

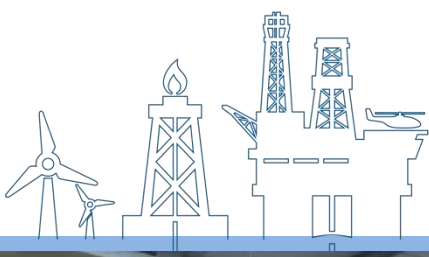


# HCL

CLAMPING SOLUTIONS



**HCL**  
CLAMPING SOLUTIONS



Innovando & produciendo soluciones de Sujeción de: larga vida, alta Resistencia, no corrosivos & intuitivo bajo el mar, costa afuera & para pozos profundos, desde 1994





Banda  
Smart®



Tirante  
Smart®

Ø60-Ø250mm

Productos Smart®





# Herramientas de instalación Smart<sup>®</sup> – 1000 (19, 20 & 32mm)





Herramientas de instalación Smart<sup>®</sup> – 2000 (19, 20 & 32mm)



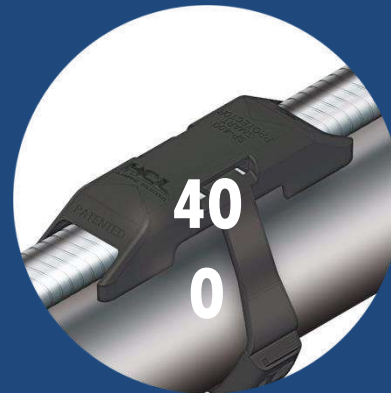
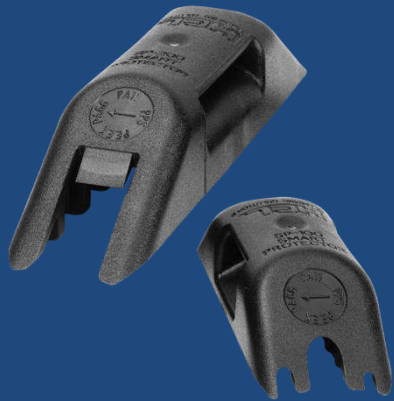


# Herramientas de instalación Smart<sup>®</sup> – 3000 (19,20 & 32mm)





# Protector Smart®



# Productos Smart®



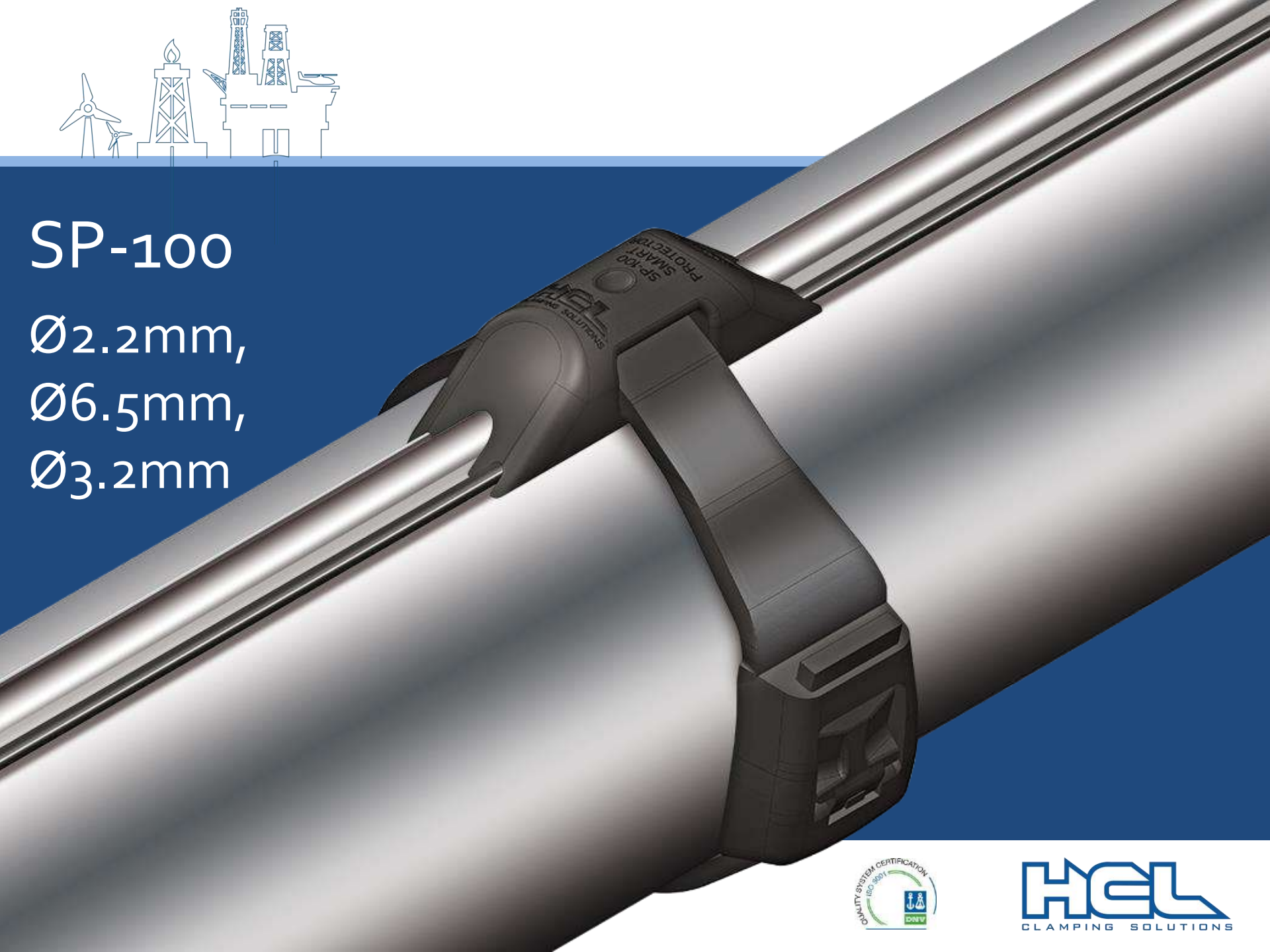


SP-100

Ø2.2mm,

Ø6.5mm,

Ø3.2mm



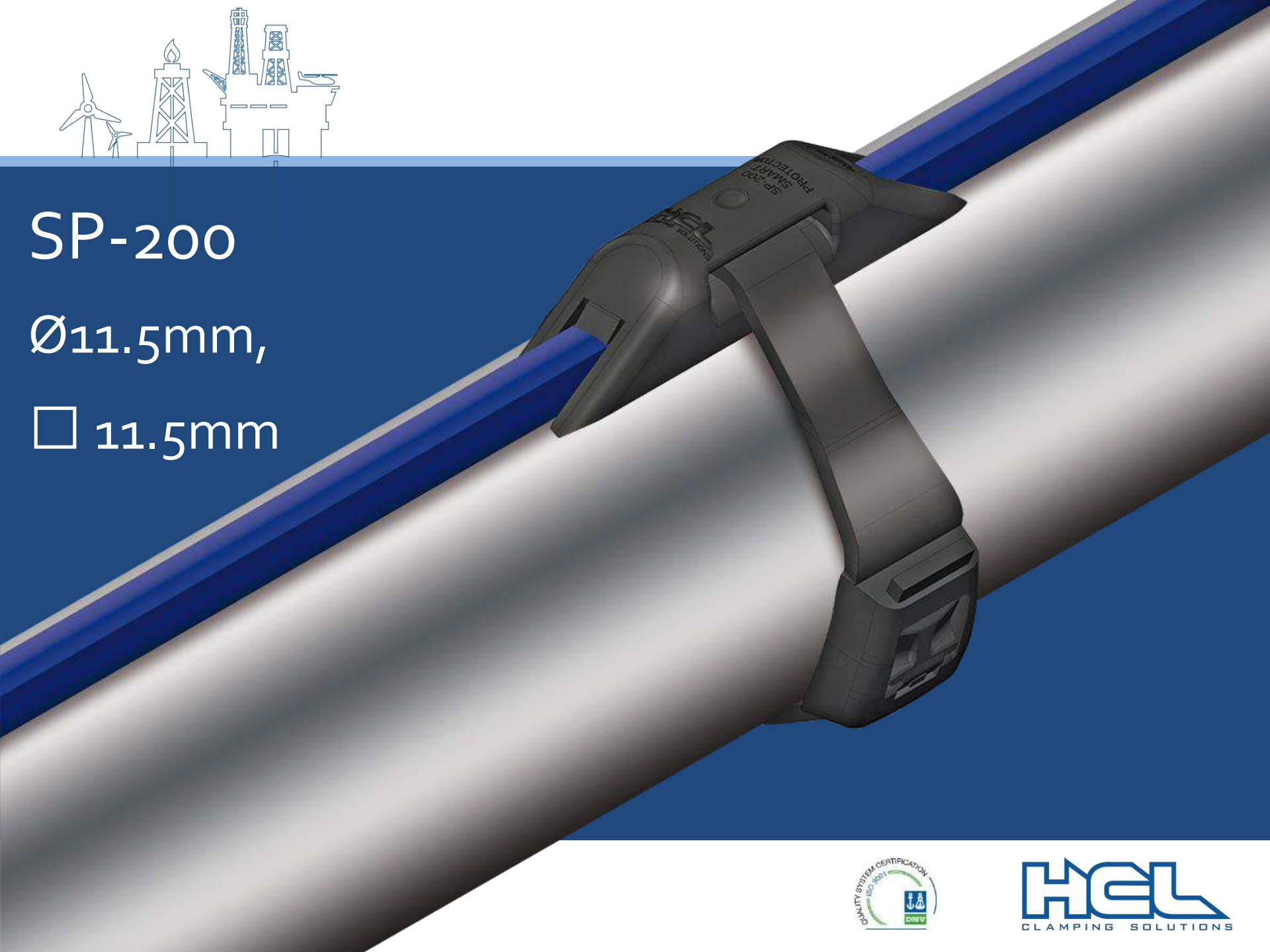




SP-200

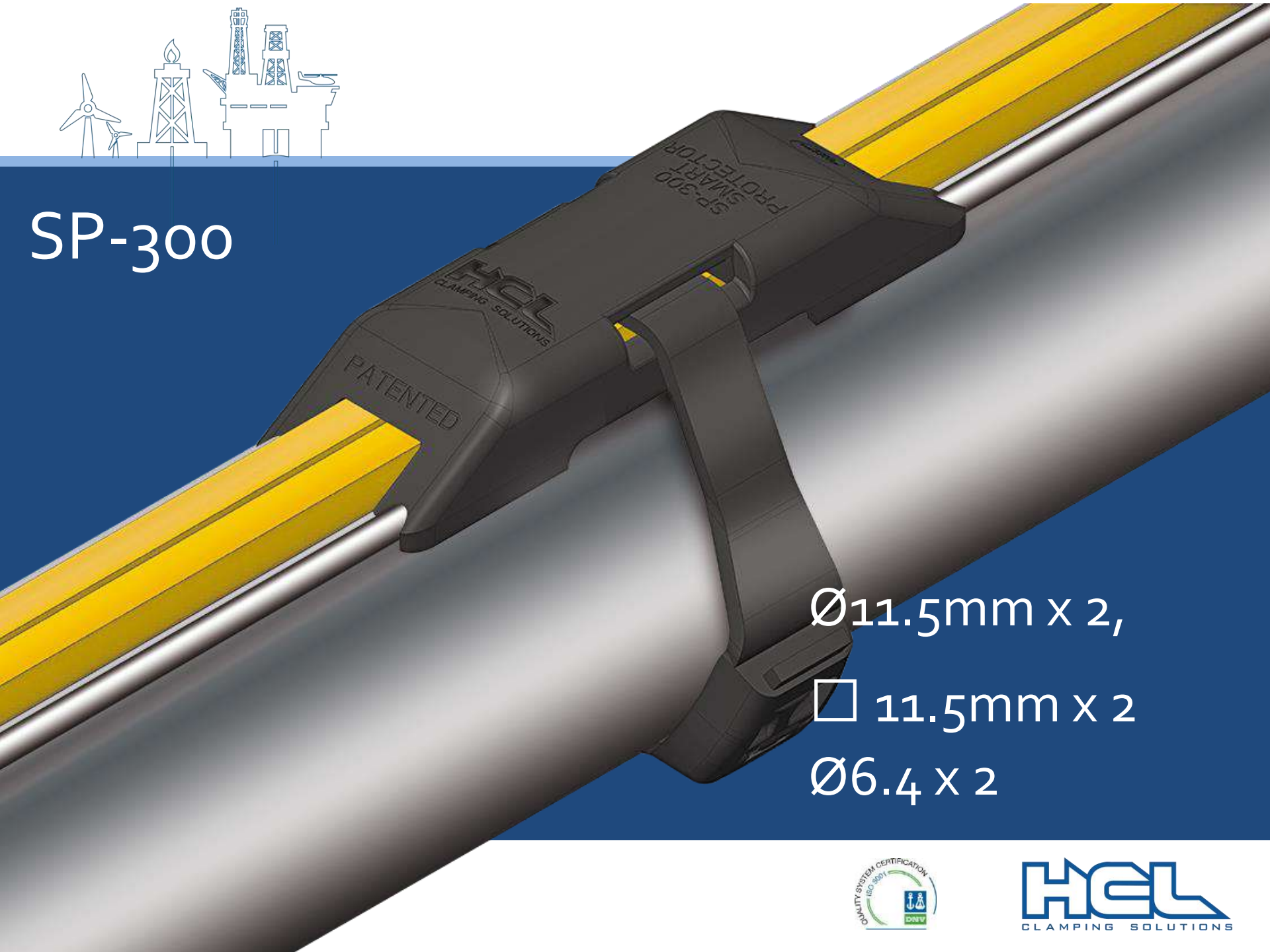
Ø11.5mm,

□ 11.5mm





# SP-300



Ø11.5mm x 2,

□ 11.5mm x 2

Ø6.4 x 2

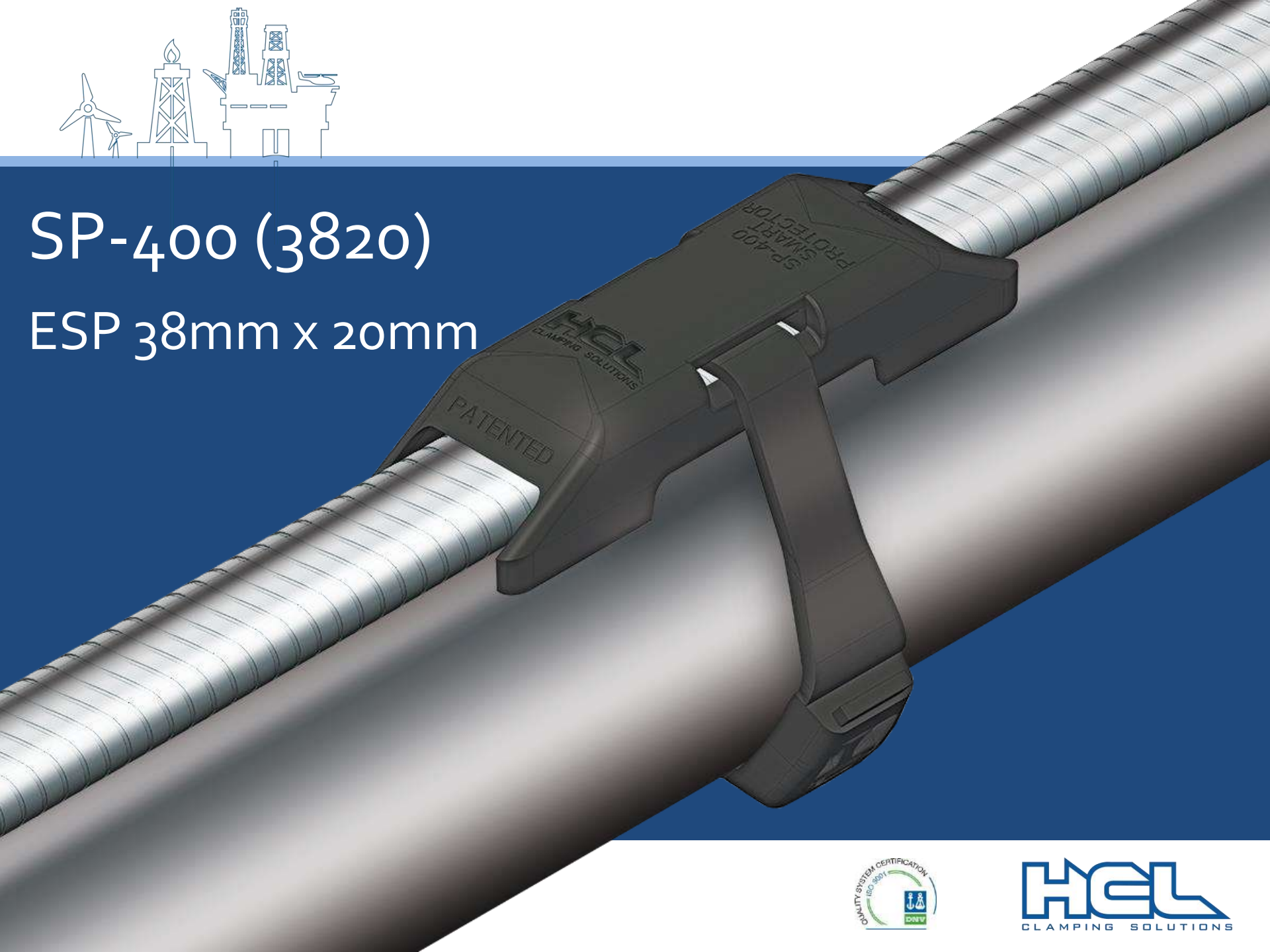


**HCL**  
CLAMPING SOLUTIONS



SP-400 (3820)

ESP 38mm x 20mm



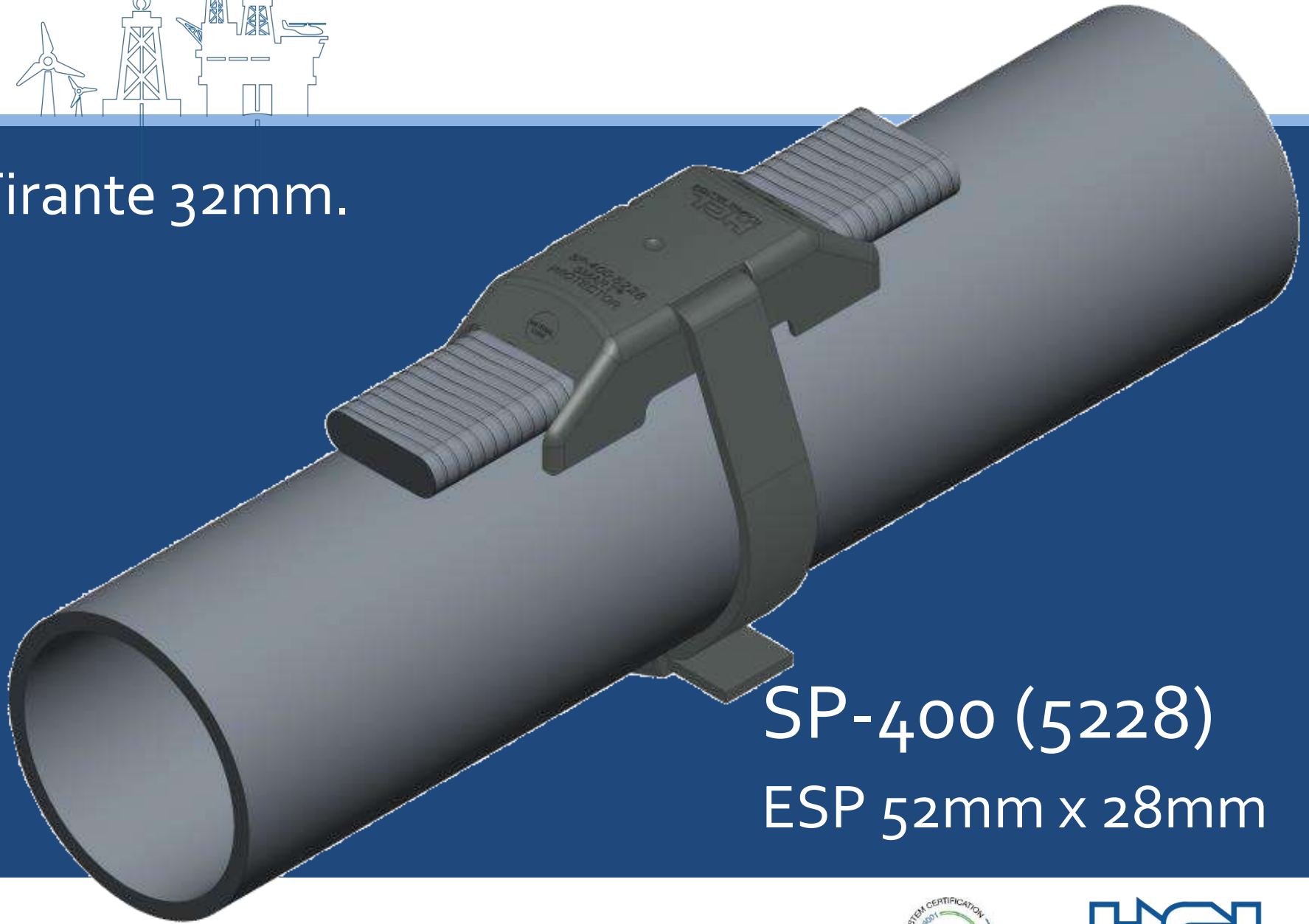


SP-400 (5228)  
ESP 52mm x 28mm





Tirante 32mm.



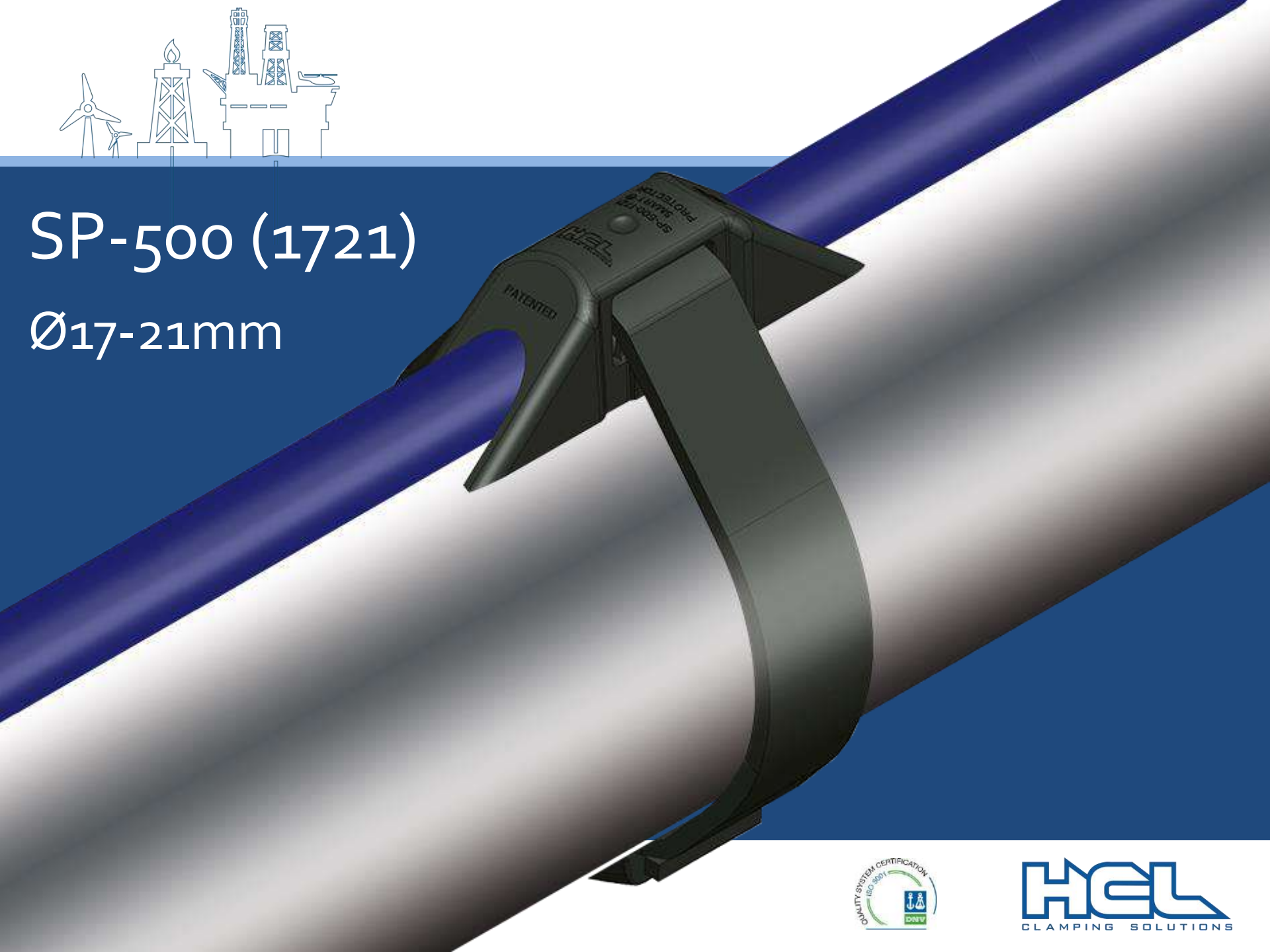
SP-400 (5228)  
ESP 52mm x 28mm

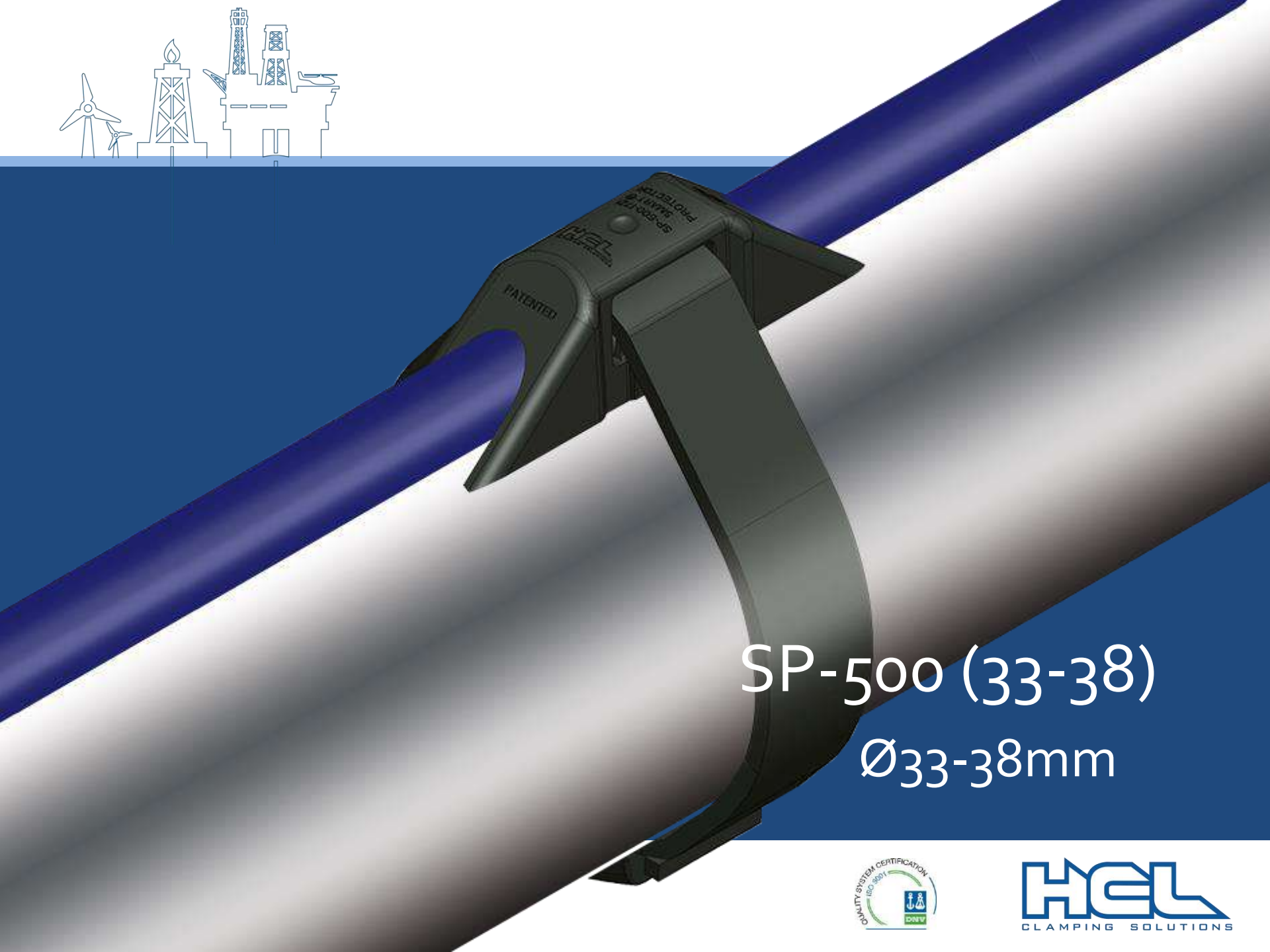




SP-500 (1721)

Ø17-21mm





SP-500 (33-38)  
Ø33-38mm





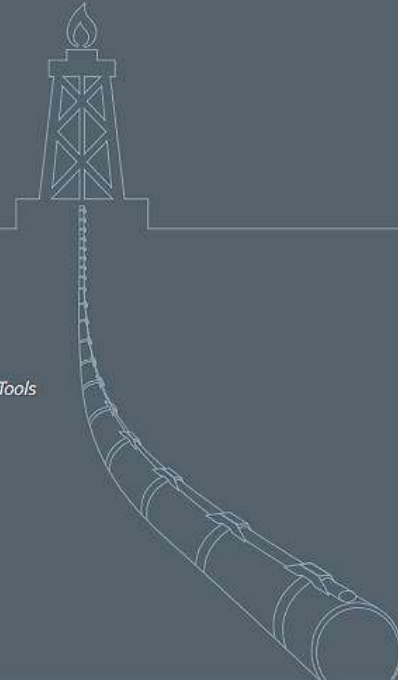
Soporte de  
producto de pozo  
profundo

# Smart® Products Technical Booklet

for Downhole use - September 2014



- *Smart® Protector*
- *Smart® Band*
- *Smart® Tie*
- *Smart® Installation Tools*



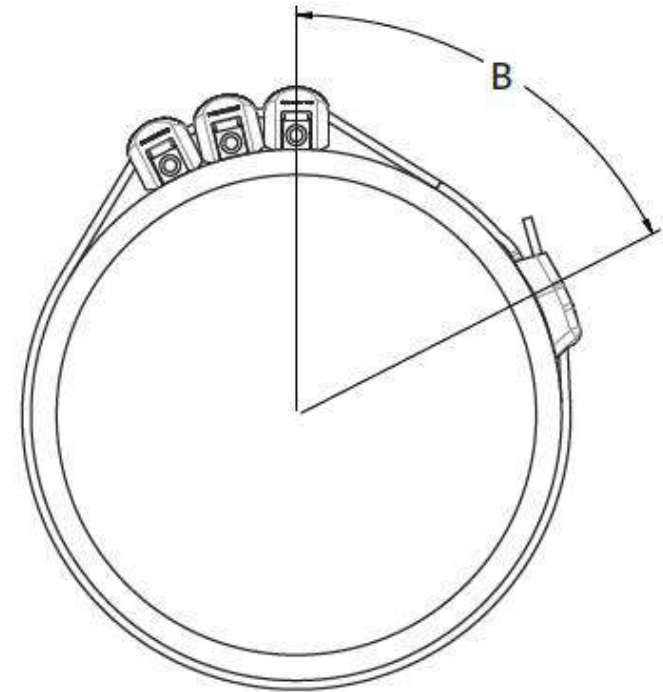




Characteristic	Units	PA66	PA12	PA11	PPS	PEEK	Detailed Section No
Recommended for Downhole use		✓ Short Term <sup>1</sup>	✓	✓	✓	✓	2
Recommended for Subsea use		✓ Short Term <sup>1</sup>	✓	✓	✗	✗	13.1
Maximum Well Temperature	°C (°F)	125 (257)	100 (212)	105 (221)	175 (347)	240 (464)	12
Sour (CO <sub>2</sub> ) & Sweet (H <sub>2</sub> S) Gas Resistance	Scale 1-10	3	5	5	9	10	13
Weathering UV Resistance	Years 1-10	7	10	10	6	4	14
Density	g/cm <sup>3</sup> (oz/inch <sup>3</sup> )	1.14 (0.66)	1.01 (0.58)	1.03 (0.60)	1.25 (0.72)	1.30 (0.75)	4
Toughness	Scale 1-10	8	9	10	6	7	9
Cost (Low to High)	Scale 1-10	2	3	4	6	10	N/A
Flammability	UL94	V-2	HB	V-2	V-0	V-0	12

## Selección de Material





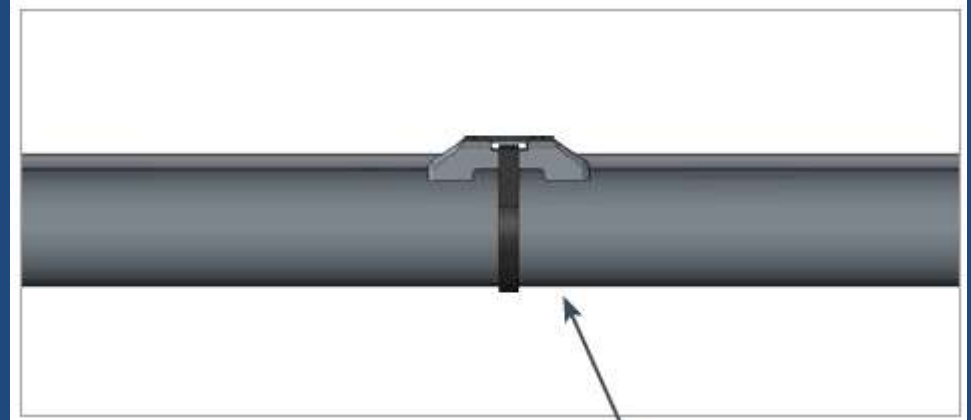
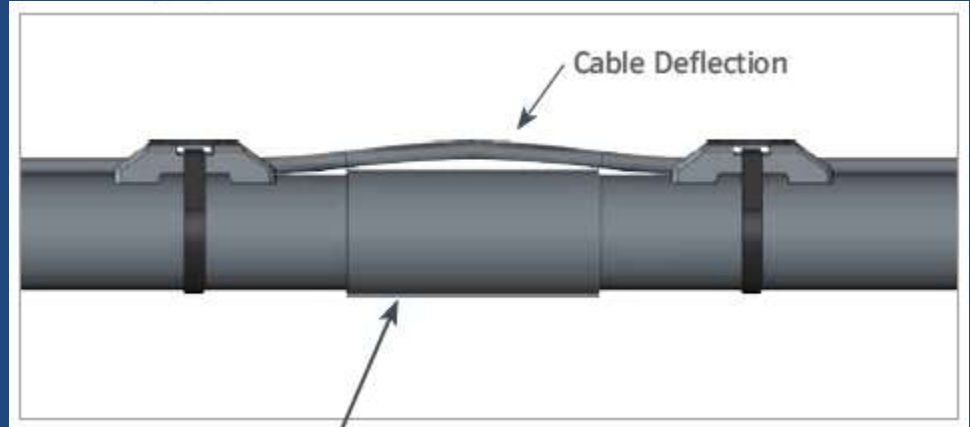
## Configuración Multi - Protector Smart<sup>®</sup>





## Configuración Multi - Protector Smart®





A través del acoplamiento & Entre medio





# Productos Smart, Guia de buen Ajuste

- Posición en secciones paralelas solamente.
- Posición con referencia al acoplamiento.
- Use protectores similares donde sea possible.
- Hebilla de posicionamiento en diámetro
- Frecuencia de sujeción en tubería
- Tirante de tamaño Smart versus cable carga





Consecuencias uso bandas de acero!





Test rig with front cover removed



Hydraulic ram applies  
2.5 tons sload  
against wheel.

Test rig setup



## Prueba de Abrasion





## Pruebas del Sistema Axial y extensible







## 13 Weathering

When exposed to weathering, polymers have a natural tendency to photo-oxidise and depolymerise to their natural elemental forms. There are variations in natural weathering depending on the intensities of the following components:

1. Solar Radiation (UV)
2. Moisture
3. Heat
4. Pollutants e.g. ozone and acid rain
5. Salt Water

The combination of more than one of these factors can also lead to accelerated degradation and aging.

Weathering intensity varies widely around the world, and may also vary from year to year for a given location, depending on weather patterns. Weather in a subtropical climate, such as Florida, may have twice the effect on a polymer as a more northerly location. A drier climate, such as Arizona, may have increased UV radiation but because of the lower humidity, the effects of weathering on a polymer will not be so severe. It is impossible to give a precise indication of the effects of weathering in a given location but by using natural outdoor and accelerated tests, certain predictions can be made.



Photo courtesy of Groupe Courbis  
Location: Malaysia

The carbon black additive in Smart® Band and Smart® Tie products, acts as a very good UV stabiliser. Heat-stabilised grades, usually copper based, also provide further protection against photo-oxidative degradation by shutting down free radicals. This combination of inhibitors helps to give the polymers many years of life.

### Estimated Polymer life expectancy when exposed to weathering

Materials all black	Life in Hot climates	Life in Temperate Climates
	YRS - Approx	YRS - Approx
PA66 (Nylon 6.6)	10+	15+
PA11 (Nylon 11) PA 11GF (Nylon 11 Glass-filled) PA 10/12 (Nylon 10/12)	15+	20+
PPS (Polyphenylene Sulphide)	10+	15+
PEEK (Poly Ether Ether Ketone)	5+	8+

### PA66 (Nylon 6.6)

Compared with other polymers, PA66 (Nylon 6.6) naturally exhibits a high resistance to weathering and UV degradation, even in its neat state. The graphs below, show the reduction in Tensile strength and Elongation at break of PA66 (Nylon 6.6), over a 2000 hour period in a weathering chamber. The accelerated weathering is achieved by wet and dry cycles and continuous UVA (320nm) exposure. The dry cycles last for 8 hours at 70°C, and the wet cycles for 4 hours.

Propiedades del material  
Resistencia a la temperatura  
Resistencia química  
Desgaste



## Pozo Profundo





Advantageous Pricing Schedule available  
for Shell & Affiliates

Users include:

- PDO
- Weatherford, Schlumberger
- Tendeka, Venoco
- Transocean

For more information  
and prices ask

Bill.Birch@Shell.com  
pcoles@hcl-clamping.co.uk  
deoles@hcl-clamping.co.uk

**HCL**  
CLAMPING SOLUTIONS



## NOT JUST ANOTHER DOWNHOLE CLAMP

Just an elegant way of  
avoiding a limp control line!

Smart® Tie incorporates the Hybrid feature  
of the Smart® Band and creates the strongest  
Polymer Cable Tie in the World.



7 in 11152 - Information & Data Services (IDS), R|jpw|k.

# Evidencia de Shell



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## Pozo Profundo - Shell





Ecopetrol





## Pozo Profundo – Dublin Petroleum & East Star





# Pozo Profundo – Baker Hughes - Chevron





## Pozo Profundo – Transocean & IODP







SMART® PROTECTOR TRACK RECORD

2007	Feb	Schlumberger	Australia	8788	PCP (application)
2007	Mar	Schlumberger	Australia	1250	Gauge
2007	Mar	Schlumberger	Australia	1900	Gauge
2007	May	Schlumberger	Australia	3000	Gauge
2007	Jun	Schlumberger	Australia	3000	PCP (application)
2007	Sep	PDVSA	Venezuela	2058	ESP
2007	Oct	Schlumberger	Australia	8600	Gauge
2007	Oct	Schlumberger	USA	2415	Gauge
2007	Nov	Schlumberger	Australia	2320	Gauge
2007	Nov	Schlumberger	Australia	3000	Gauge
2008	Jan	Confidential	Australia	900	Gauge
2008	Jan	Confidential	Australia	1953	SSSV
2008	Mar	Dublin Petroleum	Syria	7348	ESP
2008	Mar	Schlumberger	Australia	6000	Gauge
2008	Apr	Schlumberger	USA	8888	Gauge
2008	Apr	Confidential	Australia	2220	Gauge
2008	May	Schlumberger	Australia	5000	Gauge
2008	Jul	Schlumberger	USA	250	Gauge
2008	Aug	Schlumberger	Thailand	1639	Gauge
2008	Sep	Schlumberger	USA	700	Gauge
2008	Oct	Schlumberger	Venezuela	2500	SSSV
2008	Nov	Schlumberger	Oman	850	Gauge
2008	Dec	Schlumberger	Indonesia	500	Gauge
2009	Mar	Confidential	Australia	3000	Gauge
2009	Apr	Schlumberger	Venezuela	2005	Gauge
2009	Jun	Confidential	Australia	4000	Gauge
2009	Jun	Schlumberger	Russia	2000	Gauge
2009	Sep	Schlumberger	Oman	500	Gauge
2009	Oct	Schlumberger	Australia	2438	Gauge
2010	Jan	Confidential	Australia	1500	PCP (application)
2010	Mar	Confidential	Australia	2000	SSSV
2010	May	Schlumberger	Russia	1800	Gauge
2011	Nov	Schlumberger	Germany	1600	Gauge
2012	Oct	Insight	Oman	800	Gauge
2012	Nov	Rotating Right Inc	Canada	1000	ESO
2013	Mar	Rotating Right Inc	Canada	5000	Gauge
2013	Apr	Schlumberger	Oman	700	Gauge
2013		Baker Hughes	Gabon	400	SP-300
2013	Dec	Confidential	North Sea	400	SP-300
2014	Jan	Shell/PDO	Oman	3500	SP-100

NA: The above is not definitive due to lack of information on the "end user" operating companies or the exact geographical location. It is intended only for general reference only.

***Schlumberger, PDVSA, Dublin Petroleum, Insight, Rotating Right, Venoco, Baker Hughes, Chevron, Shell, PDO, Transocean, East Star, Weatherford, Tendeka***

# Pozo Profundo – Historia Proyectos





# DNV BUSINESS ASSURANCE MANAGEMENT SYSTEM CERTIFICATE

Certificate No. 162287-2014-AQ-GBR-UKAS

*This is to certify that*

## H C L Fasteners Limited

Clamping House  
First Avenue  
Westfield Industrial Estate  
Radstock  
Somerset  
BA3 4BS  
United Kingdom

*has been found to conform to the Management System Standard:*

**BS-EN-ISO 9001:2008**

*This Certificate is valid for the following product or service ranges:*

**Design and manufacture of injection moulded components, extruded plastic components and associated assembly tooling. Distribution of plastic and metallic fastening products and associated assembly tooling.**

*Initial Certification date:*  
6 January 1998

*This Certificate is valid until:*  
4 October 2017

*The audit has been performed under the supervision of:*  
Gerry Westmacott  
Lead Auditor



*Place and date:*

London, 18 August 2014

*for the Accredited Unit:*  
DNV GL BUSINESS ASSURANCE UK LIMITED,  
UNITED KINGDOM

  
Douglas Milne  
Management Representative

Lack of fulfilment of conditions as set out in the Certification Agreement may render this Certificate invalid

ACCREDITED UNIT: DNV GL BUSINESS ASSURANCE UK LIMITED, PALACE HOUSE, 1 CATHEDRAL STREET, LONDON, SE1 8DE, UNITED KINGDOM. TEL: +44 (0) 207 317 6080, [www.dnvgl.co.uk](http://www.dnvgl.co.uk)

# Calidad





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www.hclfasteners.com

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CLAMPING SOLUTIONS

Specialists in Subsea & Downhole Clamping products

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**LATEST PROJECT**  
Smart Band Hybrid system used to install VIV stakes onto risers of DP3 rig working in deep water West of Shetland. Subsequent pulling of the riser showed all Bands remained intact.  
Find out more...

Smart Band Standard Smart Band Hybrid Smart Tie Smart Protector Smart Installation Tools

TECHNICAL LITERATURE PROJECTS VIDEOS HOSE CLAMPS

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