Declaration of Performance Number 1109-CPR-0085-5

According to Regulation EU No 305/2011

Item code: **DGE01**

Manufacturer: **Tecfi S.p.A. - S.S. Appia, km 193 - 81050 Pastorano (CE), Italy**

Table 1 - Intended use	
Product type:	Metal anchor for use in concrete
Anchor type:	Bonded anchor with anchor rod for use in non-cracked concrete
Technical description of the product:	The Sinto ST-PE Tecfi Polyester Resin styrene free - DGE01 bonded anchor is a bonded anchors (injection type) consisting of an injection mortar cartridge equipped with a special mixing nozzle and threaded anchor rod of the sizes M8 to M16.
Base material:	Reinforced or unreinforced, non cracked, normal weight concrete of strength class C20/25 at minimum to C50/60 at maximum according to EN 206-1.
Installation:	Dry or wet concrete.
Materials:	**Threaded rods:** a) Galvanized Carbon steel grade 4.8 to 8.8 according to EN ISO 898-1 b) Stainless steel A4-50, A4-70 and A4-80 according to EN ISO 3506 c) High corrosion resistant stainless steel, grade 50, 70 and 80 **Nuts and washers:** Corresponding to anchor rod material above mentioned for the different environmental exposures.
Loading:	Static and quasi-static loads.
Durability:	**Elements made of galvanized steel** may be used in structures subject to dry internal conditions only. **Elements made of stainless steel** may be used in structures subject to dry internal conditions and also in concrete subject to external atmospheric exposure (including industrial and marine environment) or exposure in permanently damp internal conditions if no particular aggressive conditions exist. Such particular aggressive conditions are e.g. permanent, alternating immersion in seawater or the splash zone of seawater, chloride atmosphere of indoor swimming pools or atmosphere with extreme chemical pollution (e.g. in desulphurization plants or road tunnels where de-icing materials are used). **Elements made of high corrosion resistant steel** may be used in structures subject to dry internal conditions and also in concrete subject to external atmospheric exposure or exposure in permanently damp internal conditions or in other particular aggressive conditions. Such particular aggressive conditions are e.g. permanent, alternating immersion in seawater or the splash zone of seawater, chloride atmosphere of indoor swimming pools or atmosphere with chemical pollution (e.g. in desulphurization plants or road tunnels where de-icing materials are used).
Service temperature:	***-40°C to +50°C*** (max. short term temperature +50°C and max. long term temperature +40°C).
Fire Resistance	NPD
Fire Reaction	In the final application the thickness of the mortar layer is about 1 to 2 mm and most of the mortar is material classified class A1 according to EC Decision 96/603/EC. Therefore it may be assumed that the bonding material (synthetic mortar or a mixture of synthetic mortar and cementitious mortar) in connection with the metal anchor in the end use application do not make any contribution to fire growth or to the fully developed fire and they have no influence to the smoke hazard.

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ETA:	ETA 11/0553, issued by ETA-Denmark
On the basis of:	Etag 001 Part 5 used as EAD
Attestation of Conformity:	EC number B 1109-CPR-0081-03, issued by IFBT
Under system:	1

Table 2 - Anchor's components

Table 2.a: Threaded rods materials

Part	Designation		
	Steel: zinc plated ≥ 5 µm acc. to EN ISO 4042 hot dipped galvanized ≥ 45 µm EN ISO 10684	**Stainless steel A4**	**High corrosion resistance stainless steel (HCR)**
Threaded rod	Steel property class from 4.8 to 8.8, acc. to EN ISO 898-1	Material 1.4401; 1.4404; 1.4578; 1.4571; 1.4439; 1.4362; 1.4062 acc. to EN 10088-1; property class 50, 70 or 80 acc. to EN ISO 3506-1	Material 1.4529 / 1.4565, acc. to EN 10088-1; property class 50, 70 or 80 acc. to EN ISO 3506-1
Washer EN ISO 7089	Steel acc. to corresponding to threaded rod material	Material 1.4401; 1.4404; 1.4578; 1.4571; 1.4439; 1.4362; 1.4062 acc. to EN 10088-1; corresponding to threaded rod material	Material 1.4529 / 1.4565, acc. to EN 10088-1; corresponding to threaded rod material
Hexagon nut	Steel, property class from 4 to 8 acc. to EN 898-2; corresponding to threaded rod material	Material 1.4401; 1.4404; 1.4578; 1.4571; 1.4439; 1.4362; 1.4062 acc. to EN 10088-1; property class 50, 70 or 80 acc. to EN ISO 3506-1	Material 1.4529 / 1.4565, acc. to EN 10088-1; property class 50, 70 or 80 acc. to EN ISO 3506-1

Commercial standard threaded rods with:
- material and mechanical properties according to the previous table
- confirmation of material and mechanical properties by inspection certificate 3.1 according to EN-10204:2004
- marking of the threaded rod with the embedment depth;
- Flat end, 45° cutted end or V shape end.

Table 2.b: Injection mortar

Product	Composition
DGE01 Sinto ST-PE - two components injection mortar	Mortar resin styrene-free, hardener, filler

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Figure 1 – Anchor application and installation parameter

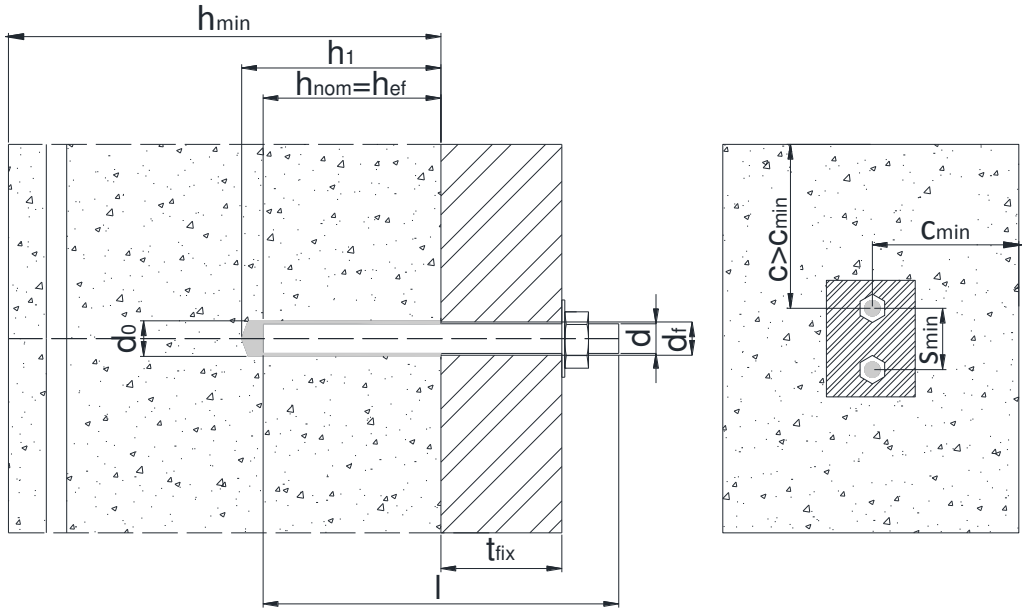


Figure 2 - Installation sequence and cleaning tools

Installation procedure

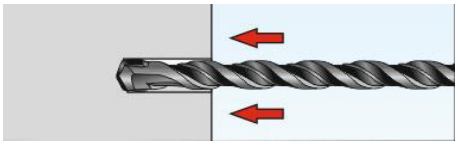
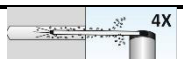
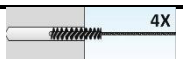
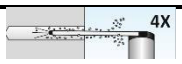
	Drill the hole with the correct diameter and depth using a rotary percussive machine. Check the perpendicularity of the hole during the drilling operation.
   **4 x Blower** **4 x Brush** **4 x Blower** if necessary use a mixer extension for the blower operation (see Annex B3). In case of use of compressed air each blower operation must be done for 5 second. Use compressed air free oil.	Clean the hole from drilling dust: the hole shall be cleaned by at least 4 blowing operations, by at least 4 brushing operations followed again by at least 4 blowing operations; before brushing clean the brush and check (see Annex B4) if the brush diameter is sufficient. For the blower tools see Annex B3.
	For coaxial and peeler cartridges unscrew the front cup, screw on the mixer and insert the cartridge in the gun. For the size 300 ml and 165 ml, unscrew the front cup, pull-out the steel closing clip according to the following operations: - insert the mixer in the eye of the plastic extractor, - pull the extractor to unhook the steel closing clip of the foil. In the version without extractor cut the foil pack. After that, screw on the mixer and insert the cartridge in the gun.

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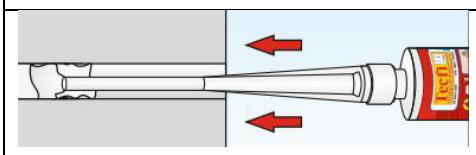
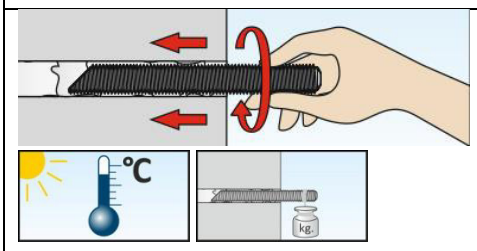
Figure 2 (cont.) - Installation sequence and cleaning tools

	Before starting to use the cartridge, eject a first part of the product, being sure that the two components are completely mixed. The complete mixing is reached only after that the product, obtained by mixing the two components, comes out from the mixer with an uniform color.
 **if necessary use a mixer extension for the injection (see Annex A4)**	Fill the drilled hole uniformly starting from the drilled hole bottom, in order to avoid entrapment of the air; remove the mixer slowly bit by bit during pressing-out; filling the drill hole with a quantity of the injection mortar corresponding to 2/3 of the drill hole depth.
 **ATTENTION: Use the rods dry and free oil and other contaminants**	Insert immediately the rod, marked according to the proper anchorage depth, slowly and with a slight twisting motion, removing excess of injection mortar around the rod. Observe the processing time according Annex B2. Wait the curing time according Annex B2.

Overhead application

In addition to standard procedure, for overhead installation, follow the instructions below

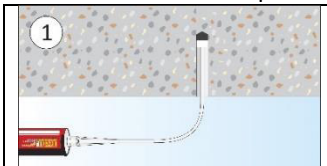
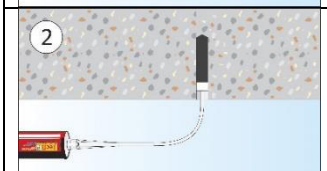
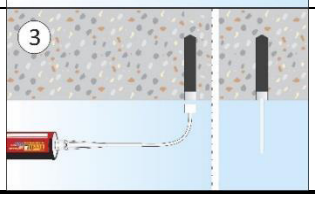
	Start injection: Inject from the bottom of the hole using the proper pneumatic-pump. Hold this position during the injection phase.
	Injection phase: inject the product about 2/3 of the hole depth. During the injection hold this position to assure the correct installation.
	End injection: remove the injection plug. Insert immediately the rod (turn the rod during the insertion).

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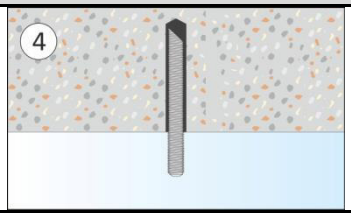
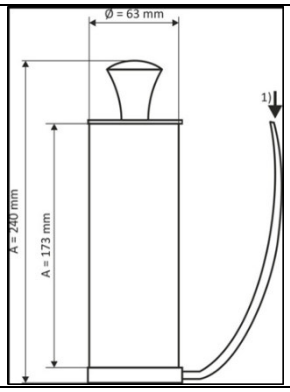
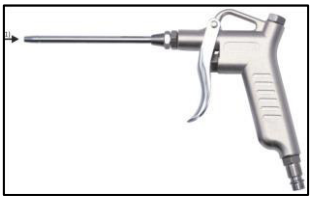
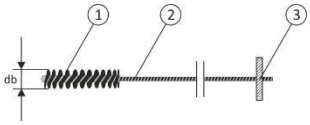
Figure 2 (cont.) - Installation sequence and cleaning tools

	End installation: to avoid the slipping of the rod during the open time of the product (due to the rod own weight) use a temporary interlocking element (e.g. wedge of wood)	

Cleaning tools

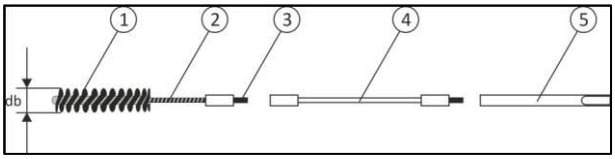
Manual blower pump	***Mechanical air system (compressed air)***
	
1) It's possible to use the mixer extension with the manual blower pump	The use of the mixer extension is allowed if using the compressor (compressed air) Minimum suitable pressure 6 [bar] at 6 [m^3/h]. Oil free compressed air. Recommended air gun with an orifice opening minimum 3,5 [mm] in diameter.

Standard brush



1 – Steel bristles
2 – Steel stem
3 – Wood handle

Special brush



1 – Steel bristles
2 – Steel stem
3 – Threaded connection for drilling tool extension
4 – Special brush extension
5 – Drilling tool connection (SDS connection)

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Table 3 – Declared performance according to ETAG 001					
Installation parameters					
Size		***M8***	***M10***	***M12***	***M16***
Nominal anchor diameter	d_{nom} [mm]	8	10	12	16
Nominal drill hole diameter	d_0 [mm]	10	12	14	18
Diameter of the clearance hole in the fixture	d_f [mm]	9	12	14	18
Depth of the drill hole	h_1 [mm]	h_{ef} + 5 mm			
Minimum thickness of concrete member	h_{min} [mm]	h_{ef}+30≥100			h_{ef}+2 d_0
Minimum embedment depth	$h_{ef,min}$ [mm]	60	70	80	100
Maximum embedment depth	$h_{ef,max}$ [mm]	160	200	240	320
Required torque moment	T_{inst} [Nm]	10	20	40	80
Minimum allowable spacing	s_{min} [mm]	40	40	40	50
Minimum allowable edge distance	c_{min} [mm]	40	40	40	50
Brush size (standard or special)	d_b [mm]	12	14	16	20

Processing and curing time[1)]

Concrete temperature	***Processing time***	***Minimum curing time for dry and wet conditions***
0°C[2)]	25 min	180 min
5°C[2)]	15 min	120 min
10°C	12 min	90 min
15°C	8 min	60 min
20°C	6 min	45 min
25°C	4 min	30 min
30°C	3 min	20 min

[1)] Minimum time from the end of the mixing to the time when the anchor may be torque or loaded (whichever is longer).
[2)] Minimum resin temperature recommended, for injection between 5°C and 0°C, equal to 10°C.

Combined pull-out and concrete cone failure to tension load in non-cracked concrete

Size			***M8***	***M10***	***M12***	***M16***
Characteristic bond resistance in non cracked concrete C20/25, Temperature range -40°C/+50°C (T_{mlp} = +40°C)		τ_{ucr} [N/mm²]	12	12	11	9
Increasing factor for non cracked concrete C30/37		$\Psi_{c,ucr,\ C30/37}$	1,04			
Increasing factor for non cracked concrete C40/50		$\Psi_{c,ucr,\ C40/50}$	1,07			
Increasing factor for non cracked concrete C50/60		$\Psi_{c,ucr,\ C50/60}$	1,09			
Splitting failure						
Spacing for ensuring the transmission of the characteristic tensile resistance of a single anchor without spacing and edge effects in case of splitting failure.	$h = h_{min}$	$s_{cr,sp}$ [mm]	4 h_{ef}			
	$h_{min} \le h \le 2$ hef		interpolated value			
	$h \ge 2\ h_{ef}$		20 d $(\tau_{Rk,ucr}/7{,}5)^{\wedge 0,5} \le 3\ h_{ef}$			
Edge distance for ensuring the transmission of the characteristic tensile resistance of a single anchor without spacing and edge effects in case of splitting failure		$c_{cr,sp}$ [mm]	0,5 $s_{cr,sp}$			

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Table 3 (cont.) – Declared performance according to ETAG 001					
Concrete pry-out failure					
Factor for concrete pry-out failure	**$k = k_3$ [-]**	2			
Displacement under service load					
Tensile service Load in non cracked concrete C20/25 to C50/60	**N_s [kN]**	9,5	13,8	16,9	23,6
Short term displacement under tensile service load	**δ_{N0} [mm]**	0,30		0,35	
Long term displacement under tensile service load	**$\delta_{N\infty}$ [mm]**	0,73			
Shear service Load in non cracked concrete C20/25 to C50/60	**V_s [kN]**	10,5	16,6	24,1	44,8
Short term displacement under shear service load	**δ_{V0} [mm]**	2,00			
Long term displacement under shear service load	**δV_∞ [mm]**	3,00			

Table 3 – Format of DGE01		
Cartridge capacity	***Type of cartridge***	***Item code***
300 ml	Coaxial special	DGE 01 00 300
400 ml	Coaxial special	DGE 01 00 400

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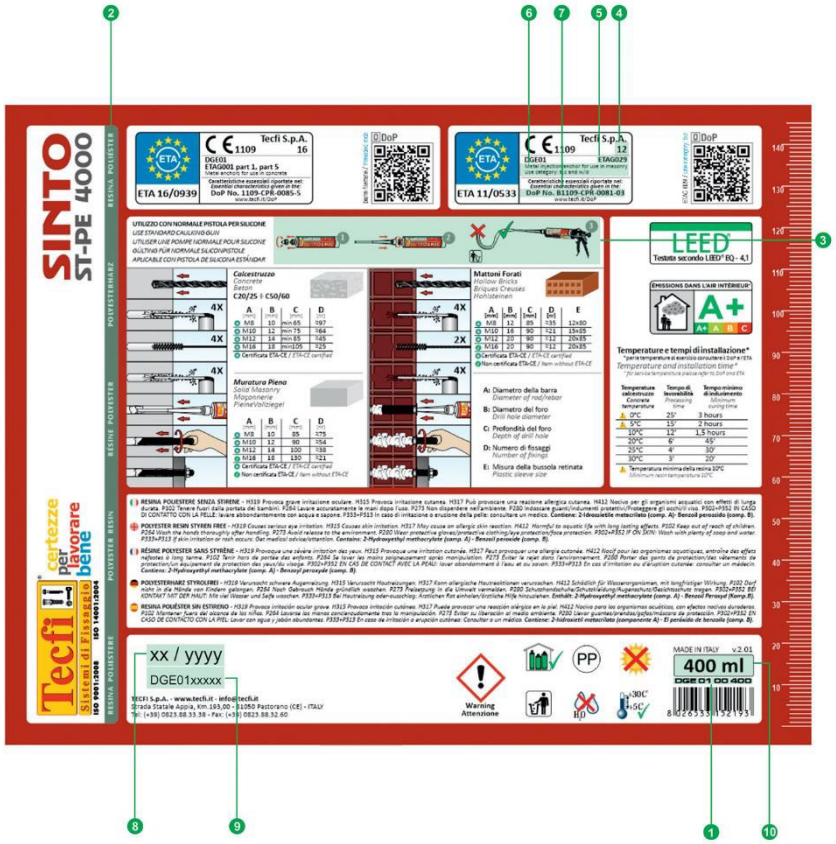
Figure 3 – Label example



1. Item Code
2. Descriptions
3. Picture
4. Last two digits of the year in wich the marking was first affixed
5. European standard applied
6. Intended use of the product as laid down in the European standard applied, level of performance declared
7. DoP Number
8. Expiring date
9. Lot Number
10. Contents

The performances of the product identified by the above identification code are in conformity with the declared performance. This declaration of performance is issued under the sole responsibility of Tecfi S.p.A.

Signed for and behalf of the manufacturer by:

Name and function	***Place and date of issue***	***Signature***
President Antonio Guarino	Pastorano, December 14th 2016	

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