



## HEAVY DUTY INJECTION SOCK ANCHOR

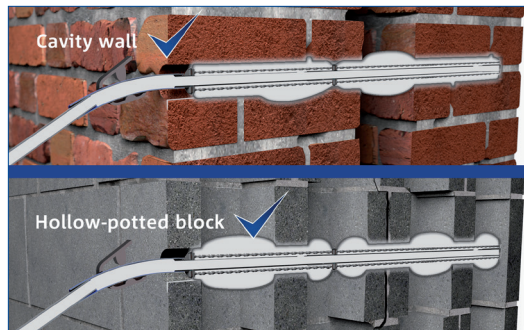
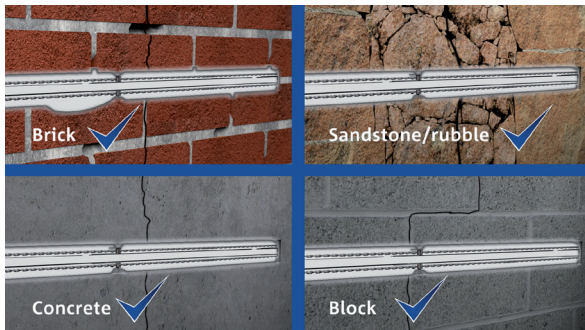
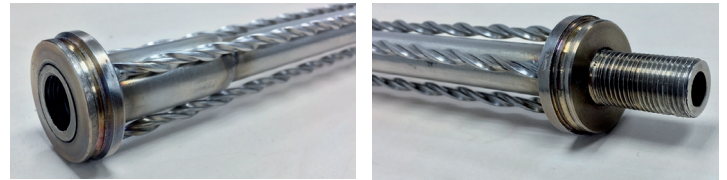


### Benefits:

- Versatile applications; (arches, historic or new build structures)
- The only injection sock anchor that is designed to be assembled on site to achieve required length facilitating the installation process
- Eliminates the need for rosette washers or restraint plates
- Compatible to the original structure; (cementitious)
- Durable; (stainless steel)
- SureTwist helical section used for increased tensile strength and keying the grout
- Easy to install
- Clean to install
- Can be used in weak and poor quality substrates
- No manufacturing lead time; (pre-manufactured in 3 lengths)
- Grout is pumped through the central spine, (no plastic tubes creating weak spots)
- Easy to ship on pallets
- Suitable for nearly all solid and hollow substrates

### Applications:

- The SureTwist Heavy Duty Sock Anchor system is a fully engineered technical solution for strengthening masonry and repairing cracked or delaminated stonework.
- Available in standard and bespoke (custom) lengths to cater for any job, the SureTwist HDS Sock Anchor system stabilises and secures all types of masonry, with minimal disruption, to ensure a strong, durable and flexible repair.



Construction Tie Products Inc.  
10422 West 400 North  
Michigan City, IN 46360  
Ph: 219-878-1427

Clay tile and brick veneer

Patent Pending

Please always wear the appropriate safety and protective clothing when installing fixing and anchor products. Always observe the necessary Health & Safety guidelines.

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Made in the EU





## HEAVY DUTY INJECTION SOCK ANCHOR

The SureTwist HDS Heavy Duty Sock Anchor system is suitable for repairing and strengthening all masonry structures: bridges, arches, historic buildings, monuments and high rise constructions, and is ideal when high shear loads are being considered.

It is the only purpose designed injection sock anchor on the market, allowing assembly on site from our three standard off the shelf stock sizes, economising transport costs as the HDS comes palletised. It also allows for the contractor to complete the contract, without manufacturing delays.

The SureTwist HDS Heavy Duty Sock Anchor has been fully tested at the Imperial College London, along with SureGrout HDS. Below is a summary of those tests.

It is a very simple anchor to install, purely drill your hole using either SDS max drills, core drills or diamond drills, clean the holes, screw the blanking plug into the end

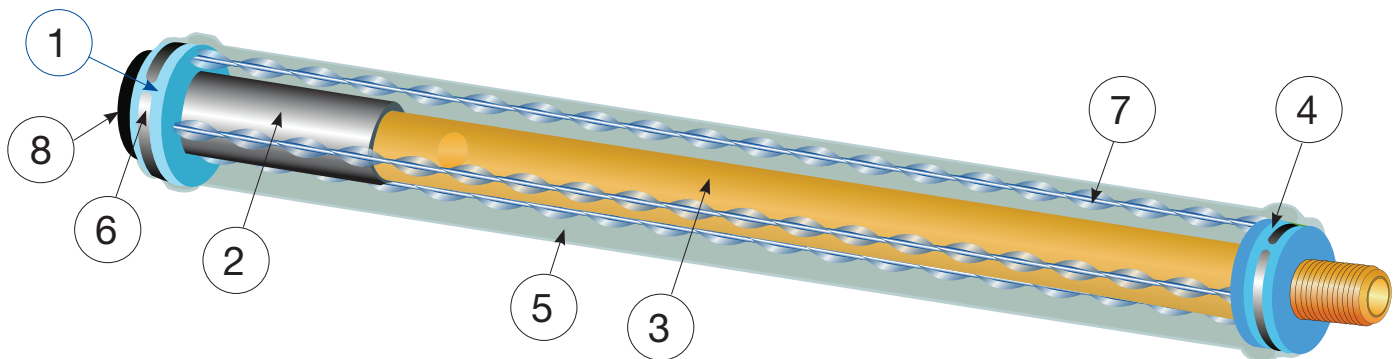
anchor and push into the drilled hole, connecting the anchors to the desired length. Screw the pipe onto the end, mix the grout, put into a pneumatic gun and fill the anchor. Once the grout milk is seen running from the hole, stop pumping and let it relax for a few minutes then clamp the pipe and remove the gun. Leave for at least an hour then remove the pipe and clamp. (See installation sheets for comprehensive installation information.)

### Technical Information

- Drill hole size 37mm - 60mm (1.5" - 2-3/8")
- Standard lengths: 1000mm, (40") 500mm, (20") and 250mm, (10"); (Individual lengths can be manufactured to order)
- Central internal pipe: 14mm, (9/16")
- Minimum tensile strength: 45.38 kN, (6580psi); (as individual connectors)
- SureGrout HDS compressive strength: 65 N/mm<sup>2</sup> (9430psi) after 28 days. Tested to EN 196-1 and 3 and EN 445, 446 and 447

Technical Guide (Initial Test Results Imperial College London.)

Anchor Type	Anchor Dia. MM	Core Dia. MM	Embedment MM	Substrate N/M	Ultimate Tensile kN	Ultimate Shear kN
HDS 32	32 (1.25")	14 (0.55")	250 (10")	Brick 16	46.77 (10.5K)	75.28 (16.9K)



ITEM	DESCRIPTION
1	17MM, (7/8") COLLAR
2	THREADED SLEEVE
3	CENTRE TUBE
4	14MM, (9/16") COLLAR
5	SOCK SLEEVE
6	28MM, (1.1") ROUND SNAP RING
7	4.5MM, (0.177") HELICAL ROD
8	BLANKING PLUG

### Additional Products

- PNEUMATIC GUN
- INSTALLATION PACK (ADDITIONAL HOSE / HOSE CLIPS / STEEL OR COPPER INJECTION NOZZLE)
- 2HP 110V COMPRESSOR
- 35LTR. (9 GAL.) MIXING TUB
- 110V, 1150W MIXER
- 20LTR. (5 GAL.) PRESSURE MIXER. (CAN CONNECT DIRECTLY TO PNEUMATIC GUN)

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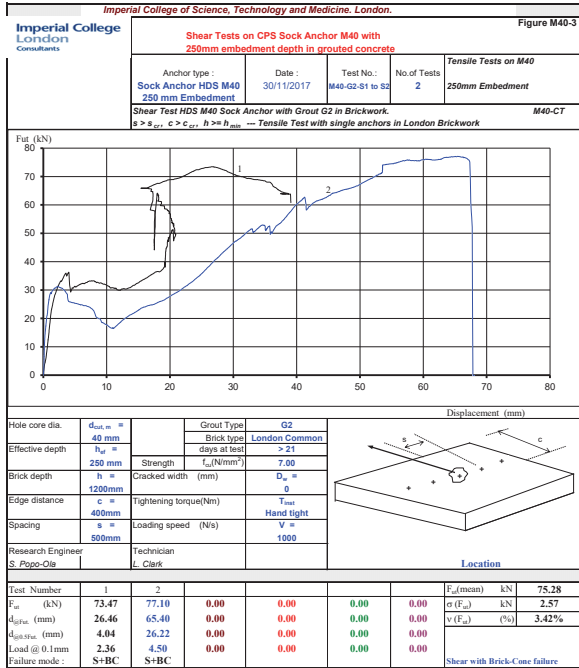
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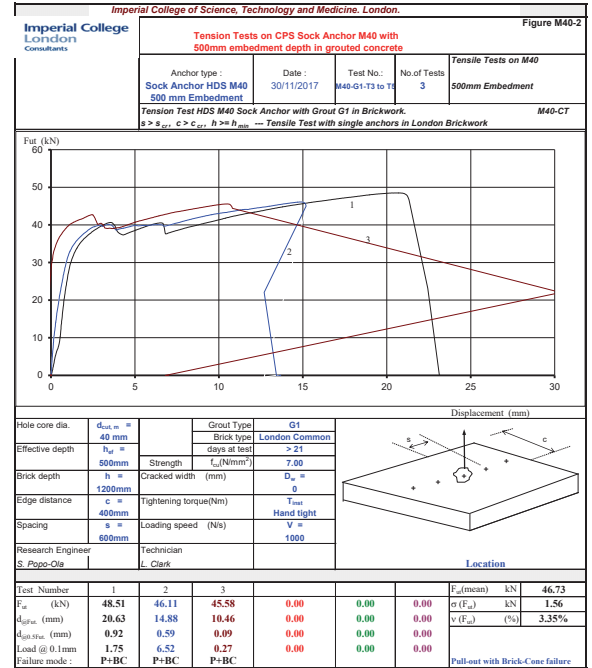


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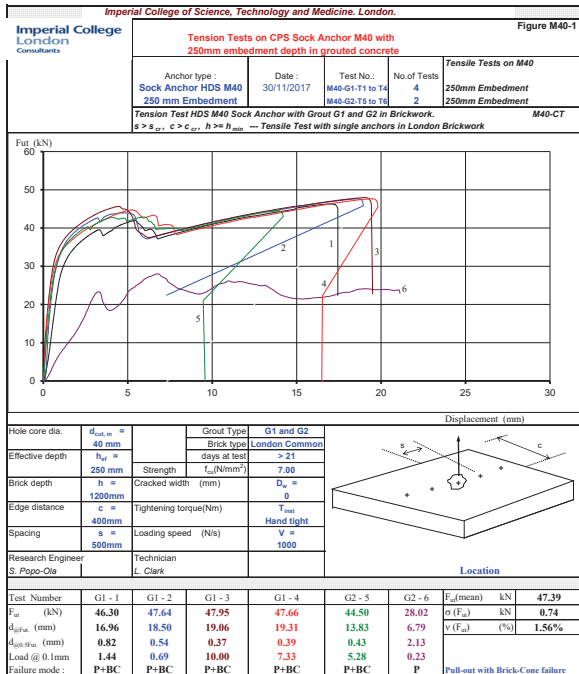
## SHEAR TESTS 250MM (10") EMBEDMENT



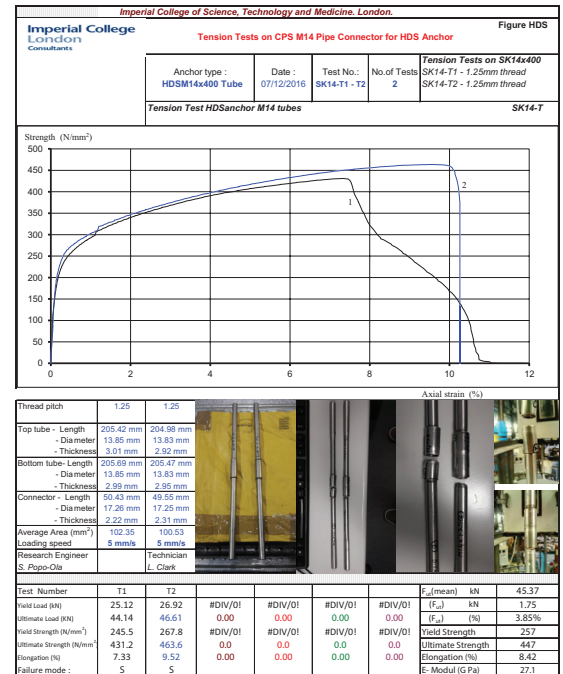
## TENSILE TESTS 500MM (20") EMBEDMENT



## TENSILE TESTS 250MM (10") EMBEDMENT



## COMPONENT TESTS



Test Ref.	Area (mm <sup>2</sup> )	Length (mm)	Failure load (kN)	Yield load (kN)	Failure Strength (MPa)	Yield Strength (MPa)	Max Axial Elongation (%)	Failure mode
M14x1.25	100.1 (0.155in <sup>2</sup> )	410 (16.1")	45.38 (10.2K)	25.9 (5822lb)	448.3 (65ksi)	255.65 (37ksi)	9.52	Top bar breakage



## HEAVY DUTY INJECTION SOCK ANCHOR

Test programme for CPS HDS M40 Sock Anchors grouted (G1 and G2) in Brickwork

Test Ref.	Test type	Anchor depth	Grout type	Face of Brick	Failure load	Date of test	Failure mode	Manufacturer Ref.
T40-G1-1	Tension	250 (10")	Grout-1	1	46.30 (10.4K)	30/11/2017	P + BC	HDS-M40-G1-T1
T40-G1-2	Tension	250 (10")	Grout-1	1	47.64 (10.7K)	30/11/2017	P + BC	HDS-M40-G1-T2
T40-G2-1	Tension	250 (10")	Grout-2	1	44.50 (10K)	30/11/2017	P + BC	HDS-M40-G2-T1
T-S40-G1-1	Tension	250 (10")	Grout-1	1	47.95 (10.8K)	30/11/2017	P + BC	HDS-M40-G1-TS1
T-S40-G1-1	Tension	250 (10")	Grout-1	1	47.66 (10.7K)	30/11/2017	P + BC	HDS-M40-G1-TS2
T40-G1-3	Tension	500 (20")	Grout-1	2	48.50 (10.9K)	01/12/2017	P + BC	HDS-M40-G1-T3
T40-G1-4	Tension	500 (20")	Grout-1	2	46.11 (10.4K)	01/12/2017	P + BC	HDS-M40-G1-T4
T40-G1-5	Tension	500 (20")	Grout-1	1	45.58 (10.2K)	30/11/2017	P + BC	HDS-M40-G1-T5
S40-G2-1	Shear	250 (10")	Grout-2	2	73.47 (16.5K)	30/11/2017	S + BC	HDS-M40-G2-S1
S40-G2-2	Shear	250 (10")	Grout-2	2	77.10 (17.3K)	30/11/2017	S + BC	HDS-M40-G2-S1

P + BC Pullout with Brickwork Cone failure S + BC Shear with Brickwork Cone Pryout failure P Pullout by hand failure

### Resistance of concrete to rapid freezing and thawing

Tested in Lichtenstein, Germany. Product: HDS Injection Grout EU. Report number: 2018/569/209. Batch number: 44709. Production quantity: Laboratory Lot. Delivery date: 1st June 2018. HDS Injection Grout EU, tested to DIN EN 1542 & DIN EN 772-22.

Inspection characteristic	Test specification	Test period from 19.02.2018 until 30.05.2018			28-02-18 10-03-18 20-03-18 30-03-18 09-04-18 19-04-18 29-04-18 09-05-18 19-05-18 30-05-18									
		Initial value	Final value	Difference	20	40	60	80	100	120	140	160	180	200
Cycles	Freeze-Thaw-Cycles in Water at -18°C/ +18°C	0 Cycles	200 Cycles	N/A	20	40	60	80	100	120	140	160	180	200
Weight loss	PVFTW01	555,5 g (average weight of test specimens)	555,5 g (average weight of test specimens)	0%	555,5	555,5	555,5	555,5	555,5	555,5	555,5	555,5	555,5	555,5
Decreasing Flexural strength	PVFTW01	9,87 Mpa (Mpa corresponds to N/mm <sup>2</sup> )	9,40 Mpa (Mpa corresponds to N/mm <sup>2</sup> )	4,76%	9,85	9,79	9,73	9,67	9,61	9,55	9,49	9,43	9,40	9,40
Decreasing Compressive strength	PVFTW01	82,33 Mpa	77,74 Mpa	5,58%	81,76	81,19	80,62	80,05	79,47	78,9	78,32	77,78	77,74	77,74
Adhesion capacity	EN-1542	2,54 Mpa	2,2 Mpa	0,34 Mpa	2,49	2,45	2,41	2,37	2,33	2,29	2,25	2,21	2,2	2,2
Visual assessment	PVFTW01			None visible	None visible	None visible	None visible	None visible	None visible	None visible	None visible	None visible	None visible	None visible

### Grout Consumption

Drill Hole Size Mm (in)	Grout Consumption per Linear metre (ft)	Metre (ft) per 20kg (44lb) bag
32 (1.25)	0,8 (14.7)	15,5 (53)
37 (1.5)	1,1 (21.2)	11,6 (37)
40 (1.56)	1,3 (23.4)	9,9 (34)
45 (1.75)	1,6 (28.9)	7,8 (27)
50 (2.0)	2,0 (37.7)	6,3 (21)
55 (2.25)	2,4 (47.7)	5,2 (17)
60 (2.5)	2,8 (58.9)	4,4 (13)

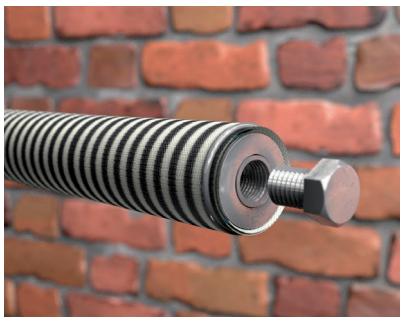
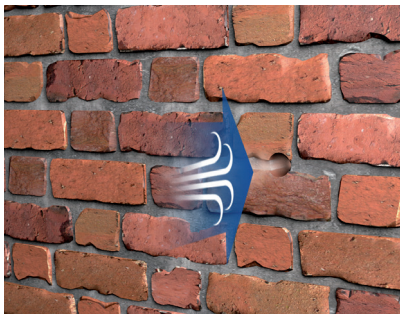
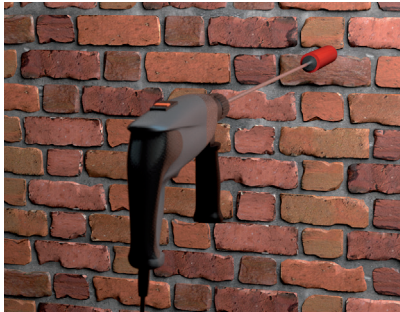
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4. Once the required length is achieved, fit the supplied hose.

1. Mark the entry points as specified by the engineer and drill to the correct length using either a core drill or an SDS Max hammer drill.

2. Ensure all debris is removed from the holes using a suitable air pump, then spray with clean water to maximise grout adhesion, and facilitate a gradual and even cure.

3. Screw the blanking plug into the end of the first HDS anchor, then insert into the hole. Additional component lengths are then added by simply screwing them together.



5. To mix the grout, add the appropriate amount of water first, then the powder and mix well using a paddle, until a very fluid but creamy uniform consistency is created. Always maintain the correct working ratio, as per the manufacturer's instructions.



## HEAVY DUTY INJECTION SOCK ANCHOR METHOD STATEMENT



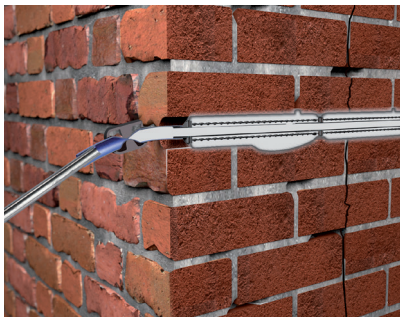
6. Pour the mix into a pneumatic grout gun, connected to a compressor - set to a maximum of 3 bar (44psi) pressure.



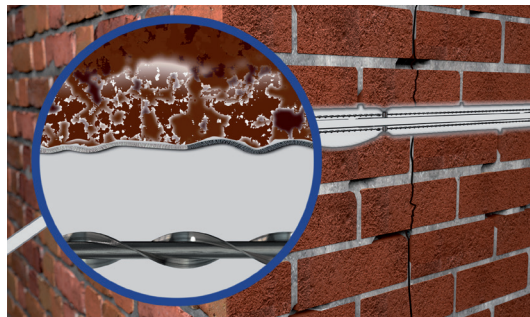
7. Once ready to fill, slip a clamp over the exposed hose, then push fit the steel pipe into the open end. Switch on the compressor and proceed with pumping.



8. The HDS Sock Anchor system is back-filled, expanding the reinforced mesh sock to completely fill any voids, providing a permanent cementitious fixing to the surrounding masonry.



9. When the sock has been fully inflated, milk grout gently runs from the anchor indicating that it's full.



10. Maintaining the pressure at this stage forces the milk grout further into the surrounding material and minimises shrinkage. As it cures, the high-performance grout firmly secures the helical bars to create a single structural entity that resists shear, compressive and tensile forces.



11. After a few minutes, fasten the clamp before turning off the compressor. It is advisable to remove the hose from the threaded tube 2-3 hours after installation. Wash any excess grout off with clean water, then fill the holes with SureFill flexible pointing mortar and colour match the masonry with Surestain.





## HDS INJECTION GROUT

### Description

HDS Grout is a specially formulated Portland cement powder mix designed for the grouting of structural anchors and cables in post-tensioned concrete for EN 446(2007) and CARES Appendix PT10 procedures.

The mix design consists of a blend of fine and ultra fine cements plus a set of synergistic admixtures. The grout powder is packaged in 20kg (44lb) durable, moisture resistant bags ready for onsite mixing.

The material readily mixes with water to produce a particularly fluid flowing grout which will penetrate and fill fine voids within and around the anchors and cables then harden without shrinking to give a high strength product.

Particular advantages of the product include a quick and easy mixing with water producing a flowing mix which promotes penetration into confined spaces. The grout is shrinkage compensated and contains a powerful corrosion inhibitor to protect the cables and anchors.

Once hardened and cured, high compressive strengths are achieved giving resistance to static and dynamic stresses. HDS Grout has a total chloride, sulphate and sulphide-ion content below that specified in EN 447 CARES PT10.

### Uses include:

- Grouting of cable ducts, voids and fine fissures.
- Support of cable anchor plates and ground anchors.
- To provide bearing or contact between structural anchor components.
- Grouting behind shafts and tunnel linings.
- Underpinning, loose floor and road slabs.

### Standards

HDS Grout has been tested in accordance with the appropriate parts of the following standards: EN445, EN446, EN447, EN196-1, EN196-3

### CARES PT10 certificate 080706 (Copies available on request).

#### Specification Outline

Grouting works shall be carried out using HDS Grout as manufactured by Parex Ltd. The product must be stored, handled and used strictly in accordance with the manufacturer's instructions.

### Accreditations

Parex Ltd. has an integrated management system which is externally accredited to ISO9001:2008, ISO14001:2004 and OHSAS18001:2007.

This product also conforms to BES 6001.

Parex Ltd. is CARES certified for the production and supply of pre-bagged grout material to appendix PT10 for use in post-tensioning systems.

### Typical Grout Properties @ 20°C (68°F)

Water content by weight 33% minimum to 35% maximum (6.6 to 7 litres (1.7 - 1.8gal.) per 20kg (44lb) bag).

### Compressive Strength Tested To EN 196-1 (W/P 0.35)

1 Day	3 Days	7 Days	28 Days
18N/mm <sup>2</sup> (2611psi)	40N/mm <sup>2</sup> (5802psi)	55N/mm <sup>2</sup> (7977psi)	65N/mm <sup>2</sup> (9427psi)

### Typical results from EN445 testing at 33% water content.

Test type	Result specified in EN447:2007 & PT10	Result obtained by testing HDS Grout
2mm sieve test	No lumps	No lumps
Flow cone	T <sub>0</sub> >25s T <sub>30</sub> >25s and within 20% of T <sub>0</sub>	T <sub>0</sub> >14s T <sub>30A</sub> >14.3s T <sub>30B</sub> >13.8s
Bleeding	Bleeding 0.3% max.	Bleeding 0.1%
Volume change	Volume change -1 to 5% max	Volume change -0.27%
Compressive strength test	>27 N/mm <sup>2</sup> (3916psi) @ 7 days	84.5 N/mm <sup>2</sup> (12.3ksi) @ 7 days
Initial and final setting test (EN196-3)	Initial > 3 hours Final < 22 hours	



## HDS INJECTION GROUT

### Instructions for Use:

#### Preparation

All necessary preparatory work must be completed before the grout is mixed. The fluid nature of the grout at 35% maximum water to powder ratio enables it to flow long distances in well prepared elements. Sufficient head should always be provided by positive pump pressure to ensure grout flow along or upwards in the cable ducts and drilled holes. Site trials may be carried out to confirm that suitable equipment is available and an appropriate water / powder ratio is chosen. A surcharge stand pipe should be allowed for to take up 'shrinkage' as the grout fills voids. Ensure that enough grout is mixed and available for the grouting operation to be completed in one continuous pour.

#### Mixing

For each 20kg (44lb) bag of HDS Grout, a maximum of 7 litres (1.8gal) of water are required. For single bag mixes suitable mixing may be achieved using a high torque, slow speed drill with a Grout Stirrer. For larger mixes use a standard grout mixer such as the Groutmaster, Putzmeister or Colcrete series. Pour the required quantity of clean water into the mixing vessel. Slowly add the HDS Grout to the water whilst continually mixing. Keep the mixed grout in a slow agitating holding tank prior to placing.

#### Placing

Where HDS Grout will be pumped into place the grout pump should be of the positive displacement type capable of generating at least 10 bars (140psi) pressure. Up to 40 bars (580psi) may be required to fill particularly long or high upward ducts. The rate and continuity of placing should be controlled to encourage good penetration of grout into the voids within the duct and the expulsion of air from the duct. Do not disturb once grouting has been completed before the grout has hardened. HDS Grout may be placed at temperatures between 5°C (41 F) and 35°C (95 F). For placing temperatures outside this range contact the Technical Service Department.

#### Curing

After grouting has been complete, or when the formwork is removed, any exposed grout must be cured immediately with Polycure at the rate of 10m<sup>2</sup>/litre, (28.5 ft<sup>2</sup>/gal). During adverse weather conditions, such as high temperatures and drying winds, a second application of Polycure should be applied after the first application is dry.

#### Precautions

##### Health and Safety

HDS Grout is alkaline when mixed with water and should not come into contact with skin or eyes. Avoid inhalation of dust during mixing and wear safety glasses, dust mask and gloves. If skin contact occurs wash thoroughly with clean water. Should eye contact occur rinse immediately with plenty of clean water and seek medical advice. Full health and safety data are given in Product Safety Data Sheet.

##### Fire

HDS Grout is non-flammable.

##### Yield

Each 20kg (44lb) bag of HDS Grout will yield approximately 13 litres (793 cu in) of mixed material at water dose rate of 35%.

##### Storage and Shelf Life

HDS Grout will have a storage life of 6 months in unopened bags when kept in dry conditions at a temperature between 5°C (41°F) and 35°C (95°F). Storage at higher temperatures and high humidity may reduce shelf life.

##### Packaging and Ordering

HDS Grout is supplied:  
20kg (44lb) valve bags Product Code TG108

For further information and sales please contact CTP at the address below.

Construction Tie Products Inc.  
10422 West 400 North  
Michigan City, IN 46360  
Ph: 219-878-1427

Date issued – 12/18

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