

## Test Intention:

In test 4901 we want to investigate and compare the lifespan of our CF211 on the short way.

## Client:

Name: Christian Mittelstedt      Team: chainflex®      Date: 24.02.2014

## Order-Info:

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

Series / No: CF211      Installation type: horizontal, short way

Customer test:      Yes  No       Development test:      Yes  No

## Technical data

## Target & Examination

e-chain® type: 1500.XX.075.0

Cable length [m]: 2,5

e-chain® radius [mm]: 75

Target [ strokes]: **Lifespan**

Stroke [m]: 0,8

Optical check:

Acceleration **a** [m/sec<sup>2</sup>]: -/-

Function check:

Velocity **v** [m/s]: -/-

Standard measuring:

Ambient temperature [°C]: approx. 25°C

AutΩMeS:

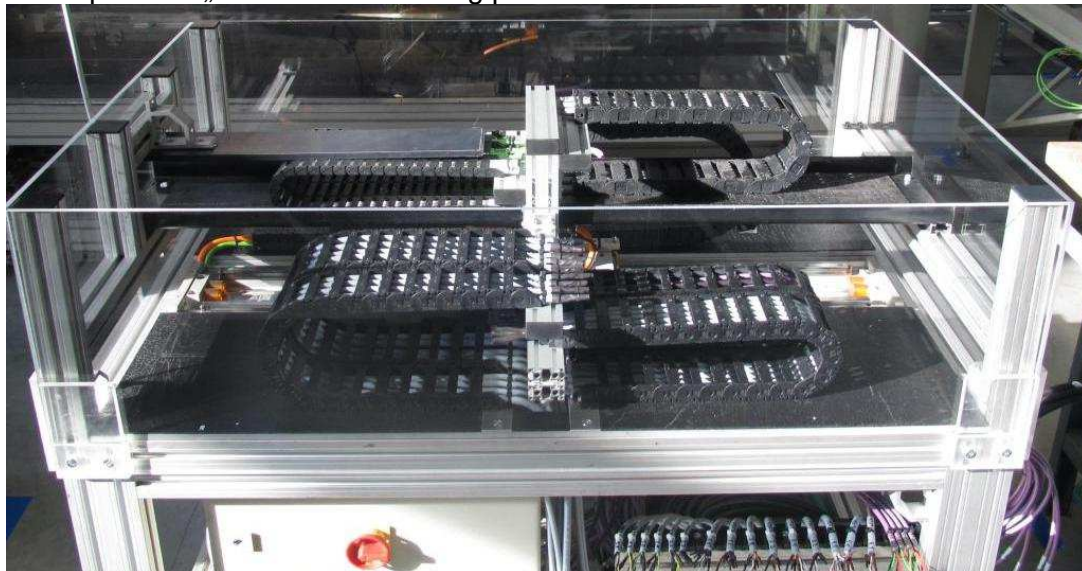
## Experimental setup

### 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 „Hiwin“. The following picture shows the test structure:



## 2. Cable and hose packages:

- No. 1: **1x CF211.02.14.02** with the cable marking  
*00011m igus chainflex CF211.02.14.02 (14x(2x0,25))C E310776 B cAUus AWM Style 2464 VW-1 AWM I/II A/B 80°C 300V FT-1 CE B Q/AG RoHS-II conform www.igus.de*
- No. 2: **1x CF211.03.08.02** with the cable marking  
*00021m igus chainflex CF211.03.08.02 (8x(2x0,34))C E310776 B cAUus AWM Style 2464 VW-1 AWM I/II A/B 80°C 300V FT-1 CE B Q/AG RoHS-II conform www.igus.de*
- No. 3: **1x CF211.05.06.02** with the cable marking  
*00015m igus chainflex CF211.03.08.02 (6x(2x0,5))C E310776 B cAUus AWM Style 2464 VW-1 AWM I/II A/B 80°C 300V FT-1 CE B Q/AG RoHS-II conform www.igus.de*

## 3. Description of the cable construction:

Standard igus chainflex® catalogue cable

## 4. Remarks:

To detect broken conductor or shielding wires we will measure the ohmic resistance of these cable elements. The cores of the samples are connected in series and one core is connected with the shielding to measure the ohmic resistances.

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	CF211.02.14.02	75	11,4	6,6	7,5
2.X	CF211.03.08.02	75	10,7	7,0	7,5
3.X	CF211.05.06.02	75	10,8	6,9	7,5

Cable no.	Cable type	Counter reading		Effectively tested strokes	Cable okay after ... strokes
		... mounting	... demounting		
1.1	CF211.02.14.02	0	53.152.584	53.152.584	53.152.584
2.1	CF211.03.08.02	0	53.152.584	53.152.584	53.152.584
3.1	CF211.05.06.02	0	53.152.584	53.152.584	53.152.584

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

Date:	<b>24.02.2014</b>	Name:		Name:	<b>Christian Mittelstedt</b>
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## Result

### Start report 28.02.2014:

At the 28.02.2014 we started the test 4901 at counter reading 0, and we will measure the ohmic resistance regularly.

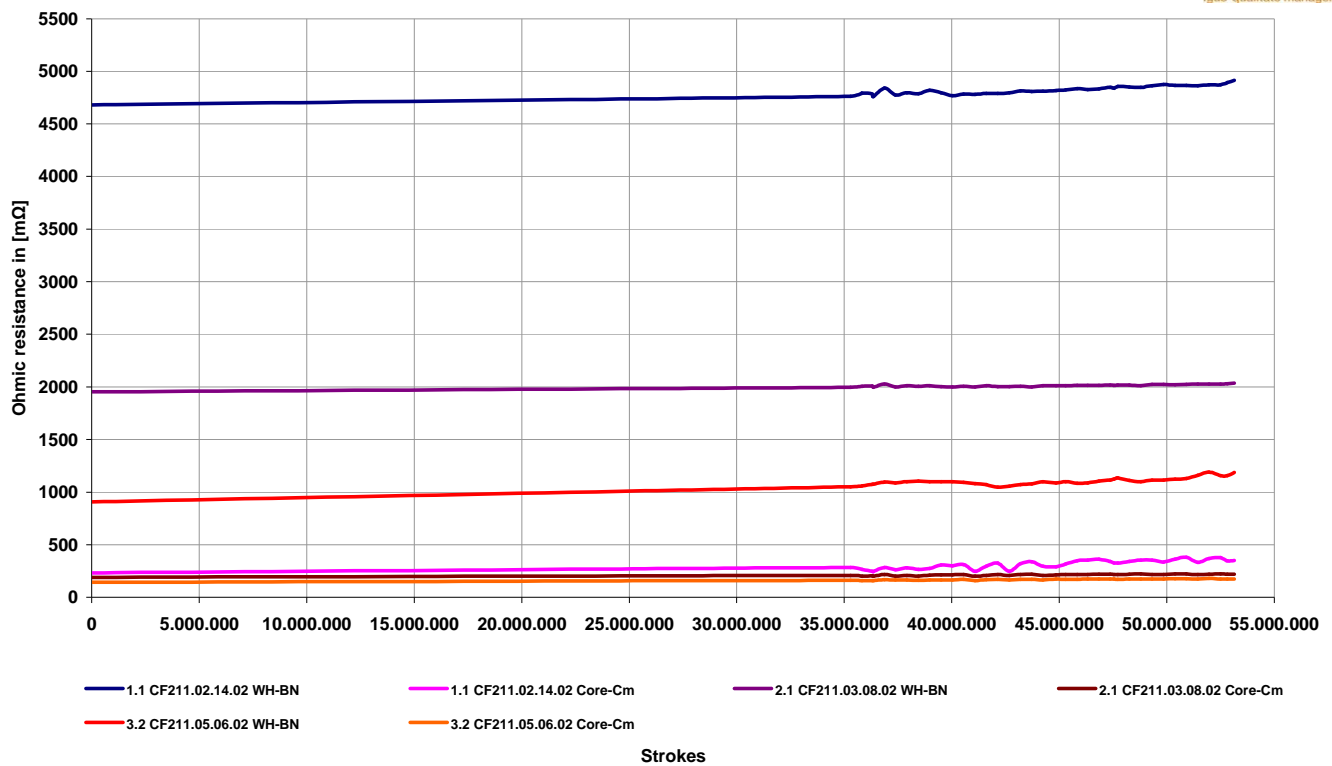
### Interim report 22.03.2016:

At the 22.03.2016 after 53.152.584 strokes we demounted the cables, because we want to finalize the test.

The following diagram shows the trend of the ohmic resistances during the test:



Trend of the ohmic resistances

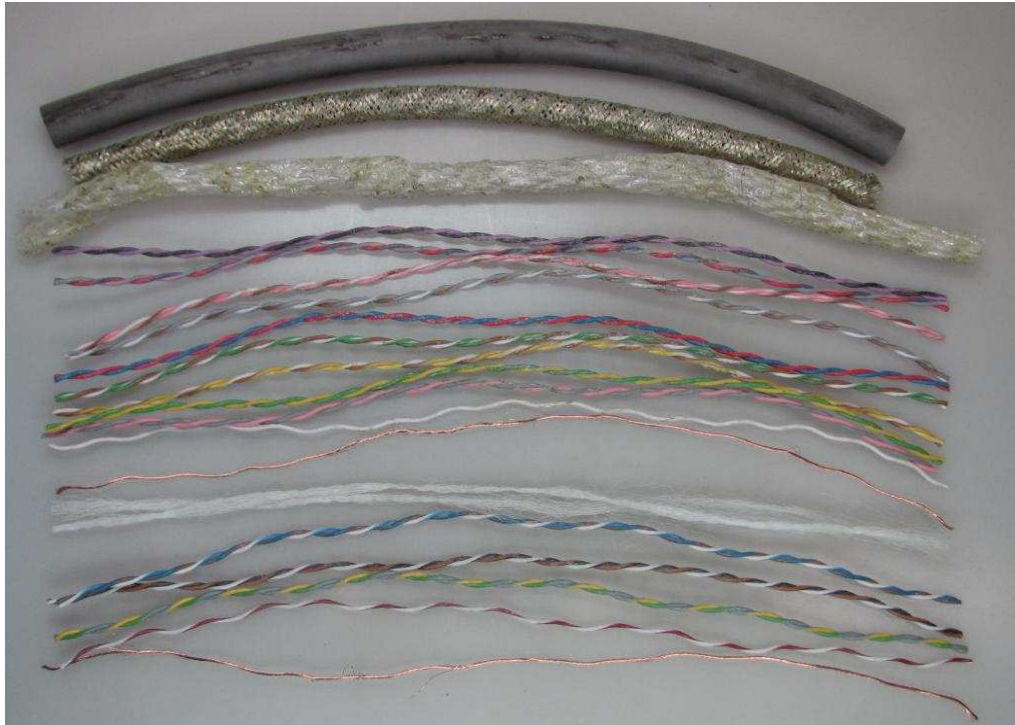


## Evaluation

### Dissection report:

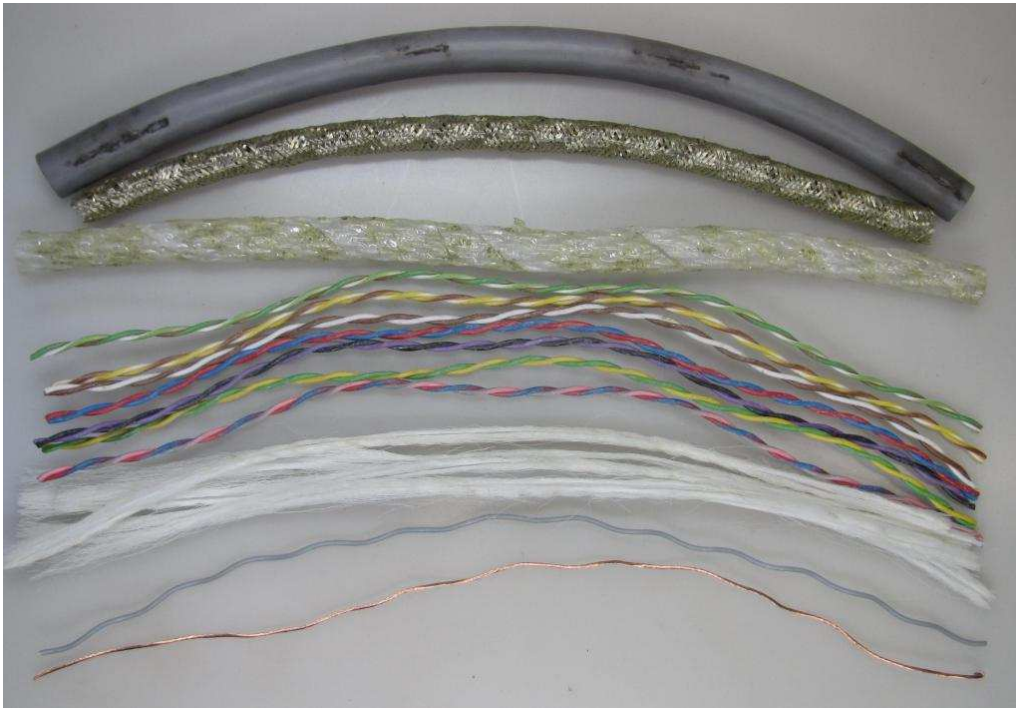
The following pictures show the dissected elements of the cables

#### The condition of the cable no. 1.1 (CF211.02.14.02) after 53.152.584 strokes



Strokes	53.152.584
Condition outer jacket	o.k.
Condition overall shielding	Broken single wires
Condition banding	Ruptured
Condition centre element	o.k.
Condition core insulation	o.k.
Condition conductor	o.k.
<b>- centre layer -</b>	
Condition core insulation	o.k.
Condition conductor	o.k.

## The condition of the cable no. 2.1 (CF211.03.08.02) after 53.152.584 strokes



Strokes	53.152.584
Condition outer jacket	o.k.
Condition overall shielding	Broken single wires
Condition banding	Ruptured
Condition centre element	o.k.
Condition core insulation	o.k.
Condition conductor	o.k.

## The condition of the cable no. 3.1 (CF211.05.06.02) after 53.152.584 strokes



Strokes	53.152.584
Condition outer jacket	o.k.
Condition overall shielding	Broken single wires
Condition banding	Ruptured
Condition centre element	Ruptured
Condition core insulation	o.k.
Condition conductor	o.k.

Name: *R. Thof*

Date: **07.04.2016**