

# Smart<sup>®</sup> Products

Product Range - August 2019



- *Smart<sup>®</sup> Band*
- *Smart<sup>®</sup> Tie*
- *Smart<sup>®</sup> Protector*
- *Smart<sup>®</sup> Installation Tools*



# Smart<sup>®</sup> Product Literature

All HCL Smart<sup>®</sup> Product Literature can be downloaded from our website:  
[www.hclfasteners.com](http://www.hclfasteners.com)



## Smart<sup>®</sup> Band Compact High Load

The Smart<sup>®</sup> Band Compact High Load has an additional stabilisation feature which prevents any sideway movement on the product and enables it to be deployed successfully over Pipelay Rollers (stingers) effectively, especially in an S-Lay configuration.

Extensive data and testing can found in our Technical Booklet in relation to Roller Loads and Smart<sup>®</sup> Band performance. Many projects have been completed by clients, the most recent being the deepest Piggyback Pipelay Project in the world - Installed by the Allseas ship Audacia. Smart<sup>®</sup> Band Compact High Load was installed alongside Carbon Steel Sacrificial Strapping.



32mm (1 1/4 inch)



Smart<sup>®</sup> Band installed on Piggyback Pipelay operation



Detailed view of High Load feature

# Smart® Band Compact



The new Smart® Band Compact 32mm Banding System is an exciting step forward in the evolution of the Smart® Band range. It combines the best features of both the Smart® Tie and the Smart® Band Hybrid systems to create a superior product.

The Smart® Band Compact reduces the size of the Hybrid buckle by over 60% allowing it to be installed on applications as low as 100mm in diameter. Yet unlike the Smart® Tie it contains glass fibre reinforced yarn allowing it to maintain the superior strength, retention and relaxation features of the Hybrid system.

Furthermore the innovative technology of over-moulding the buckle directly onto the band has actually produced an increase in the strength and retention of the Compact system. As such the Compact system is now perfectly placed to provide a High Strength, High Retention, Long Life and "quick to fit" strapping method for all major subsea applications including VIV Strake attachment on risers down to 100mm.

## Key Features

- 60% reduction in buckle size compared to Hybrid System
- Improved Minimum Diameter - 100mm for 19mm and 200mm for 32mm
- Increase in Strength of over 10% for both 19mm and 32mm systems
- High Load feature for Stinger Installation

<b>19mm (3/4 inch)</b>	<b>32mm (1 1/4 inch)</b>
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## Performance & Material

System		Material	Max System Strength <small>Measured on 600mm diameter</small>		Min Diameter		Max Temp Resistance*		Flammability*
Dimensions			kgf	lbf	mm	in	°C	°F	
mm	in								
19	3/4	PA12GF	1453	3203	100	4	110	230	HB
		PPS	1193	2629	100	4	175	347	V-0
32	1 1/4	PA12GF	2689	5929	200	8	110	230	HB
		PPS	2068	4458	200	8	175	347	V-0

\*Life expectancy is dependant on the working temperature. Refer to the Smart Products Technical Booklet for Downhole Use.

## Dimensions, Part Numbers & Packaging

System		Band Dimensions						Buckle Dimensions		
Dimensions		HCL Part No	Width		Thickness		Supplied	Height	Length	Width
mm	in		mm	in	mm	in		mm/in	mm/in	mm/in
19	3/4	SB-COM-19-PA12GF-XXXXMM	19.2	0.76	3.6	0.14	In pre-cut lengths	23.4/0.92	58.6/2.31	37.4/1.47
32	1 1/4	SB-COM-32-PA12GF-XXXXMM	32.2	1.27	4.7	0.19	In pre-cut lengths	30.0/1.18	74.0/2.91	51.9/2.04

\*Available in PA12GF and PPS for Part No. replace PA12GF with PPS. \*\*Replace XXXX in Part No. with desired length in mm.

## Tool Options & Retention

System		Tool	Min System Retention*			Speed of Installation	Tool Type	Tension Control
Dimensions			N	kgf	lbf			
mm	in							
19	3/4	SM-FT-1000-19	3500	357	787	20 secs	Manual	Torque Wrench
		SM-FT-2000-19	3000	306	674	10 secs	Manual	Hand
		SM-FT-3000-19	4000	408	899	5 secs	Pneumatic	Air Regulator
32	1 1/4	SM-FT-1000-32	7000	714	1574	20 secs	Manual	Torque Wrench
		SM-FT-2000-32	3500	357	787	10 secs	Manual	Hand
		SM-FT-3000-32	9000	918	1798	5 secs	Pneumatic	Air Regulator

\*Values may be lower depending on materials chosen please refer to Technical Booklets for more information.

Note - Values may be lower depending on Buckle position, Material chose and Application Diameter. Please refer to the Technical Booklet for more information.

# Smart® Band Hybrid



The Hybrid name points to the unique patented design of the teeth that sit within the buckle. The low profile buckle is made from a composite of materials allowing for greater flexibility and providing a significant increase in strength over the Standard system.

Smart® Band Hybrid is HCL's high strength composite polymer based band and buckle system. With a range of installation tools including the high speed 3000 pneumatic tool the **Smart® Band Hybrid** is the ideal solution for many offshore and onshore applications.

Smart® Band Hybrid is typically used as an alternative to high grade corrosion resistant alloy strapping solutions such as Inconel 625, Monel & Titanium. The Hybrid system combines a number of excellent qualities such as high strength, ease of use, high retention, relaxation properties and long life, to provide the ideal strapping solution for offshore & subsea use.

## Key Features

- Low Profile Buckle
- High strength up to 2629kgf (5793lbf)
- Long-life materials
- Safe and easy to fit
- High speed installation
- High retention force - above 918kgf (2023lbf)
- Suitable for divers

<b>19mm (3/4 inch)</b>	<b>32mm (1 1/4 inch)</b>
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## Performance & Material

System		Material	Max System Strength Measured on 600mm diameter		Min Diameter		Max Temp Resistance*		Flammability*
Dimensions			kgf	lbf	mm	in	°C	°F	
mm	in								
19	3/4	PA12GF	1321	2911	200	4	110	230	HB
		POM	1017	2238	200	4	95	203	
		PA66	1297	2859	200	4	125	257	
32	1 1/4	PA12GF	2344	5166	400	8	110	230	

\*Life expectancy is dependant on the working temperature.

## Dimensions, Part Numbers & Packaging

System		Band Dimensions				Buckle Dimensions			Buckle				
Dimensions		HCL Part No		Width		Thickness		Band Reel Lengths*		Height	Length	Width	Pack Qty
mm	in	Band	Buckle	mm	in	mm	in	m	ft	mm/in	mm/in	mm/in	
19	3/4	SB-BA-3/4	SB-BU-3/4-HY	19.2	0.76	3.6	0.14	30/60	100/200	12.8/0.50	99.0/3.90	53.0/2.09	50
32	1 1/4	SB-BA-1-1/4	SB-BU-1-1/4-HY	32.2	1.27	4.7	0.19	30	100	16.8/0.66	135.5/5.33	76.8/3.02	25

\*Band is available in pre-cut lengths with buckle fitted for large volume orders.

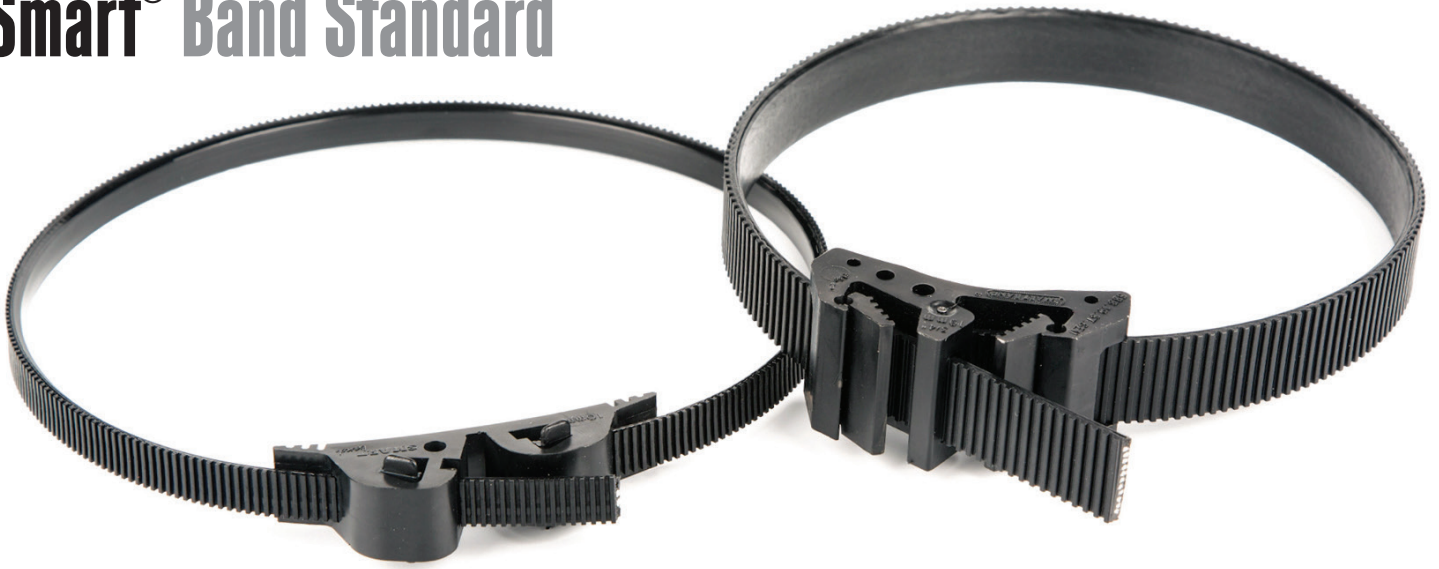
## Tool Options & Retention

System		Tool	Min System Retention*			Speed of Installation	Tool Type	Tension Control
Dimensions			N	kgf	lbf			
mm	in							
19	3/4	SM-FT-1000-19	3500	357	787	20 secs	Manual	Torque Wrench
		SM-FT-2000-19	3000	306	674	10 secs	Manual	Hand
		SM-FT-3000-19	4000	408	899	5 secs	Pneumatic	Air Regulator
32	1 1/4	SM-FT-1000-32	7000	714	1574	20 secs	Manual	Torque Wrench
		SM-FT-2000-32	3500	357	787	10 secs	Manual	Hand
		SM-FT-3000-32	9000	918	2023	5 secs	Pneumatic	Air Regulator

\*Values may be lower depending on materials chosen please refer to Technical Booklets for more information.

Note - Values may be lower depending on Buckle position, Material chose and Application Diameter. Please refer to the Technical Booklet for more information.

# Smart® Band Standard



The standard name denotes the simplicity of the buckle design, allowing for ease of use & application and presenting itself within HCL's product range as the general industry solution.

**Smart® Band Standard** is a non-metallic band and buckle system. Highly suited to lightweight applications such as temporary and permanent sign fixing and HVAC.

**Smart® Band Standard** system is available in a variety of materials, sizes and reel lengths. It offers long-life and non-corrosive properties, making it the ideal alternative to many high grade stainless steel strapping solutions.

## Key Features

- Strength up to 440kgf (969lbf)
- Non-corrosive
- Safe and easy to fit
- Long life materials
- Lightweight easy to use hand tools
- Highly suited for sign installation
- Non-conductive

<b>7mm (1/4 inch)</b>	<b>10mm (3/8 inch)</b>	<b>19mm (3/4 inch)</b>
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## Performance & Material

System			Max System Strength Measured on 600mm diameter		Min Diameter		Max Diameter		Max Temp Resistance*		Flammability*
Dimensions		Material	kgf	lbf	mm	in	mm	in	°C	°F	
mm	in										
7	1/4	PA66	90	197	100	3.94	600	24	125	257	HB
		PA12	TBC	TBC	100	3.94	600	24	100	212	
10	3/8	PA66	264	581	76	2.96	600	24	125	257	
10	3/8	PA12	127	280	76	2.96	600	24	100	212	
19	3/4	PA66	440	969	75	3.00	800	32	125	257	
		PA12	385	850	76	2.96	600	24	100	212	

\*Life expectancy is dependant on the working temperature. Refer to the Smart Products Technical Booklet for Downhole Use



## Dimensions, Part Numbers & Packaging

System				Band Dimensions						Buckle Dimensions			Buckle
Dimensions		HCL Part No		Width		Thickness		Band Reel Lengths		Height	Length	Width	Pack Qty
mm	in	Band	Buckle	mm	in	mm	in	m	ft	mm/in	mm/in	mm/in	
7	1/4	SB-BA-1/4	SB-BU-1/4-ST	6.9	0.27	2.6	0.1	30/225	100/820	19.2/0.76	76.0/2.99	15.1/0.59	100
10	3/8	SB-BA-3/8	SB-BU-3/8-ST	9.8	0.39	3.6	0.14	30/125	100/410	21.5/0.85	77.2/3.04	22.9/0.90	100
19	3/4	SB-BA-3/4	SB-BU-3/4-ST	19.2	0.76	3.6	0.14	30/60	100/200	28.3/1.11	63.8/2.51	30.2/1.19	50



## Tool Options & Retention

System			Min System Retention			Speed of Installation	Tool Type	Tension Control
Dimensions		Tool	N	kgf	lbf			
mm	in							
7	1/4	SM-TA-528A	200	20	45	10 secs	Manual	Hand
10	3/8	SM-TA-528A	750	77	169	10 secs	Manual	Hand
19	3/4	SM-FT-1000-19	1200	122	270	20 secs	Manual	Torque Wrench
		SM-FT-2000-19	1200	122	270	10 secs	Manual	Hand

# Smart<sup>®</sup> Tie



Smart<sup>®</sup> Tie incorporates the High Strength Tooth Feature of the Smart<sup>®</sup> Band Hybrid and Compact and creates the strongest Polymer Cable Tie in the World.

Smart<sup>®</sup> Tie is a patented heavy duty polymer tie wrap, able to withstand system loads in excess of 1200kgf.\* It has the advantage of being manufactured from a range of high temperature polymers, giving it superior chemical and temperature resistance up to 175°C\*.

Lightweight and very easy to use the Smart<sup>®</sup> Tie has become the ideal downhole cable tie solution and compatibility with the Smart<sup>®</sup> Protector provides a complete solution for many downhole applications. The Smart<sup>®</sup> Tie is also used widely in offshore applications such as Cable Protection and can be manufactured from long-life PA12.

\*Depending on material choice.

## Key Features

- High temperature resistance up to 175°C (347°F)
- High strength up to 1223kgf (2695lbf)
- Safe and very easy to fit
- High speed installation
- 100% recyclable
- Non-corrosive
- Long life materials
- Suitable for divers

<b>19mm (3/4 inch)</b>	<b>20mm (3/4 inch)</b>	<b>32mm (1 1/4 inch)</b>
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## Performance & Material

System			Max System Strength Tested on 100mm diameter		Min Diameter		Max Temp Resistance*		Flammability*	Gas Resistance	
Dimensions		Material	kgf	lbf	mm	in	°C	°F		CBM Coal Seam Gas	H <sub>2</sub> S Sour Gas
mm	in										
20	3/4	PA66	508	1119	60	2.36	125	257	V-2	?	?
		PK	603	1329	60	2.36	125	257	HB	Good	Good
		PA12	413	1119	60	2.36	100	212	HB	Fair	Fair
		PPS	512	1129	60	2.36	175	347	V-0	Very Good	Very Good
32	1 1/4	PK	949	2818	60	2.36	125	257	HB	Good	Good
		PA12	949	2092	60	2.36	100	212	HB	Fair	Fair
		PPS	1223	2695	60	2.36	175	347	V-0	Very Good	Very Good

\*Life expectancy is dependant on the working temperature. Refer to the Smart Products Technical Booklet for Downhole Use



## Dimensions, Part Numbers & Packaging

System			Band Dimensions									
Dimensions		HCL Part No	Maximum Length		Band Width		Band Thickness		Head Width		Head Height	
mm	in		mm	in	mm	in	mm	in	mm	in	mm	in
20	3/4	ST-20-450*	470.0	18.50	20.0	0.79	3.6	0.14	35.0	1.38	12.0	0.47
		ST-20-600	620.0	24.41								
		ST-20-750	770.0	30.31								
32	1 1/4	ST-32-550**	573.0	22.56	32.0	1.26	4.6	0.18	50.0	1.97	20.0	0.79
		ST-32-850	873.0	34.37								

\*Only available in PA66 material. \*\*Not available in PPS material.



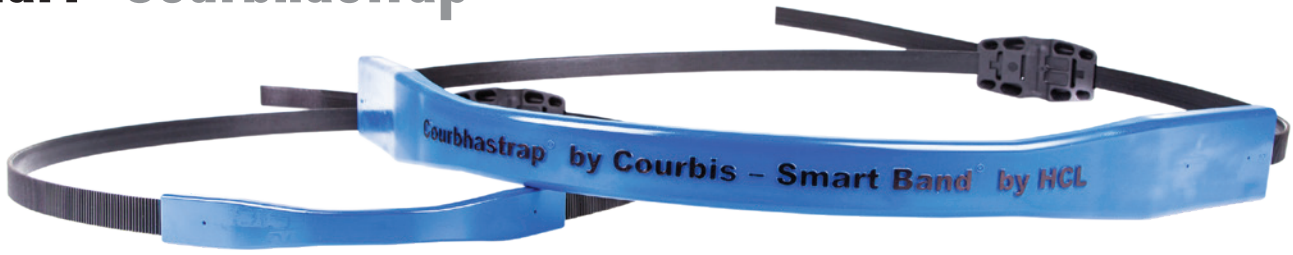
## Tool Options & Retention

System			Min Retention*			Speed of Installation	Tool Type	Tension Control
Dimensions		Tool	N	kgf	lbf			
mm	in							
20	3/4	SM-FT-1000-20ST	1500	153	337	20 secs	Manual	Torque Wrench
		SM-FT-2000-19	1500	153	337	10 secs	Manual	Hand
		SM-FT-3000-20ST	2500	255	562	5 secs	Pneumatic	Air Regulator
32	1 1/4	SM-FT-1000-32ST	4000	408	899	20 secs	Manual	Torque Wrench
		SM-FT-2000-32	3700	377	832	10 secs	Manual	Hand
		SM-FT-3000-32ST	4000	408	899	5 secs	Pneumatic	Air Regulator

\*Values may be lower depending on materials chosen please refer to Technical Booklets for more information.

Note - Values may be lower depending on Buckle position, Material chose and Application Diameter. Please refer to the Technical Booklet for more information.

# Smart® Courbhastrap



## The Problem

Ultra deep water projects are now using new coated pipe with 5 LSPP (five layer Syntatic Polypropylene) & C25 Silicon System. Deep water pressure causes the shrinkage of the coatings generating an OD reduction of up to 10%. The result is a loss in the tension of any bands attached.

## The Solution

In collaboration with Group Courbis of France HCL have developed the Courbhastrap. Designed to maintain tension over long life in applications where the diameter increases or decreases by up to 10% - Qualified by Technip - Total & Hereema for the Kaombo project.

# Smart® Saddles

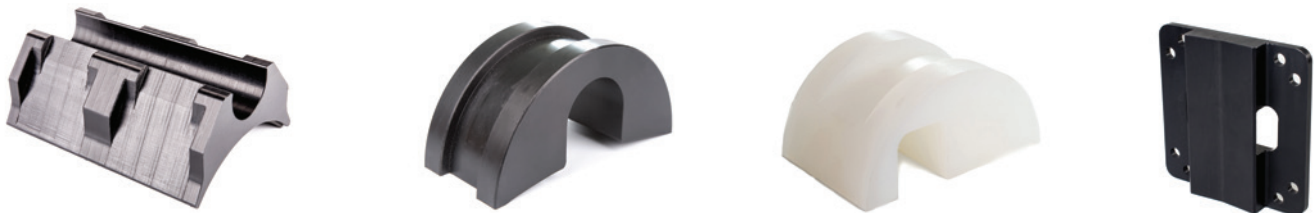


HCL have a dedicated team of highly qualified engineers on hand to work with the clients on special projects. HCL can design and supply PU Casted, PP injection moulded or machined parts which work in conjunction with the **Smart®** Range specifically the **Smart® Band & Smart® Ties**. HCL also has an In-House Tool Shop to enable a quick response to client inquiries and delivery of a complete package including ties & saddles. These saddles are often referred to as Piggyback saddles and generally used in the attachment of Cables to Offshore or Subsea Structures such as Risers, Pipes or Oil Rigs.

## Polyurethane Cast Saddles



## Machined Saddles



## Injection Moulded Saddles



Style	Materials	Volume	Cost	Lead time
Cast	PU	10-500	££	Short
Machined	HDPE	1-50	££	Medium
Moulded	PA66, PPS, PA12	500+	£	Long

# Smart® Protector



A range of polymer cable protectors for use in Downhole, subsea and flow line applications.

<b>SP-100</b>	<b>SP-100-2</b>	<b>SP-200</b>	<b>SP-300</b>
<b>SP-400-3820</b>	<b>SP-400-5228</b>	<b>SP-500-1721</b>	<b>SP-500-3338</b>

The **Smart® Protector** is a patented product developed in co-operation with Shell. It is designed to operate within restricted annular clearances, to accommodate various tubing diameters, all coupling types and most cable combinations.

The **Smart® Protector** is not only used as a cable protector downhole it can be used to protect & attach cables in many other situations in conjunction with either the **Smart® Band** or **Smart® Tie**. One of the most successful applications is the attachment of Cathodic protection cables to Marine structures.

## Key Features

- High temperature resistance up to 175°C (347°F)
- Fits any tubing diameter or coupling length
- Can be used for multi-line installations
- Prevents cable snagging
- Low profile and low friction coefficient
- Available for many different cable configurations
- Will not hang in BOP stack
- Easy to mill



## Cable Configurations & Dimensions

Part	Cable Configuration/Options	Strapping Compatibility		Height	Length	Width
		20mm/¾ inch	32mm/1¼ inch	mm/in	mm/in	mm/in
SP-100	1 x ¼ inch control line 1 x ½ inch control line 1 x 2mm fibre optic	Yes	No	19.5/0.77	75.5/2.97	25.0/0.98
SP-100-2	2 x ¼ inch control line	Yes	Yes	22.0/0.87	104.0/4.09	25.0/0.98
SP-200	1 x 11mm square or round encapsulated line	Yes	Yes	24.9/0.98	114.0/4.49	25.0/0.98
SP-200-3/8	1 x 10mm square or round encapsulated line	Yes	Yes	24.9/0.98	114.0/4.49	25.0/0.98
SP-300	1 or 2 x 11mm square or round encapsulated line 1 or 2 x ¼ inch control lines	Yes	Yes	27.9/1.10	159.6/6.28	46.2/1.82
SP-400-3820	Flat Packs & Flat ESP Cables up to 38mm width & 20mm height	Yes	Yes	32.5/1.28	160.0/6.30	46.2/1.82
SP-400-5228	Flat Packs & Flat ESP Cables up to 52mm width & 28mm height	Yes	Yes	41.5/1.63	159.6/6.28	62.6/2.46
SP-500-1721	Round Cables between 17mm to 21mm Diameter	Yes	Yes	34.9/1.37	122.9/4.84	33.8/1.33
SP-500-3338	Round Cables between 33mm to 38mm Diameter	Yes	Yes	56.2/2.19	181.0/7.13	55.7/2.19



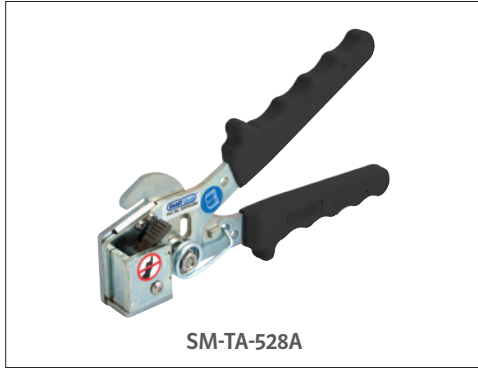
## Performance & Material

Material	Max Temp*		Longevity*	Gas Resistance		Rotational Load	Crush Load
	°C	°F		CBM Coal Seam Gas	H <sub>2</sub> S Sour Gas		
PK	125	257	Long term		Good	50	2000
PA12	100	212	Long term	Fair	Fair		
PPS	175	347	Long term	Very Good	Very Good		
PA66	125	257	Long term	?	?		

\*Life expectancy is dependant on the working temperature. Refer to the Smart Products Technical Booklet for Downhole Use.



# Smart® Installation Tools



SM-TA-528A



SM-FT-1000



SM-FT-2000-19



SM-FT-2000-32



SM-FT-3000



SM-FT-3000-AIRSET

HCL provide a complete range of highly engineered Installation Tools.

**SM-TA-528A**

**SM-FT-1000**

**SM-FT-2000**

**SM-FT-3000**

HCL has developed a range of tooling suitable for the installation of its range of **Smart® Band** and **Smart® Ties**.

- a. **SM-TA-528A** - Lightweight and easy to use, the 528A tool is a manual tool for the smaller Standard systems
- b. **SM-FT-1000** - A highly specified manual tool which can incorporate the addition of a torque wrench to enable consistent tightening to a set tension
- c. **SM-FT-2000** - The divers choice. Loved for its exceptional ease of use and its ability to provide high retention forces
- d. **SM-FT-3000** - Exceptionally fast, the 3000 tool has been designed to enable installation of **Smart® Bands** and **Smart® Ties** in under 5 seconds

## Tool Options

Tool	Part Number	System Compatibility				Tool Weight		Speed of Installation	Control Type
		System		Product	Buckle	kg	lb		
		mm	in						
528A	SM-TA-528A	7	¼	Smart® Band	Standard	0.43	0.95	10 secs	Manual
		10	⅜	Smart® Band	Standard				
1000	SM-FT-1000-19	19	¾	Smart® Band	Standard & Hybrid	2.75	6.06	20 secs	Manual with Torque capability
	SM-FT-1000-20ST	20	¾	Smart® Tie					
	SM-FT-1000-32	32	1¼	Smart® Band	Hybrid & Compact				
	SM-FT-1000-32ST	32	1¼	Smart® Tie					
2000	SM-FT-2000-19	19	¾	Smart® Band	Standard & Hybrid	0.75	1.65	10 secs	Manual
		Smart® Tie							
	SM-FT-2000-32	32	1¼	Smart® Band	Hybrid & Compact	1.33	2.93		
		Smart® Tie							
3000	SM-FT-3000-19	19	¾	Smart® Band	Standard & Hybrid	6.40	14.11	5 secs	Pneumatic Tightening & Cutting
	SM-FT-3000-20ST	20	¾	Smart® Tie					
	SM-FT-3000-32	32	1¼	Smart® Band	Hybrid & Compact	7.50	16.53		
	SM-FT-3000-32ST	32	1¼	Smart® Tie					

# Smart<sup>®</sup> Product Applications

## Piggyback Pipelay



There are numerous requirements for piggyback pipe lay including the attachment of Fibre Optic, Methanol and DEH lines (Direct Electrical Heating). Smart<sup>®</sup> Band is an ideal solution for attachment in conjunction with piggyback clamps of the piggyback line to the main pipeline.

## Cable, Riser & Flowline Protection



The installation of Subsea Cables is widespread. A key issue in this area is cable protection. HCL works alongside Half Shell Cable protection providers to provide a complete solution to the client. The Smart<sup>®</sup> Band is ideal for such applications offering good impact and abrasion resistance alongside its usual features of high strength, long life and price competitiveness.

## Flotation and Buoyancy



Smart<sup>®</sup> Band is being increasingly utilised on risers and flowlines for clamping buoyancy and flotation products. Offering High Strength and excellent Elastic and Hydrostatic Compression characteristics the Smart<sup>®</sup> Band works with the buoyancy products to provide excellent long term retention.

## VIV Strakes



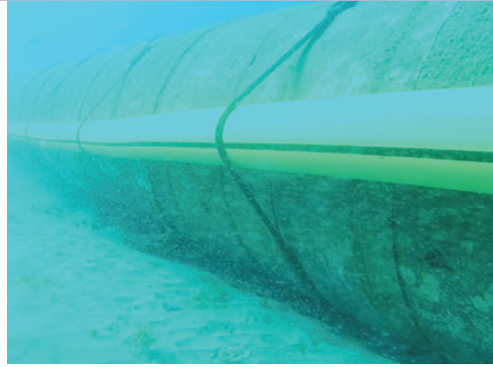
Smart<sup>®</sup> Band is an ideal clamping solution for Strakes to risers and in particular in the deepwater environment. In these areas the Elasticity of the band and the excellent Hydrostatic Compression data become increasingly important. Specifically any applications where there is a susceptibility to compression.

## Wind Farms



Attaching cables or brackets to the main structure of a Wind Farm can be expensive and fraught with difficulty. The ease of installation and the non-corrosive nature of the Smart<sup>®</sup> Band makes it an ideal solution for this application and it has been installed successfully in many projects worldwide.

One of the most common applications for Smart® Band offshore is subsea/offshore attachment of all sorts of cables and umbilicals. In many cases Smart® Band is the ideal solution. It's safe and easy to fit and because it has no sharp edges to damage the cables etc. We have an extensive track record in this area.



## Cable Attachment

Sensor attachment is a common application offshore and subsea as companies attempt to identify patterns and record data. Smart® Band and Smart® Tie have both been extensively utilised in this area.



## Sensor Attachment

Attaching corrosion protective Jackets to Jetty Piles has been one of the most successful applications for the Smart® Band and in terms of strapping has become the number 1 solution in this application. Key benefits are the corrosion resistance, ease of use, competitive pricing and also Smart® Band is not easily recyclable therefore will not get stolen from the Jettys once installed.



## Pile Protection

Downhole is a very specific and aggressive application and attaching cables downhole often can often be a headache. The Smart® Tie is being increasingly utilised in this area replacing standard metal solutions which often causes significant disruption when they fail and fall to the bottom of the well.



## Downhole

The uses for Smart® Band & Smart® Tie offshore and onshore are simply endless. Wherever something needs to be attached these products can often be used. Sign Fixing and other applications within the Utilities industry often utilise the Smart® Products on the basis of ease of fitting and Non-conductive characteristic.



## Other Applications



Visit [www.hclfasteners.com](http://www.hclfasteners.com) to view our complete range of products.

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