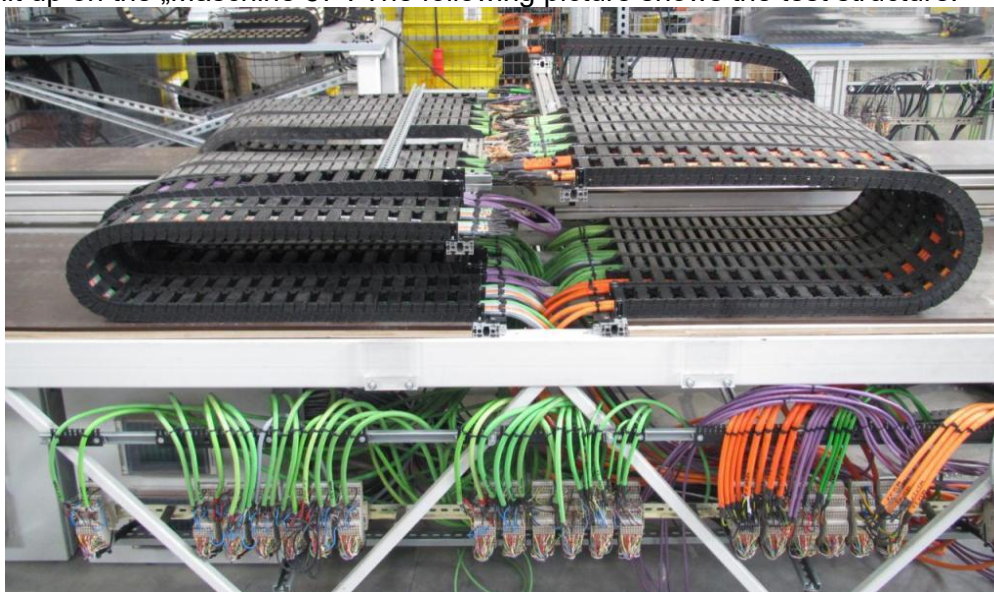
Customer / No.: igus® GmbH, Spicher Str.1a, 51147 Köln

Series / No: CFBUS	Installation type: horizontal, short way
Customer test: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Development test: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Technical data	Target & Examination
e-chain® type: E6.40.070.063.0	Target [strokes]: Lifespan
e-chain® radius [mm]: 63	Optical check: <input checked="" type="checkbox"/>
Stroke [m]: 2,1	Fluke DTX-ELT: <input checked="" type="checkbox"/>
Ambient temperature [°C]: approx. 25°C	Standard measuring: <input type="checkbox"/>
Cable length [m]: 10,0	AutΩMeS: <input type="checkbox"/>

- 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:



The managing data show the results of the accomplished examinations. With all data it still acts neither around one or more warranties of certain characteristics around one or more warranties regarding the suitability of a product for a certain targeted application, since the examinations on laboratory conditions took place. The warranty of certain characteristics of the products and/or their suitability for a certain application requires writing in the confirmation of order. Finally we recommend user-specific measurements under genuine operating conditions.

2. Cable and hose packages:

No. 1: **1x CFBUS.060** with the cable marking
*01607m igus chainflex CFBUS.060 (4x0,38)C Star Quad Design E310776 N CϣUs AWM Style
 21235 VW-1 AWM I/II A/B 80°C 30V FT-1 CE N P/BJ DESINA ProfiNet Typ C 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.X	CFBUS.060	63	7,1	8,9	10,0

Cable no.	Cable type	Counter reading		Effectively tested strokes	Cable okay after ... strokes
		... mounting	... demounting		
1.1	CFBUS.060	23.057.700	88.703.510	65.645.810	65.645.810

Test-order was checked by ... [Martin Göllner or Rainer Rössel and further employee]

Date:	17.09.2013	Name:		Name:	Christian Mittelstedt
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Result

Start report 17.09.2013:

At the 17.09.2013 we started the test 4866 at a counter reading of 23.057.700, we will measure the function with FLUKE regularly.

Interim report 11.07.2017:

At the 11.07.2017 we demounted cable no. 1.1 after 65.645.810 strokes, because we want to finalize the test.

The following Fluke protocol shows the parameter of the cable after 65.645.810 strokes:



Kabelkennung: 4866-1.1

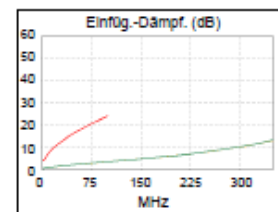
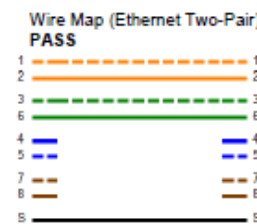
Datum/Uhrzeit: 07/11/2017 12:59:35
Reserve 15.7 dB (NEXT 12-36)
Grenzwert: Profinet
Kabeltyp: Cat 5e F/UTP
NVP: 66.0%

Bediener: A.FINKE
Software-Version: 2.7800
Grenzwerte Version: 1.9500
Kalibrierungsdatum:
Hauptgerät (Tester): 03/03/2017
Remote (Tester): 03/03/2017

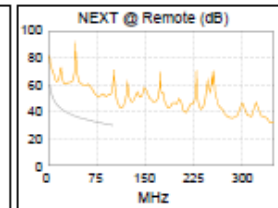
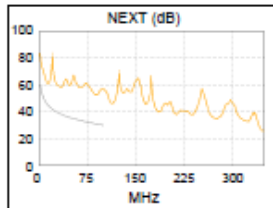
Testzusammenfassung: PASS

Modell: DTX-ELT
Hauptgerät S/N: 9751011
Remote S/N: 9751012
Adapter Hauptgerät: DTX-CHA002
Adapter Remote: DTX-CHA002

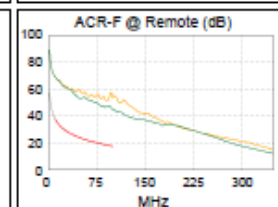
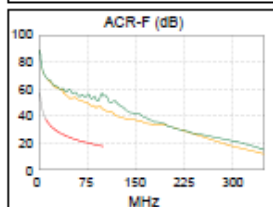
Länge (m)	[Paar 12]	10.3
Laufzeit (ns), Gmz. 555	[Paar 12]	52
Abweichung (ns), Gmz. 20	[Paar 12]	0
Widerstand (Ohm), Gmz. 25.0	[Paar 12]	1.4
Einfüg.-Dämpf. Reserve (dB)	[Paar 12]	20.4
Frequenz (MHz)	[Paar 12]	100.0
Grenzwert (dB)	[Paar 12]	24.0



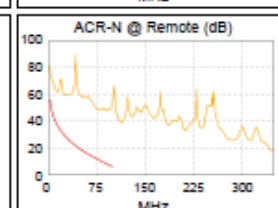
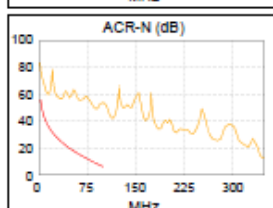
	Min. Abstand		Min. Wert	
N.A.	MAIN	SR	MAIN	SR
Schlechtest Paar	12-36	12-36	12-36	12-36
NEXT (dB)	15.7	16.7	21.3	18.8
Freq. (MHz)	11.9	10.9	87.8	76.8
Grenzwert (dB)	45.8	46.4	31.1	32.1
Schlechtest Paar	12	12	12	12
PS NEXT (dB)	18.7	19.7	24.3	21.8
Freq. (MHz)	11.9	10.9	87.8	76.8
Grenzwert (dB)	42.8	43.4	28.1	29.1



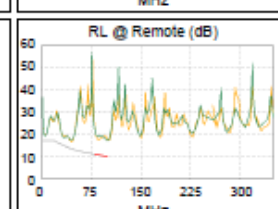
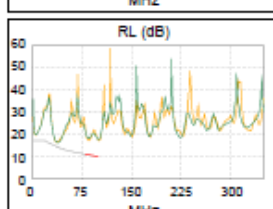
PASS	MAIN	SR	MAIN	SR
Schlechtest Paar	12-36	36-12	12-36	36-12
ACR-F (dB)	27.3	27.3	27.3	27.3
Freq. (MHz)	99.5	100.0	99.5	100.0
Grenzwert (dB)	17.4	17.4	17.4	17.4
Schlechtest Paar	36	12	36	12
PS ACR-F (dB)	30.3	30.3	30.3	30.3
Freq. (MHz)	99.5	99.5	99.5	99.5
Grenzwert (dB)	14.4	14.4	14.4	14.4



PASS	MAIN	SR	MAIN	SR
Schlechtest Paar	12-36	12-36	12-36	12-36
ACR-N (dB)	22.6	21.7	40.4	39.3
Freq. (MHz)	10.8	2.3	87.8	88.8
Grenzwert (dB)	39.1	53.6	8.7	8.5
Schlechtest Paar	12	12	12	12
PS ACR-N (dB)	25.6	24.7	43.4	42.3
Freq. (MHz)	10.8	2.0	87.8	88.8
Grenzwert (dB)	36.1	51.4	5.7	5.5



PASS	MAIN	SR	MAIN	SR
Schlechtest Paar	12	12	12	36
RL (dB)	6.3	6.9	6.9	7.1
Freq. (MHz)	85.0	85.3	100.0	99.0
Grenzwert (dB)	10.7	10.7	10.0	10.0



Erfüllte Network Standards:
10BASE-T 100BASE-TX 100BASE-T4
100BASE-T ATM-25 ATM-S1
ATM-155 100VG-AnyLan TR-4
TR-16 Active TR-16 Passive

LinkWare™ PC Version 9.6

Projekt: CHAINFLEX
Unbenannt1

Ort: IGUS



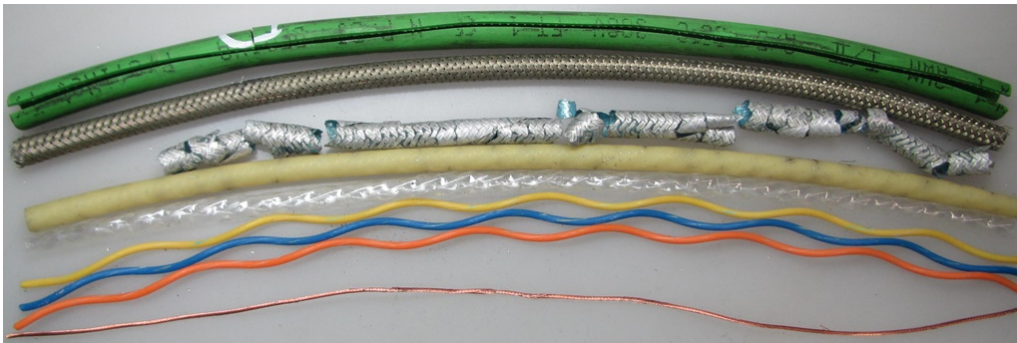
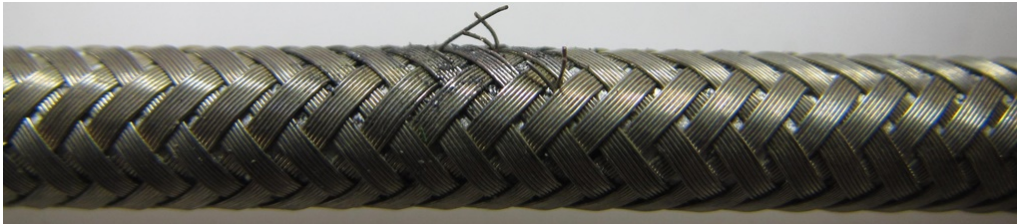
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Evaluation

Dissection report:

The following pictures show the dissected elements of the cables

The condition of the cable no.1.1 (CFBUS.060) after 65.645.810 strokes



Strokes	65.645.810
Condition outer jacket	O.K.
Condition overall shielding	Single broken wire
Condition 1 st banding	Ruptured
Condition inner jacket	O.K.
Condition 2nd banding	O.K.
Condition core insulation	O.K.
Condition conductor	O.K.

Name: C. Szodrow

Date: 28.12.2018