

spit

2019
2020



NEVER STOP BUILDING

PULSA 800E
PULSA 800P
PULSA 800P+
SPITFIRE P370
SPITFIRE P560

TECHNICAL GUIDE
GAS TOOLS | POWDER ACTUATED TOOLS

Foreword

More than 65 years after the launch of Powder Actuated Tools, **SPIT Gas & Powder Nailing Systems** continue to increase their market share across Europe's construction jobsites.

With strong brand recognition **SPIT Gas & Powder Nailing Solutions** offer significant technical and financial advantages to construction companies of any size:

→ TECHNICAL ADVANTAGES

SPIT Nailing Systems offer a user friendly, fast and reliable cordless solution for a variety of fixing requirements. The recent '**One Step Solution**' innovation has provided SPIT customers with a unique way to fasten a variety of accessories and consumables into steel and concrete that is up to 8 times faster than traditional plug and screw methods.

→ FINANCIAL ADVANTAGES

By being close to its customers SPIT has been able to benefit from a sound understanding of their customers' needs and requirements. This understanding has enabled SPIT to develop a complete range of products designed specifically to help contractors increase on site productivity and, in turn save significant time and money on any job.

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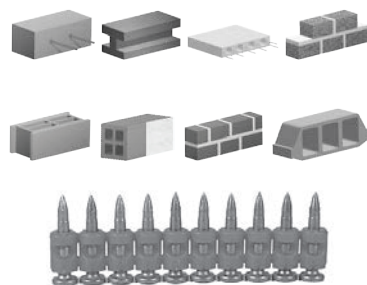
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GAS Tool

With its own internal combustion engine, Pulsa fastens cable management, wiring accessories and drywall track up to eight times faster than any other system.

You must read, understand, and strictly comply with instruction manual.

PRINCIPLE



Train the operator



Use the tool designed
for your application
Electrician: P800E
Drywall: P800P
P800P+



Fully
automatic
tool using
fuel energy

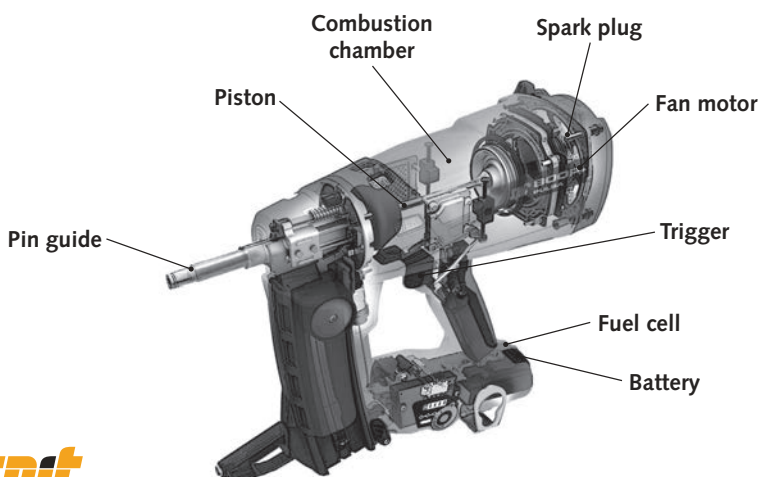


Select the correct pin depends on
the base material

FEATURES

- Fuel injection carried out by an electro valve and an electronic chip (fully automatic tool).
- Pins are delivered in 10 pins strips.
Each fuel cell allows up to 750 pins at 20 °C (for P800E et P800P) or 600 pins at 20 °C (for P800P+).
- Battery: high autonomy. Capacity up to 3000 pins. Rechargeable battery (time: 90 min).
- Energy from 82 Joules to 100 Joules (for P800P+).
- Telescopic pin guide 5 kg actuation force: little effort required when fixing overhead, particularly for ceiling applications (the majority of powder actuated nailing tools required approximately 15 kg actuation force).
- Full range PULSA accessories for electrician application.
- Small edge distance (cf p. 17).
- Working with extreme temperature: -15 °C ; +49 °C.
- 20 or 50 pins magazine.
- Low recoil vibration.
- CE marking.
- Low and easy maintenance.
- Well adapted to low strength material (masonries).

FUNCTIONING PRINCIPLE FOR GAS TOOL



PULSA is powered by easily replaceable fuel cells. Each time the nose of the tool is depressed a metered amount of air and fuel gas mixture is injected into the combustion chamber where it is ignited by a spark when the trigger is pressed.

GAS Tool

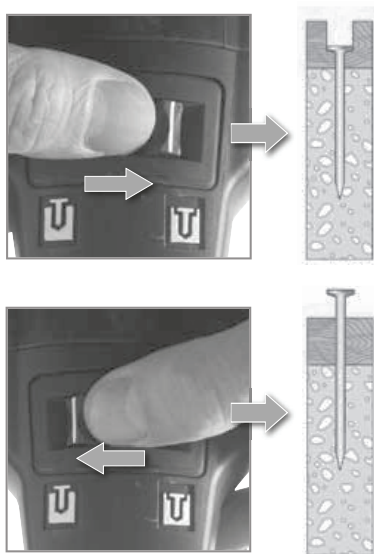
CONTACT PRESSURE SAFETY

2 conditions to obtain percussion, in order:

- 1 - Press the tool against the working surface
 - 2 - Press the trigger
- > Sequential shot

PIN PENETRATION

The tool automatically absorbs excess of power to suit the supporting material. However, certain applications may require the pin to penetrate deeper into the base material or penetrate less.



The minimum and maximum penetration is adjusted by using a button on the front of the tool.

To ensure successful nailing of wiring and cable management accessories, it is recommended that the tool is set to the minimum drive position. Failure to do so could result in cracking or breaking of accessories and PVC-U trunking.

Fuel cartridge

Fuel cartridge contains butene propene. The pressure is 12 bars. The safety data sheet is available on request.

BEST BEFORE DATE

The usage limit date is affixed to the fuel cell, after this date, the performance could be affected.

STORAGE CONDITIONS

- Storage temperature: +5 to +25°C.
- Protect from direct sunlight.
- Use and keep in well ventilated area.
- Keep out of reach of children.

OPERATING CONDITIONS

- Do not expose to temperatures exceeding 50 °C.
- Its contents are extremely flammable. Keep away from any heat sources and from electrostatic charges.

Powder Actuated tool (PAT)

You must read, understand, and strictly comply with instruction manual.

PRINCIPLE



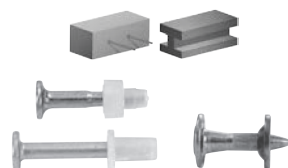
Train the operator



Use the tool designed for your application



Select the correct cartridge to adapt the power to the type of fixing

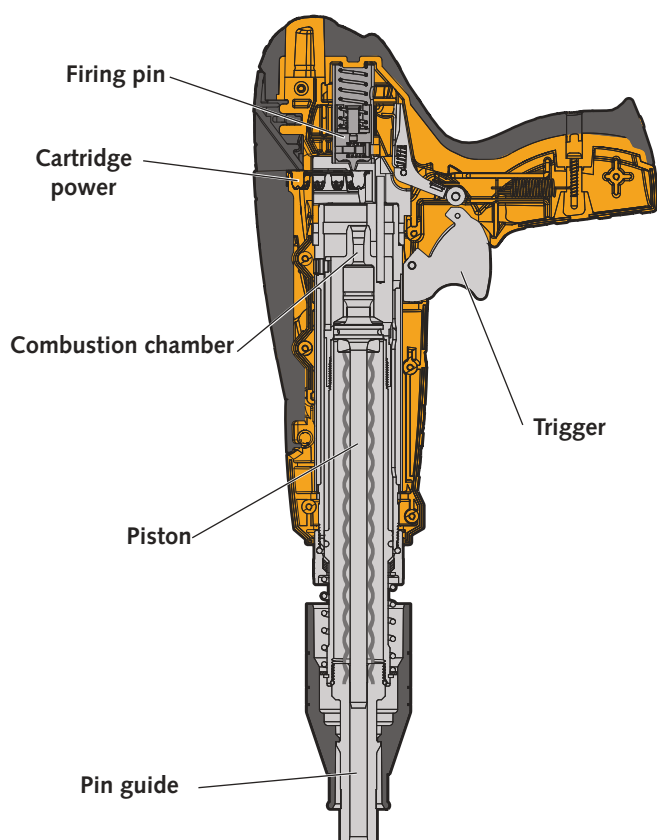


Select the correct pin to suit fixture and base material

FEATURES

- Safety use
- Instant fixing
- High fixing rate
- Self contained
- Energy from 350 to 520 Joules
- Mechanical power adjustment on P370
- Large consumable range (maximum pin length 90 mm)
- All weather condition
- Easy and low maintenance (see notice)

FUNCTIONING PRINCIPLE FOR SPIT POWDER ACTUATED TOOLS



2 conditions to obtain percussion, in order:

- 1 - Press the tool against the working surface
- 2 - Press the trigger

The SPIT Powder Actuated Tools used the indirect firing system, this means that a piston is positioned between the fastener and the propellant charge, to reduce the speed of the pin.

The SPIT powder-actuated fastening tools employ the well-proven piston principle. Pulling the trigger causes ignition of the propellant and the energy it releases is then transferred to the piston.

The energy from the propellant charge transferred into combustion chamber on the piston. The accelerated mass of which drives the pin into the base material at a much lower velocity.



It is essential that the safety instructions, operating conditions (safety guide included in each toolbox) are strictly adhered to.



All SPIT tools are CE marked: CE2006/42 EN15895.



The cartridge can only be fired if the tool is fully depressed and contact pressure is maintained hard up against the support material.



The cartridge cannot be fired even if the trigger is pulled prior to positioning the tool and taking up the full contact pressure. (CI Requirements).



The trigger is locked in place when the tool is not in use. It cannot be fired unless the tool is in the full down-hand position. The trigger safety function will not permit the tool to be fired if the support material is not rigid enough (except P370 tool).



The cartridge disc is totally enclosed within the tool.



When the tool is loaded it is easy to verify the presence of the cartridge disc.

Powder Actuated tool (PAT)

PRINCIPLE OF POWDER ADJUSTMENT

Procedure: 1 - Choose the pin length (see p.13)
2 - Choose the lowest cartridge power
3 - Adjust mechanically the tool power

Always start by using the lowest possible cartridge and the lowest possible setting.

CARTRIDGE POWER

The wide range of cartridge types allows successful fixing to a variety of base materials.

To maintain reliability and reduce operator fatigue, use the lowest level of power to achieve an acceptable fix.

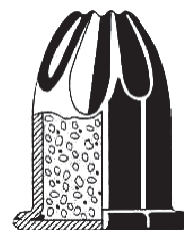
Pins are fired into the support by an explosive cartridge. To cover this range of applications, the SPIT range of cartridges is specifically calibrated to meet specific needs (2 calibers and 6 levels).

→ Caliber 6.3/10

→ Caliber 6.3/16



0080-P1.13.0086



The cartridge power is identified by an international colour code within each calibre:

Brown, Green, Yellow, Blue, Red, Black.

Caliber power	Low → Medium ← High						Mechanical adjustment
Caliber type	Brown	Green	Yellow	Blue	Red	Black/Purple	
International Code	2	3	4	5	6	7	
SPITFIRE P370	6.3/10	6.3/10	6.3/10		6.3/10		Yes
SPITFIRE P560			6.3/16	6.3/16	6.3/16	6.3/16	No

MECHANICAL POWER ADJUSTMENT

P370 is equipped with following mechanical system: combustion chamber fume exhausts adjustment by knurled wheel, to allow flexibility to the end user with a same type of cartridge changing the tool power.



Field of use

INTO A STEEL MEMBER

As the pin penetrates into the steel, it compresses the support material. The elasticity of the steel is what holds the pin firmly in place. The knurling on the pin further enhances this effect.

Construction grade steel is an excellent base material for reliable powder and gas tool.

Penetration depth depends on the strength steel quality and the thickness of the base material.

For each product, product data sheet gives the application field.

The principle steels suitable are:

(1)	E24	E28	E36	A60	(1) French designation
(2)	ST37	ST44	ST52	ST60	(2) German designation
(3)	S235	S275	S355	E335	(3) European standard NF EN 10027-1

Minimum ultimate tensile strength of steel base material (N/mm²)

350	400	500	550	600	700	f _{uk} (N/mm ²)
-----	-----	-----	-----	-----	-----	--------------------------------------

INTO CONCRETE BASE MATERIAL

As the pin penetrates into concrete, the pin displaces soft components such as cement, stone, and aggregates and heats up to as much as 900°C. This sinters the surface of the pin shank which becomes extremely rough.

A specific heat treatment increases SPIT pin resistance to shearing.

Three factors affect the suitability:

- Compressive strength of the concrete
- Age of the concrete
- Aggregate hardness, size, form and percentage

For information, the table below gives the correlation between characteristic values and average strength on cylindrical and cubic specimens in Mpa.

Classes	Characteristic strength f _{ck}		Average strength		
	cylinder 16 x 32 cm	Cube 15 x 15 x 15 cm	cylinder (f _{cm}) 16 x 32 cm	Cube 15 x 15 x 15 cm	Cube 20 x 20 x 20 cm
C 16/20	16	20	20	25	24
C 20/25	20	25	25	31	29
C 25/30	25	30	30	37	36
C 30/37	30	37	37	46	43
C 35/45	35	45	45	56	53
C 40/50	40	50	50	62	59
C 45/55	45	55	55	69	65
C 50/60	50	60	60	72	68

Prestressed concrete / concrete beam slab

Over 90 days curing time, some concrete beam slab could reach 80 Mpa.

INTO OTHER BASE MATERIAL (only with gas nailing and after jobsite test)



Solid brick



Hollow concrete block
R_c = 6.5 N/mm²



Engineer clay brick rendered
R_c = 14.5 N/mm²



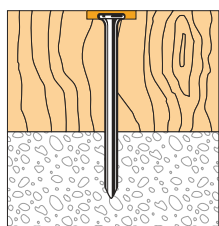
Calcium silicate block
R_c = 16 N/mm²

Suitable base material

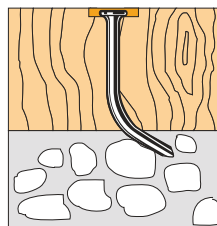
<div><div></div>Suitable</div> <div><div></div>Verify the using limit on technical sheet or check by site suitability tests</div>	Tools	Steel ultimate strength < 500 N/mm²	Steel ultimate strength 500 to 680 N/mm²	Concrete C20/25 up to C25/30	Concrete C30/37 up to C40/50	- Hard concrete ≥ C50/60 Concrete beam slab	Solid brick	Hollow concrete block	Engineer clay brick rendered	Calcium silicate block	Asphalte	Wood
Pins designation												
GAS Solutions												
SPIT C6	PULSA 800											
SPIT HC6	PULSA 800											
SPIT CG6	PULSA 800											
SPIT HCG6	PULSA 800											
SPIT CW6	PULSA 800											
SPIT IF	PULSA Insulfast											
PAT Solutions												
SPIT HSB14 SPIT HSRB14 strip (P560)	P560											
SPIT SBR9	P370											
SPIT SC9 SPIT SC9 strip	P370											
SPIT C9 SPIT C9 strip SPIT CR9	P370											
SPIT CR9TP CR9P	P370											
SPIT C9 for shuttering spacer	P370											
SPIT C9 formwork spacer	P370											
SPIT SA12-8	P370											
SPIT CI6	P370											

Success rate in concrete

When the aggregate hardness is lower then fasteners will go into the aggregate, if it's hard, the fastener will deflect.



SOFT aggregate types



HARD aggregate types

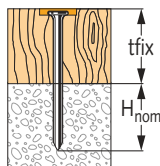
Using in ceiling position or in floor direction:

In case of overhead fastening the density of aggregates is more important on the under part of the slab because of the aggregates migration during concrete pouring. This phenomenon involves that the rejection factor will be more important for firing in ceiling. The pin suitable for this kind of application is the HC6 range.

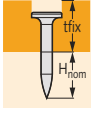
PIN LENGTH SELECTION

The choice of the pin length is linked to the embedment depth of the pin in the base material. The embedment depths depends on the compressive strength of the concrete, or the ultimate limit strength of the steel, and whatever the thickness of the base material.

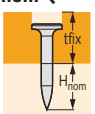
So, **Total pin L = $H_{nom} + t_{fix}$**



→ In **concrete base material**, the table below gives an information of the minimum embedment depth related to concrete compressive strength:

 H_{nom} (mm)		H_{nom} (mm)⁽¹⁾		
		C9 / SC9	C6	HC6
	C16/20	30 – 35	25 – 28	25 – 28
	C20/25	25 – 30	20 – 22	20 – 22
	C25/30	25 – 28	15 – 20	15 – 20
	C30/37	20 – 25	15 – 18	15 – 18
	C40/50	15 – 20		13 – 16
	C50/60	15 – 20		12 – 15

→ In **steel base material**, the table below gives an information of the minimum embedment depth related to the ultimate limit strength of the steel:

 H_{nom} (mm)		H_{nom} (mm)⁽¹⁾	
		SC9	HC6
	$f_{uk} = 350 \text{ N/mm}^2$	12	6.5
	$f_{uk} = 500 \text{ N/mm}^2$	10	

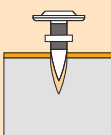
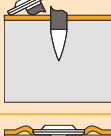
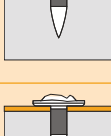
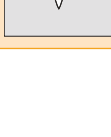
f_{uk} : ultimate strength

⁽¹⁾ All figures given are to be used as a guide and a job site suitability tests is always recommended.

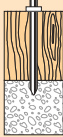
Trouble shooting

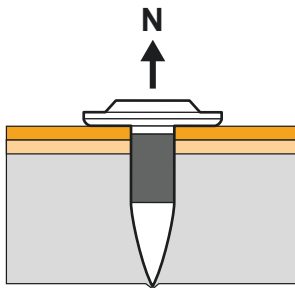
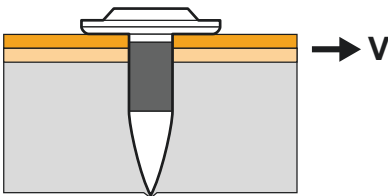
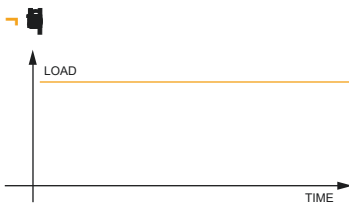
All visible failures must be replaced

FIXINGS TO STEEL

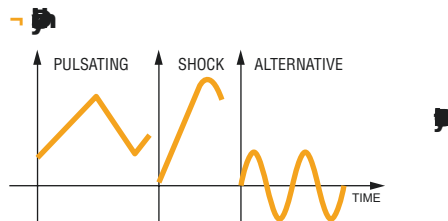
Pin is not deep enough in the steel		Too less power Base material too hard	Use stronger cartridge if possible More power Use high performance pins
Pin does not stick to the steel		Base material not thick enough (minimum thickness: 5 mm)	If thickness > 5mm: decrease power adjustment or cartridge. Check pin selection
Pin breaks		Too much power Base material too hard Pin too long	Use weaker cartridge or decrease power setting Use shorter pin Check tool piston wear
Pin head damages the material to be fixed		Too much power	Use weaker cartridge Less power
Hurt pin head		Too much power Damage piston	Decrease tool power setting Use weaker cartridge Change piston

FIXINGS TO CONCRETE

Pin too deep		Pin too short Too much power Depth adjustment incorrect (GAS)	Use longer pin Less power (PAT) Use weaker cartridge (PAT) Decrease depth adjustment (GAS)
Pin not deep enough		Pin too long Too less power Depth adjustment incorrect (GAS)	Use shorter pin More power (PAT) Use stronger cartridge (PAT) Increase depth adjustment (GAS)
Pin is bent		Hard and/or big supplementaries in the concrete Rebar directly under the surface Hard surface (steel)	Use shorter pin Use stronger cartridge Check perpendicularity shooting
Concrete flakes off		Prestressed concrete Hard and/or big supplementaries in the concrete Old concrete	Use shorter pin
Hurt pin head		Too much power Damaged piston	Less power Use weaker cartridge Change piston



The static or quasi-static loads are dead loads of the element fixed, permanent and variable actions as wind, snow...



The dynamic loads are variable actions in time with a medium or high amplitude. For example, motor vibration, regular shock...
Some dynamic loads could be considered as quasi-static loads (wind...).



The same fastener will behave differently if fixed into concrete than if fixed into steel.



- For concrete,
 - concrete strength
 - aggregate size and hardness
- For steel,
 - Steel tensile strength
 - Steel thickness



Thin or weak items may be pulled over the fastener.

Firing through thick or strong parts may absorb driving energy.



As the penetration depth increases, so does pullout resistance. The recommended penetration depth depends on the fastener shank length chosen.

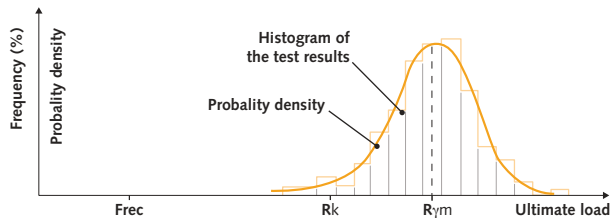


The recommended resistance can be achieved at the minimum dimensions for spacing (S_{min}), and edge distance given in the data sheet.

Resistance

CHARACTERISTIC RESISTANCE

The characteristic resistance is calculated from the average value of the mean failure load. It corresponds to the 5%-fractile of failure loads for the level of confidence (90%). The estimation depends on number of tests and the variation coefficient of tests.



DESIGN, RECOMMENDED RESISTANCE AND SAFETY FACTORS

Out of the characteristic loads, the safety factors are then applied to give the design resistance (using partial safety factor) and recommended resistance (using global safety factor).

The global safety factor takes account of both the uncertainty of applied load and of resistance.

The global safety factor are slowly being replaced by partial safety factor which allow the two uncertainties to be treated separately.

S: Action

F_{rk} : characteristic resistance

γ_M : partial safety factor for resistance

F_{rd} : Design resistance

γ_F : partial safety factor for action

F_{rec} : recommended resistance

$\nu = \gamma_M \cdot \gamma_F$: global safety factor

Design resistance

$$F_{Rd} = \frac{F_{Rk}}{\gamma_M} \geq S \cdot \gamma_F$$

Recommended resistance

$$F_{Rec} = \frac{F_{Rk}}{\nu} \geq S$$

FIXING TO STEEL

Static tests are performed on all SPIT fasteners, and the mean ultimate resistance obtained are used to calculate the characteristic resistance.

So, typically, the following global safety factors are applied: $\nu \geq 2.5$.

For HSBR14, the cycle test program is carried out on these fasteners, so the following global safety factors must be applied: $\nu \geq 2$.

FIXING TO CONCRETE

Hard aggregates, in concrete may result a failed installation. The proportion of failed installation to successful ones increase with concrete compressive strength and maximum aggregate size.

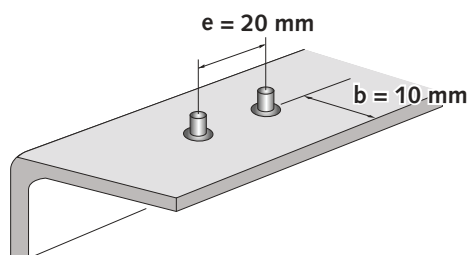
As a result, we recommend to use the individual resistance of one fastener to design the application, but with condition that at least 5 fixings are used to fix each part into concrete. So the following global safety factors must be applied: $\nu \geq 3$.

Edge and spacing distance recommendation

Distance recommendations with GAS technology

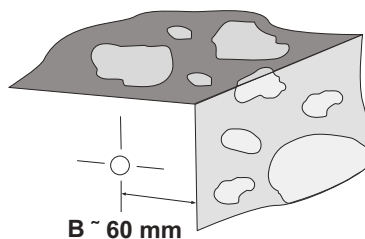


Steel

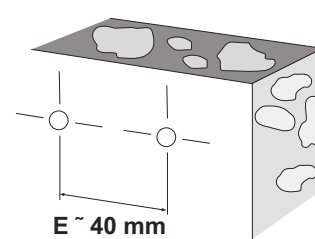


e = the minimum space between two fixings
b = the minimum distance from the edge

Concrete



B = the minimum distance from the edge

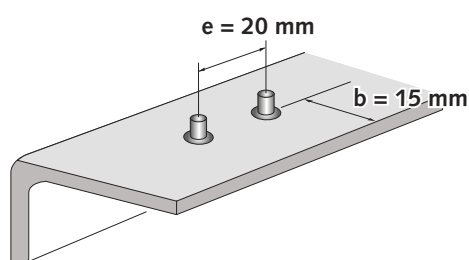


E = the minimum space between two fixings

Distance recommendations with POWDER technology

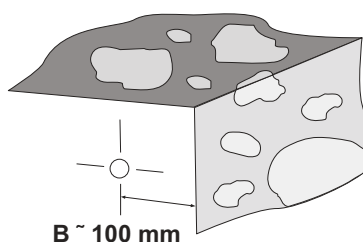


Steel

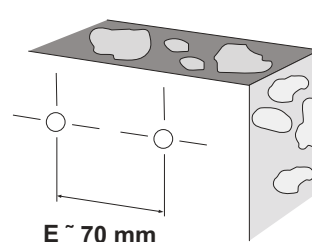


e = the minimum space between two fixings
b = the minimum distance from the edge

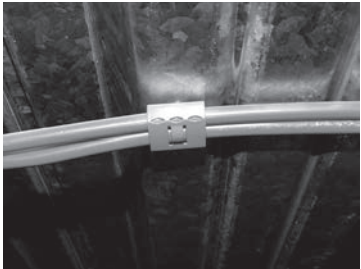
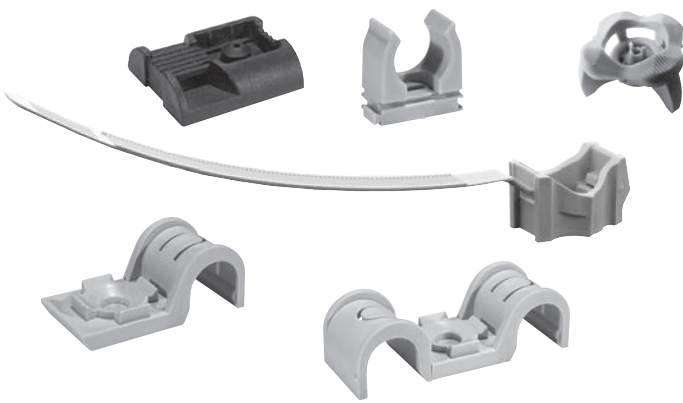
Concrete

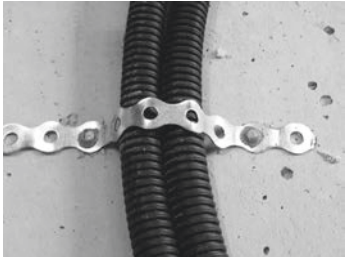


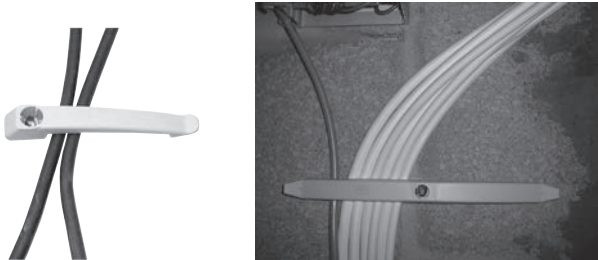
B = the minimum distance from the edge

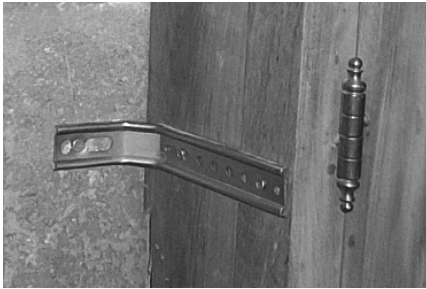


E = the minimum space between two fixings

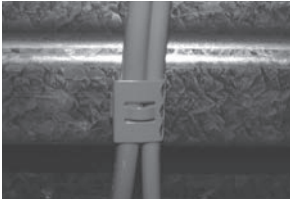
ELECTRICIAN & PLUMBER Applications		Gas solutions	Powder solutions
	Junction boxes PVC-U back boxes	CG6 C6 HCG6	
	PVC-U trunking Metal trunking	HCG6 CG6 (through pre-drilled trunking system)	
	Pipework Conduits to floor and wall	C6 HC6 With SPIT metal clip	C9 With metal clip
	Pipes and conduits with moulded cable ties	C6 HC6 With CT Clip or Tie Clip	
	Fire resistant cabling	C6 HC6 with FP FIREFIX™ clip	
	PULSABLE accessories SPIT range	C6 HC6	

			
	Overhead cable management	C6 HC6 PULSA800 E-LIFT polesystem	
	For pipes and cable (with perforated strip)	C6 HC6 Perforated strip	C9 Perforated strip
	For pipes and cable (with textile strip)	C6 HC6 Textilestrip	C9 Textilestrip
	for conduit and pipe work	C6 HC6 With P-CLIP	C9 With metal Clip
	Collar fixing	C6 HC6 With Tieclip or CT-clip	

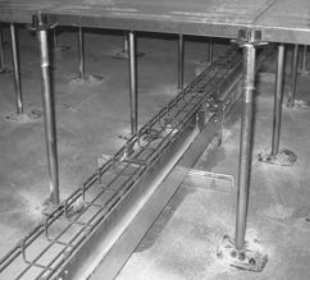
ELECTRICIAN & PLUMBER Applications		Gas solutions	Powder solutions
	Low voltage cabling & temporary lighting	C6 HC6 With Single & double cable bows Fireproof versions available	
BUILDER Applications		Gas solutions	Powder solutions
	Wood to concrete		C9 SC9
	Wooden plate onto steel / Concrete	C6	C9 SC9 CR9
	Waterproof membrane		CR9P
	Formwork		C9 shuttering spacer C9 formwork spacer

			
	Metal bracket to align fix window frame		C9
	Connectors on steel frame		HSBR14

			
	Steel to steel roof decks		HSBR14
	Steel cladding		HSBR14
	Gratings system		SA12-8

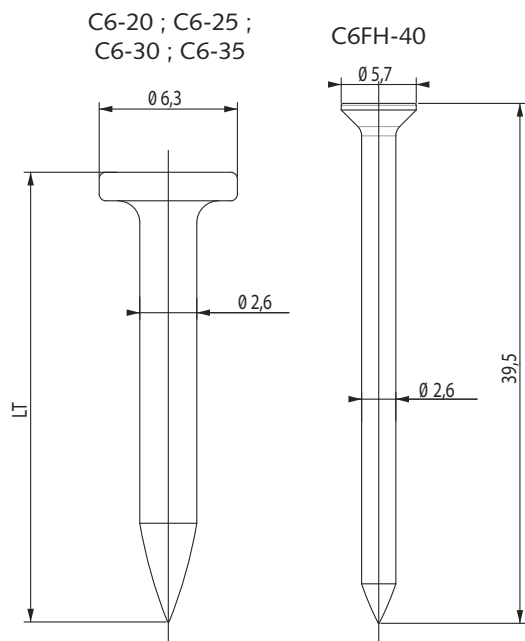
INSULATION/FIRE PROTECTION Applications		Gas solutions	Powder solutions
	Rigid insulation		CI6 + P370 kit (maximum thickness: 120 mm)
	Soft insulation under cladding facade	IF Insulfast	
	Wire mesh fixing	C6 HC6	
	Fire protection	C6 HC6 FP FIREFIX™	C9 CR9 CR9TP

DRYWALL Applications		Gas solutions	Powder solutions
	Angled bar (PVC/Aluminium)	C6 HC6	
	Metal tracks / Partitioning	C6 HC6	C9 SC9

			
	Drylining/Optimatrack	C6	
		HC6	
	Woodplate to concrete	C6FH	SC9 C9
	Floating floor	C6	C9
	Check regulation in country		
	Suspended ceiling brackets to wood	CW6	

			
	Waterproof membranes fixing		CR9TP C9

SPIT C6 / C6 FH



DESCRIPTION

- Using with wiring accessories, to fix drywall track.

PROPERTIES MATERIAL

Shank in carbon steel

- Total length Lt: 20, 25, 30, 35 or 40 mm
- Black collated strip
- Electrogalvanised, min zinc coating 5 µm
- Hardness (C6-20): 53 to 56 HRC
- Hardness (C6-25/30/35/40): 50 to 55 HRC

TOOLS

P800E - P800P - P800P+

AGREEMENT

CSTB Technical approval 3/06 - 460

ACCESSORIES

Magnetic nose pieces for:

- Fixing Metal latch

- Metal P-CLIP



Eurocode 014641



Eurocode 014642

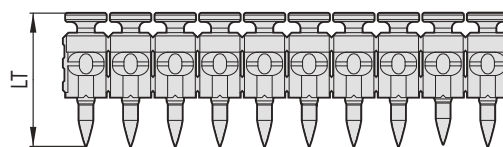
- Other accessories

- Wiring accessories for electrician & Plumber
- FP FIREFIX™ for fire resistant cabling
- Threaded rod hanger: TRH CLIP MCC-0

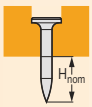
PIN LENGTH SELECTION

C6 range	Length (LT)	Black strip 500 pcs/box	Flush head pin range * 500 pcs/box
C6-20	20	057540	-
C6-25	25	057541	-
C6-30	30	057542	-
C6-35	35	057543	-
C6-40	40	-	057544

*: leaves no plastic residue after fixing

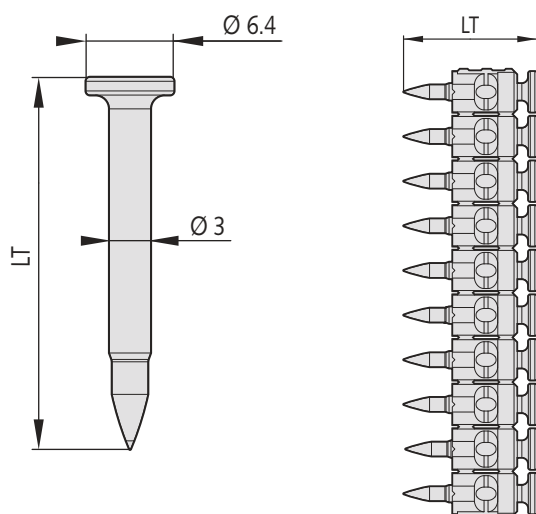


RECOMMENDED LOAD

C6 range		Characteristic resistance		Recommended load	
		NRk (kN)	VRk (kN)	NRec (kN)	VRec (kN)
 C20/25 to C30/37	H _{nom} ⁽¹⁾ = 15 mm	0.87	0.75	0.30	0.25
	H _{nom} ⁽¹⁾ = 18 mm	1.19		0.40	
	H _{nom} ⁽¹⁾ = 20 mm	1.41		0.47	

(1) Embedment depth
H_{nom} = 15-20 mm is recommended

L = H_{nom} + t_{fix} (see p. 13)



DESCRIPTION

- Using with wiring accessories, to fix drywall track.
- Using in hard material, to improve the success rate.

PROPERTIES MATERIAL

Shank in carbon steel

- Total length Lt: 15, 17, 22, 27, or 32 mm
- Orange collated strip
- HC6 - 17, 22, 27, 32
- Mechanical zinc plating, min zinc coating 10 µm
- Hardness ≥ 56 HRc
- HC6 - 15
- Electrogalvanised, min zinc coating 5 µm
- Hardness: 53 to 56 HRc

TOOLS

P800E - P800P / P800P+

AGREEMENT

CSTB Technical approval 3/06 - 460

PIN LENGTH SELECTION

HC6 range	Length shank	Orange strip 500 pcs/box
HC6-15	15	057550
HC6-17	17	057551
HC6-22	22	057552
HC6-27	27	057553
HC6-32	32	057554

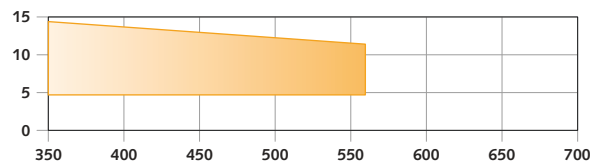
RECOMMENDED LOAD

HC6 range		Characteristic resistance		Recommended load	
		N _{Rk} (kN)	V _{Rk} (kN)	N _{Rec} (kN)	V _{Rec} (kN)
 C20/25 to C60/70	H _{nom} = 15 mm	0.87	0.75	0.30	0.25
	H _{nom} = 18 mm	1.19		0.40	
	H _{nom} = 20 mm	1.41		0.47	
 f _{uk} = 410 - 450 N/mm ²	H _{nom} = 6.5 mm	2.58	3.6	1.03	1.2
	H _{nom} = 7.5 mm	2.91		1.16	
	H _{nom} = 8.5 mm	3.24		1.30	
	H _{nom} = 9.5 mm	3.57		1.43	
	H _{nom} = 10 mm	3.74		1.49	

APPLICATION LIMIT

-  Concrete: C50/60
-  Prestressed - Prefabricated concrete C60/70
-  Steel

Thickness of base material (mm)

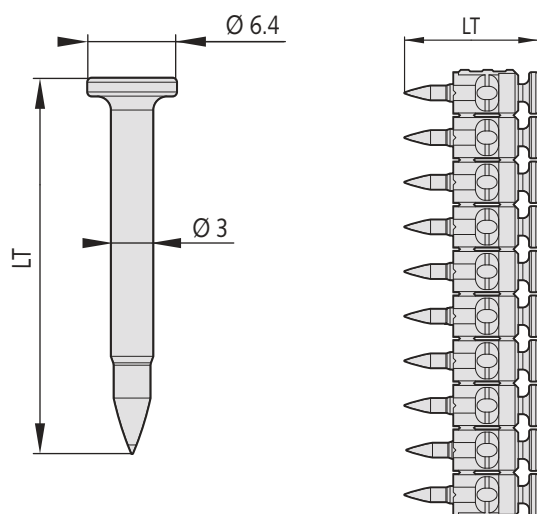


(1) E24	E28	E36	A60
(2) ST37	ST44	ST52	ST60
(3) S235	S275	S355	E335

(1) French designation - (2) German designation
(3) Designation according to European standard NF EN 10027-1

Ultimate tensile strength of base material (N/mm²)

SPIT HC6-15



DESCRIPTION

- Temporary fastening of steel sheets for steel decking

PROPERTIES MATERIAL

- Shank in carbon steel
- Electrogalvanised, min zinc coating 5 µm
- Hardness: 53 to 56 HRC

TOOL

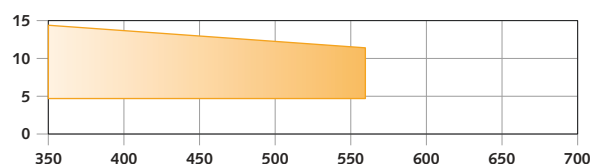
P800P / P800P+

APPLICATION LIMIT



Steel

Thickness of base material (mm)



(1) E24	E28	E36	A60
(2) ST37	ST44	ST52	ST60
(3) S235	S275	S355	E335

(1) French designation - (2) German designation
(3) Designation according to European standard NF EN 10027-1

Ultimate tensile strength of base material (N/mm²)

DESIGN & RECOMMENDED LOADS

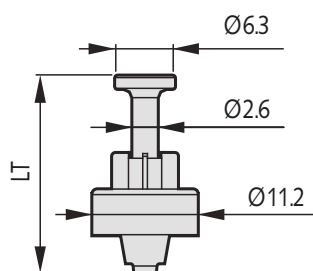
The performances given below, are suitable for a resistance of base material lower than 550 N/mm² and with a minimum thickness of 5 mm.

Sheet thickness (1) $f_{uk} > 390 \text{ N/mm}^2$ (S320GD)	H _{nom} min (mm)	Design resistance [kN]		Recommended load [kN]	
		Tensile	Shear	Tensile	Shear
		N _{Rd}	V _{Rd}	N _{Rec}	V _{Rec}
0,75 mm	6.5	2.25	1.80	1.5	1.2
1,00 mm					
1,25 mm					

$F_{rec} = F_{Rk} / 2.5$: the recommended load is calculated from the characteristic load and a global safety factor equal to 2.5.

Design load is calculated with a safety factor $\gamma_F = 1.5$.

SPIT CG6 - HCG6



DESCRIPTION

- Using for PVC-U trunking
- The patented energy absorber design eliminated damage to the trunking and prevents deformation.
- The head of the pin is designed to countersink into the washer stopping contact between the metal pin head and cabling.

PROPERTIES MATERIAL

Shank in carbon steel

- Total length Lt: 15, 20, 25, 30, 35 mm
- Electrogalvanised, min zinc coating 5 µm
- Hardness (HCG6-15/CG6-22): 53 to 56 HRc
- Hardness (CG6-20/25/30): 50 to 55 HRc

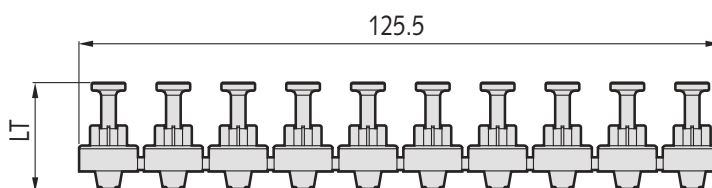
TOOL

P800E

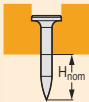
PIN LENGTH SELECTION

CG6/HCG6 range	Length (LT)	White strip 500 pcs/box*
CG6-20	20	057563
CG6-25	25	057564
CG6-30	30	057565
HCG6-15	15	057567
HCG6-22	22	057568

*: leaves no plastic residue after fixing



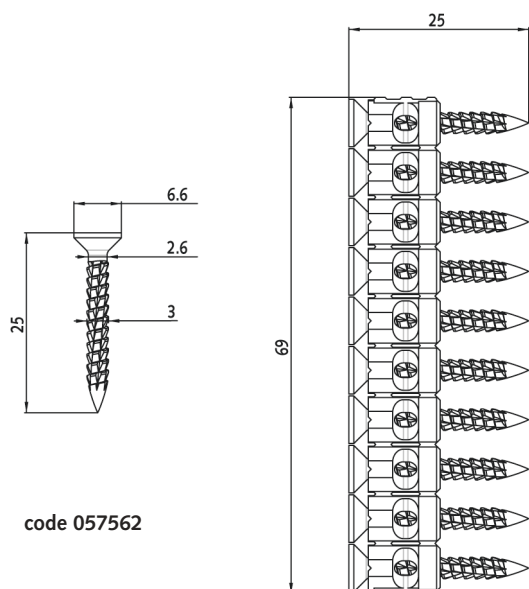
RECOMMENDED LOAD

CG6 range		Characteristic resistance		Recommended load	
		NRk (kN)	VRk (kN)	NRec (kN)	VRec (kN)
 C20/25 to C30/37	H _{nom} ⁽¹⁾ = 15 mm	0.87	0.75	0.30	0.25
	H _{nom} ⁽¹⁾ = 18 mm	1.19		0.40	
	H _{nom} ⁽¹⁾ = 20 mm	1.41		0.47	

(1) Embedment depth
H_{nom} = 15-20 mm is recommended

L = H_{nom} + tfix (see p. 13)

SPIT CW6 - crocowood



DESCRIPTION

- Metal suspension system to wood truss.
- Possibility to remove it, using Pozidrive print (PZ2).

PROPERTIES MATERIAL

Screw in carbon steel

- Countersunk head, PZ2
- Electrogalvanised, min zinc coating 5 μm
- Hardness: 500 N/mm² mini
- Without Chrome VI

TOOLS

P800P / P800P+

APPLICATION LIMIT

- Wooden structures, with minimum thickness 25 mm.
- No adapted for concrete base material.

RECOMMENDED LOAD

CW6 range	Tensile load		Shear load for a displacement of 1 mm
	N _{Rk} * (kN)	N _{Rec} * (kN)	V _{Rec} * (kN)
 Wooden plate, thickness 35 mm (pine wood)	0.46	0.15	0.10

* Indicative value

SPIT wiring accessories



RECOMMENDED LOAD AND DISPLACEMENT

Accessories	Failure load (kN)	Displacement at the failure load (mm)	Recommended load (kN) for a displacement equal to 1 mm for accessories $N_{rec} (d = 1 \text{ mm})$
Metal P-CLIP	0.30	13 mm	0.07
TIE-CLIP	0.30	4 mm	0.10
P-CLIP simple	0.22	10 mm	0.03
P-CLIP double	0.10	9 mm	0.06
CLIPLEC	0.60	22 mm	0.20
E-CLIP	0.04	1 mm	0.04
Single cable bows	0.10	16 mm	0.025
Double cable bows	0.16	16 mm	0.04
Drywall track	1.0	-	0.20
Wood sole plate with thickness 27 mm	1.2	-	0.16

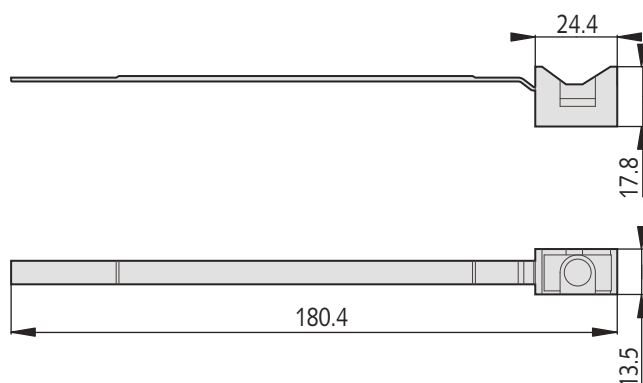
Check that the embedment depth is adapted to the recommended load requested for the accessories.

SPIT wiring accessories



CT-CLIP FOR CONDUIT, PIPEWORK, LOW VOLTAGE CABLING, ARMoured CABLING

- Description : Cables : Ø mini 16 – Ø maxi 32
RNC conduits : Ø16 – Ø20 – Ø25 – Ø32.
- Raw material : Polyamid 6-6 according to ISO 1874
- Color : Grey, RAL 7035.
- Burning properties : Incandescent wire test according to CEI 695-2-1/2.: 650°C passed
- Installation temperature : T°C : -5°C / +35°C.
- Working temperature: T°C : -40°C / +70°C.



Pin selection guide

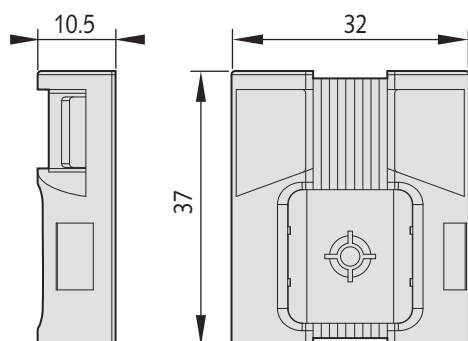
CT-CLIP	C6-20	C6-25	C6-30	HC6-15	HC6-17	HC6-22	HC6-27
Concrete C20/25		●	●			●	●
Concrete C30/37		●			●	●	
Concrete C40/50					●	●	
Prestressed / Prefabricated concrete					●	●	
Solid brick		●	●			●	●
Hollow brick rendered		●	●			●	●
Hollow concrete block		●	●			●	●
Calcium silicate block		●	●			●	●
Steel				●	●		

Tool : P800E

CLIPLEC FOR CONDUIT, PIPEWORK, LOW VOLTAGE CABLING, ARMoured CABLING

It is for use with cable ties (not included).

- Code product: 011203 (black) / 053881 (grey)
- Raw material: copolymer polypropylene
- Color: black (UV protected) / grey
- Allogene free
- Burning properties: Incandescent wire test according to CEI 695-2-1/2.: 750°C passed
- Installation temperature: T°C: -5°C / +35°C
- Working temperature: T°C: -30°C / +55°C



Pin selection guide

CLIPLEC	C6-20	C6-25	C6-30	HC6-15	HC6-17	HC6-22	HC6-27
Concrete C20/25		●	●			●	●
Concrete C30/37		●			●	●	
Concrete C40/50					●	●	
Prestressed / Prefabricated concrete					●	●	
Solid brick		●	●			●	●
Hollow brick rendered		●	●			●	●
Hollow concrete block		●	●			●	●
Calcium silicate block		●	●			●	●
Steel				●	●		

Tool: P800E

SPIT wiring accessories



PERFORATED STRIP, TEXTILE STRIP & METAL CLIP

Using only for fixing on floor.

Perforated strip

- 12 mm x 10 m: 056562
- 17 mm x 10 m: 056561



Metal P-Clip, Ø 16, Ø 20, Ø 25, Ø 32.



Possible to use with C9 pins

Magnetic nose piece



Pin selection guide

PERFORATED STRIP AND METAL CLIP	C6-20	C6-25	C6-30	HC6-15	HC6-17	HC6-22	HC6-27
Concrete C20/25	●	●			●	●	
Concrete C30/37	●				●		
Concrete C40/50				●	●		
Prestressed / Prefabricated concrete				●	●		
Solid brick		●				●	
Hollow brick rendered		●				●	
Hollow concrete block		●				●	
Calcium silicate block		●				●	
Steel				●			

TEXTILE STRIP

- 15 x 1,1 L 10 M



P-CLIP FOR CONDUIT, PIPEWORK, HOT AND COLD PIPING

Description for P-CLIP simple:

- Cables: Ø mini 16 – Ø maxi 25
- RNC and rigid conduits: Ø16 – Ø20 – Ø25

Description for P-CLIP double:

- Cables: Ø mini 16 – Ø maxi 20
- RNC and rigid conduits: Ø16 – Ø20

Raw material: Polypropylen

Color: Grey, RAL 7035

Burning properties: Incandescent wire test according to CEI 695-2-1/2.: 650 °C passed

Installation temperature: T°C: -5 °C / +35 °C

Working temperature: T°C: -30 °C / +60 °C

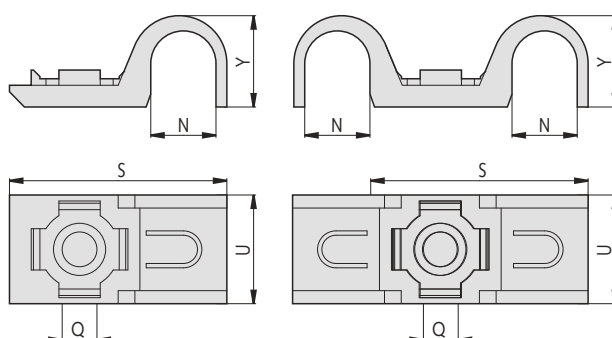


Pin selection guide

P-CLIP	C6-20	C6-25	C6-30	HC6-15	HC6-17	HC6-22	HC6-27
Concrete C20/25		●	●			●	●
Concrete C30/37		●			●	●	
Concrete C40/50					●	●	
Prestressed / Prefabricated concrete					●	●	
Solid brick		●	●			●	●
Hollow brick rendered		●	●			●	●
Hollow concrete block		●	●			●	●
Calcium silicate block		●	●			●	●
Steel				●	●		

Tool: P800E

SPIT P-CLIP	N	S	Y	Q	U	code
P-CLIP 16	16	52	20.5	8	25	567206
P-CLIP 20	20.0	54	25.0			565082
P-CLIP 25	24.7	59.8	30.6			567208
P-CLIP 16x16	16.2	68.3	20.5			567209
P-CLIP 20x20	20.0	78.4	25.0			565086

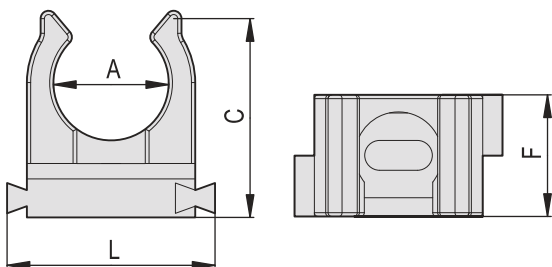


SPIT wiring accessories



E-CLIP CONDUIT CLIP FOR CONDUIT AND PIPEWORK

- Description: Cables: Ø mini 16 – Ø maxi 50
Tubes IRL: Ø16 – Ø20 – Ø25 – Ø32 – Ø50
- Raw material: Polypropylen
- Color: Grey, RAL 7035
- Burning properties: Incandescent wire test according to CEI 695-2-1/2.: 650°C passed
- Installation temperature: T°C: -5°C / +35°C
- Working temperature: T°C: -30°C / +55°C



SPIT E-CLIP	A	C	F	L	code
D.16	14.7	26.9	16.1	27.1	567214
D.20	18.6	29.3		32.8	565032
D.25	23.5	35.5		39.1	565033
D.32	30.5	43.5		46.2	565034
D.50	48.5	58.5		64.4	567215

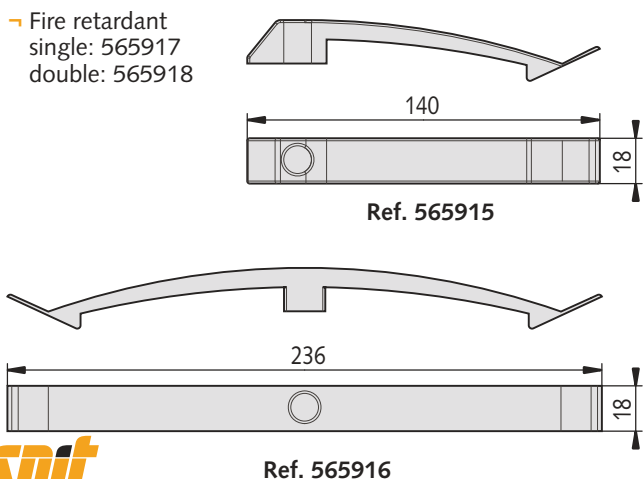
Pin selection guide

 E-CLIP	C6-20	C6-25	C6-30	C6-35	HC6-15	HC6-17	HC6-22	HC6-27	HC6-32
Concrete C20/25			●					●	
Concrete C30/37		●					●	●	
Concrete C40/50							●		
Prestressed / Prefabricated concrete							●		
Solid brick			●	●				●	●
Hollow brick rendered			●	●				●	●
Hollow concrete block			●	●				●	●
Calcium silicate block			●	●				●	●
Steel					●	●			

Tool: P800E

SINGLE & DOUBLE CABLE BOWS: FOR LOW VOLTAGE CABLING AND TEMP LIGHTING

- Cables: 8 cables 3x1.5 (simple version)
16 cables 3x1.5 (double version)
- Raw material: Polypropylen copolymer
- Color: Grey, RAL 7035.
- Burning properties: Incandescent wire test according to CEI 695-2-1/2.: 650 °C passed
960 °C on fire version
- Installation temperature: T°C: -5 °C / +35 °C.
- Working temperature: T°C: -20 °C / +70 °C



Pin selection guide

 CABLE BOWS	C6-20	C6-25	C6-30	C6-35	HC6-15	HC6-17	HC6-22	HC6-27	HC6-32
Concrete C20/25			●	●				●	●
Concrete C30/37			●				●	●	
Concrete C40/50							●		
Prestressed / Prefabricated concrete							●		
Solid brick			●	●				●	●
Hollow brick rendered			●	●				●	●
Hollow concrete block			●	●				●	●
Calcium silicate block			●	●				●	●
Steel						●	●		

Tool: P800E



- Fixing for ceiling application (security cable for lightening), with wire

- P370
- P800

- HC6-15 in steel base material (P800E)
- HC6-17-22 in concrete
- SC9-15 in steel base material (P370)
- SC9-25 in concrete

- Static Application only

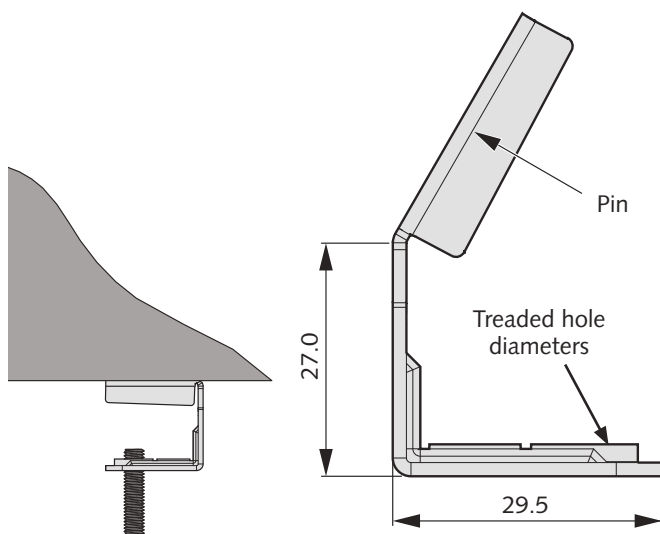
BASE MATERIAL	h_{nom} (mm)	SPIT MCC-O	
		Recommended load NRec (kN) for a displacement equal to 1 mm	
		5 fixings per part fastened	8 fixings per part fastened
Pins SC9			
C 20/25	20	0,15	0,30
C 50/60	15		
Prefabricated Prestressed slab	15		
Steel E24	12		
Pins HC6			
C 20/25 to C50/60	15	0,15	0,30
Prefabricated Prestressed slab	15		
Steel E24	6.5		
Safety factor > 3 The recommended load take into account the level arm			

The fixing density is defined according to the recommended load requested.
A minimum of 5 or 8 fixings per part fastened must be installed. All visible failure must be replaced.

The power adjustment must be done on the jobsite, to obtain the right embedment allowing the pin resistance (see the minimum embedment values h_{nom} indicated in the recommended load table above).

Base material	Color caliber	Tool adjustment
Concrete C20/25	6,3/10 Green	mini power
Concrete C50/60	6,3/10 Green	Medium power
Prefabricated	6,3/10 Yellow	Minimum power
Prestressed slab		
Steel E24		

SPIT threaded rod hanger



APPLICATION

- Metal clip to hang threaded rod (M6/M8), chains or suspension cables

PROPERTIES MATERIAL

- Steel E24, thickness 1.5 mm
- Coating, electroplating 7 to 15 μm
- TRH-CLIP element with threaded hole diameters for M6-M8 (code 011430)

TOOL

P800E

PINS TYPE RECOMMENDED

- HC6-15 in steel base material
- HC6-15, HC6-17, HC6-22 in concrete C50/60 and prestressed concrete
- C6-20, C6-25 in concrete C30/37 maximum

APPLICATION LIMITS

- Static application only
- Maximum rod length: 600 mm

RECOMMENDED LOAD

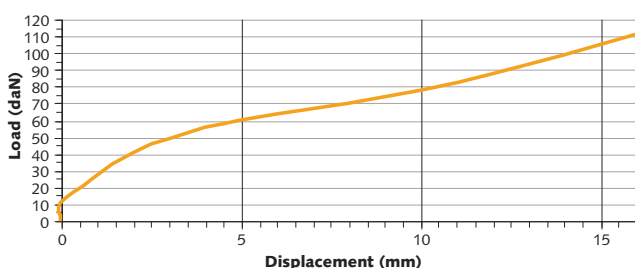
HC6-15			Characteristic resistance	Recommended load	TRH-CLIP displacement at the recommended load
			N _{Rk} (kN)	N _{Rec} (kN)	d(N _{Rec}) (mm)
	f _{uk} = 410 – 450 N/mm ²	H _{nom} = 6.5 mm	5.0	1.5	9.5
	f _{uk} = 500 – 550 N/mm ²				

HC6 range			Recommended load	TRH-CLIP displacement at the recommended load	Code
			N _{Rec} (kN)	d(N _{Rec}) (mm)	
	≥ C20/25	H _{nom} ≥ 15 mm	0.10	0.4	011430: M6-M8
	Prefabricated Prestressed	H _{nom} = 10-12 mm	0.10	0.4	011431 : M8-M10

$N_{rec} = N_{Rk} / 3$: the recommended load is calculated from the characteristic load and a global safety factor equal to 3.

Minimum 5 fixings per part fastened.

TRH-CLIP DEFORMATION



FIRE TEST

Test report. nb 05-158/A (CSTB)



TRH-Clip + HC6-17 pin	Characteristic resistance under fire exposure		
	$N_{Rk,fi}$ (kN) 30 mn	$N_{Rk,fi}$ (kN) 60 mn	$N_{Rk,fi}$ (kN) 90 mn
C20/25 $H_{nom} = 15 \text{ mm}$	0.25	0.13	0.02

$N_{Rd,fi}(t) = N_{Rk,fi} / \gamma_{M,fi}$, usually the safety factor under fire exposure $\gamma_{M,fi} = 1$.

FP FIREFIX™ using SPIT Pulsa nailing



CLIP conform fixing requirements of BS5839-1:2002 standard

DESCRIPTION

Pirelli has developed FP Firefix™ in partnership with ITW Construction Products. Pirelli has designed special cable clips and adaptators to fit PULSA 800E.

Pirelli clip is used to fix fire performance cables, holds one or two cables.

PROPERTIES MATERIAL

- Stainless steel
- Available in red or white LSOH powder coating

TOOL

P800E

SIZE SUITABLE

Description	Size	Cable Ø Suitability	Colour	Wire Guide	Box Qty	Code
Firefix™ Single Clip	01	$8,0 \text{ mm}^2 \leq D < 8,2 \text{ mm}^2$	Red	2 core x 1,5 mm ²	500	921622
Firefix™ Double Clip	02	$8,0 \text{ mm}^2 \leq D < 8,5 \text{ mm}^2$	Red	2 core x 1,5 mm ² ou 3 core x 1,0 mm ²	200	921623
Firefix™ Double Clip	04	$8,5 \text{ mm}^2 \leq D < 9,0 \text{ mm}^2$	Red	4 core x 1,0 mm ² ou 3 core x 1,5 mm ²	200	921624
Firefix™ Single Clip	01	$8,0 \text{ mm}^2 \leq D < 8,2 \text{ mm}^2$	White	2 core x 1,5 mm ²	500	924252
Firefix™ Double Clip	02	$8,0 \text{ mm}^2 \leq D < 8,5 \text{ mm}^2$	White	2 core x 1,5 mm ² ou 3 core x 1,0 mm ²	200	924251
Firefix™ Single Clip	04	$8,5 \text{ mm}^2 \leq D < 9,0 \text{ mm}^2$	White	4 core x 1,0 mm ² ou 3 core x 1,5 mm ²	200	924253

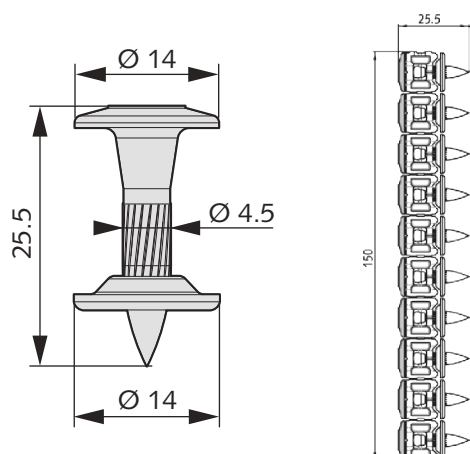
PIN SELECTION GUIDE

FP FIREFIX™	C6-20	C6-25	C6-30	HC6-15	HC6-17	HC6-22	HC6-27
Concrete C20/25	●	●					
Concrete C30/37		●			●		
Concrete C40/50				●	●		
Prestressed / Prefabricated concrete				●	●		
Solid brick		●	●				
Hollow brick rendered		●	●				
Hollow concrete block		●	●				
Calcium silicate block		●	●				
Steel				●			

FIXING DENSITY

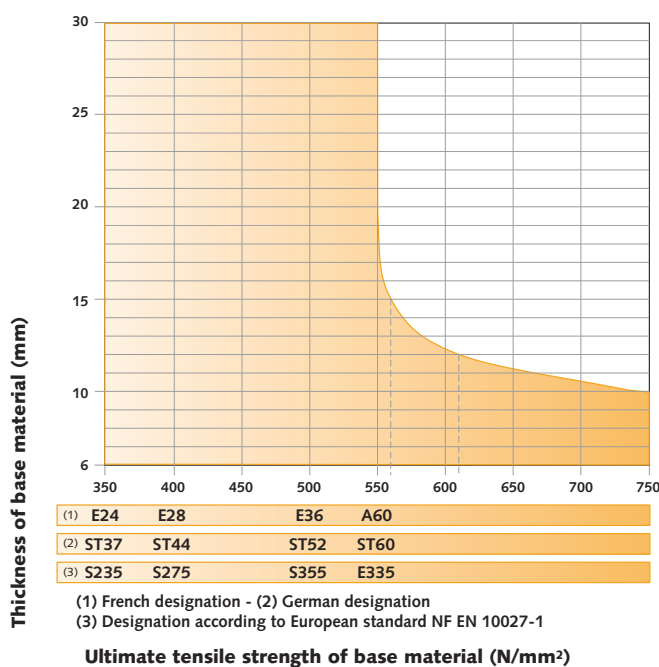
Recommended maximum spacing of FP FIREFIX™ clips

Cable diameter (mm)	Horizontal spacing (mm)	Vertical spacing (mm)
Not exceeding 15 mm	300	400

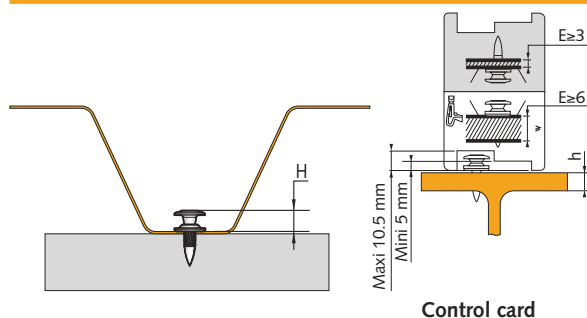


code 011391 (in tube) / code 011390 (in bulk) / code 053953 (in strip)

APPLICATION LIMIT



CONTROL FIXING



Thickness of base material	$H_{min}^{(1)}$ (mm)	$H_{max}^{(1)}$ (mm)
$h \geq 6$ mm	5	10.5

(1) Values obtained with 0.75 mm steel sheet.

DESCRIPTION

→ Steel to Steel cladding panels and roof decks

PROPERTIES MATERIAL

The HSBR14 pins is composed of:

→ Shank in carbon steel

- Ultimate tensile strength: 2300 N/mm²
- Yield strength: 1600 N/mm²
- Mechanical zinc plating, min zinc coating 10 µm
- Hardness > 57 HRC

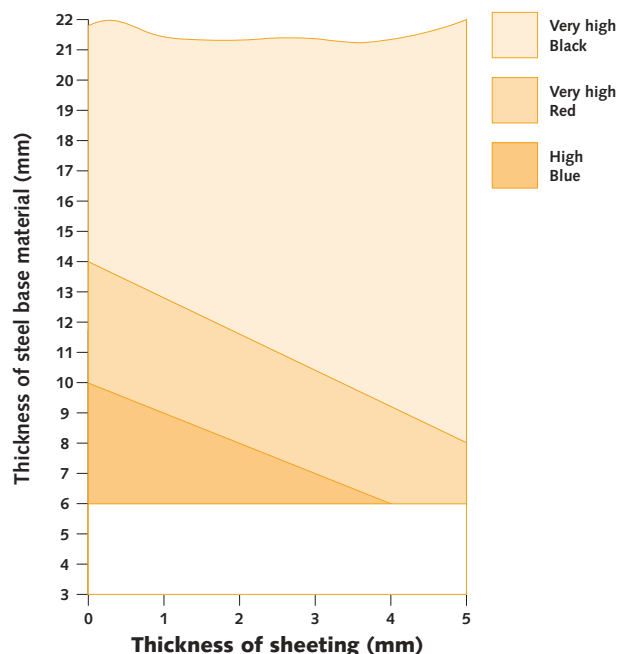
→ One steel washer

- Min zinc coating 8 µm
- Electro galvanizing
- The plate washer developed for a good clamping of the plates to avoid damages when shooting.

TOOL

P560

POWER SETTING



HSBR14 range	Length	Quantity	Euro code
HSBR14 Strip	14	1000 pcs	053953
HSBR14 Tube	14	1000 pcs	011391
HSBR14 Loose	14	1000 pcs	011390



→ Base material:

Resistance of base material S235 (E24) and with a thickness higher than 6mm according to the field of application given in the first page.

ACCORDING TO EUROPEAN TECHNICAL ASSESSMENT ETA N° 08/0040



→ Sheetings and type of connections:



1 sheeting



2 sheetings



2 Sheetings



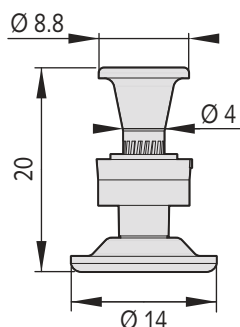
4 sheetings

Sheeting thickness (mm)	Characteristic loads [kN]		Design loads [kN]		Recommended loads [kN]		Connection type
	Shear	Tensile	Shear	Tensile	Shear	Tensile	
	V_{Rk}	N_{Rk}	V_{Rd}	N_{Rd}	V_{Rec}	N_{Rec}	
0.63	4,2	5,3	3,4	4,2	2,2	2,8	A B C D
0.75	5,8	6,6	4,6	5,3	3,1	3,5	A B C D
0.88	7,7	7,7	6,2	6,2	4,1	4,1	A B C D
1.00	8,6	8,2	6,9	6,6	4,6	4,4	A B C D
1.13	9,1	9,1	7,3	7,3	4,9	4,9	A
1.25	9,5	9,5	7,6	7,6	5,1	5,1	A
1.50	10,0	10,1	8,0	8,1	5,3	5,4	A
1.75	10,0	10,3	8,0	8,2	5,3	5,5	A
2.00	10,0	10,4	8,0	8,3	5,3	5,5	A
2.50	10,0	10,5	8,0	8,4	5,3	5,6	A

$V_{Rd} = V_{Rk} / \gamma_M$: the design load is calculated from the characteristic load and a partial safety factor $\gamma_M = 1.25$.

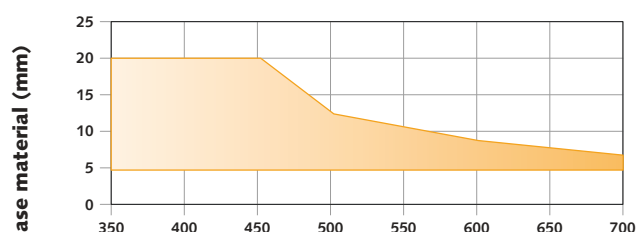
$N_{Rd} = \alpha_{cycl} \times N_{Rk} / \gamma_M$: the design load is calculated from the characteristic load and a partial safety factor $\gamma_M = 1.25$ and $\alpha_{cycl} = 1$.

For the calculation of the recommended load, we applied the partial safety factor $\gamma_F = 1.5$. The recommended loads N_{rec} and V_{rec} are appropriate for Eurocode 1 wind loading design with a partial safety factor $\gamma_F = 1.5$ for wind load and a partial resistance factor $\gamma_N = 1.25$ for fastening.



Code 032650

APPLICATION LIMIT

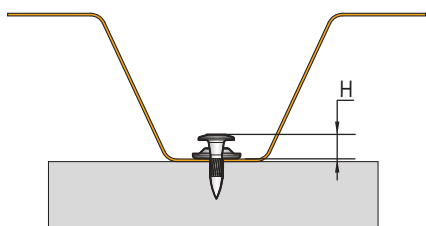


(1) E24	E28	E36	A60
(2) ST37	ST44	ST52	ST60
(3) S235	S275	S355	E335

(1) French designation - (2) German designation
(3) Designation according to European standard NF EN 10027-1

Ultimate tensile strength of base material (N/mm²)

CONTROL FIXING



- $H_{\min} = 5 \text{ mm}$ and $H_{\max} = 7 \text{ mm}$ for guaranteeing the recommended working loads within the application limits.
- Maximum sheet thickness: 2 sheets with max thickness of 1 mm.

DESCRIPTION

Fix metal cladding sheets to steel framework.

PROPERTIES MATERIAL

The SBR9 pin is composed of:

→ Shank in carbon steel

- Ultimate tensile strength: 2000 N/mm²
- Yield strength: 1600 N/mm²
- Hardness: 54-58 HRc
- Electro galvanizing, Min zinc coating 7 μm

→ One steel washer

- Min zinc coating 8 μm
- The plate washer developed for a good clamping of the plates to avoid damages when firing.

TOOL

P370

RECOMMENDED LOAD

The recommended load given below, are suitable for a resistance of base material higher than 400 N/mm² and with a minimum thickness of 5 mm.

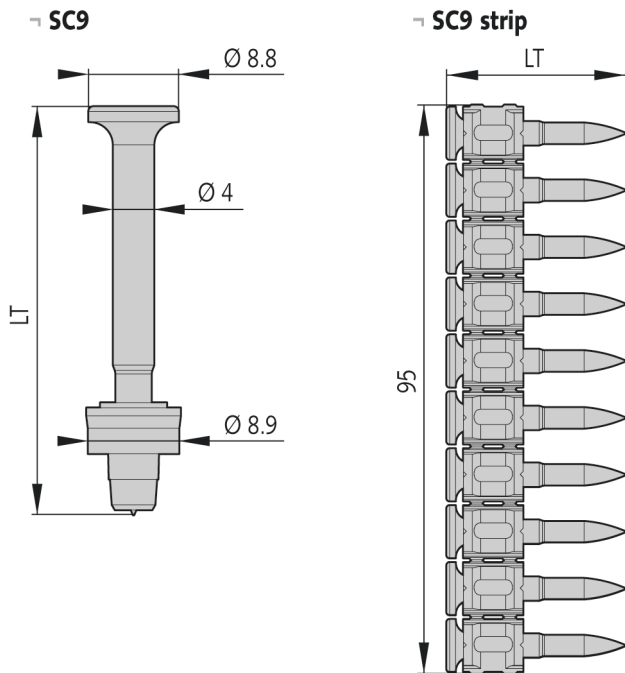
Sheet thickness ⁽¹⁾ $F_{uk} > 390 \text{ N/mm}^2$ (S320GD)	Design resistance [kN]		Recommended load [kN]	
	Tensile	Shear	Tensile	Shear
	N_{Rd}	V_{Rd}	N_{Rec}	V_{Rec}
0.75 mm	2.5	2.2	1.7	1.4
1.00 mm	3.2	3.2	2.2	2.2
1.25 mm	4.0	4.7	2.6	3.1
1.50 mm	4.1	4.7	2.8	3.1
2.00 mm	4.3	4.7	2.9	3.1

$F_{rec} = F_{Rk} / 2.5$: the recommended load is calculated from the characteristic load and a global safety factor equal to 2.5.

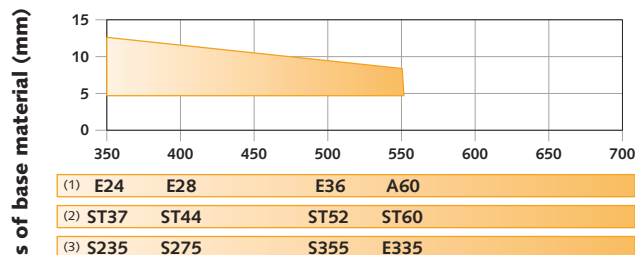
Recommended load is calculated with a safety factor $\gamma_F = 1.5$.

⁽¹⁾ For a sheet thickness equal to 2 mm, it is possible to use 2 sheets of 1 mm.

SPIT SC9 - SC9 strip



APPLICATION LIMIT

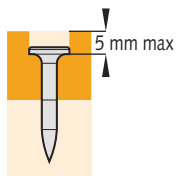


(1) French designation - (2) German designation
(3) Designation according to European standard NF EN 10027-1

Ultimate tensile strength of base material (N/mm²)

CONTROL FIXING

Fixing of timber



Embedment depth in base material

		H _{nom} ⁽¹⁾ (mm)
	E24	12
	ST 52	10
	C30/37	20 - 25
	C40/50	15 - 20
	C50/60	15 - 20

⁽¹⁾ indicative value

DESCRIPTION

- Timber to concrete
- Timber to steel
- Steel to Steel
- Steel to concrete

PROPERTIES MATERIAL

- Core hardness: 54-58 HRC
- Electrogalvanizing, min zinc coating 7µm

TOOLS

P370

SC9 strip only with P370 C60

PIN LENGTH SELECTION

Fixing of steel sheet

SC9 (SC9-LT)	Thickness of steel sheet		Code for SC9 strip	Code for SC9 loose
	E24	C30/37 ⁽¹⁾		
SC9-15	≤ 1.5	-	011340	032500
SC9-20	≤ 3	-	011341	032510
SC9-25	-	≤ 3	011342	032950

Fixing of timber

SC9 (SC9-LT)	Thickness of timber	Code for SC9 strip	Code for SC9 loose
	C30/37 ⁽¹⁾		
SC9-25	≤ 5	011342	032950
SC9-30	5 - 10	011343	032930
SC9-35	10 - 15	011344	032940
SC9-40	15 - 20	011345	032920
SC9-50	25 - 30	011346	032910
SC9-60	35 - 40	011347	032900
SC9-70	45 - 50	-	032890
SC9-75	50 - 55	055621	-

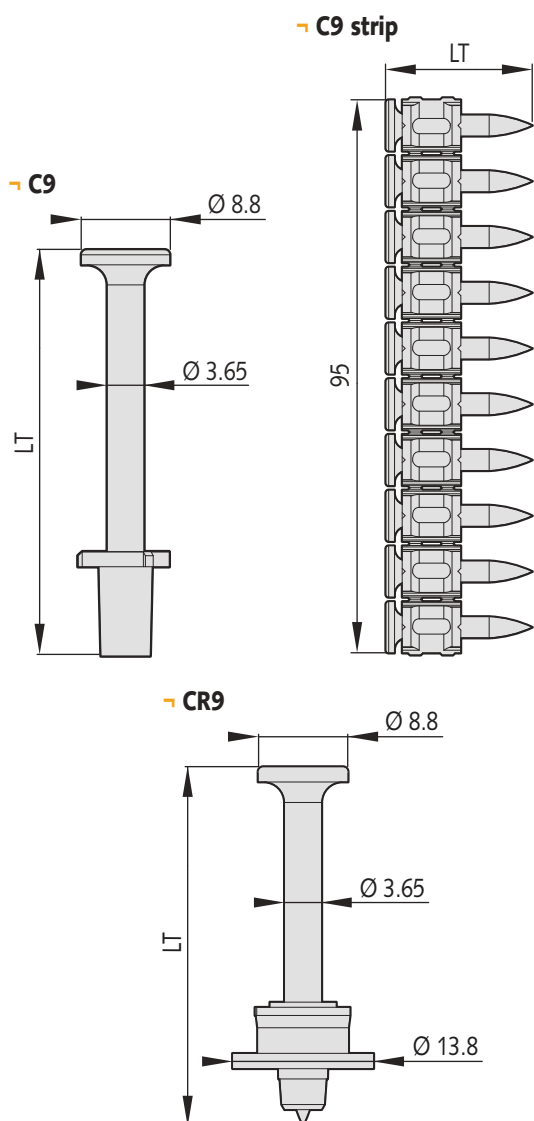
⁽¹⁾ For other concrete class, select the length of pin with the embedment depth given above.

RECOMMENDED LOAD

Base material	N _{Rec} (kN)	V _{Rec} (kN)
 Steel E24 Thickness min. 5 mm	2.0	2.0
 Concrete C20/25	0.5	0.5

Recommended loads are calculated with global safety factor.

SPIT C9 - C9 strip - CR9

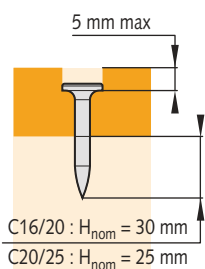


APPLICATION LIMIT

- For harder concrete > 25 Mpa, use the same setting and a shorter pin or SC9 with the same length.

CONTROL FIXING

Fixing of timber



Embedment depth in base material

	$H_{nom}^{(1)}$ (mm)
C16/20	30 - 35
C20/25	25 - 30
C25/30	25 - 28

(1) indicative value

DESCRIPTION

- Timber to concrete
- Steel sheeting to concrete with a max thickness of 5 mm (except for CR9)
- The version CR9 with metallic washer allows to flatten in against wood, and to avoid wood splitting.

PROPERTIES MATERIAL

- Core hardness: 50-55 HRC
- Electrogalvanizing, min zinc coating 7 μ m
- Washer, electrogalvanizing (CR9)

TOOL

P370

C9 strip only for P370 C60

ACCESSORIES

Accessories available, see the product catalogue.

PIN LENGTH SELECTION

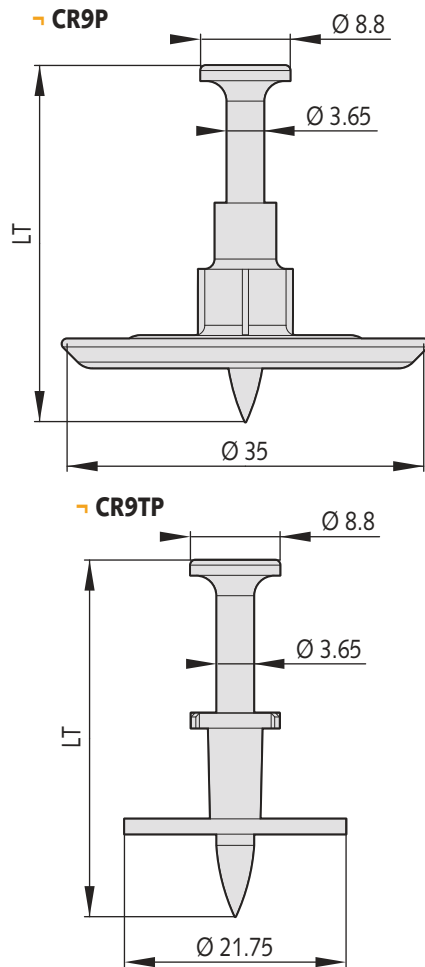
Fixing of timber

C9 (C9-LT)	Thickness of timber		Code for C9 strip	Code for C9 loose	Code for CR9 R.14 loose
	C16/20	C20/25			
C9-20			011330	032740	-
C9-25			011331	032520	032070
C9-30		≤ 5	011332	032530	032100
C9-35	≤ 5	5 - 10	011333	032540	-
C9-40	5 - 10	10 - 15	011334	032550	032090
C9-50	15 - 20	20 - 25	011335	032560	
C9-55	20 - 25	25 - 30	011337	032210	
C9-60	25 - 30	30 - 35	011336	032570	
C9-70	35 - 40	40 - 45		032580	
C9-80*	45 - 50	50 - 55		032590	
C9-90*	55 - 60	60 - 65		032600	

*Pre-drive before firing

RECOMMENDED LOAD

Base material	N_{Rec} (kN)	V_{Rec} (kN)
Concrete C20/25	0.5	0.5



DENSITY FIXING

- 3 pins per m² for vertical installation.
- 5 pins per m² for ceiling installation.
- Maximum spacing between washer: 0.7 meter.

DESCRIPTION

- CR9P: Fastening of waterproof membranes
- CR9TP for PVC Washer (Ø80 mm) : using in tunnel for fastening of the geotextile for the waterdrainage. The layer is welded on the PVC washer.

PROPERTIES MATERIAL

- **Shank in carbon steel**
 - Hardness: 50 – 55 HRC
 - Electrogalvanizing, min zinc coating 7 µm
- **CR9P**
 - Plastic washer: Ø 35 mm
- **CR9TP**
 - Flat metallic washer
 - Ø 21.75 mm
 - Electrogalvanizing, min zinc coating 3 µm
 - Plastic tip for pin centering

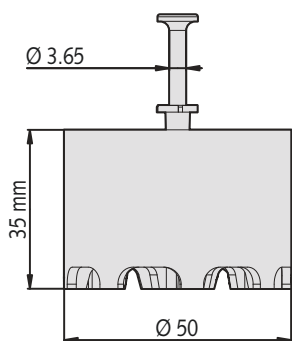
TOOL

P370 single shot

PIN LENGTH SELECTION

Designation	Ø washer	Code
CR9-35 TP	21.75	011321
CR9-40 TP	21.75	011322
CR9-30 P	35	038090
CR9-40 P	35	038100

SPIT C9 formwork spacer



DESCRIPTION

- Form work for round post, round elements, cardboard formwork...

PROPERTIES MATERIAL

- Polypropylene

TOOL

P370

PIN LENGTH SELECTION

Designation	Code
Formwork spacer + C9-60	032750

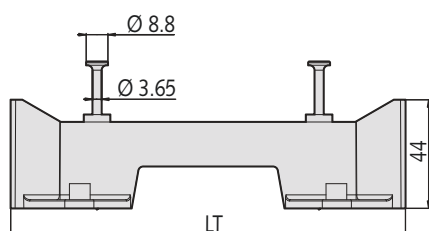
RECOMMENDED LOAD

Base material	N _{Rec} (kN)
 Concrete C20/25	0.5

DENSITY FIXING

- Fixing in staggered with a spacing equal to 1 meter or 1.25 meter in line.

SPIT C9 for shuttering spacer



DESCRIPTION

- All type of Formwork.

PROPERTIES MATERIAL

- Polyethylene high density

TOOLS

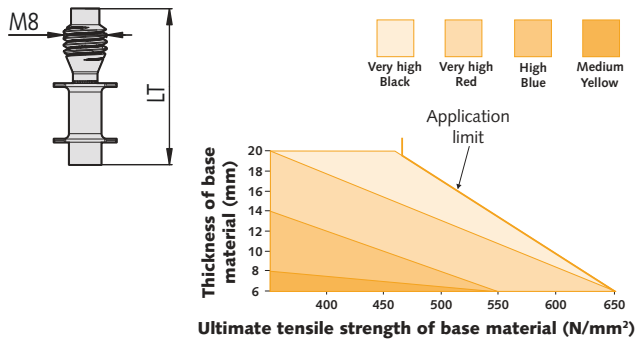
P370

PIN LENGTH SELECTION

Designation	Color	Code with pin
Shuttering spacer 160 + C9-60	Grey	496750
Shuttering spacer 180 + C9-60	Green	496760
Shuttering spacer 200 + C9-60	Beige	496710

DENSITY FIXING

- Fixing in staggered with a spacing equal to 0.8 meter in line.
- Suitable for maximum compressive strength of 2.5 kN.



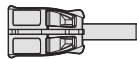
PIN LENGTH SELECTION

SA 12	Thread diameter	Thread length	Pin length	Code
SA12 8 10/25	M8	10	25	033750
SA12-8 15/30		15	30	033760

ACCESSORIES

→ For SA12-8 pins, use kit:

P560: SA 12-8 kit
Code 013969



DESCRIPTION

- Fixing of threaded pins onto steel
- Using for attachment an collar

PROPERTIES MATERIAL

- Fine carbon steel
- Core hardness: 54 - 58 HRC
- Electrogalvanizing - min. zinc. coating 7 µm

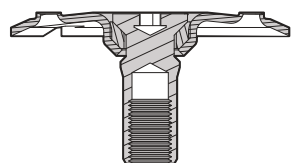
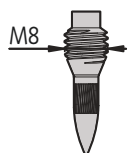
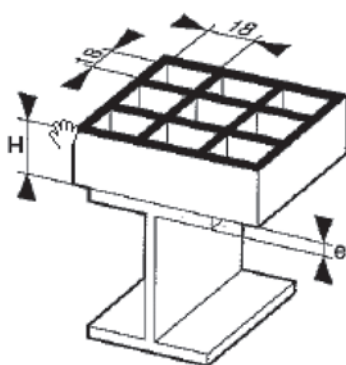
TOOLS

P560 + kit

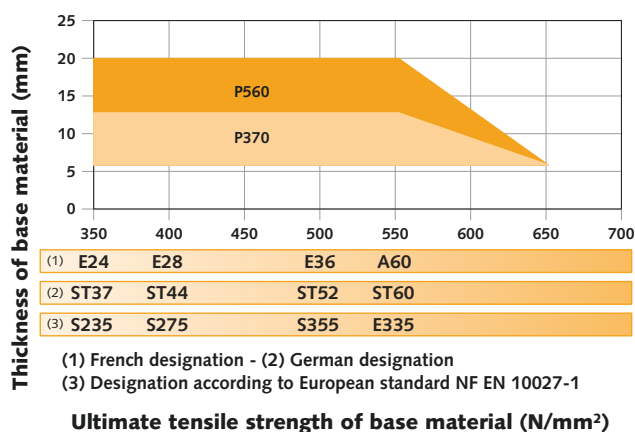
RECOMMENDED LOAD

Base material	N _{Rec} (kN)	V _{Rec} (kN)
 Steel E24 thickness min. 5 mm thickness max. 12 mm	3.0	0.8

SPIT SA12-8 / grating system



APPLICATION LIMIT



APPLICATION

Fixing of grating

Suitable for grids of 20 to 45 mm in height and base steel at least 6 mm thick, with a mesh dimension higher than 18x18 mm to allow the clearance of the setting tool.

PROPERTIES MATERIAL

Pin

- Fine carbon steel.
- Core hardness: 54 - 58 HRc.
- Electro galvanizing min. zinc coating 7 µm.

Spacer washer

- Sleeve steel, coated with 15 to 20 µm zinc plating.
- Ring in thermoplastic (anti-UV).
- Washer in steel with high yield limit coated with 15 to 20 µm zinc plating.

TOOLS

P560 + kit

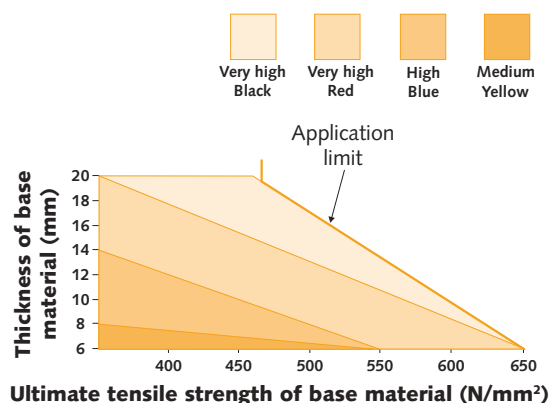
ACCESSORIES

- For SA12-8 pins, use kit:

- P560: SA 12-8 kit. Product code: 013969



POWER SETTING



SPIT SA12-8 / grating system



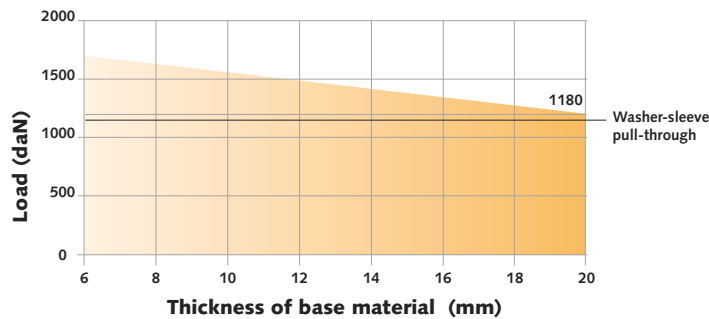
PIN LENGTH SELECTION

Pins designation	Thickness of grids				
	25	30	35	40	45
SA 12-8 10/25 Code: 033750	RE 25 499610	RE 30 499620	-	RE 40 499630	-
SA 12-8 15/30 Code: 033760	-	RE 30 499620	RE 30 499620	RE 40 499630	RE 40 499630

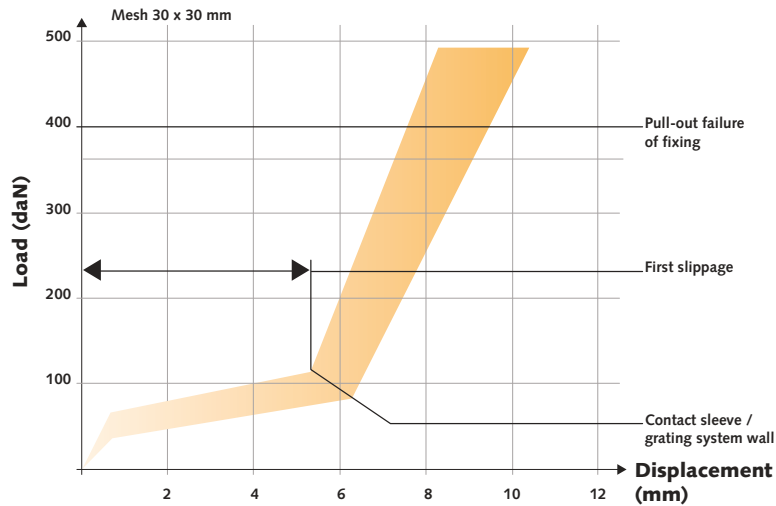
RECOMMENDED LOAD

The pull-through value of the spacer-washer is 1180 daN.

Tensile

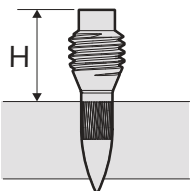


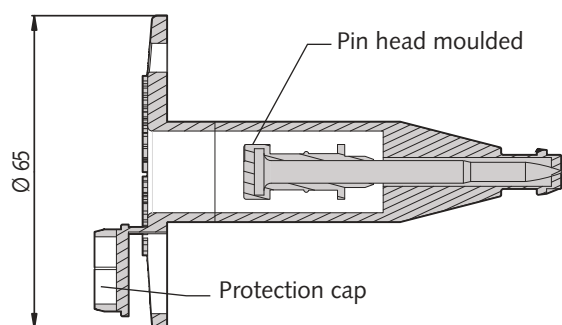
Shear



- **Fixing density:** Around 4 or 5 fixings per m² (see the specification sheet of the supplier of grating).
- **Fixing position:** Minimum distance from edge of the beam is 15 mm.
- **Screwing washer-sleeve:** Tighten to the torque equal to 6 Nm (correspond to the load 250 daN).

CONTROL FIXING

		Hmin	Hmax
	SA 12-8 10/25	10	13.5
	SA 12-8 15/30	15	18.5



PIN LENGTH SELECTION

Designation	Type of insulation	Insulation thickness	Code
CI 6-50	Rigid insulation	50	038520
CI 6-70		70	038540
CI 6-80		80	038550
CI 6-100		100	038560
CI 6-120		120	038570

APPLICATION

- Rigid insulation fixing with premounted pin.

DESCRIPTION

- Polyethylen High density.
- CI-6:
 - The pin head (for CI-6) is mould in thermoplastic-elastomer to improve the corrosion resistance
 - A protection cap to allow a good waterproofness and to reduce thermic transmission

PROPERTIES MATERIAL

Plastic sleeve head

- CI6: Ø65 head – Natural color

Pin shank

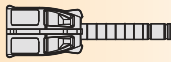
- Carbon steel
- Core hardness: 50 - 55 HRC
- Electrogalvanizing, min zinc coating 7 µm

TOOL

P370 using adaptor

ACCESSORIES

Using CI adaptor kit for P370 tool

	P370
Adaptor kit for CI 50 to CI 120	011030

POWER SETTING

Choose the cartridge color on the job site



DISTANCE RULES

Between 2 fixings: minimum distance of 90 mm
Distance from edge: minimum distance of 100 mm

APPLICATION LIMIT

The mean compressive strength of the concrete must be between C20/25 and C40/50.

ANCHOR DEPTH



It must be between 25 and 31 mm to ensure the recommended load given above.

RECOMMENDED LOAD

TENSILE

The recommended load (kN) are calculated from the mean ultimate load and a safety factor higher than 4.

Insulation thickness (mm)	50	70	80	100	120
Recommended loads	0.30				

SHEAR

The recommended load (kN) are calculated from the mean load with a displacement equal to 10 mm and a safety factor higher than 3.

Insulation thickness (mm)	50	70	80	100	120
Polystyren density =15 kg/m ³	0.13				
Polystyren density =30 kg/m ³	0.20				

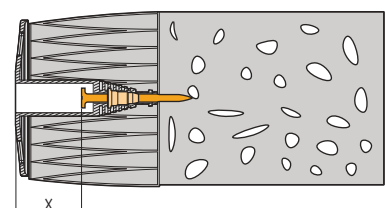
PULL-THROUGH

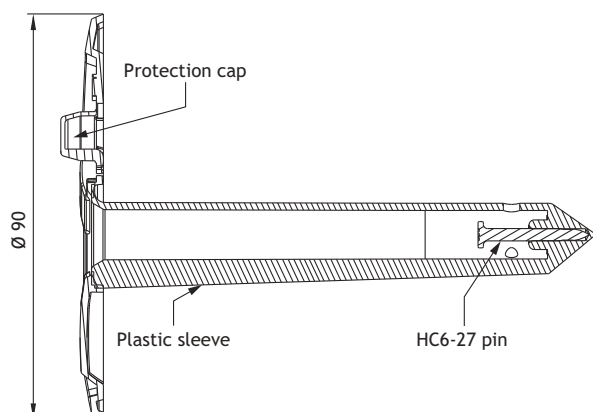
The recommended pull-through (kN) are calculated from the failure load and a safety factor equal to 3.

Insulation thickness (mm)	50	70	80	100	120
Rock wool density =120 kg/m³	0.12	0.16			
Polystyren density =15 kg/m³	0.20				
Polystyren density =30 kg/m³	0.30				

CONTROL FIXING

Ref		Insulation thickness (mm)				
		50	70	80	100	120
CI-6	Xmini	9	29	39	59	79
	Xmaxi	15	35	45	65	85





FASTNER LENGTH SELECTION

Designation	Insulation thickness	Code
IF 60	50 - 60	060501
IF 80	70 - 80	060502
IF 100	90 - 100	060503
IF 120	110 - 120	060504
IF 140	130 - 140	060505
IF 160	150 - 160	060506
IF 180	170 - 180	060507
IF 200	190 - 200	060508

APPLICATION

- To fix soft insulation under cladding facade.

WARNING:

- Not to be used for ceiling applications
- Not suitable for stiff insulation materials

DESCRIPTION

- Plastic sleeve head Ø90.
- Pin HC6-27 is premounted.
- A protection cap to allow a good waterproofness and eliminate thermal bridge.

PROPERTIES MATERIAL

Plastic sleeve head Ø90:

- Polyethylen High density.
- Black anti-UV.

HC6-27 Pin:

- Carbon steel.
- Mechanical zinc plating, min zinc coating 10 µm.
- Core hardness ≥ 56 HRC.

TOOL

- PULSA InsulFast.

APPLICATION LIMIT

- Minimum installation temperature: -5°C.
- Base materials:
 - Concrete C50/60.
 - Other material: jobsite tests must be performed to ensure reliability of the product.

Spit shall not be liable for any failures of the products unless Spit (i) tested the product and (ii) confirmed it to be reliable for the material intended for use.

DISTANCE RECOMMENDED

- Between 2 fixings: distance of 83 mm.
- Distance from insulation edge: minimum distance of 25 mm.
- Density: 2 fixings/m² minimum, for insulation thickness <140 mm.
- In the case of cutting or singular points, it may be necessary to increase the number of fixings.

RECOMMENDED LOADS

→ TENSILE

The recommended load (kN) is calculated from the characteristic load and a safety factor higher than 3.

Insulation thickness (mm)	50 -> 200
Concrete (h _{nom} = 15 mm)	0.30 kN



- SPITPULSA800E
- SPITPULSA800P/PULSA800P+
- SPITPULSA800INSULFAST



- SPITSPITFIREP370
- SPITSPITFIREP560

SPIT PULSA 800E



+ Pulsa E-Lift
pole tool



In accordance to:
EN 12549
EN ISO 11148-13
Directive tool :
2006/42/EC
2011/65/UE
1999/5/EC
CEM 2004/108/EC
Fuel cell : 75/324/EC
Battery : 2006/66/EC
Charger :
2006/95/EC
CEM 2004/108/EC

Tool specifications

Name	SPIT PULSA 800E
Impact force (Joules)	82
Weight (kg)	3.7 kg (with battery)
Overall dimension LxHxW (mm)	385x114x309
Energy	Fuel cell & Battery
Fastener lengths (mm)	15 to 40 mm in strip

Characteristics

Electrical accessories pin-guide
Fully automatic tool (1000 shots per hour)
20 pins magazine (10 per strip)
Gas & Battery gauges: check gas & battery levels anytime
Start & Go system: energy saving, "self cut-off" when it is not used for 1mn
Low push down force (4.5 kg)
Automatic energy absorber
Automatic gas dosage (used T° - 15 °C to + 49 °C)
Battery charging time: 90 mn (25 mn = 500 pins)
Fuel cell: 750 shots (20 °C), battery: up to 3000 shots

Safety specifications

CE marking
Complete tool pressure necessary to generate the shot
Security with on / off led indicator
Noise level, EN 12549 : LpA,1s,1m=96dB(A) / Lp Cpeak=135 dB(C)
Vibration, EN ISO 8662-11: 4.1 m/s ²

Accessories	Consumables
50 pins magazine WARNING: incompatible with Pulsa lift	C6, HC6, CG6, CT-CLIP, E-CLIP, E-CAV, CLIPELEC, ...TRH-CLIP
Magnetic pin guide	Metal P-CLIP
Cleaning kit	
Pulsa E-LIFT pole tool	

SPIT PULSA 800P



In accordance to:
 EN 12549
 EN ISO 11148-13
 Directive tool :
 2006/42/EC
 2011/65/UE
 1999/5/EC
 CEM 2004/108/EC
 Fuel cell : 75/324/EC
 Battery : 2006/66/EC
 Charger :
 2006/95/EC
 CEM 2004/108/EC

Tool specifications	
Name	SPIT PULSA 800P
Impact force (Joules)	82
Weight (kg)	3.7 kg (with battery)
Overall dimension LxH (mm)	385x114x309
Energy	Fuel cell & Battery
Fastener lengths (mm)	15 to 40 mm in strip

Characteristics	
Drywall pin guide	
Fully automatic tool (1000 shots per hour)	
20 pins magazine (10 per strip)	
Gas & Battery gauges: check gas & battery levels anytime	
Start & Go system: energy saving, "self cut-off" when it is not used for 1mn	
Low push down force (4.5 kg)	
Automatic gas dosage (used T° - 15 °C to + 49 °C)	
Battery charging time: 90 mn (25 mn = 500 pins)	
Fuel cell: 750 shots (20 °C), battery: up to 3000 shots	

Safety specifications	
CE marking	
Complete tool pressure necessary to generate the shot	
Security with on / off led indicator	
Noise level, EN 12549 : LpA,1s,1m=96dB(A) / Lp Cpeak=135 dB	
Vibration, EN ISO 8662-11: 4.1 m·s ⁻²	

Accessories	Consumables
50 pins magazine	C6, HC6, CW6
Magnetic pin guide	Metal washer
Cleaning kit	

SPIT PULSA 800P+



In accordance to:
 EN 12549
 EN ISO 11148-13
 Directive tool :
 2006/42/EC
 2011/65/UE
 1999/5/EC
 CEM 2004/108/EC
 Fuel cell : 75/324/EC
 Battery : 2006/66/EC
 Charger :
 2006/95/EC
 CEM 2004/108/EC

Tool specifications

Name	SPIT PULSA 800P+
Impact force (Joules)	100
Weight (kg)	3.7 (with battery)
Overall dimension LxHxW (mm)	396x114x309
Energy	Fuel cell & Battery
Fastener lengths (mm)	15 to 40 mm in strip

Characteristics

Drywall pin guide
Fully automatic tool (1000 shots per hour)
20 pins magazine (10 per strip)
Low push down force (4.5 kg)
Gas & Battery gauges: check gas & battery levels anytime
Start & Go system: energy saving, "self cut-off" when it is not used for 1mn
Automatic gas dosage (used T° - 15 °C to + 49 °C)
Battery charging time: 90 mn (25 mn = 500 pins)
Fuel cell: 600 shots (20 °C), battery: up to 3000 shots

Safety specifications

CE marking
Complete tool pressure necessary to generate the shot
Security with on / off led indicator
Noise level, EN 12549 : LpA,1s,1m=95dB(A) / Lp Cpeak=135 dB
Vibration, EN ISO 8662-11: 4.4 m·s ⁻²

Accessories	Consumables
50 pins magazine	C6, HC6, CW6
Magnetic pin guide	Metal washer
Cleaning kit	

SPIT PULSA 800 INSULFAST



In accordance to:
 EN 12549
 EN ISO 11148-13
 Directive tool:
 2006/42/EC
 2011/65/UE
 1999/5/EC
 CEM 2004/108/EC
 Fuel cell: 75/324/EC
 Battery: 2006/66/EC
 Charger: 2006/95/EC
 CEM 2004/108/EC

Tool specifications	
Name	SPIT PULSA 800 INSULFAST
Impact force (Joules)	82
Weight (kg)	3,6 kg (with battery)
Overall dimension LxH (mm)	544x114x309
Energy	Fuel cell & Battery
Fastener lengths (mm)	60 to 200 mm

Characteristics
Fully automatic tool (1000 shots per hour)
Low push down force (4.5 kg)
Gas & Battery gauges: check gas & battery levels anytime
Start & Go system: energy saving, "self cut-off" when it is not used for 1mn
Automatic gas dosage (used T° - 5 °C to + 49 °C)
Battery charging time: 90 mn (25 mn = 500 pins)
Fuel cell: 750 shots (20 °C), battery: up to 3000 shots

Safety specifications
CE marking
Complete tool pressure necessary to generate the shot
Security with on / off led indicator
Noise level, EN 12549 : LpA,1s,1m=96dB(A) / Lp Cpeak=135 dB (C)
Vibration, EN ISO 8662-11 : 5,3 m·s ⁻²

Accessories	Consumables
Cleaning kit	IF pins

SPITFIRE P370



In accordance to:
EN 15895+A1: 2018
EN 12549
Directive Tool:
2006/42/EC
Loads:
2013/29/UE
EN 16264

Tool specifications

Name	Spitfire P370	Spitfire P370 C60
Impact force (Joules)	350	350
Weight (kg)	2.8	3.2
Overall dimensions LxH (mm)	435/69/208	450/69/240
Ammunition caliber	6.3/10 (10 loads per disc)	6.3/10 (10 loads per disc)
Disc loads colors	Brown, Green, Yellow, Red	Brown, Green, Yellow, Red
Pin capacity (nbr)	single shot	10 in magazine (1 strip)
Fastener, lengths mm	20 to 70 with C9 for concrete 15 to 70 with SC9 for steel and hard concrete (80 and 90 if predriven)	15 to 60 in strip

Characteristics

Automatic piston return by rubber spring
Universal fully automatic tool (1 pin per second with magazine)
Power adjustment by wheel with indicator
Different nose adapters for different application

Safety specifications

CE marking
Indirect action class A1 (A*), velocity < 100 m/s
Complete contact pressure necessary to generate the shot
Shock energy absorber for comfort
Easy and quick maintenance
Window for checking cartridge presence
Noise level at operator, EN 12549: LWA,1s = 110 dB(A) / LpA,1s,0 = 106 dB(A) / Lp Cpeak = 144 dB(C)
Vibration: < 2.5 m.s⁻²

Accessories	Consumables
Single shot	C9, CR9, CR9P, SC9, SBR9, SA9, CT30, C9 clip A, Shuttering spacer, Formwork spacer, metal P-CLIP, CR9TP
Magazine	C9, SC9 (15 to 60 mm in strip), metal P-CLIP
Kit CI 50 to 120	CI-6 (up to 120 mm)

SPITFIRE P560



In accordance to:
 EN 15895+A1: 2018
 EN 12549
 Directive Tool:
 2006/42/EC
 Loads:
 2013/29/UE
 EN 16264

Tool specifications	
Name	SPITFIRE P560
Impact force (Joules)	520
Weight (kg)	4.2 (3.7 as single shot version)
Overall dimensions LxH (mm)	363/277/77 (363/215/77 as single shot version)
Ammunition caliber	6.3/16 (10 loads per disc)
Disc loads colors	Yellow, blue, red, black
Pin capacity (nbr)	10 in magazine (1 strip)
Fastener lengths (mm)	26 in strip (single shot also available)

Characteristics
Specialised tool for cladding, roofing & decking
Automatic cartridge advance
No mechanical power adjustment
Quick un-lock system
Easy maintenance
Different nose adapters
Stability STAB system

Safety specifications
CE marking
Indirect action class A1 (A*), velocity < 100 m/s
Complete tool pressure necessary to generate the shot
Window for check disc presence
Noise level at operator, EN 12549: LWA,1s = 118 dB(A) / LpA,1s,0 = 111 dB(A) / Lp Cpeak = 144 dB(C)
Vibration: < 2.5 m.s ⁻²

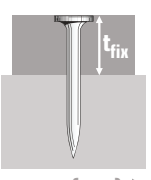
Accessories	Consumables
Magazine	HSBR14 strip
Single shot pin guide	HSBR14
Kit SA12-8	SA12-8 + RE 25 to 40

PIN SELECTOR HC6 – C6

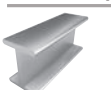
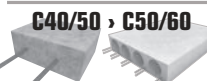
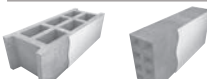
PULSA 800P / 800P+ - DRYWALL APPLICATIONS

PULSA 800 Pin Selector

C6 & HC6



t_{fix} (mm)

	1 (mm)	5 (mm)	10 (mm)	15 (mm)	20 (mm)	P800P+ 24 (mm)	
	HC6 15	HC6 15	HC6 17	HC6 22	HC6 27	HC6 32	HC6 15-17
	HC6 17	HC6 17	HC6 22-27	HC6 27	HC6 32	-	HC6 15-22
	HC6 22	HC6 22-27	HC6 27	HC6 32	-	-	HC6 17-22
	HC6 22	HC6 22-27	HC6 27	HC6 32	-	-	HC6 17-22
	C6 20	C6 25	C6 25-30	C6 35	C6 35-40	C6 40	C6 20-25
	HC6 22	HC6 22-27	HC6 27-32	HC6 32	-	-	HC6 22
	C6 20-25	C6 25	C6 30-35	C6 35	C6 35-40	C6 40	C6 25

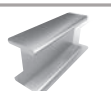
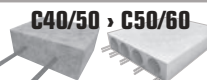
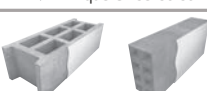
Version P

PULSA 800E - ELECTRICIAN APPLICATIONS

PULSA 800 Pin Selector

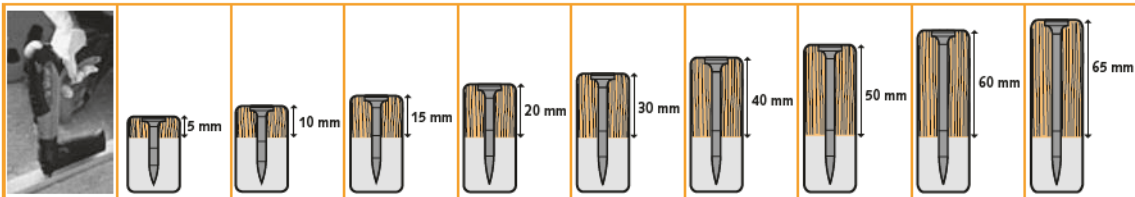
C6 & HC6



	CLIPLEC	E-CLIP	CT-CLIP	P-CLIP	COW HORN	PERF. BAND	METAL CLIP	TRH CLIP
	HC6 15-17	HC6 15-17	HC6 15-17	HC6 17-22	HC6 17-22	HC6 15	HC6 15	HC6 15
	HC6 17-22	HC6 22	HC6 17-22	HC6 22	HC6 22	HC6 15-17	HC6 15-17	HC6 15-17
	HC6 22-27	HC6 27	HC6 22-27	HC6 22-27	HC6 22-27	HC6 17-22	HC6 17-22	HC6 17-22
	HC6 22-27	HC6 27	HC6 22-27	HC6 22-27	HC6 22-27	HC6 17-22	HC6 17-22	HC6 17-22
	C6 25-30	C6 30	C6 25-30	C6 25-30	C6 25-30	C6 20-25	C6 20-25	C6 20-25
	HC6 22-27	HC6 27-32	HC6 22-27	HC6 27-32	HC6 27-32	HC6 22-27	HC6 22-27	HC6 22-27
	C6 25-30	C6 30-35	C6 25-30	C6 30-35	C6 30-35	C6 25-30	C6 25-30	C6 25-30

Version E

PIN SELECTOR P370 SC9 – C9

										
Soft steel  <i>Ultimate strength = 350 N/mm²</i>	SC9 15	SC9 15-20	SC9 20-25	SC9 25	SC9 30	SC9 40	SC9 50	SC9 60	SC9 70	-
Hard steel  <i>Ultimate strength = 500 N/mm²</i>	SC9 15	SC9 15	SC9 20	SC9 25	SC9 30	SC9 40	SC9 50	SC9 60	SC9 70	-
C 25/30 	C9 25-30	C9 30	C9 35	C9 40	C9 50	C9 55	C9 60-70	C9 70	C9 80	C9 90
Concrete C 40/50 	C9 20	SC9 20	SC9 25-30	SC9 30-35	SC9 40	SC9 50	SC9 60	SC9 70	C9 80	C9 90
	SC9 15-20									
C 50/60 	SC9 15	SC9 20	SC9 25	SC9 30	SC9 35	SC9 40*	SC9 50*	SC9 60*	SC9 70*	-



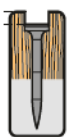
Steel support material:

- thickness mini = 5 mm
- recommended static load = 200 kg

Concrete:

- recommended static load = 50 kg maxi (C20-25)

* with a 3-4 mm over-embedment



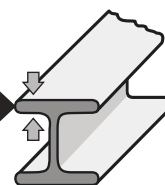
All figures given are to be used as a guide, and a job site suitability test is always recommended.

PIN SELECTOR HSBR14

P560 - STEEL ERECTORS APPLICATIONS



HSBR14

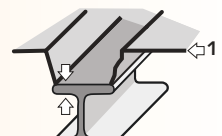


	EU	Fra. / Ger.	6	8	10	12	14	16	18	20	>22
Soft steel	S235	E24 / ST37									
	S275	E28 / ST44									
	E295	A50 / ST50									
Hard steel	S355	E36 / ST52									
	E335	A60 / ST60									
	E360*	A70 / ST70									
Base material designation											

*Maximum value = 740 N/mm²

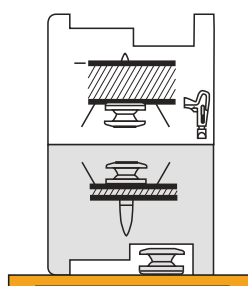
HSBR14



Caliber type  International code	Thickness base material (mm) ref. S235 							
	6	8	10	12	14	16	28	>20
Yellow 3	●							
Blue 5	●	●	●	●	●			
Red 6			●	●	●	●	●	
Black 7					●	●	●	●

● OK

● Check by site suitability tests



Pin depth gauge



The European Standard EN 792-13: 2000 + A1: 2008 lays down certain safety requirements for non-electric portable nailing tools, and in your own interest we recommend you follow these safety requirements without exception.

EN 792-13 + A1. § 7.2.1 a: *only those fasteners listed in the operating instructions may be used in the driving tools.*

EN 792-13 + A1. § 7.2.1 b: *only the main energy and the lubricants listed in the operating instructions may be used.*

EN 792-13 + A1. § 7.2.1 e: *for the maintenance of fastener driving tools, only spare parts specified by the manufacturer or his authorised representatives shall be used.*

EN 792-13 + A1. § 7.2.1 f: *repair shall be carried out only by a agent authorized by the manufacturer or by other specialists, having due regard to the information given in the operating instructions.*

EN 792-13 + A1. § 7.2.5 a: *fastener driving tools operated by internal combustion shall only be used with dispensers for combustible gas which are listed in the operating instructions.*

The European Standard EN 792-13:2000 has the status of a British Standard.

Only use SPIT specified consumables or compatibles. In accordance with EN 792-13, SPIT has specified, in its operating instructions, SPIT consumables as safe to use. In case of use of non-specified consumables, ensure that they are compatible, safe and lawfully on sale in European Union.



Read all the safety instructions and the instructions for the tool, fuel cell, battery and battery charger carefully.



The PULSA[®] system consists of: tool, fuel cell, battery, charger and fasteners.

In the interests of operator and system safety, the tool, fasteners and the fuel cells referred to in the SPIT documents, must be considered as one single, complete system.

Only experienced operators should use the SPIT PULSA[®] nailing system. They must know how the tool works and must follow the manufacturer's operating and safety instructions. Operators should be capable of conducting basic maintenance on the tool.

Please keep the nailer, fuel cell, battery and charger out of the reach of children.

When using the tool, the operator and any bystanders must wear appropriate eye and ear protection.

Only use the tool for nailing applications for which it was designed. This tool must not be used in a combustible environment.

Observe battery disposal regulations.

When not in use, remove the battery and the fasteners and return the tool to its carrying case. Do not load fasteners with the trigger and/or work-contacting element pressed.

When using the tool, never point it at yourself or anyone else. If the operator has to move locations, the tool must be carried pointed downwards. Never carry the tool with your finger on the trigger.

Always assume the tool is loaded.

The tool must be used in well-ventilated areas. Exhaust gases in a confined space can be hazardous. Do not use the tool outside in the rain or where excessive moisture is present.

Keep the tool from heat sources as the fuel cell could be damaged. Do not smoke when handling the fuel cell.

Keep it away from your face and eyes. Do not inhale its contents.

When using the tool, the operator must be in a stable position. Operate the tool in a manner that should the tool recoil, there is no risk of injury to the operator.

The operator must ensure that no-one is in the immediate vicinity of the work area. Check the work place and environment.

If the tool misfires, always remove the battery prior to examination of the tool. If the problem persists contact the tool manufacturer. The tool should be regularly inspected for defective parts, loose screws (especially after cleaning), etc and any defects rectified before use. Check prior to each operation that the safety mechanism is functioning properly.

Never put your hand on the front of the tool. The tool must be operated only when it is in contact with the material to be fixed.

Ensure that you use the correct length of fastener with the depth adjuster correctly set, so that nails do not protrude when a fixing is made. Take particular care when nailing close to edges as fasteners can break-out and deflect out of the substrate.

Do not drive fasteners into knots or on top of other fasteners. Never drive fasteners into areas with concealed hazards.

The temperature of the tool may increase depending on the firing frequency. Observe the maximum cycle rates given in the operating instructions. We recommend that you carry out regular maintenance (cleaning and lubrication) to keep the tool in good working order.

It is not permitted to make any modification to the tool, fuel cell or battery, other than those specified by the manufacturer.

Fuel cell



The fuel cell is an aerosol product corresponding to the 2008/47/EC regulations. It contains:

- liquefied hydrocarbon gases (butane, propane, propylene),
- a lubricant to maximize the tool durability.

When the fuel is used there will always be some propellant left inside the cartridge. The fuel cell is always pressurized. **Its contents are extremely flammable.** The fuel cell is not reusable. Do not attempt to refill.

Do not spray towards a flame or an incandescent body. Keep away from any heat sources and from electrostatic charges. Do not smoke when handling or loading fuel cells.

Do not expose to temperatures exceeding 50 °C.

Warning: liquid gas can cause injury in the event of contact with the skin or eyes.

Store and use the cartridge in a well-ventilated area only.

Do not inhale.

Do not pierce or burn the cartridge after use.

Keep away from children.

Dispose of only in designated places.

For optimum performance, use before the date indicated at the bottom of the cartridge.

Transport

Transport of small amounts (< 30 Kg) in a private vehicle is permitted without a transport and safety sheet.

The regulations by transport categories are:

- Road/rail: ADR – RID – UN code 1950 class 2 code 5F
- Sea: IMDG – UN code 1950 + risk sheet FD S-U
- Air: IATA – UN code 1950 class 2.1

Goods must be accompanied by a transport emergency card for road UN 1950.

Transport by post is not permitted.

Storage

Stores and showrooms must comply with building regulations. All local instructions corresponding to fire regulations must be followed.

Where possible, store fuel at a stable temperature in the range: 5 to 25 °C. Do not expose to temperatures exceeding 50 °C. Do not use tools that emit flames, sparks or reach high temperatures in the vicinity that fuel cells are stored.

Do not store in designated thoroughfares, hallways or stairwells.

Store in a well-ventilated area. Fuel cells must not be displayed in shop windows.

Storage with pyrotechnic products is not permitted.

First aid

Direct contact with liquid gas may cause burns or frostbite.

In case of inhalation remove the person to fresh air, and encourage breathing.

Should the casualty become unconscious, or breathing does not quickly return to normal, summon urgent medical assistance.

If gas gets into the eyes they should be flushed out with copious amounts of water.

Skin contamination should be removed with soapy water. If symptoms persist, seek medical assistance.



The adapter, charger and battery are designed to operate together as one system.

Only use the 'SPITPULSA®' charger for 'SPITPULSA®' batteries.

The charging system is designed for use in covered areas. Do not expose it to rain or to excessive humidity.

Arrange the charger lead appropriately to avoid unnecessary damage to it. Do not use the system if the cable or plug is damaged. Replace immediately.

To avoid electrocution, disconnect the power supply adapter before cleaning the terminals and contacts. Use a dry cloth. Do not short-circuit a battery.

Do not put a battery on charge if its temperature is less than 5 °C or greater than 40 °C. Do not use a battery charger which heats up excessively or gives off fumes when connected - disconnect the charger immediately.

Do not pierce or open the battery's cells.

Do not store batteries at a temperature above 50 °C. Do not incinerate spent batteries.

Only charge one battery at a time.

Batteries and charging systems must be recycled or taken to a designated disposal area. Keep away from children.



Read all the safety instructions carefully.



Only qualified persons over 18 years of age can be permitted to use a stud driver. These persons must know perfectly how the tool works and must follow exactly the manufacturer's instructions and the safety regulations. They must be capable of maintaining the tool.

The charges and studs used must be exclusively those designed and manufactured by SPIT for this tool.

The SPIT FIREP370 must be checked before use, so as to ensure that the safety devices are working properly and that the front end and the munition carrier are clean. Also ensure that the moving part generally slides well.

The tool must be loaded just before use. If the tool is not in use, it must be unloaded and put back into its original packing. It must not under any circumstances be transported loaded.

When firing, the operator must be in a stable position. The tool must be held at right angles to the base material.

When a firing incident occurs, the tool must be unloaded immediately, taking all necessary precautions. If several incidents occur, inform the manufacturer.

The SPIT FIREP370 and its chargers must only be transported in their original packing.

Never point the end of the stud driver at anyone. The driver must always be pointed downwards.

Never operate the driver with the flat of the hand.

The manufacturer must check the condition of the tool, even if it is not used, at least once a year.

It is prohibited for an unauthorized person to use a stud driver.

It is prohibited to make any modification to the tool other than those specified in this manual.

It is prohibited to do stud driving on profiled sheet on a metal structure before having ensured that there is no one behind it.

Fixing must not be attempted at a point where the profiled sheet support iron has been damaged or is defective.

Fixing must be done at least 2 cm away from this area.

It is prohibited to attempt fixing on materials which are not rigid or strong enough: hollow brick, plasterboard, slate, etc.

It is prohibited to drive studs into brittle, hard materials, like cast iron, hardened steel, marble or granite.

It is prohibited to do any fixing on concrete less than 10 cm from the edges.

It is prohibited to use a stud driver in workshops or other premises where there are explosion risks.

When using the tool, the user and bystanders must wear suitable safety glasses, a hard hat and hearing protection.

General safety instructions SPITFIRE P560



Read all the safety instructions carefully.



It is prohibited to do stud driving on profiled sheet on a metal structure before having ensured that there is no-one behind it.

When using the tool, the user and bystanders must wear suitable safety glasses, a hard hat, hearing protection and gloves.

Only qualified persons over 18 years of age can be permitted to use a stud driver. These persons must know perfectly how the tool works and must follow exactly the manufacturer's instructions and the safety regulations. They must be capable of maintaining the tool.

The SPITFIRE P560 must be checked before use, so as to ensure that the safety devices are working properly and that the front end and the munition carrier are clean. Also ensure that the moving part generally slides well.

The tool must be loaded just before use. If the tool is not in use, it must be unloaded and put back into its original packing. It must not under any circumstances be transported loaded.

When firing, the operator must be in a stable position. The tool must be held at right angles to the base material.

When a firing incident occurs, the tool must be unloaded immediately, taking all necessary precautions. If several incidents occur, inform the manufacturer.

The SPITFIRE P560 and its chargers must only be transported in their original packing.

Never point the end of the stud driver at anyone. The driver must always be pointed downwards.

Never operate the driver with the flat of the hand.

The manufacturer must check the condition of the tool, even if it is not used, at least once a year.

It is prohibited for unauthorized persons to use a stud driver.

It is prohibited to make any modification to the tool other than those specified in this manual.

Fixing must not be attempted at a point where the profiled sheet support iron has been damaged or is defective.

Fixing must be done at least 2 cm away from this area.

It is prohibited to attempt fixing on materials which are not rigid or strong enough: hollow brick, plasterboard, slate, etc.

It is prohibited to drive studs into brittle, hard materials, like cast iron, hardened steel, marble or granite.

It is prohibited to use a stud driver in workshops or other premises where there are explosion risks.

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SPIT products are specifically designed for trained professional end users.

Operation and safety instructions within the user manuals must be adhered to at all times. Anchors must be selected according to the nature of base materials, the load to be supported and exterior conditions. The selected product has to be checked and approved according to technical data, precise calculations and on-site tests if required, particularly in cases where there is undefined base materials or products without technical agreements. Please feel free to contact us for advice: www.spitpaslode.com

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