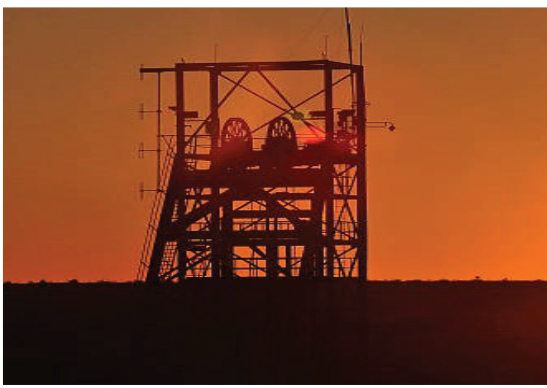


Carl Hamm

Pipes | Pumps | Solutions



HCL
CLAMPS



Smart[®] Products



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



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 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 200mm 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 200mm.

32mm (1¼ inch)



Performance & Material

System		Material	Max System Strength		Min Diameter		Max Temp Resistance*		Flammability*
Dimensions			kgf	lbf	mm	in	°C	°F	
mm	in								
32	1¼	PA12GF	2689	5929	200	8	100	212	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		Width		Thickness		Supplied	Height	Length	Width		
mm	in	mm	in	mm	in		mm/in	mm/in	mm/in		
32	1¼	SB-COM-32-PA12GF-?M		32.2	1.27	4.7	0.19	In pre-cut lengths	30.0/1.18	55.2/2.17	51.1/2.01



Tool Options & Retention

System		Min System Retention*			Speed of Installation	Tool Type	Tension Control			
Dimensions		N	kgf	lbf						
mm	in	Tool								
32	1¼	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.

Key Features

- 60% reduction in buckle size over 32mm Hybrid
- Improved minimum diameter of 200mm over 32mm Hybrid
- Increase in system strength of 345kgf over the 32mm Hybrid

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 2344kgf (5166lbf)
- Long-life materials
- Safe and easy to fit
- High speed installation
- High retention force - above 918kgf (1798lbf)
- Suitable for divers

19mm (3/4 inch)

32mm (1 1/4 inch)



Performance & Material

Dimensions		Material	Max System Strength		Min Diameter		Max Temp Resistance*		Flammability*
mm	in		kgf	lbf	mm	in	°C	°F	
19	3/4	PA12GF	1321	2911	200	4	100	212	HB
19	3/4	POM	1017	2238	200	4	95	203	HB
32	1 1/4	PA12GF	2344	5166	400	8	100	212	HB

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



Dimensions, Part Numbers & Packaging

Dimensions		HCL Part No		Width		Thickness		Band Reel Lengths*		Height	Length	Width	Buckle
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

Dimensions		Tool	Min System Retention*			Speed of Installation	Tool Type	Tension Control
mm	in		N	kgf	lbf			
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.

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.

7mm (1/4 inch)

10mm (3/8 inch)

19mm (3/4 inch)



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 264kgf (581lbf)
- Non-corrosive
- Safe and easy to fit
- Long life materials
- Lightweight easy to use hand tools
- Highly suited for temporary sign installation



Performance & Material

System			Max System Strength		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	260	V-2
10	3/8	PA66	264	581	76	2.96	600	24	125	260	V-2
10	3/8	PA12	127	280	76	2.96	600	24	100	212	HB
19	3/4	PA66	440	969	75	3.00	800	32	125	260	V-2

* 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	30/250	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	22.9/0.9	100
19	3/4	SB-BA-3/4	SB-BU-3/4-ST	19.0	0.75	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[®] Tie



Smart[®] Tie incorporates the High Strength Tooth Feature of the Smart[®] Band Hybrid and Compact and creates the strongest Polymer Cable Tie in the World.

Smart[®] 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[®] Tie has become the ideal downhole cable tie solution and compatibility with the Smart[®] Protector provides a complete solution for many down-hole applications. The Smart[®] 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

19mm (3/4 inch)

20mm (3/4 inch)

32mm (1 1/4 inch)



Performance & Material

System			Max System Strength		Min Diameter		Max Temp Resistance*		Flammability*	Gas Resistance	
Dimensions		Material	kgf	lbf	mm	in	°C	°F		CBM Coal Seam Gas	H ₂ S Sour Gas
mm	in										
19	3/4	PA66	513	1128	60	2.36	125	260	V-2	?	?
20	3/4	PK	565	1220	60	2.36	125	257	HB	Good	Good
		PA12	414	911	60	2.36	100	212	HB	Fair	Fair
		PPS	514	1130	60	2.36	175	347	V-0	Very Good	Very Good
32	1 1/4	PK	1270	2800	60	2.36	125	257	HB	Good	Good
		PA12	984	2169	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-20-600	620.0	24.41	20	0.79	3.6/0.14	35.0/1.38	12.0/0.47
		ST-20-750	770.0	30.31					
32	1 1/4	ST-32-550	573.0	22.56	32	1.26	4.6/0.18	50.0/1.97	20.0/0.79
		ST-32-850	873.0	34.37					



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	1500	153	337	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.

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	Voilume	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.

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 250°C (482°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

SP-100	SP-100-2	SP-200	SP-300
SP-400-3820	SP-400-5228	SP-500-1721	SP-500-3338



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	21.6/0.85	25.7/0.99	104.2/4.10
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-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	160.0/6.30	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	160.0/6.30	62.6/2.46
SP-500-1721	Round Cables between 17mm to 21mm Diameter	Yes	Yes	35.0/1.38	122.7/4.83	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

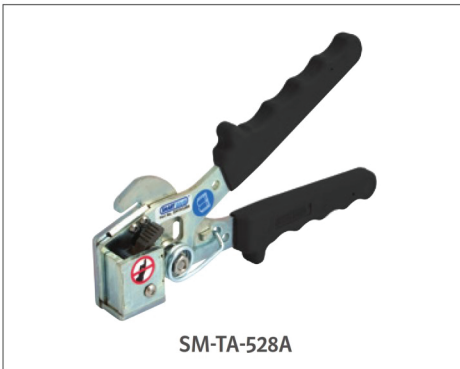


Performance & Material

Material	Max Temp*		Longevity*	Gas Resistance		Rotational Load	Crush Load
	°C	°F		CBM Coal Seam Gas	H ₂ S Sour Gas	kgf	kgf
PK	125	257	Long term				
PA12	100	212	Long term	Fair	Fair	50	2000
PPS	175	347	Long term	Very Good	Very Good		
PEEK	250	482	Long term	Excellent	Excellent		

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

Smart® Installation Tools



To enable the installation of the Smart® Band and Smart® Tie HCL had to design and manufacture a range of specific installation tools.

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

SM-TA-528A

SM-FT-1000

SM-FT-2000

SM-FT-3000

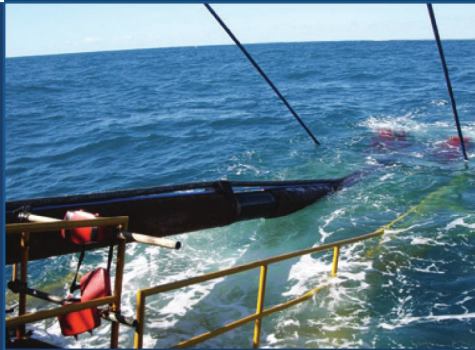
Tool Options

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	¾	Smart® Band	Standard				
1000	SM-FT-1000-19	19	¾	Smart® Band	Standard & Hybrid	2.79	6.14	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
		20	¾	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	14.08	5 secs	Pneumatic Tightening & Cutting
	SM-FT-3000-20ST	20	¾	Smart® Tie		7.50	16.50		
	SM-FT-3000-32	32	1¼	Smart® Band	Hybrid & Compact				
	SM-FT-3000-32ST	32	1¼	Smart® Tie					



Smart® Product Applications

Piggyback Pipelay



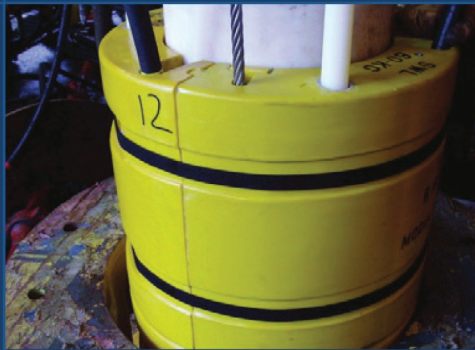
There are numerous requirements for piggyback pipe lay including the attachment of Fibre Optic, Methanol and DEH lines (Direct Electrical Heating). Smart® Band is an ideal solution for attachment in conjunction with piggyback clamps of the piggyback line to the main pipeline.

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® 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® 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® Band works with the buoyancy products to provide excellent long term retention.

VIV Strakes



Smart® 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



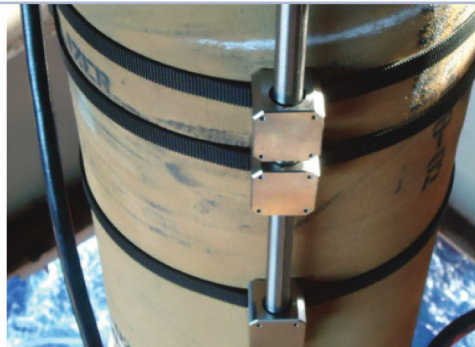
Attaching cables or brackets to the main structure of a Wind Farm can be expensive and fraught with difficulty. The ease of installation and the non-corrosive nature of the Smart® Band makes it an ideal solution for this application and it has been installed successfully in many projects worldwide.

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 and Smart® Tie offshore and subsea are simply endless. Wherever something needs to be attached then these products can often be used.



Other Applications



Carl Hamm

Pipes | Pumps | Solutions

Competence, experience, innovative thinking, modern manufacturing plants and motivated employees form the basis of our services.

With the flexibility of a modern, medium-sized company and the experience of our over 90-year history, we are well equipped to meet the requirements of the future.

The numerous certifications and technical approvals of course ensure that we serve our customers with the highest quality standards through the complete project phases.

Our product range focuses on water, waste water and power industries, tunnel construction and well sinking as well as open-pit and underground mining.

We as a competent partner ensure an added value for the specific customer needs: from the conceptual planning to professional production and punctual delivery.



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