

MANUFACTURING AND SUPPLY OF ACCESSORIES FOR SUBMARINE CABLES



P.C.S. Italiana S.r.l. was established in January 1991 by a team of highly skilled maritime experts and cable manufacturing technicians

**we are is based in Brandizzo
(30 Km East of Torino)
with offices and warehouses**

Market grow for the O&G driven us also to establish a subsidiary in Doha Qatar that handles all operations for the ME we have also direct connections in:

- Egypt - UAE - USA



PCS Italiana S.r.l. since 1991 is operating in the O&G business with equipment and technicians for the laying and installation of power and optical fibres submarine cables.

From the early years of activity the Company started operation with international cabled makers and the experience list has extended to several of the major O&G Companies/Contractors and Utilities both in Italy and abroad.

Company activity is driven to provide services for submarine cables and umbilical laying and installation covering the service from engineering stages until final test and commissioning; within this range of application also the accessories supply is concerned and for this reason, thanks to the experience developed working on submarine cables Company started to design and propose a comprehensive range of accessories from topside platform junction boxes until repair joints, covering all the accessories and ancillaries within.

The track reference for supplied accessories shows a consistent experience, capability and reliability thanks to the fact that all PCS Italiana accessories are tailored designed and manufactured according to direct cable and site needs thus provide a specific solution for the purpose of installation.

All manufacturing and assembly activities are held in the headquarter in order to provide a safe and comprehensive location for all specific operations.

Company staff is composed of approx. 25 people that considers both employees and operational staff.

Thanks to the light structure capacity and relevant direct control on all activities, PCS Italiana can take direct and immediate actions in order to provide immediate and supportive responses to Customer needs.

Company location is in Brandizzo in North West Italy very close to Torino, with close access to Milano Malpensa Airport and closer seaport is Genoa situated approx. 200 Km South-West of Brandizzo.

Company has a complete owned headquarter and manufacturing-assembling unit of 2500 m² among which the covered surface is of 2000 m². An additional area is available at 20 Km east with an open air surface of 9000 m² for storage of equipment and means.

Via Fratelli Rosselli, 24
10032 Brandizzo (TO)
ITALY

Web: www.pcsitaly.it

E-mail: pcsitaly@pcsitaly.it

Tel + 39 011 91 70 260



PCS Cables L.L.C.

Mr. ALI MOHAMED JAIDAH

Office Bldg 4th Floor,

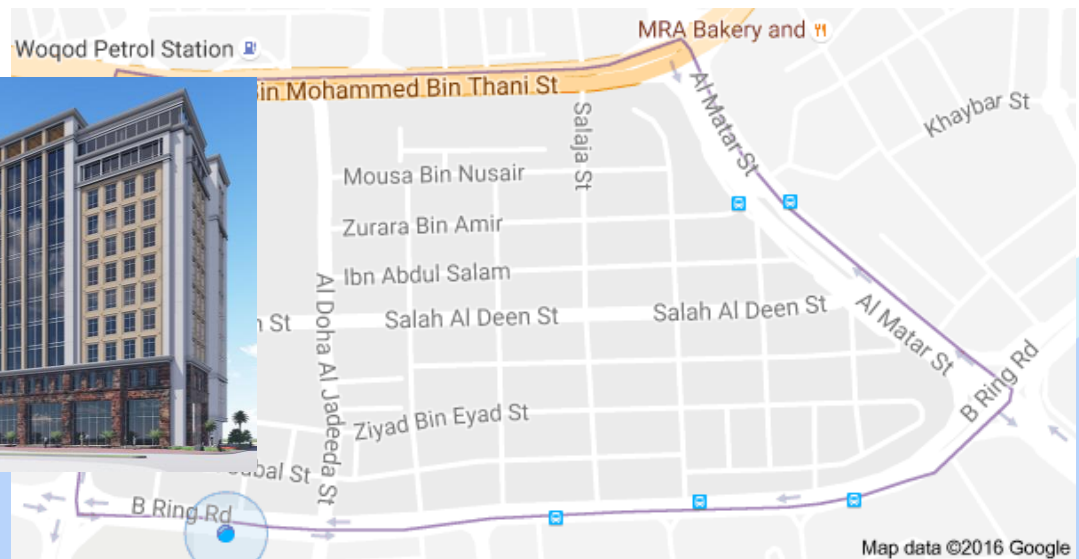
Doha Jadeedah - B Ring Road

PO BOX 24561 Doha - Qatar

Ms. Nadia Cossa - Resident Mgr

Tel: +974 557 962 28

e-mail: sales@pcscables.net



OUR ACTIVITIES

MANUFACTURING OF SUBMARINE ACCESSORIES

Topside hang-off



Safety on seabed



Bull-noses and pulling head

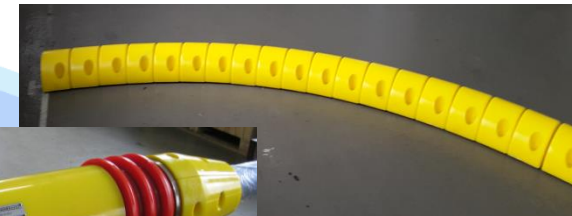


PCS design and manufacture a complete range of accessories and ancillaries for submarine cables to deliver the relevant support to end users and contractors

**ATEX Certified
Junction boxes
for power and fibre
optic**



Submarine joints for power and OF cables

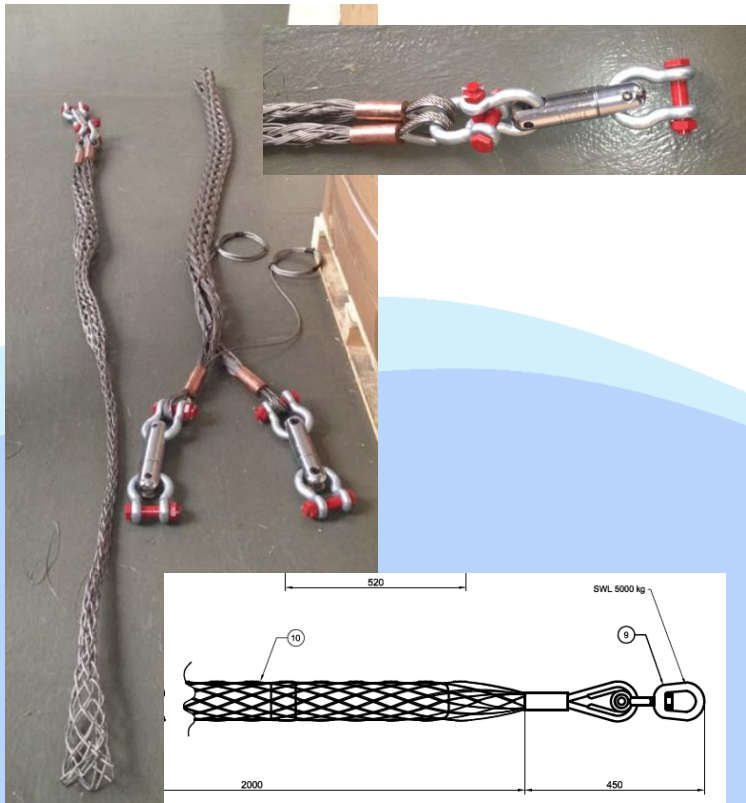


J-Tubes seals, centralizers and bend restrictors

MANUFACTURING OF SUBMARINE ACCESSORIES

CABLES BULL-NOSES AND PULLING HEADS

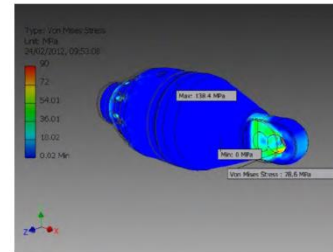
Cable bull-noses and pulling heads are designed and manufactured in reason of mechanical performances to be granted and cables dimensions.



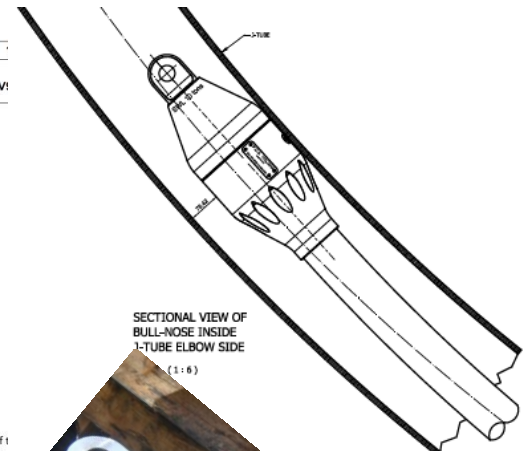
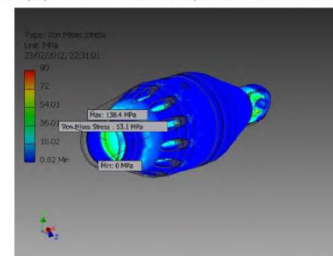
Supplier	CABLE BULL NOSE PULLING CALCULATION REPORT	Rev. X4
PCS ITALIANA SRL	Subcontractor/Vendor Doc. No.: 1067 - BNPV	Contractor Doc. No.: 01-ZA-E-VI

Figures

Von Mises Stress -[MPa]



Von Mises stress results use color contours to show the stresses calculated during the solution of 1. The deformed model is displayed. The color contours correspond to the values defined by the color bar.

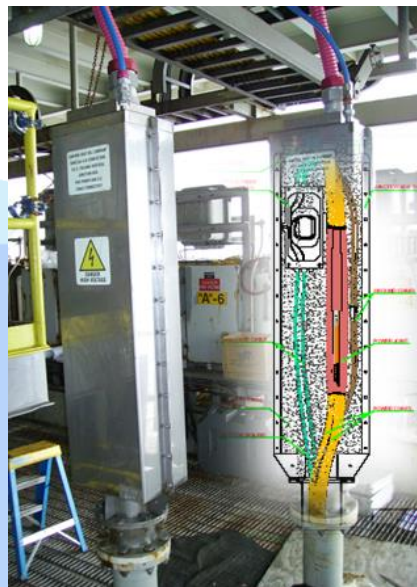
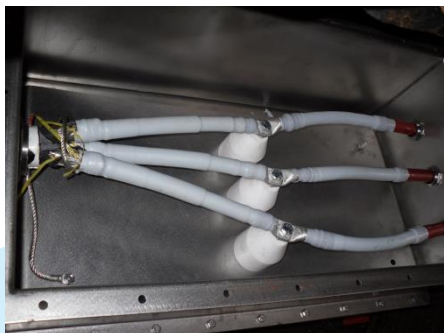


MANUFACTURING OF SUBMARINE ACCESSORIES

JUNCTION BOXES FOR POWER AND OPTICAL CABLES

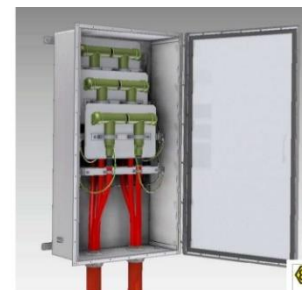
A wide range of junction boxes is available for power, control and optical cables with “Ex” Certification under IECEx or ATEX Standard with protection grade up to IP 68.

As alternative, also sealed JB without certification are available.



3D VIEW - Close

POWER JUNCTION BOX
up to 15 kV - 620 A
ATEX CERTIFIED



3D VIEW - Open /Sectioned

Available in different sizes to satisfy all necessities



3D VIEW - Close

FOC JUNCTION BOX
ATEX CERTIFIED



3D VIEW - Open /Sectioned

Available in different sizes to satisfy all necessities



Sealed vertical and horizontal junction boxes

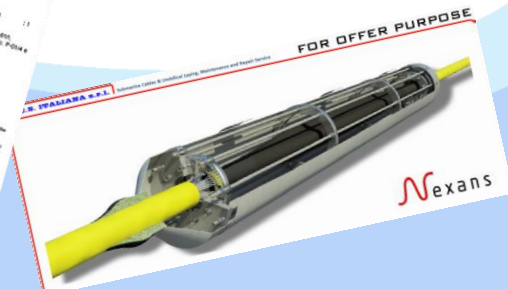
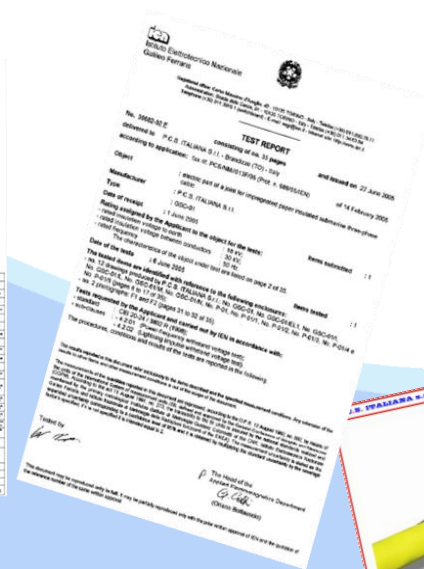
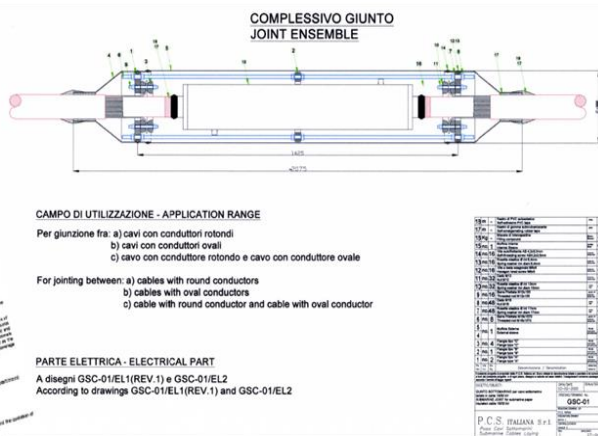
MANUFACTURING OF SUBMARINE ACCESSORIES

SUBMARINE JOINTS FOR MEDIUM VOLTAGE POWER CABLES

A universal range of power submarine joints allow PCS to provide a unique solution that covers different ranges of insulation, voltages and size.

Joint is developed in cooperation with Nexans for the electrical part to provide to customers a reliable supplier for electrical joints.

The joint have been tested to an independent laboratory to verify the compatibility for application at 150 m depth with satisfactory results.



MANUFACTURING OF SUBMARINE ACCESSORIES

SUBMARINE JOINTS FOR OPTICAL FIBRE CABLES

With the same universal philosophy also the fibre optic submarine joint has a universal design and allows with the same design, the connection up to 96 fibres thus including the largest industry solutions.

This joint has been designed by PCS and tested in cooperation with Tratos Cavi to an independent laboratory in order to confirm its design compatibility for application until 2000 m depth.

I.N.R.I.M.
ISTITUTO NAZIONALE DI RICERCA METROLOGICA
Strada 6/8 - 00100 ROMA (Italy)

tel. +39 011 5019.1
e-mail: info@inrim.it
www.inrim.it

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TEST REPORT

N. 11-0420-01 Issued on 2011-06-13

Object Fiber-optic submarine cable joint certification

Identification Fiber-optic submarine cable manufactured by TRATOS mod. ST 963765
Fiber joint realized by: P.C.S. Italiana S.r.l.; type: SUFOJ

Test date Dal 2011-02-11 al 2011-02-17

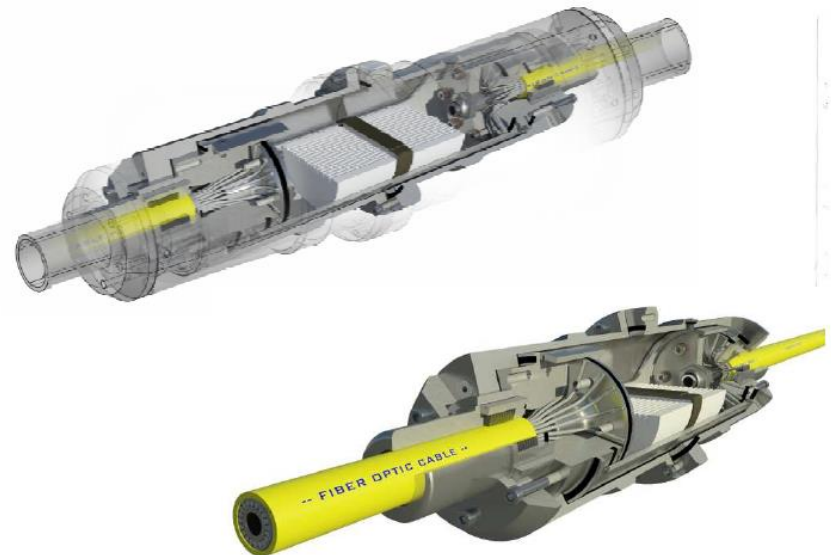
Customer P.C.S. Italiana
Posa Cavi Sottomarini e Lavori Marittimi S.r.l.

Address Via Fratelli Rosselli 24
10032 Branzazzo (TO)

Responsable for the test The head of the
Optical Division

Giorgio Baida
(signature)

Manuela Roselli
(signature)



MANUFACTURING OF SUBMARINE ACCESSORIES

TOPSIDE HANG-OFF

To provide a safe solution for cables hang-off on platform, PCS provide specific studies and design purposely the hang-off for topside application. These ancillaries provide the Customer required pulling strength by use of proven quality material and supported by specific fatigue stress calculation.



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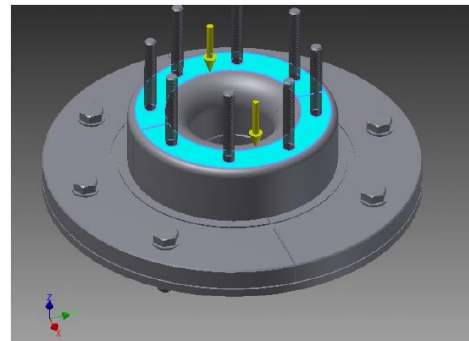
01.10 - STRESS ANALYSIS REPORT

Physical (Note: Physical values could be different from Physical values used by FEA reported below)

Mass	127.657 kg
Area	2219560 mm ²
Volume	16275300 mm ³
Center of Gravity	x=-0.000302585 mm y=0.000777184 mm z=52.4764 mm

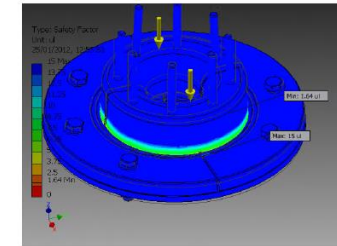
Force:1

Load Type	Force
Magnitude	182280.000 N
Vector X	0.000 N
Vector Y	0.000 N
Vector Z	-182280.000 N

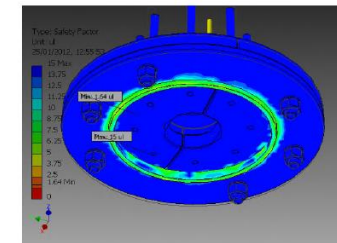


Supplier PCS ITALIANA SRL	Subcontractor/Vendor Doc. No.: 1067 - HOPV	Contractor Doc. No.: 01-ZA-E-V91825
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Safety Factor



Safety factor shows the areas of the model that are likely to fail under load. The color contours correspond to the values defined by the color bar.



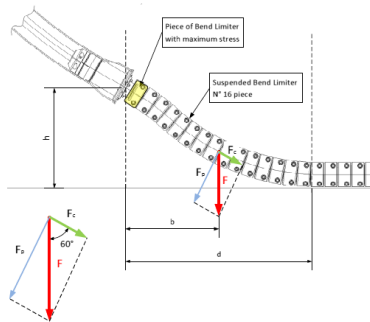
MANUFACTURING OF SUBMARINE ACCESSORIES

J-TUBE SEALS, CENTRALIZERS AND BEND RESTRICTORS

From topside to bell-mouth, PCS can provide all ancillaries. J-tube seals or centralizers that can be also completed by suitable bend restrictors elements for an increased safety for cables at j-tube exit.

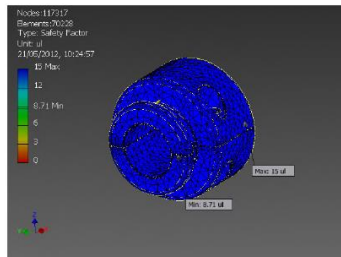
PCS ITALIANA SRL Subcontractor/Vendor Doc. No.: 1067 - CBRV Contractor Doc. No.: 01-ZA-E-V91830

01.03 - CALCULATION OF PULLING FORCE ACTING ON CENTRALIZER



PCS ITALIANA SRL Subcontractor/Vendor Doc. No.: 1067 - CBRV Contractor Doc. No.: 01-ZA-E-V91830

Safety Factor



Safety factor shows the areas of the model that are likely to fail under load. The color contours correspond to the values defined by the color bar.



MANUFACTURING OF SUBMARINE ACCESSORIES

SAFETY ON SEABED

At j-tube exit, additional safety may be required and PCS can provide specific solution tailored for the need



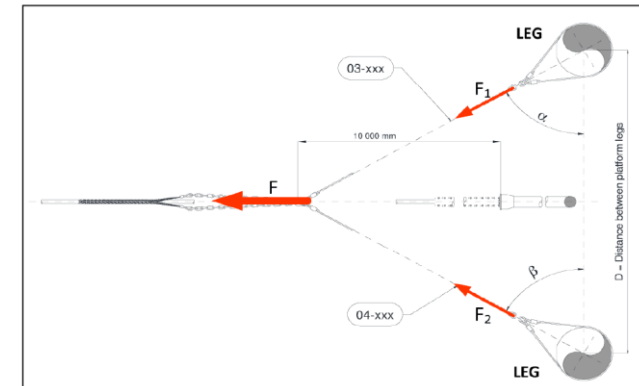
Iron cast shell protection for preserved marine environment

PCS ITALIANA SRL

Subcontractor/Vendor Doc. No.:
1067 - CTBG

Contractor Doc. No.:
01-ZA-E-V91832

02 - GS Wire Rope Verification



Starting data:

$F =$	8.00 [tons]	78 452.80 [N]	
$\alpha =$	25.000 [deg]	0.43633231 [rad]	MINIMUM ANGLE
$\beta =$	40.000 [deg]	0.6981317 [rad]	MINIMUM ANGLE

Results:

$$F_1 = \frac{F \cdot \sin(\pi/2 - \beta)}{\sin(\alpha + \beta)} = 66\,311.17 \text{ [N]} \rightarrow 6.76 \text{ [tons]} \text{ VERIFIED}$$

$$F_2 = \frac{F \cdot \sin(\pi/2 - \alpha)}{\sin(\alpha + \beta)} = 78\,452.80 \text{ [N]} \rightarrow 8.00 \text{ [tons]} \text{ VERIFIED}$$

Tie-back grip calculation for supply and application at j-tube exit

Document Deliverables

- **Accessories drawings**
- **Material Inspection Test Plan**
- **Assembly instructions**
- **Material certificates**
- **Type Tests on previous samples**
- **Shipment documents**
- **Certificate of Origin**

PCS ITALIANA SRL

THANKS FOR YOUR ATTENTION

Via Fratelli Rosselli, 24/26
10032 Brandizzo (TO) ITALY

www.pcsitaly.it

pcsitaly@pcsitaly.it

Tel + 39 011 91 70 260

Fax + 39 011 91 39 540

<https://it-it.facebook.com/pcsitaliana/>