

**УЧАСТНИК:** „Филкаб“ АД  
**Седалище и адрес на управление:** гр. Пловдив, ул. „Коматевско шосе“ № 92  
**Тел:** 032 277 171 /**Факс:** 032 671 133 /**E-mail:** office@filkab.com  
**ЕИК/Булетат:** 115328801  
**Адрес за кореспонденция:** гр. Пловдив, ул. „Коматевско шосе“ № 92  
**представяван от** ..... Атанас Иванов Танчев  
**в качеството на** ..... Изпълнителен директор

## О Ф Е Р Т А<sup>1</sup>

за участие в обществена поръчка при условията на чл. 187 по реда на Глава двадесет и шеста от Закона за обществените поръчки (ЗОП)

### УВАЖАЕМИ ГОСПОЖИ И ГОСПОДА,

С настоящото Ви представяме нашата оферта за участие в обявената от Вас обществена поръчка № 140-EP-17-MP-D-3 с предмет: „Доставка на опъвателни клеми и изолации за опъвателни клеми за ССХ“

Декларираме, че сме запознати с обявата и условията за участие в обявената от Вас обществена поръчка. Съгласни сме с поставените от Вас условия и ги приемаме без възражения.

Декларираме, че сме запознати и приемаме условията в следните документи: Търговски условия, Техническо описание EVN България EP ЕАД – ТО 184/00 (Издание: 10.02.2017), Техническо описание EVN България EP ЕАД – ТО 185/00 (Издание: 10.02.2017), Общи условия на дружествата от групата EVN, Клауза за социална отговорност на дружествата от групата на EVN.

Запознати сме с проекта на договор, приемаме го и ако бъдем определени за изпълнител, ще сключим договор в законоустановения срок.

Декларираме, че ще сключим писмен договор, който включва всички предложения от офертата ни.

Декларираме, че при сключването на договор ще представим документи, издадени от компетентен орган за удостоверяване на липсата на обстоятелствата по чл. 54, ал. 1, т. 1 – 3 и декларации за липсата на обстоятелствата по чл. 54, ал. 1, т. 4, 5 и 7 от ЗОП.

Ние сме съгласни да се придържаме към това предложение за срок от 90 дни от датата, която е посочена в обявата за дата на получаване на офертата.

При изпълнението на поръчката ще използваме/няма да използваме услугите на следните подизпълнители (невярното се зачертава):

Наименование на подизпълнителя	Обхват на дейностите, които ще извършва	Размер на участието на подизпълнителя в %
н/п	н/п	н/п
н/п	н/п	н/п

**Забележка:** В случай, че се използват подизпълнители се представя:

- Заверено от участника копие от документа за регистрация или единния идентификационен код (ЕИК), съгласно чл. 23 от Закона за търговския регистър, когато участникът е юридическо лице или едноличен търговец, копие от документа за самоличност, когато участникът е физическо лице;
- Доказателство за поетите от подизпълнителите задължения

<sup>1</sup> Офертата се подава на български език.

При изпълнението на поръчката ще използваме/няма да използваме капацитета на трети лица (невярното се зачертава):

Наименование на трето лице	Вид/наименование на ресурса	Местонахождение/ Описание на дейностите, които ще се изпълняват с ресурса
н/п	н/п	н/п
н/п	н/п	н/п

**Забележка:** В случай, че участника се позовава на капацитета на трети лица, той трябва да докаже, че ще разполага с тези ресурси, като представя:

- Документи за поетите от третите лица задължения

**Като неразделна част от настоящата оферта, прилагаме:**

1. Техническо предложение (по образец);
2. Ценово предложение (по образец);
3. Декларация по чл.54, ал.1, т.1, 2 и 7 от ЗОП (по образец);
4. Декларация по чл.54, ал.1, т.3 - 5 от ЗОП (по образец);
5. Мостри на предлаганите изделия както следва:
  - 5.1. 1бр. (един брой) Опъвателна клема за изолиран проводник ССХ за PAS система за сечение – 50 мм<sup>2</sup> и 70 мм<sup>2</sup>;
  - 5.2. 1бр. (един брой) Изолация за опъвателна клема за ССХ проводник за PAS система – 50мм<sup>2</sup> и 70 мм<sup>2</sup>.

Дата 13.04.2017 г.

ДЕКЛАРАТОР: .....  
(подпис и печат)

Атанас Танчев

Изпълнителен директор на Филкаб АД



## ТЕХНИЧЕСКО ПРЕДЛОЖЕНИЕ

От: ..... „Филкаб“ АД ..... (наименование на участника)

С представянето на нашата оферта заявяваме желанието си да участваме в обявената от възложителя обществена поръчка за възлагане чрез събиране на оферти с обява № 140-EP-17-MP-D-3 с предмет: Доставка на опъвателни клеми и изоляции за опъвателни клеми за ССХ:

Мястото за изпълнение на поръчката: Склад в гр. Стара Загора, бул. Славянски.

Срокът за изпълнение на поръчката: 30 календарни дни, след заявка (не повече от 30 дни).

Капацитет до 20 % от офериранията количества (не по-малко от 20%).

Гаранционният срок е: 36 месеца, считано от датата на приемо-предавателния протокол (не по-малко от 36 месеца).

Ние сме съгласни да се придържаме към направеното техническо предложение за срок от 90 дни от датата, която е посочена в обявата за дата на получаване на офертата.

### ТЕХНИЧЕСКИ

### ПАРАМЕТРИ:

**Таблица № 1 – попълването на всички полета е задължително**

№	Минимални изисквания на възложителя	Предложение на участника (Да/Не, Информация, Технически показатели)
1	Отговарят ли предлаганите от участника продукти (Опъвателни клеми и изоляции за опъвателни клеми за ССХ) изцяло на заложените в настоящото техническо предложение Технически описания, параметри, респективно спазени ли са Технически описания EVN България EP EAD – TO 184/00 и EVN България EP EAD - TO 185/00 във всичките им точки?  <b>Ако „НЕ“</b> , моля, опишете подробно	[X] Да [ ] Не  [.....]
2	Притежават ли предлаганите от участника продукти сертификати/протоколи за успешно издържана „типова проверка“ по EN 50397-2, или еквивалентен, съгласно EVN България EP EAD – TO 184/00, EVN България EP EAD - TO 185/00, изготвени от акредитирана изпитателна лаборатория, или еквивалентен орган. Моля приложете ги.  В случай, че сертификатите/протоколите са издадени от еквивалентен орган, то моля представете доказателство за еквивалентността (равностойността).  <i>Ако съответните документи са на разположение в електронен формат, моля, посочете:</i>	[X] Да [ ] Не  [.....]  (уеб адрес, орган или служба, издаващи документа, точно пазоваване на документа); [.....][.....][.....][.....]
3	Към настоящето Техническо предложение приложени ли са по един брой от следните мостри: 1бр. (един брой) Опъвателна клема за изолиран проводник ССХ за PAS система за сечение – 50 мм <sup>2</sup> и 70 мм <sup>2</sup> ; 1бр. (един брой) Изолация за опъвателна клема за ССХ проводник за PAS система – 50мм <sup>2</sup> и 70 мм <sup>2</sup> .	[X] Да [ ] Не  [X] Да [ ] Не

	[X] Да [ ] Не
Мострите отговарят ли на всички посочени в цитираните по-горе в настоящото техническо предложение Технически описания EVN България ЕР ЕАД – ТО 184/00 и EVN България ЕР ЕАД – ТО 185/00 конкретни характеристики и параметри ?	

<i>Таблица № 2 – попълването на полетата е пожелателно и служи за по-пълно представяне на участника</i>		
№	Обща информация за предлаганите продукти	Предложение на участника (Да/Не, Информация, Технически показатели)
1	<b>Данни за поризводител и производство:</b>	
1.1	Данни за производственото хале на производителя	Адрес: ..... Ensio Miettisen katu 2 Fi-06150 Porvoo Финландия Уеб сайт: ..www.ensto.com

Име производител / Търговска марка: ENSTO Finland Oy

**За изпълнение на изискванията на Възложителя се счита положителен отговор (ДА) на изброените в Таблица № 1 точки, прилагане на изискваните документи, доказващи изпълнение на изискванията, както и прилагане на 2 броя от посочените по-горе мостри, отговарящи на всички посочени в цитираните по-горе в настоящото техническо предложение Технически описания EVN България ЕР ЕАД – ТО 184/00 и EVN България ЕР ЕАД - ТО 185/00 конкретни характеристики и параметри.**

**По свое усмотрение участникът е в правото си да приложи допълнителни документи, извън изрично посочените, като доказателства на зададените въпроси.**

**Офертата на участник, чието техническо предложение не изпълнява някое/и от минималните изисквания на Възложителя няма да бъде разгледана, респективно участникът няма да участва в класирането.**

Дата 13.04.2017 г.

УЧАСТНИК: .....  
(подпис и печат)

**Атанас Танчев**

Изпълнителен директор на Филкаб АД







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Product: SO255

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# PRODUCT SPECIFICATION

31.5.2011

## SO255

Name: **Tension clamp**  
 PAS/BLL- 50-70 AlMgSi

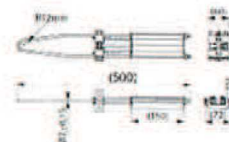
Type: SO255

EAN: 6438100303846

Description: Tension clamp for covered conductors (PAS/BLL AlMgSi and for insulated messengers of aerial MV cables like AHXAMK-WM3 (Multi-wiski). The insulation piercing contact part has silicone seal which prevents the moisture getting into the conductor.

Package: 9/216

Unit: PCS



### Technical specification

Weight (kg): 1.133

Conductor diameter mm: 12.7-16.7

For conductor mm<sup>2</sup>: PAS/BLL 50-70 AlMgSi

SMFL kN: 18

Tightening torque Nm: 40

Use: Tension clamp for covered conductors (PAS/BLL AlMgSi and for insulated messengers of aerial MV cables like AHXAMK-WM3 (Multi-wiski). The insulation piercing contact part has silicone seal which prevents the moisture getting into the conductor.

Construction:	Component	Material
	Body	Corrosion resistant aluminium alloy
	Plastic parts	Frost, heat and UV-radiation resistant plastic
	Bolts	Hot-dip galvanised steel
	Bail	Stainless steel

Installation: The clamp is opened and the conductor wire is inserted between the wedges. The locking connector is tightened. Tightening torque 40 Nm. The clamp is closed and strained.

Tools required: Torque wrench and 17 mm and 13 mm sockets

Markings: ENSTO SO 255  
 PSS1215  
 PSS1216  
 50-70mm<sup>2</sup>  
 40 Nm  
 week/year of manufacture

Standard: EN 50397-2



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## PRODUCT SPECIFICATION

20.6.2011

# SO255.2

**Name:** Tension clamp  
 PAS/BLL- 50-70 AlMgSi with adapter for hoist hook

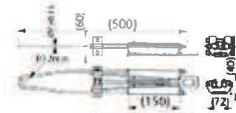
**Type:** SO255.2

**EAN:** 6438100303860

**Description:** Tension clamp for covered conductors (PAS/BLL AlMgSi and for covered conductors. Eg. for covered conductors (PAS) and for insulated messengers of aerial MV cables like AHXAMK-WM3 (Multi-wiski). The insulation piercing contact part has silicone seal which prevents the moisture getting into the conductor. Clamp is equipped with an adapter for hoist hook.

**Package:** 9/216

**Unit:** PCS



### Technical specification

**Weight (kg):** 1.25

**Conductor diameter mm:** 12.7-16.7

**For conductor mm<sup>2</sup>:** PAS/BLL-T 50-70 AlMgSi

**SMFL kN:** 18

**Tightening torque Nm:** 40

**Use:** Tension clamp for bare and covered conductors. Tension clamp is watertight and can be used eg. for covered conductors (PAS/BLL) and for bare conductors like ACSR 85/14 Pigeon, AAC 132 and for insulated messengers of aerial MV cables like AHXAMK-WM3 (Multi-wiski).

Construction:	Component	Material
	Body	Corrosion resistant aluminium alloy
	Plastic parts	Frost, heat and UV-radiation resistant plastic
	Bolts	Hot-dip galvanised steel
	Bail	Stainless steel
	Hoist adapter	Hot-dip galvanised steel

**Installation:** The clamp is opened and the conductor wire is inserted between the wedges. The locking connector is tightened. Tightening torque 40 Nm. The clamp is closed and strained.

**Markings:** ENSTO SO 255.2  
 50-70mm<sup>2</sup>  
 40 Nm  
 week/year of manufacture

**Standard:** EN 50397-2



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## PRODUCT SPECIFICATION

20.9.2011

# PK557

Name: **End cap**  
50-157 mm<sup>2</sup>  
Type: PK557  
EAN: 6438100306915  
Description: PK557 is used for preventing water entry into the end of the branch cable.  
Package: 120  
Unit: PCS



### Technical specification

Conductor size mm<sup>2</sup>: 50-157  
Weight (kg): 0.007  
Conductor diameter mm: 12.7-22.3  
Construction: **Component Material**  
Body UV-resistant elastomer  
Markings: Ensto, Ø12,7-22,3 and PMR2720  
Standard: EN 50397-2:2009 clause 7.6



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# SGS

## CERTIFICATE FI 27046



Our Ref. 2586147

**Product** Connector for overhead lines

**Type** SO255  
SO255.2

**Trade mark** ENSTO

**Certificate Holder** Ensto Finland Oy  
Ensio Miettisen katu 2  
FI-06150 PORVOO, FINLAND

**Manufacturer** Ensto Finland Oy  
Ensto Utility Networks  
Ensio Miettisen katu 2  
FI-06150 PORVOO, FINLAND

**Technical Information** Tension clamp for covered conductors PAS/BLL 50 – 70 mm<sup>2</sup> AlMgSi  
Conductor diameter 12,7 – 16,7 mm  
Tightening torque 40 Nm SMFL 18 kN

**The product is certified according to the following standard(s)** EN 50397-2:2009

**Validity** This certificate is valid until 12 October 2016 unless the standard in question has been amended or superseded with significant changes in requirements, in which case, SGS Fimko has the right to shorten the validity of the certificate based on the legislation of the European Union. This certificate includes the right to use the FI mark under the condition that changes (if any) will be checked at SGS Fimko before the product is brought onto market and that the conditions for FI certification are met.

**Date of Issue** 12 October 2011

**SGS Fimko Ltd**

**Signature**

Sixten Lökfors  
Project Manager

ВЯРНО С ОРИГИНАЛА



This certificate has 1 appendix



This certificate is issued by the company under its General Conditions for Certification Services accessible at [www.sgs.com/terms\\_and\\_conditions.htm](http://www.sgs.com/terms_and_conditions.htm). Attention is drawn to the limitations of liability defined therein and in the Test Report here above mentioned which findings are reflected in this certificate. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

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t. +358 9 698 381 f. +358 9 692 5474 [www.fi.sgs.com](http://www.fi.sgs.com)

Business ID 0978538-5

Member of the SGS Group (SGS SA)

Appendix to Certificate: 27046

**Manufacturing site**

Ensto Ensek AS  
Paldiski mnt. 35 / 4A  
EE-76606 KEILA, ESTONIA

**Additional Information**

SO255.2 with adapter for hoist hook.

Additional parts for tension clamps SO255 and SO255.2:  
Power arc device SDI27.2 including power arc horns SDI10.2 and PEJ90  
conductor with screw type cable lugs SML1.17.  
End cap PK557.

**Is based on test / Our ref.**

Tests made in manufacturer's premises, witnessed by SGS Fimko Ltd.

**Manufacturer's test reports:**

2168S, 2176S, 2169S, 2177S, 2048S, 2049S, 2050S, 2052S, 2053S, 2055S,  
2056S, 2058S, 2059S, 2061S, 2062S, 2064S, 2065S, 2067S, 2068S, 2180S  
and 2170S

**Solar simulator test reports:**

050810\_SO255, 071210\_SDI27-1 and 05111\_SDI10\_2

**SGS Fimko test report:**

251420\_SML1-17

ВЯРНО С ОРИГИНАЛА



09





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## LABORATORY REPORT

No.: 2168S

Revision: A

Page: 1/5

Date of Test: 19.4. and 16.6.2011

### Test object:

Tension clamp SO255 and SO255.2.

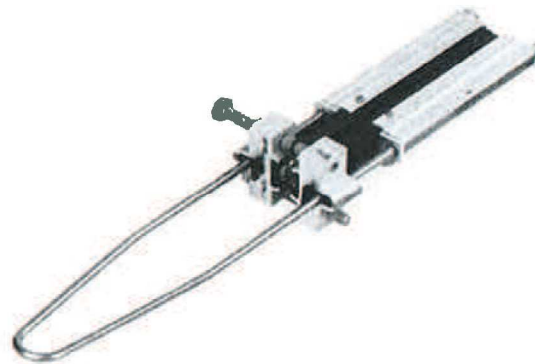
### Purpose of the test and relevant standards:

Part of type test.

Visual examination test and Dimensional and material verification test, according to EN 50397-2:2009 clause 7.1 and 7.2.

### Conclusion:

The clamp passed the test.



Picture 1: Tested clamp SO255

ENSTO  
UTILITY NETWORKS  
LABORATORY

Date of Report: 20.6.2011

Tested by: Patrick Ekholm

Reviewed by: Janne Lappalainen

Witnessed by: Sami Hakonen / SGS Fimko

Ordered by: V.Vilenius

Distribution: OHL PD-team

Ensto Utility Networks Laboratory  
Ensto Finland Oy

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Fax +358 204 76 2770

Business ID: 0130215-0  
Reg Office: Porvoo

ВЯРНО С ОРИГИНАЛА



## 1. Test objects

Clamp:

Type:	Tension clamp SO255
Batch number:	0-series
Conductor range:	50 – 70 mm <sup>2</sup>
Conductor diameter:	12,7 – 16,7 mm
Tightening torque:	40Nm
No of pcs:	1

Type:	Tension clamp SO255.2
Batch number:	0-series
Conductor range:	50 – 70 mm <sup>2</sup>
Conductor diameter:	12,7 – 16,7 mm
Tightening torque:	40Nm
No of pcs:	1

## 2. Testing procedure

The test was performed against the manufacturer specification sheet and standard requirement. The test included a visual examination part and a dimensional and material verification part.

### **Requirement:**

The clamp shall fulfil the manufacturer specification data and standard requirement.



**3. Test results**

**SO255**

**Visual examination:**

The clamp was visually looking the same as in the specification drawing.

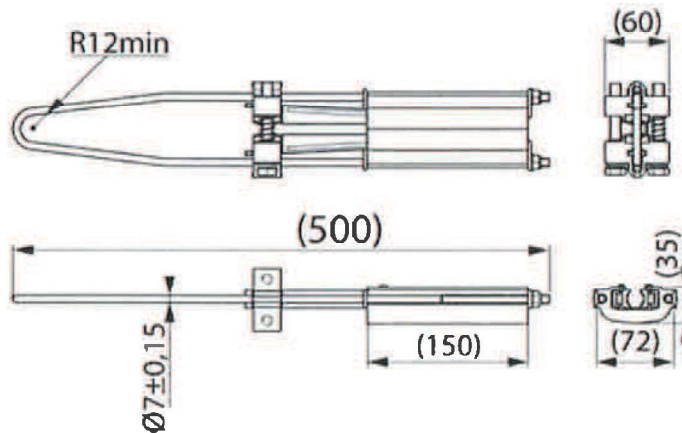
All markings required by the standard were found:

Manufacturer's logo:	ENSTO
Product code:	SO255
Batch number (production date):	10/2011
Minimum and maximum cross section:	50-70mm <sup>2</sup>
Tightening torque:	40Nm

**Dimensional and material verification:**

All samples were within specification requirements. Clamp dimensions were within specification tolerances, see picture 2.

Distance	Requirement [mm]	Measured [mm]
Body height	35	34,8
Body length	150	149,8
Body width	72	72,2
Clamping piece width	60	59,8
Bail diameter	7±0,15	7,0
Bail radius	≥ 12	> 12



Picture 2: Specification drawing







**SO255.2**

**Visual examination:**

The clamp was visually looking the same as in the specification drawing.

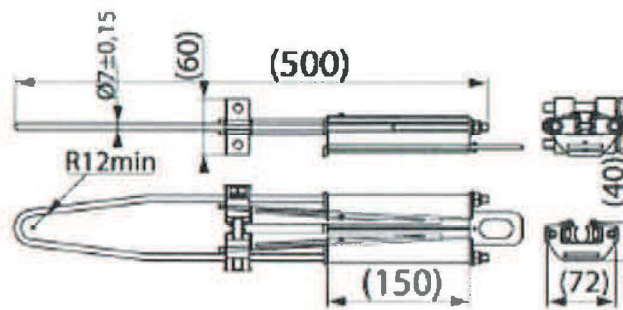
All markings required by the standard were found:

Manufacturer's logo:	ENSTO
Product code:	SO255.2
Batch number (production date):	24/2011
Minimum and maximum cross section:	50-70mm <sup>2</sup>
Tightening torque:	40Nm

**Dimensional and material verification:**

All samples were within specification requirements. Clamp dimensions were within specification tolerances, see picture 2.

Distance	Requirement [mm]	Measured [mm]
Body height	40	39,9
Body length	150	149,6
Body width	72	71,8
Clamping piece width	60	60,1
Bail diameter	7±0,15	7,1
Bail radius	≥ 12	> 12



Picture 3: Specification drawing

**Summary:**

The clamps fulfilled all test requirements.



**4. Pictures**



Pictures 4 to 5: Clamp markings

**5. Test equipment**

ID	TYPE	MODEL	PURPOSE
A227	Calliper Steel sleeve	Limit Ø 24,1 mm	Dimension measurements Radius check

**6. Test Id**

1214

**7. Revision history**

A

ВЯРНО С ОРГИНАЛА

ФИЛКАБ  
18  
\* ПЛОВДИВ \* 00



Saves Your Energy

## LABORATORY REPORT

No.: 2169S

Revision: A

Page: 1/3

Date of Test: 24.3.2011

### Test object:

Tension clamp SO255.

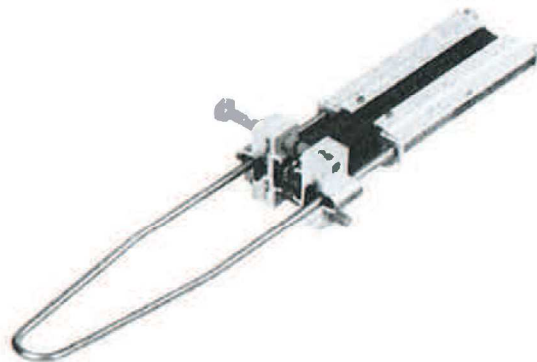
### Purpose of the test and relevant standards:

Part of type test.

Test for permanent marking according to EN 60397-2:2009 clause 7.3.

### Conclusion:

The clamp passed the test.



Picture 1: Tested clamp SO255

ENSTO  
UTILITY NETWORKS  
LABORATORY

Date of Report: 23.5.2011

Tested by: Patrick Ekholm

Witnessed by: Sami Hakonen / SGS Fimko

Reviewed by: Janne Lappalainen

Ordered by: V.Vilenius  
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ВЯРНО С ОРИГИНАЛА





Saves Your Energy

## LABORATORY REPORT

No.: 2169S

Revision: A

Page: 2/3

### 1. Test objects

Clamp:

Type:	Tension clamp SO255
Batch number:	0-series
Conductor range:	50 – 70 mm <sup>2</sup>
Conductor diameter:	12,7 – 16,7 mm
Tightening torque:	40Nm
No of pcs:	3

### 2. Testing procedure

The test procedure was acc. to standard.

The marking of the clamp was rubbed by hand for 15 s with a piece of cloth soaked with water and another 15 s with a piece of cloth soaked with petroleum spirit.

The petroleum spirit used was Mineral turpentine from KIILTO / Finland

#### **Requirement:**

The marking shall remain clear and allow the accessory to be easily identified.

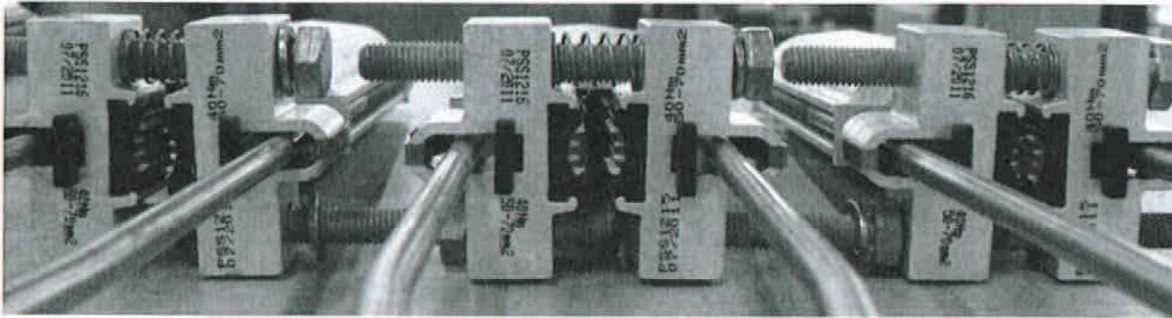
### 3. Test results

The marking remained clear and was not at all affected of the rubbing.





4. Pictures



Picture 2: Markings after test



Picture 3: Markings after test

5. Test equipment

No special test equipment needed

6. Test Id

1214

7. Revision history

A







Saves Your Energy

**LABORATORY REPORT**

No.: 2048S

Revision: A

Page: 1/4

Date of Test: 19.8.2010

**Test object:**

Tension clamp SO255.

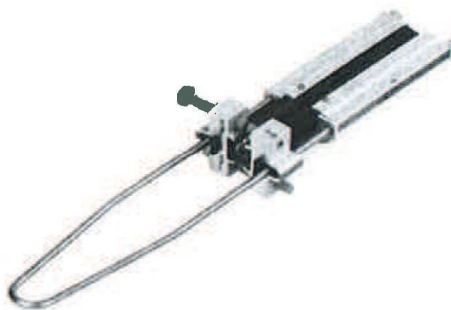
**Purpose of the test and relevant standards:**

Part of type test.

Damage and failure load test for tension clamp according to EN 50397-2:2009 clause 7.4.1. Two samples were tested after gas atmosphere test (Method 2) done at Solar Simulator Finland acc. to EN 50397-2:2009 clause 7.10.1.2.2., test report: 050810\_SO255\_prohesion\_test\_Solar\_TR.pdf and two samples were tested after climatic ageing test (Method 2) acc. to EN50397-2 clause 7.10.2.2., test report: 2180\_SO255\_UV\_test\_TR.docx.

**Conclusion:**

The clamp passed the test.



Picture 1: Tested clamp SO255



**Date of Report:** 13.1.2011

*Kari Malinen*

**Tested by:** Kari Malinen

*Sami Hakonen*

**Witnessed by:** Sami Hakonen / SGS Fimko

*Janne Lappalainen*

**Reviewed by:** Janne Lappalainen

**Ordered by:** V.Vilenius

**Distribution:** OHL PD-team

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Reg Office: Porvoo





1. Test objects

Clamp:

Type:	Tension clamp SO255
Batch number:	0-series
Conductor range:	50 – 70 mm <sup>2</sup>
Conductor diameter:	12,7 – 16,7 mm
Tightening torque:	40Nm
Specified minimum damage load:	18kN
Specified minimum failure load:	20kN
No of pcs:	4

Conductors:

Type:	SAX-W 70
Used cross-sections:	70 mm <sup>2</sup>
Manufacturer/Country:	Prysmian / Finland
Insulation thickness:	2,4 mm
Total diameter:	14,3 mm
Number of strands:	7
Insulation material:	XLPE
Conductor material:	AlMgSi
Conductor MBL:	22,5 kN
Refer to standard:	EN50397-1



**2. Testing procedure**

The test was carried out as in Picture 2. The load was applied in the direction 1. The load was gradually increased until it reached the specified minimum damage load (SMDL). This load was kept constant for 60s. The fitting was then removed and measurement of any permanent deformation was done. The load was gradually increased until it reached the specified minimum failure load (SMFL). This load was kept constant for 60s.



Picture 2

**Requirement:**

Regarding damage load, the test is passed if no permanent deformation, which can affect the proper function of the fitting, occurs at or below the specified mechanical minimum damage load.

Regarding failure load, the test is passed if failure of the fitting does not occur at a load less than or equal to the specified minimum failure load.

**3. Test results**

Sample	Conductors	SMDL [kN]	SMFL [kN]	SMDL for 60s	SMFL for 60s	Remarks
1	SAX-W70	18	20	Passed	Passed	Test piece from prohesion test
2	SAX-W70	18	20	Passed	Passed	Test piece from prohesion test
3	Steel wire	18	20	Passed	Passed	Test piece from UV test
4	Steel wire	18	20	Passed	Passed	Test piece from UV test

Table 1: Test data

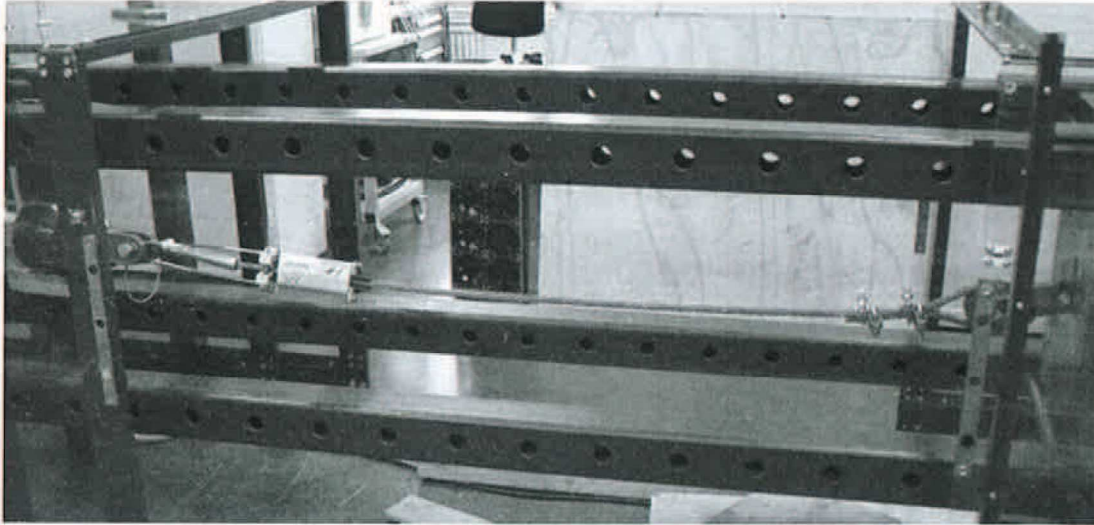
Steel wire diameter was approximately 14 mm.

**Summary:**

All samples fulfilled standard requirements.



**4. Pictures**



Picture 3: Test setup in tensile test machine

**5. Test equipment**

ID	TYPE	MODEL	PURPOSE
L14	Torque wrench	BDS 80 E	Torque adjustment
L110	Tensile test machine	50 kN	Tensile tests

**6. Test Id**

881

**7. Revision history**

A







Saves Your Energy

## LABORATORY REPORT

No.: 2049S

Revision: A

Page: 1/4

Date of Test: 27.5.2010

### Test object:

Tension clamp SO255.

### Purpose of the test and relevant standards:

Part of type test.

Tensile test for tension clamp at ambient temperature according to EN 50397-2:2009 clause 7.4.7.

### Conclusion:

The clamp passed the test.



Picture 1: Tested clamp SO255



Date of Report: 13.1.2011

Tested by: Patrick Ekholm

Reviewed by: Janne Lappalainen

Witnessed by: Sami Hakonen / SGS Fimko

Ordered by: V.Vilenius

Distribution: OHL PD-team

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ВЯРНО С ОРИГИНАЛА





**1. Test objects**

## Clamp:

Type:	Tension clamp SO255
Batch number:	0-series
Conductor range:	50 – 70 mm <sup>2</sup>
Conductor diameter:	12,7 – 16,7 mm
Tightening torque:	40Nm
No of pcs:	4

## Conductors:

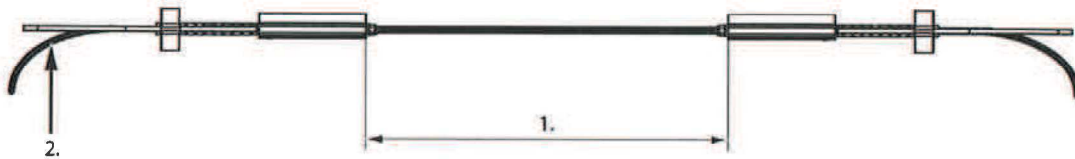
Type:	BLL-T 50
Used cross-section:	50 mm <sup>2</sup>
Manufacturer/Country:	AMO Kraft AB / Sweden
Insulation thickness:	2,5 mm
Total diameter:	14,2 – 15,2 mm
Number of strands:	7
Insulation material:	HDPE+PE
Conductor material:	AlMgSi
Conductor MBL:	13,9 kN
Refer to standard:	EN50397-1

Type:	BLL-T 70
Used cross-section:	70 mm <sup>2</sup>
Manufacturer/Country:	AMO Kraft AB / Sweden
Insulation thickness:	2,5 mm
Total diameter:	15,7 – 16,7 mm
Number of strands:	7
Insulation material:	HDPE+PE
Conductor material:	AlMgSi
Conductor MBL:	18,6 kN
Refer to standard:	EN50397-1



**2. Testing procedure**

Two tension clamps were installed in each end of the conductor, see Picture 2. The distance between clamps [1] was 100 x core diameter and the length of the tails [2] was approximately 500mm. The clamping pieces of the clamps were tightened to the nominal tightening torque. The arrangement was installed into a tensile test machine. The load of the arrangement was increased to 20% of SMFL. Then the conductor was marked at the end of the wedges. The load was then increased gradually until it reaches 60% of SMFL and kept there for 60s. After that the load was increased to SMFL and kept there for 60s. The load was then increased until failure occurred.



Picture 2

**Requirement:**

The test is passed if the movement of the conductor relative the clamp is less than 3 mm. Also no failure of the clamp or covered conductor occurs below the SMFL.  $SMFL = 0,8 \times \text{conductor MBL}$ .

**3. Test results**

Sample	Conductors	MBL [kN]	20% of SMFL [kN]	60% of SMFL [kN]	SMFL [kN]	Result	Broke [kN]	Breakin point
5	BLL-T 50	13,9	2,2	6,7	11,1	OK	17,8	Conductor
6	BLL-T 50	13,9	2,2	6,7	11,1	OK		
7	BLL-T 70	18,6	3	8,9	14,9	OK	21,9	Clamp
8	BLL-T 70	18,6	3	8,9	14,9	OK		

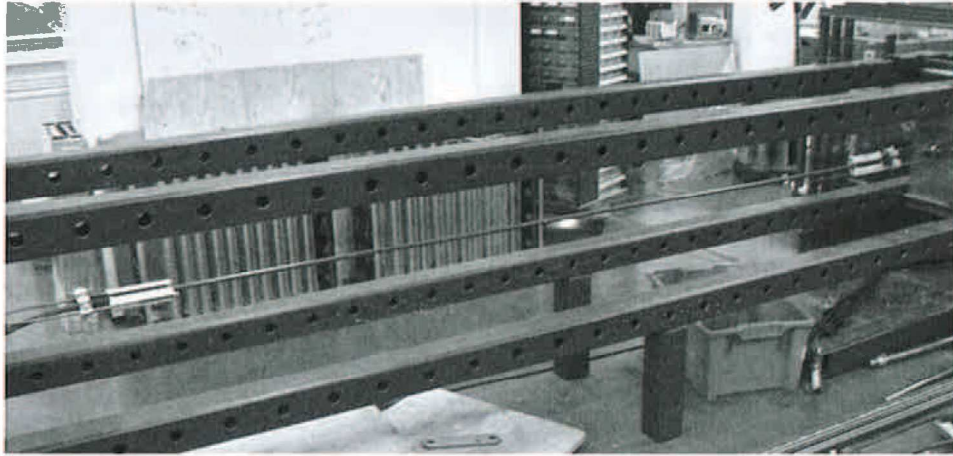
Table 1: Test data

**Summary:**

All samples fulfilled standard requirements.



#### 4. Pictures



Picture 3: Test setup in tensile test machine

#### 5. Test equipment

ID	TYPE	MODEL	PURPOSE
L14	Torque wrench	BDS 80 E	Torque adjustment
L110	Tensile test machine	50 kN	Tensile tests

#### 6. Test Id

851

#### 7. Revision history

A





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**LABORATORY REPORT**

No.: 2050S

Revision: A

Page: 1/4

Date of Test: 27.5.2010

**Test object:**

Tension clamp SO255.

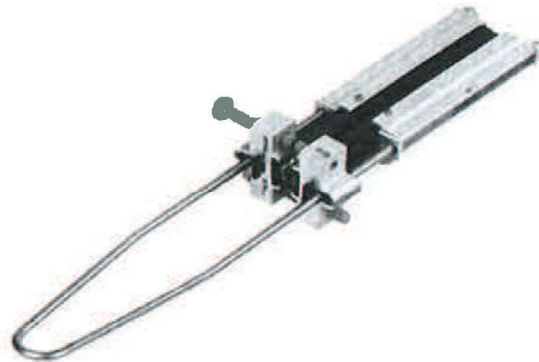
**Purpose of the test and relevant standards:**

Part of type test.

Tensile test for tension clamp at ambient temperature according to EN 50397-2:2009 clause 7.4.7.

**Conclusion:**

The clamp passed the test.



Picture 1: Tested clamp SO255



**Date of Report:** 13.1.2011

**Tested by:** Patrick Ekholm

**Reviewed by:** Janne Lappalainen

**Witnessed by:** Sami Hakonen / SGS Fimko

**Ordered by:** V.Vilenius  
**Distribution:** OHL PD-team

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Reg Office: Porvoo

ВЯРНО С ОРИГИНАЛА





**1. Test objects**

## Clamp:

Type:	Tension clamp SO255
Batch number:	0-series
Conductor range:	50 – 70 mm <sup>2</sup>
Conductor diameter:	12,7 – 16,7 mm
Tightening torque:	40Nm
No of pcs:	4

## Conductors:

Type:	SAX-W 50
Used cross-sections:	50 mm <sup>2</sup>
Manufacturer/Country:	Prysmian / Finland
Insulation thickness:	2,4 mm
Total diameter:	12,7 mm
Number of strands:	7
Insulation material:	XLPE
Conductor material:	AlMgSi
Conductor MBL:	15,5 kN
Refer to standard:	EN50397-1

Type:	SAX-W 70
Used cross-sections:	70 mm <sup>2</sup>
Manufacturer/Country:	Prysmian / Finland
Insulation thickness:	2,4 mm
Total diameter:	14,3 mm
Number of strands:	7
Insulation material:	XLPE
Conductor material:	AlMgSi
Conductor MBL:	22,5 kN
Refer to standard:	EN50397-1



**2. Testing procedure**

Two tension clamps were installed in each end of the conductor, see Picture 2. The distance between clamps [1] was 100 x core diameter and the length of the tails [2] was approximately 500mm. The clamping pieces of the clamps were tightened to the nominal tightening torque. The arrangement was installed into a tensile test machine. The load of the arrangement was increased to 20% of SMFL. Then the conductor was marked at the end of the wedges. The load was then increased gradually until it reaches 60% of SMFL and kept there for 60s. After that the load was increased to SMFL and kept there for 60s. The load was then increased until failure occurred.



Picture 2

**Requirement:**

The test is passed if the movement of the conductor relative the clamp is less than 3 mm. Also no failure of the clamp or covered conductor occurs below the SMFL.  $SMFL = 0,8 \times \text{conductor MBL}$ .

**3. Test results**

Sample	Conductors	MBL [kN]	20% of SMFL [kN]	60% of SMFL [kN]	SMFL [kN]	Result	Broke [kN]	Breaking point
1	SAX-W 50	15,5	2,5	7,5	12,4	OK	18,4	Conductor
2	SAX-W 50	15,5	2,5	7,5	12,4	OK		
3	SAX-W 70	22,5	3,6	10,8	18	OK	22,3	Conductor
4	SAX-W 70	22,5	3,6	10,8	18	OK		

Table 1: Test data

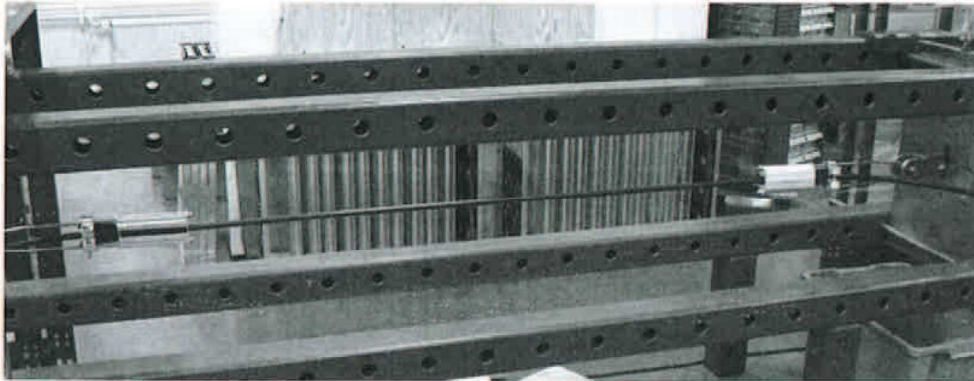
**Summary:**

All samples fulfilled standard requirements.





4. Pictures



Picture 3: Test setup in tensile test machine

5. Test equipment

ID	TYPE	MODEL	PURPOSE
L14	Torque wrench	BDS 80 E	Torque adjustment
L110	Tensile test machine	50 kN	Tensile tests

6. Test Id

851

7. Revision history

A





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### LABORATORY REPORT

No.: 2052S

Revision: A

Page: 1/5

Date of Test: 12.10 – 14.10.2010

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**Test object:**

Tension clamp SO255.

---

**Purpose of the test and relevant standards:**

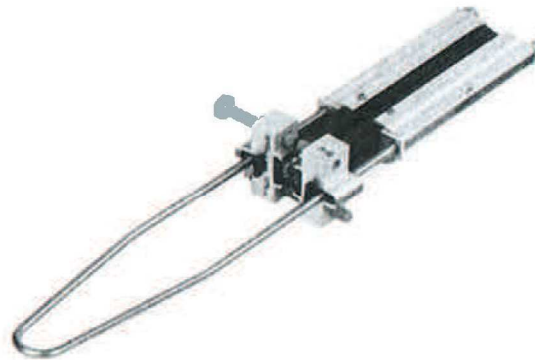
Part of type test.

Tensile test for tension clamp at low temperature according to EN 50397-2:2009 clause 7.4.8.

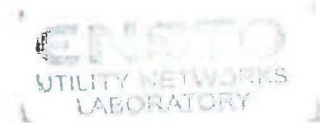
---

**Conclusion:**

The clamp passed the test.



Picture 1: Tested clamp SO255



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**Date of Report:** 13.1.2011

**Tested by:** Patrick Ekholm

**Reviewed by:** Janne Lappalainen

**Witnessed by:** Sami Hakonen / SGS Fimko

**Ordered by:** V.Vilenius

**Distribution:** OHL PD-team

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ВЯРНО С ОРИГИНАЛА







**1. Test objects**

**Clamp:**

Type:	Tension clamp SO255
Batch number:	0-series
Conductor range:	50 – 70 mm <sup>2</sup>
Conductor diameter:	12,7 – 16,7 mm
Tightening torque:	40Nm
No of pcs:	6

**Conductors:**

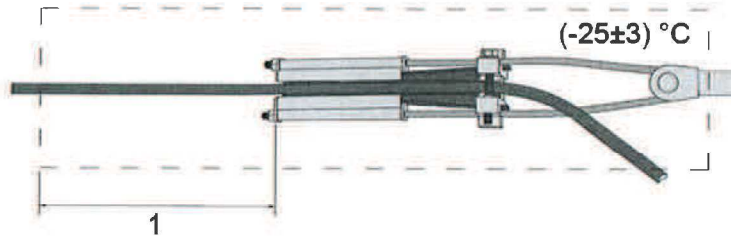
Type:	BLL-T 50
Used cross-section:	50 mm <sup>2</sup>
Manufacturer/Country:	AMO Kraft AB / Sweden
Insulation thickness:	2,5 mm
Total diameter:	14,2 – 15,2 mm
Number of strands:	7
Insulation material:	HDPE+PE
Conductor material:	AlMgSi
Conductor MBL:	13,9 kN
Refer to standard:	EN50397-1

Type:	BLL-T 70
Used cross-section:	70 mm <sup>2</sup>
Manufacturer/Country:	AMO Kraft AB / Sweden
Insulation thickness:	2,5 mm
Total diameter:	15,7 – 16,7 mm
Number of strands:	7
Insulation material:	HDPE+PE
Conductor material:	AlMgSi
Conductor MBL:	18,6 kN
Refer to standard:	EN50397-1



**2. Testing procedure**

Three tension clamps were tested in low temperature zone, see Picture 2. The clamp and 300 mm of conductor [1] was cooled down to  $(-25\pm 3)^\circ\text{C}$ .



Picture 2

Tension clamps were installed in each end of the conductor, see Picture 3. The distance between clamps [1] was approximately  $100 \times$  core diameter and the length of the tails [2] was approximately 500mm. The clamping pieces of the clamps were tightened to the nominal tightening torque. Two arrangements were installed into a tensile test machine. The load of the arrangements was increased to 70% of conductor MBL. Three clamps were cooled down to  $(-25\pm 3)^\circ\text{C}$  in one hour and kept there for one hour. The tension was released. After the pre-tensioning the clamps were subjected to a 24h tensile test in low temperature,  $(-25\pm 3)^\circ\text{C}$ . Before starting the test the load of the arrangements was increased to 20% of the specified minimum slip load. Then the conductor was marked at the end of the wedges. After marking the load was increased gradually until it reaches the specified minimum slip load and kept there for 24h.



Picture 3

**Requirement:**

The test is passed if the movement of the conductor relative the clamp is less than 3 mm at or below specified minimum slip load. Also no damage shall occur which could affect the correct function of the clamp.





3. Test results

Sample	Conductors	MBL [kN]	70% of MBL [kN]	20% of SMSL [kN]	SMSL [kN]	Result
7	BLL-T 50	13,9	9,73	1,7	8,7	No slippage
8	BLL-T 50	13,9	9,73	1,7	8,7	No slippage
9	BLL-T 50	13,9	9,73	1,7	8,7	No slippage
10	BLL-T 70	18,6	13,02	2,33	11,63	No slippage
11	BLL-T 70	18,6	13,02	2,33	11,63	No slippage
12	BLL-T 70	18,6	13,02	2,33	11,63	No slippage

Table 1: Test data

Specified minimum slip load (SMSL) = MBL / 1,6

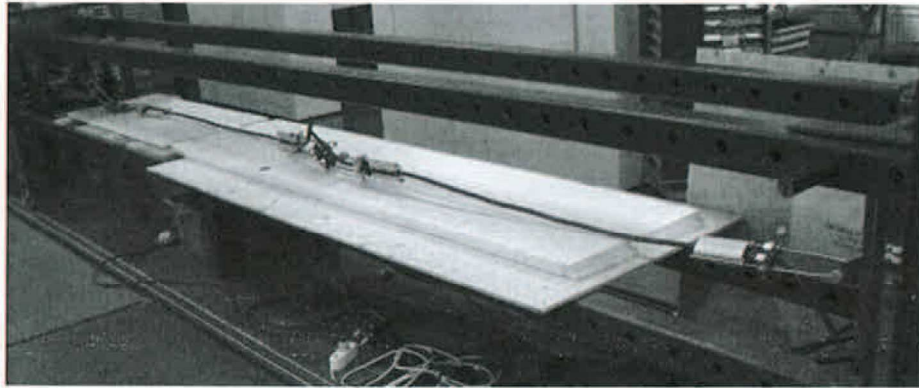
**Summary:**

All samples fulfilled standard requirements.

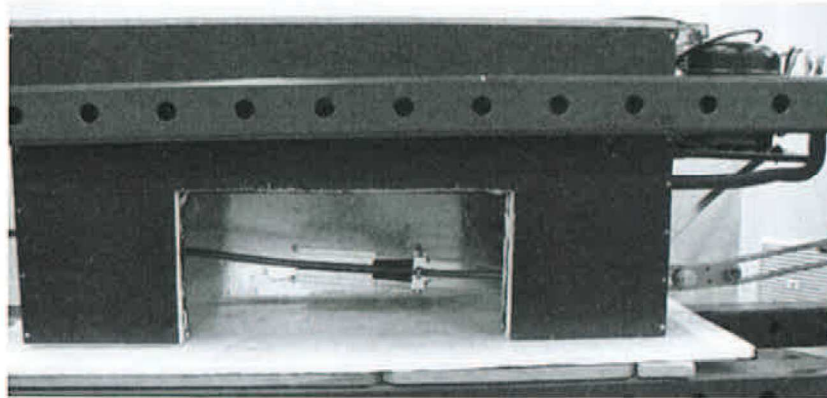




4. Pictures



Picture 4: Test setup in tensile test machine (with out cooling device)



Picture 5: Tension clamp in cooling device

5. Test equipment

ID	TYPE	MODEL	PURPOSE
L14	Torque wrench	BDS 80 E	Torque adjustment
L110	Tensile test machine	50 kN	Tensile tests
C1	Cooling device -25°C	Ensto	Tensile test
C2	Cooling device -25°C	Ensto	Tensile test

6. Test Id

847

7. Revision history

A







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**LABORATORY REPORT**

No.: 2053S

Revision: A

Page: 1/5

Date of Test: 29.9 – 8.12.2010

**Test object:**

Tension clamp SO255.

**Purpose of the test and relevant standards:**

Part of type test.

Tensile test for tension clamp at low temperature according to EN 50397-2:2009 clause 7.4.8.

**Conclusion:**

The clamp passed the test.



Picture 1: Tested clamp SO255



**Date of Report:** 17.1.2011

**Tested by:** Patrick Ekholm

**Witnessed by:** Sami Hakonen / SGS Fimko

**Reviewed by:** Janne Lappalainen

**Ordered by:** V.Vilenius  
**Distribution:** OHL PD-team

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ВЯРНО С ОРИГИНАЛА





**1. Test objects**

**Clamp:**

Type:	Tension clamp SO255
Batch number:	0-series
Conductor range:	50 – 70 mm <sup>2</sup>
Conductor diameter:	12,7 – 16,7 mm
Tightening torque:	40Nm
No of pcs:	6

**Conductors:**

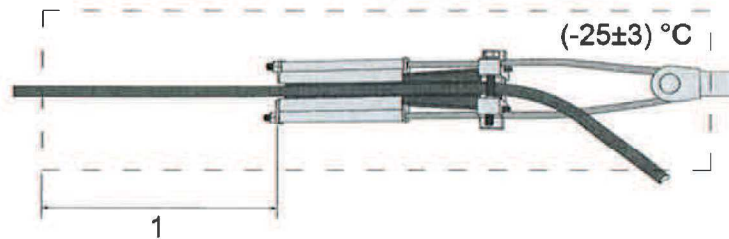
Type:	SAX-W 50
Used cross-sections:	50 mm <sup>2</sup>
Manufacturer/Country:	Prysmian / Finland
Insulation thickness:	2,4 mm
Total diameter:	12,7 mm
Number of strands:	7
Insulation material:	XLPE
Conductor material:	AlMgSi
Conductor MBL:	15,5 kN
Refer to standard:	EN50397-1

Type:	SAX-W 70
Used cross-sections:	70 mm <sup>2</sup>
Manufacturer/Country:	Prysmian / Finland
Insulation thickness:	2,4 mm
Total diameter:	14,3 mm
Number of strands:	7
Insulation material:	XLPE
Conductor material:	AlMgSi
Conductor MBL:	22,5 kN
Refer to standard:	EN50397-1



## 2. Testing procedure

Three tension clamps were tested in low temperature zone, see Picture 2. The clamp and 300 mm of conductor [1] was cooled down to  $(-25\pm 3)^\circ\text{C}$ .



Picture 2

Tension clamps were installed in each end of the conductor, see Picture 3. The distance between clamps [1] was approximately  $100 \times$  core diameter and the length of the tails [2] was approximately 500mm. The clamping pieces of the clamps were tightened to the nominal tightening torque. Two arrangements were installed into a tensile test machine. The load of the arrangements was increased to 70% of conductor MBL. Three clamps were cooled down to  $(-25\pm 3)^\circ\text{C}$  in one hour and kept there for one hour. The tension was released. After pre-tensioning the clamps were subjected to a 24h tensile test in low temperature,  $(-25\pm 3)^\circ\text{C}$ . Before starting the test the load of the arrangements was increased to 20% of the specified minimum slip load. Then the conductor was marked at the end of the wedges. After marking the load was increased gradually until it reaches the specified minimum slip load and kept there for 24h.



Picture 3

### Requirement:

The test is passed if the movement of the conductor relative the clamp is less than 3 mm at or below specified minimum slip load. Also no damage shall occur which could affect the correct function of the clamp.



**3. Test results**

Sample	Conductors	MBL [kN]	70% of MBL [kN]	20% of SMSL [kN]	SMSL [kN]	Result
1	SAX-W 50	15,5	10,85	1,94	9,7	No slippage
2	SAX-W 50	15,5	10,85	1,94	9,7	No slippage
3	SAX-W 50	15,5	10,85	1,94	9,7	No slippage
4	SAX-W 70	22,5	15,75	2,8	14,1	No slippage
5	SAX-W 70	22,5	15,75	2,8	14,1	No slippage
6	SAX-W 70	22,5	15,75	2,8	14,1	No slippage

Table 1: Test data

Specified minimum slip load (SMSL) = MBL / 1,6

**Summary:**

All samples fulfilled standard requirements.

