HOW TO CHOOSE THE RIGHT PRODUCTS FOR YOUR SWIMMING POOL

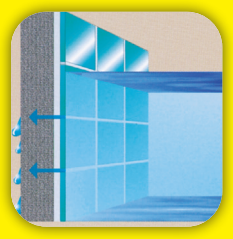
weber
SAINT-GOBAIN

What is the cause of each problem occurring in swimming pools

It is very essential to select the appropriate products and to do the right application when building a swimming pool because after filling in with water, it can costs a lot of money to fix the problem occurring from the improper use. The products starting from waterproofing system, tiling, and then grouting must be specially designed to be used in the pool where is continuously subject to water pressure.

The problem, its causes, and the effects

Problem **Low water level from the leakage**



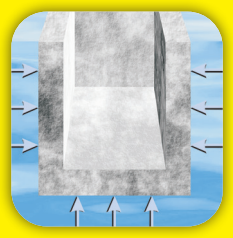
Cause **No proper waterproofing system**

Effect **Cost of water to fill up the pool**

Concrete is naturally porous and should not be considered to be water-tight structure. Even though admixture to reduce porosity; as known as waterproofing admixture; is added, water will slowly seep through tiny pores in the concrete. Seeping is exacerbated when the water is under pressure.

Water pressure to the structure of the pool

Positive water pressure
(water containment)



Negative water pressure
(water exclusion e.g. the pools being built on underground level or the pools being near other outside sources of water)

To install waterproofing system is consequently very important when building a pool. To properly waterproof the pool, waterproofing system must separately be installed thoroughly and continuously from structure as a tanking system.

Problem **Tiles debonding**

Cause **Improper tile adhesive is used**
Wrong application when tiling

Effect **Accident from the sharp edge of the broken tiles Labor cost to remove the tiles cost of the tiles Labor cost to lay new tiles cost of water to fill in the pool (if empty the pool for fixing)**

Problem **Debonding, discoloration, and powdering of tile grout**

Cause **Improper tile grout is used**

Effect **Dirty and turbid water to aesthetic of the pool when mostly of tile grout debonds, tiles edge will reveal and could cause a cutting accident**

Details to be concerned and products

*Advices from Structural Engineer are importantly

1 Concrete substrates

Leave the new concrete in structure for at least one month for the complete set. Other wise the shrinkage could easily happen.

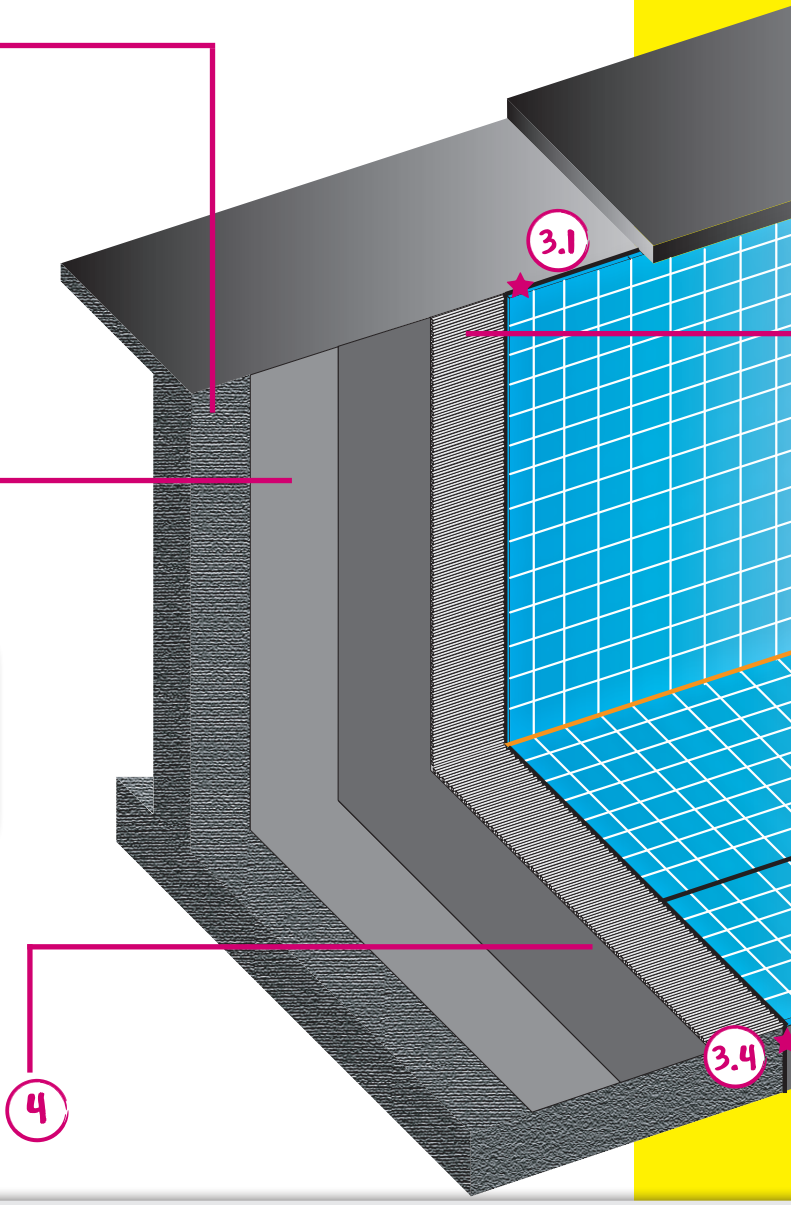
2 Leveling floors and rendering walls

Leveling and rendering mortars should be left to set at the rate of 7 days per 1 cm. thickness. Detail fixing should be done 12 – 24 hours before laying tiles

3 Joints

Consideration should be given at the design stage to the provision of movement joints in large areas of tiling. The type and location will involve the construction materials, type of installation and the setting out of tiling. Stress can occur in tiled installation as a result of movement due to such factors as drying shrinkage movement. These stress can sometimes cause loss of adhesion, bulging or cracking of tiles but can be localized by incorporating movement joints.

3.1 Where tiling abuts other materials
3.2 At internal vertical corner and horizontal corner of floor and wall
3.3 In large areas at 3 m to 4.5 m centers horizontally and vertically
3.4 Over existing and/or structural movement joints



Waterproofing system with weberdry tex or weberdry top

Location and level of the pools play an important role for recommended to have waterproof as a tanking system

Admixture in concrete and/or rendering and leveling Therefore another continuous layer of waterproof as

The ease to use and the adhesion to substrates are factors **weberdry tex** or **weberdry top** (together with **webertape BE14**) cement substrates and can be directly tiled on top with

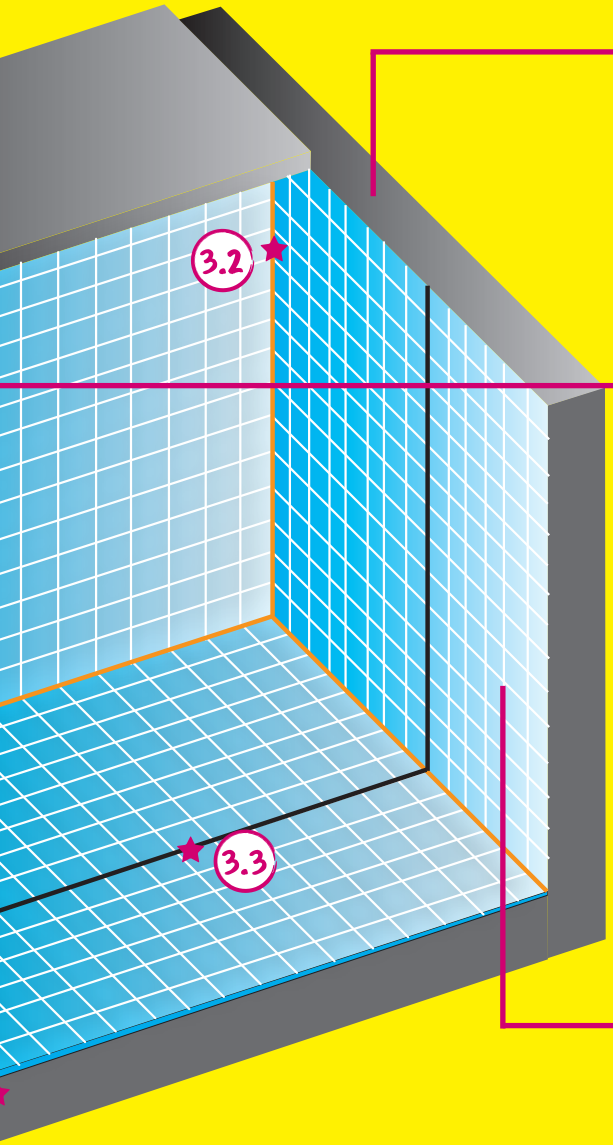
OR

weberdry tex

suitable for the pools being built on underground level (more details on P.8)

to be used when building swimming pools

required for the accurate design of the pool structure*



5 **Substrate before tiling**

Ensure that all surfaces are clean, dry, sound, and free from dust, grease or any contamination barrier. Install waterproofing system and leave it to set. Substrate temperature should not be higher than 45°C. If tiles have to be laid in the sunlight, substrate should be damped to release the accumulate heat and working area should be shaded.

6 **Tile adhesive by using webertai gres or webercolor poxy**

Tile adhesive being suitable to use in swimming pools must perform excellent adhesion property and be durable because tiles are continuously subject to water pressure.

webertai gres

suitable for all types of tile /stone (more details on P.11)

+

webercolor poxy

suitable for glass mosaic and resin mosaic(more details on P.13)

7 **Tile grout by using webercolor HR or webercolor poxy**

Chemicals added to the pool water tend to degrade cement-based grouts. Moreover water pressure affects directly to the grout. The choice of grout and its chemical resistance are important factors for the durability of the installation.

webercolor HR

suitable for swimming pools of resident areas (more details on P.12)

OR

webercolor poxy

suitable for swimming pools of resident areas / public (more details on P.13)

waterproofing system selection. It's strongly installed before tiling the pool.

mortar cannot be considered as water tight. a tanking system is a must.

to consider when selecting waterproofing system are specially formulated to ideally used on Weber's tile adhesive

weberdry top

+

webertape BE 14

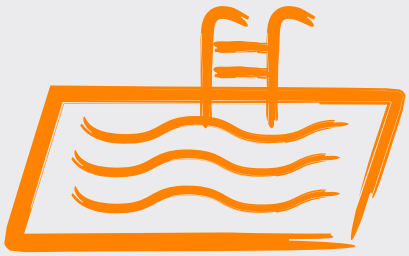
suitable for the pools with the structure subject to movement (more details on P.9-P.10)

Recommended products to use with swimming pools

Appropriate selection of Weber's products for swimming pools depends on each factor as per the following. Location, level of the pool, and possibility of structural movement must be considered for the selection of waterproof products

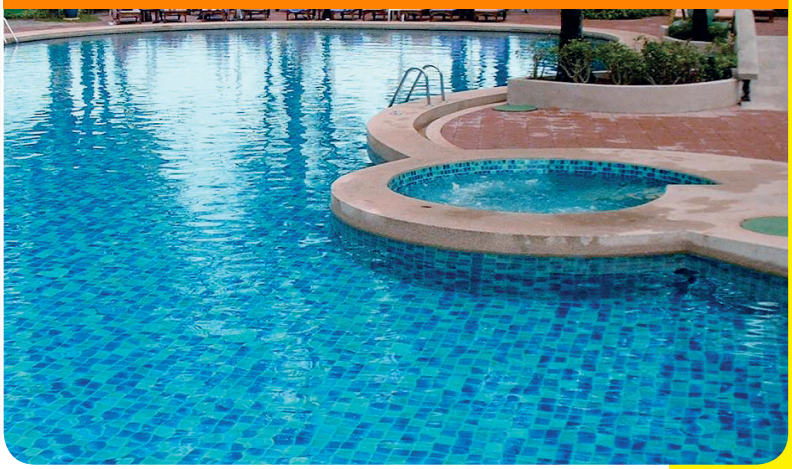
Tiles to be laid, frequency of use, temperature of and chemical added to the pool water must be considered for the selection of tile adhesive and tile grout

More details of the selection of products on P.7



Location : on ground and on the building Swimming pool where structural movement is likely

Location: underground Swimming pool where is subject to negative water pressure (underground water)



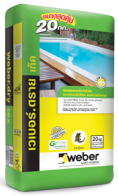
Waterproofing system for the pool being subject to movement

weberdry top

+

webertape BE 14

Waterproofing system for the pool being subject to negative water pressure (underground water)



weberdry tex

Tile adhesive

webertai gres

OR

webercolor poxy

Tile grout

webercolor HR

OR

webercolor poxy

Factors to consider for selection of waterproof

Structure of the pool	weberdry tex	weberdry top	webertape BE 14
- Being underground		-	-
- Being subject to movement	-		

Factors to consider for selection of tile adhesive

Type of tiles	webertai gres	webercolor poxy
- Ceramic tiles - Glazed clay tiles - Natural stones, granites, marble - Ceramic mosaics		
- Glass mosaics - Resin mosaics	-	

Factors to consider for selection of tile grout

Type of tiles	webercolor HR	webercolor poxy
- Ceramic tiles - Glazed clay tiles - Natural stones, granites, marble - Ceramic mosaics	For 2-10 mm joints	For 2-12 mm joints
		
- Glass mosaics - Resin mosaics	-	
Frequency of the pool in use	**webercolor HR**	**webercolor poxy**
- Private - Public		
- Jacuzzi	-	
Temperature of the pool water	**webercolor HR**	**webercolor poxy**
- Ambient temperature - Subject to change		
pH value of the pool water (normally at pH7)		
- pH value is normally controlled		
- Acidity condition (pH<3) is likely from pool water treatment	-	

Remark : Please select the product of your preference when there are 2 products being recommended

weberdry tex

weberdry tex is single-component cementitious mortar, Suitable for any substrate subjected to positive and negative water pressures (water in the pool and underground water) such as swimming pools, water tanks, structure.

- **Resist to water pressure up to 50 meters depth**
- **Ideal waterproof in swimming pool before tiling**
- **Easy to apply by brush or trowel**
- **Resist to hard water and chlorined water**
- **Non-toxic**
- **Low VOCs**

KEY BENEFITS

- Resist to positive and negative water pressures up to 50 meters depth
- Particularly suit to waterproof swimming pools before tiling
- Non-toxic
- Easy to apply by brush or trowel

RECOMMENDATION

- Suitable to waterproof underground areas, car park, water tanks, lift shaft, foundation, and swimming pools

**Note: For application on any other substrate, please contact Saint-Gobain Weber for technical assistance.*

TECHINCAL PERFORMANCES

Category	Cementitious waterproof
Density	1.35 g/cm^3
Bond to concrete	1.48 N/mm^2 (MPa)

**Note: These test results are from the laboratory test. They could be slightly different from the on-site results because of the differences in applications and conditions.*

DIRECTION FOR USE

- See details on page 15-16

PACKAGING

- 5 kg bag
- 20 kg bag

CONSUMPTION

- Approximately 5 kg bag per 1.7 sq.m (two coats are recommended)
- Approximately 20 kg bag per 6.7 sq.m (two coats are recommended)

COLOR

- GREY

SHELF LIFE AND STORAGE

- 1 year after manufacturing date when stored unopened in dry and ventilated place (store airtight in dry and ventilated conditions, if remained in opened bag)

GUARANTEED STANDARD

Europian Std. testing items	Standard	Result
Waterproofing property DIN 1048	No water with positive and negative pressure permeation	Pass
Initial tensile adhesion strength EN 14891-A.6.2:2007	>0.5 N/mm^2	1.58 N/mm^2
Adhesion strength after water immersion EN 14891-A.6.3:2007	>0.5 N/mm^2	1.03 N/mm^2
Adhesion strength after contact with chlorinated water EN 14891-A.6.9:2007	>0.5 N/mm^2	1.38 N/mm^2
Adhesion strength after contact with lime water EN 14891-A.6.7:2007	>0.5 N/mm^2	1.22 N/mm^2

weberdry top

weberdry top is 2-component flexible waterproofing product to waterproof swimming pools, water tanks, terraces, balconies, and any wet areas in residential and high rise buildings. where subject to structural movement.

- **Flexible, resist to micro cracking**
- **Resist to water pressure up to 30 m. depth**
- **Suitable for interior and exterior use**
- **Resist to hard water and chlorinated water**
- **Non-toxic**
- **Low VOCs**

KEY BENEFITS

- Resist to water pressure up to 30 m. depth
- Ideal to waterproof the pool being subject to structural movement
- Non-toxic
- Easy to apply by brush or trowel

RECOMMENDATION

- Ideal for waterproof swimming pools, water tanks, terraces, balconies and any wet areas in high rise buildings.
- Suitable for waterproof areas where subjected to structural movement

**Note: For application on any other substrate, please contact Saint-Gobain Weber for technical assistance.*

TECHINCAL PERFORMANCES

Category	Flexible waterproof
Appearance - Part A - Part B	Two components - Grey powder - Milky like liquid
Powder density (Part A)	1.26 g/cm^3
Specific gravity (Part B)	1.02
Crack bridging at dry stage	> 1.00 mm.
Crack bridging after contact with water	> 0.75 mm.
Crack covering ability	2.5 mm.
Bond to concrete	0.99 N/mm^2

**Note: These test results are from the laboratory test. They could be slightly different from the on-site results because of the differences in applications and conditions.*

DIRECTION FOR USE

- See details on page 15-16

PACKAGING

- 4.5 kg bucket
- 23 kg bucket

CONSUMPTION

- Approximately 4.5 kg bucket per 2.25 sq.m (two coats are recommended)
- Approximately 23 kg bucket per 11.5 sq.m (two coats are recommended)

COLOR

- Part A (powder) : grey cement-like powder
- Part B (liquid) : white milky liquid

SHELF LIFE AND STORAGE

- 1 year after manufacturing date when stored unopened in dry and ventilated place (store airtight in dry and ventilated conditions, if remained in opened bucket)

GUARANTEED STANDARD

International Std. testing items	Standard	Result
Waterproofing property JIS A 1404	no leakage : 3 bars @ 2 mm thickness, 28 days	Pass
Initial tensile adhesion strength EN 14891-A.6.2:2007	>0.5 N/mm^2	0.83 N/mm^2
Adhesion strength after contact with chlorinated water EN 14891-A.6.9:2007	>0.5 N/mm^2	0.66 N/mm^2
Adhesion strength after contact with lime water EN 14891-A.6.7:2007	>0.5 N/mm^2	0.66 N/mm^2

webertape BE 14

webertape BE 14 is reinforced highly flexible waterproofing tape designed to use for stanching or expansion joints, for internal vertical corner and horizontal corner of floor and wall

- ✓ **Waterproof 100 %**
- ✓ **Highly flexible**
- ✓ **UV resistance**
- ✓ **Chemical resistance**

COLOR
- White flexible mesh with yellow-rubber-sheet stanching area

SHELF LIFE AND STORAGE
- 2 years after manufacturing date

KEY BENEFITS
- 100% waterproof
- Resistance to hydrostatic pressure
- Permanent resistance to tearing
- Permanent resistance to many chemicals
- Permanent resistance to frost
- UV resistace

DIRECTION FOR USE
- See details on page 16

PACKAGING
- 10 m roll (12 cm wide)

CONSUMTION
- Depends on the length and the number of joints.

TECHNICAL PERFORMANCES

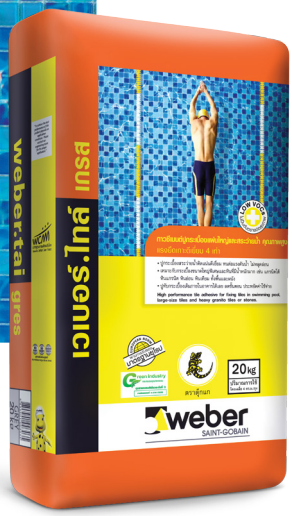
Category	Reinforced highly flexible waterproofing tape
Width of stanching area	120 mm.
Width of holding area	70 mm.
Thickness	0.6 mm.
Average weight	36 g/m.
Breaking strength	6.5 N/mm^2
Water pressure resistance	3 bars.
Temperature resistance	- 30 to +90˚C

GUARANTEED STANDARD

Testing items	Standard	Result
Burst pressure : max.	Internal	2,5 bar
Breaking load longitudinal	DIN EN ISO 527-3	91 N/ 15 mm
Breaking load lateral	DIN EN ISO 527-3	44 N/ 15 mm
Extension break longitudinal	DIN EN ISO 527-3	33%
Extension break lateral	DIN EN ISO 527-3	125%
Power absorption at 25% Elasticity lateral	DIN EN ISO 527-3	0,52 N / mm
Power absorption at 50% Elasticity lateral	DIN EN ISO 527-3	0,73 N / mm
Resistance to water pressure	DIN EN 1928 (Version B)	> 1,5 bar
UV-Resistance : min.	DIN EN ISO 4892-2	500 h
Chemical Properties:	**Resistance after storage over 7 days by room temperature in following chemicals**	**+ = resistant 0 = weakened - = non resistant**
Hydrochloric acid 3%	Internal	+
Sulphuric acid 35%	Internal	+
Citric acid 100 g/l	Internal	+
Lactic acid 5%	Internal	+
Potassium hydroxide 3% / 20%	Internal	+/0
Sodium hypochlorite 0,3 g/l	Internal	+
Salt water (20 g/l Sea water salt)	Internal	+

**Note: These test results are from the laboratory test. They could be slightly different from the on-site results because of the differences in applications and conditions.*

webertai gres



weber.tai gres is high performance tile adhesive for fixing all types of tiles especially for large-size tiles e.g. porcelain tiles, granites, and natural stones. It can be used on cement-based substrates, paint, polished cement for interior and exterior areas and onto interior existing tiles.

- **For large-size tile or stone such as granito, granite, marble**
- **Suitable for swimming pool**
- **On interior existing tile**
- **Low VOCs**

KEY BENEFITS

- ☐ Excellent bonding strength
- ☐ Can be used on cement-based substrates or onto interior existing tiles
- ☐ Tiles can be adjusted for long period due to longer open time
- ☐ Longer pot life allows the mixture standing longer for use (keep away from heat and sunlight)
- ☐ Tiles are adjustable within 15 minutes
- ☐ Tiled floor can open for foot traffic after 24 hours

RECOMMENDATION

- ☐ Ideal for tiling in both public and private swimming pools.
- ☐ Suitable for laying large size tiles, granitos, etc

**Note: For application on any other substrate, please contact Saint-Gobain Weber for technical assistance.*

TECHNICAL PERFORMANCES

Category	High-performance
Density	~1.4 g/cm^3
Chemical curing time	3-4 minutes
Pot life	4 hours
Open time	20-30 minutes
Adjusting time	15 minutes
Recommended thickness	2-10 mm
Time before grouting	after 24 hours
Time before traffic	24-48 hours after laying

**Note: These test results are from the laboratory test. They could be slightly different from the on-site results because of the differences in applications and conditions.*

DIRECTION FOR USE

- ☐ See details on page 17-18

PACKAGING

- ☐ 20 kg bag

CONSUMPTION

- ☐ Approximately 20 kg bag per 4 sq.m

COLOR

- ☐ GREY and WHITE

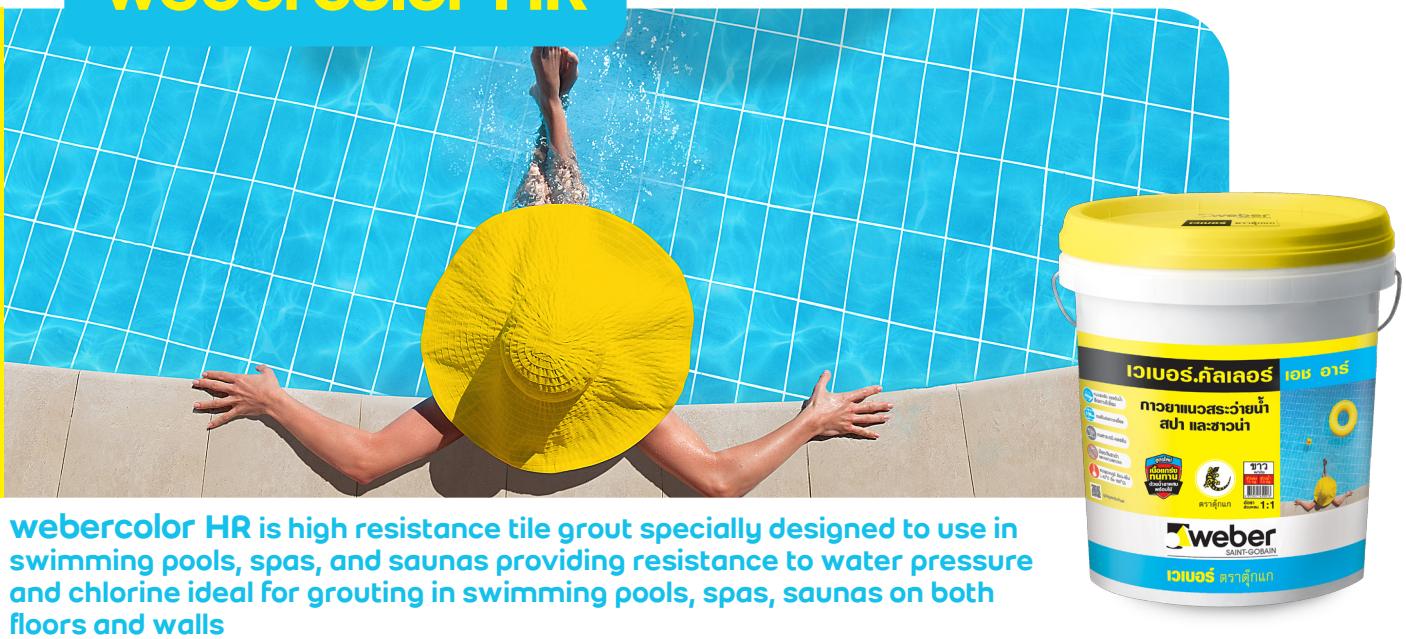
SHELF LIFE AND STORAGE

- ☐ 1 year after manufacturing date when stored unopened in dry and ventilated place (store airtight in dry and ventilated conditions, if remained in opened bag)

GUARANTEED STANDARD

Europian Std. testing items	Standard	Result
Initial tensile adhesion strength ISO 13007 part 2-4.4.4.2 or EN 1348-8.2	≥1.0 N/mm^2	2.06 N/mm^2
Tensile adhesion strength after water immersion ISO 13007 part 2-4.4.4.3 or EN 1348-8.3	≥1.0 N/mm^2	1.60 N/mm^2
Open time : tensile adhesion strength ISO 13007 part 2-4.1 or EN 1346	≥0.5 N/mm^2	0.83 N/mm^2

webercolor HR



webercolor HR is high resistance tile grout specially designed to use in swimming pools, spas, and saunas providing resistance to water pressure and chlorine ideal for grouting in swimming pools, spas, saunas on both floors and walls

- **For 2 – 10 mm joint width**
- **Resist to water pressure**
- **Resist to chemical cleaning agent like chlorine**
- **Anti-fungus and anti-dirt**
- **Resist to temperature between –40˚C to + 100˚C**
- **Low VOCs**

PACKAGING

□ 3.7 kg and 18.5 kg bucket

COLOR

□ 8 colors

white	grey	pearl grey	natural green
green	natural blue	blue	black

**These color presentations are as close as printing techniques permit. It is recommended to use the actual grout presenter for final selection.*

COVERAGE

□ average 4 m^2/ 3.7 kg bucket
□ average 20 m^2/18.5 kg bucket

DIRECTION FOR USE

□ See details on page 19-20

TECHNICAL PERFORMANCES

Type	Cementitious grout
Density of powder	1.3 g/cm^3
Chemical curing time	3 – 4 minutes
Pot life (in shade)	20 minutes
Waiting time after tiling before grouting	24 hours
Recommended joint width	2-10 mm
Waiting time before filling in with water	3 days

**Note: These test results are from the laboratory test. They could be slightly different from the on-site results because of the differences in applications and conditions.*

APPLICATION

□ **Substrate preparation**
- Properly clean the joints until free from any dirt to make sure of good bonding and color uniformity
- Avoid the application in direct sunlight, cover the areas to have shade when working

□ **Grouting**
- Use rubber trowel or grout trowel to diagonally fill up the joints.
- Wipe off excess grout with damp sponge 10 – 20 minutes before the grout sets.
- Leave for 1 hours and then clean tiles' surface with clean cloth
- Wait 12 hours for the grout to set and then sprinkle water thoroughly for 2 – 3 days for curing
- Leave for 3 days before filling in with water for reaching high resistance property and good bonding

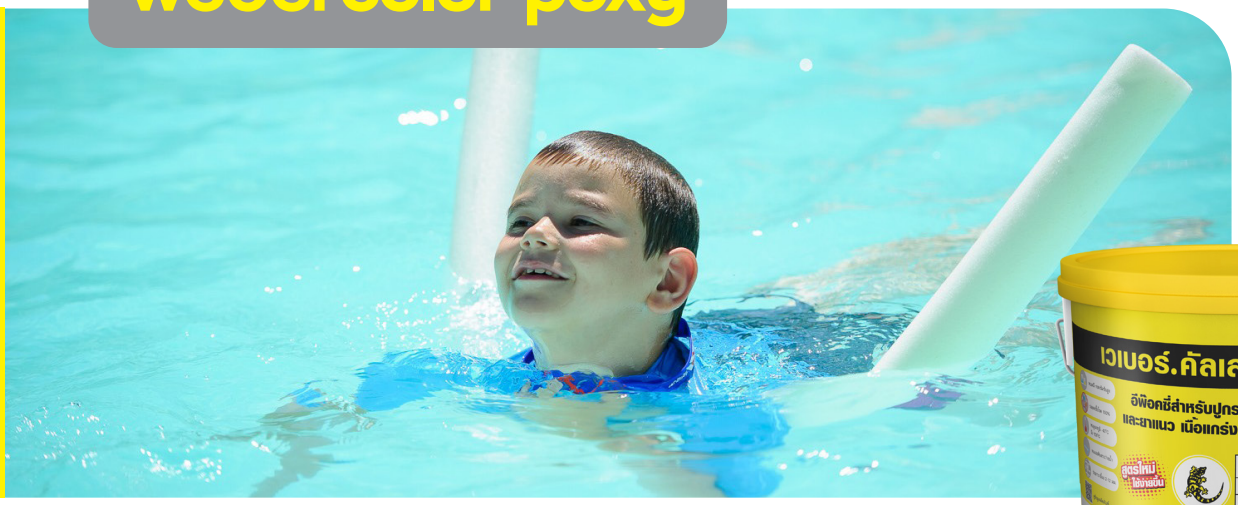
SHELF LIFE AND STORAGE

□ One year after manufacturing date when stored unopened in dry and ventilated place. Store airtight in dry and ventilated conditions if remained in opened bucket

CERTIFIED STANDARD

International/European standard	Standard	Result
Abrasion resistance ISO 13007 part 4.4.4 or EN 12808-2	≤ 2,000 mm^3	297 mm^3
Flexural strength under standard condition ISO 13007 part 4-4.1.3 or EN 12808-3	≥ 2.5 N/mm^2	6.17 N/mm^2
Compressive strength under standard condition ISO 13007 part 4-4.1.4 or EN 12808-3	≥ 15.0 N/mm^2	27.29 N/mm^2
Shrinkage ISO 13007 part 4-4.3 or EN 12808-4	≤ 3.0 mm/m	1.29 mm/m
Water absorption after 30 minutes ISO 13007 part 4-4.2 or EN 12808-5	≤ 5.0 g	0.07 g
Water absorption after 240 minutes ISO 13007 part 4-4.2 or EN 12808-5	≤ 10 g	0.23 g

webercolor poxy



webercolor poxy is durable two component epoxy based tile adhesive and tile grout

- **Excellent chemical and high acidity resistant**
- **Resist to temperature from -40˚C to +100˚C**
- **For 2 to 12 mm joint width without crack**
- **Anti-bacteria providing no infection**
- **Low VOCs**

KEY BENEFITS

- Resist to chemical and high acidity
- Anti-bacteria and anti-infection
- Ideal for use with the areas
- Resist to wide range of temperature -40˚C to +100˚C (+180˚C in case of thermal shock)
- Resist to water pressure in the pool
- Suitable to grout 2 – 12 mm joint width without crack

AREAS OF USE

- **Chemical industries**
  - Laboratory, production area, warehouse, paper-mill, tannery, painting plant, etc.
- **Food industries**
  - Brewery, cold storage, dairy, beverage industry, commercial cuisine, slaughter house, etc.
- **Hospitals**
  - Operating room, clinic, shower area, sanitary kitchen, etc.
- **Swimming pools**
  - Pool, shower area, toilet, spa and sauna.
- **Others**
  - Battery room, public bathroom, waste-treatment plant.

TECHNICAL PERFORMANCES

Category	High performance epoxy tile adhesive and grout
Pot life	30 minutes
Initial setting time	4–8 hours
Final setting time	4 days @ 20˚C 8 days @ 10˚C
Temperature resistance	-40˚C to +100˚C upto +180˚C if temporality in contact
Shear strength	14 N/mm²
Adhesion strength at dry stage	>3 N/mm²
Adhesion strength after contact with water	>3 N/mm²
pH	10-11

GUARANTEED STANDARD

Epoxy tile adhesive		
European Std. testing items	**Standard**	**Result**
Shear adhesion strength ISO13007 part 2-4.3.4 or EN 12003-7.2	≥ 2 N/mm²	8.4 N/mm²
Shear adhesion strength after water immersion ISO13007 part 2-4.3.5 or EN 12003-7.3	≥2 N/mm²	7.4 N/mm²
Open time : tensile adhesion strength** ISO13007 part 2-4.1 or EN 1346	≥0.5 N/mm²	4.2 N/mm²
Shear adhesion strength after thermal shock ISO13007 part 2-4.3.8 or EN 12003-7.5	≥ 2 N/mm²	9.9 N/mm²
Epoxy tile grout		
European Std. testing items	**Standard**	**Result**
Abrasion resistance ISO 13007 part 4-4.4 or EN 12808-2	≤ 250 mm³	67 mm³
Flexural strength under standard conditions ISO 13007 part 4-4.1.3 or EN 12808-3	≥30 N/mm²	30 N/mm²
Compressive strength under standard conditions ISO 13007 part 4-4.1.4 or EN 12808-3	≥45 N/mm²	64.38 N/mm²
Shrinkage ISO 13007 part 4-4.3 or EN 12808-4	≤1.5 mm./m	0.46 mm./m
Water absorption after 240 min. ISO 13007 part 4-4.2 or EN 12808-5	≤ 0.1 g	0.00 g

**Note: These test results are from the laboratory test. They could be slightly different from the on-site results because of the differences in applications and conditions.*

webercolor poxy

DIRECTION FOR USE

- See details on page 19-20

PACKAGING

- 5 kg bucket

CONSUMPTION

- Approximately 5 kg bucket per 8 sq.m

COLOR

- 4 color

white light grey dark grey black

SHELF LIFE AND STORAGE

- 1 year after manufacturing date when stored unopened in dry and ventilated place (store airtight in dry and ventilated conditions, if remained in opened bucket)

CHEMICAL RESISTANCE TABLE

Key :

+	**webercolor poxy**	is unaffected by the material
(+)	**webercolor poxy**	is unaffected by the material with short contact.
-	**webercolor poxy**	is not resistant to the material.

RESISTANCE TO ACIDS

Product	Concentration	Frequent exposure 20˚C	Occasional exposure 20˚C
Acetic	2.5%	(+)	(+)
Acetic	10%	-	-
Lactic	2.5%	+	+
Lactic	10%	(+)	(+)
Oleic	100%	-	(+)
Sulphuric	50%	(+)	+
Sulphuric	75%	-	(+)
Citric	10%	+	+
Citric	20%	+	+
Nitric	20%	(+)	+

RESISTANCE TO ALKALIS, SALTS ETC.

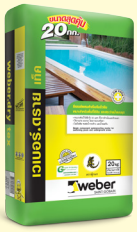
Product	Concentration	Frequent exposure 20˚C	Occasional exposure 20˚C
Sodium Hypochlorite	6.4 g/liter	(+)	+
Caustic Soda	10%	+	+
Caustic Soda	30%	+	+
Potassium Hydroxide	30%	+	+
Ammonia Solution	25%	+	+
Potassium Sulphate	10%	+	+
Ammonium Sulphate	10%	+	+
Sodium Chloride	10%	+	+
Potassium Chloride	10%	+	+
Ammonium Chloride	10%	+	+

RESISTANCE TO OILS AND GREASE

	Frequent exposure 20˚C	Occasional exposure 20˚C
Heavy Oil	+	+
Light Heating Oil	+	+
Paraffin	+	+
Red Diesel	+	+
White Diesel	+	+
Vegetable Oil	+	+
Olive Oil	+	+
Petrol	+	+
White Spirit	+	+
Motor Oil	+	+

RESISTANCE TO SOLVENTS

	Frequent exposure 20˚C	Occasional exposure 20˚C
Acetone	-	-
Ethylene Glycol	+	+
Glycerine	+	+
Methanol	+	+
Methylcellulose	-	-
Perchloroethylene	-	-
Trichloroethylene	-	-
Dichloromethane	-	-
Benzyl Alcohol	(+)	+
Dibutylphthalate	(+)	+

Waterproof for swimming pool / Product	 Recommended for underground swimming pool	 Recommended for swimming pool being subject to movement
	weberdry tex	**weberdry top**
Mixing ratio	1:4 by weight 1:3 by volume (water : mortar)	1:3.5 by weight 1:2.25 by volume (liquid : powder)
Pot life	← 60 minutes →	

SUBSTRATE PREPARATION

- ☐ Substrate should be sound, flat and level, dry and clean with normal absorption.
- ☐ Make good any unsound areas. Fill up any holes or any joints and then render over.
- ☐ New screed or render should be fully cured for 7 days per 1 cm thickness before applying waterproofing product.
- ☐ Thoroughly dampen the entire area with clean water. Wait until water absorbs into substrate before applying waterproof

MORTAR PREPARATION

weberdry tex

- ☐ Put 5 liters of clean water in mixing bucket.
- ☐ Gradually add 20 kg of **weberdry tex** in the bucket (1 part of water per 4 parts of mortar by weight) and mix by using low speed (500 rpm) electric mixer until obtain homogeneous paste.
- ☐ When mixing partially, 1 part of water per 3 part of mortar by volume can be used. Mix by using either slow speed electrical mixer or traditional trowel until homogeneous lump-free paste is obtained.
- ☐ Leave the mixture for 3 – 4 minutes for chemical curing before use.
- ☐ The mixture of **weberdry tex** can be used within 60 minutes when not exposing to heat and sunlight.

weberdry top

- ☐ Put the liquid part in mixing bucket and gradually add the powder part with the mixing ratio of
  - o 1 part of liquid per 3.5 parts of powder by weight
  - o 1 part of liquid per 2.25 parts of powder by volume
- ☐ Mix by using slow speed (500 rpm) electrical mixer until getting homogeneous lump-free paste.
- ☐ When mixing partially, gradually add both parts. Stir until homogeneous lump-free paste is obtained.
- ☐ Leave the mixture for 3 – 4 minutes before use for chemical curing.
- ☐ The mixture of **weberdry top** can be used within 60 minutes when not exposing to heat and sunlight.

Waterproofing application for swimming pool

APPLICATION
weberdry tex

□ **WEBERDRY TEX CAN BE APPLIED BY USING BRUSH AND NOTCHED TROWEL :**

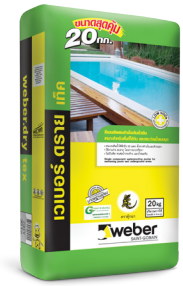
1) USING BRUSH

- Use appropriate brush to apply the first layer of **weberdry tex** on the substrate at the consumption of 2 kg/m^2
- Make sure of overall covering.
- Leave the area for 6 – 12 hours to reach initial set. The duration depends also on weather condition.
- Dampen the surface and apply the second layer of **weberdry tex** perpendicularly, to ensure a pinhole-free coating, at the consumption of 1.5 – 2 kg/m^2. Total thickness should be 2 – 3 mm. (If the recommended thickness cannot be obtained, render first the mortar and then use the brush to ensure suitable roughness and bubble-free surface)

2) USING U9 NOTCHED TROWEL

- Apply the product as the scratch layer (hardly pressing the trowel) to cover the holes in substrate.
- Leave the area to dry by touching and get no product sticking with the fingers.
- Apply the product with U9 notched trowel, and smooth the notches until getting at least 2 mm thickness.
- Leave for 24 hours before tiling or install other covering materials.

□ **weberdry tex** can be left bare without any covering material in case of internal lining of water tank. The tank with the lining of **weberdry tex** should be left for at least 3 days before cleaning and then filling in with water.



RECOMMENDATION OF USE

1. If there is water permeation, drain off the water by making a drainage hole at the structure base. Use water-plug mortar to plug the hole before applying **weberdry tex**
2. Substrate working temperature is 5˚C – 45˚C
3. Not recommended to use on very cold substrate
4. Avoid the application on very hot substrate with direct sunlight.

APPLICATION
weberdry top

□ **PLACE WEBERTAPE BE14 REINFORCING TAPE ALONG THE ANGELS OR JOINTS BY USING WEBERDRY TOP AS THE ADHESIVE.**

□ **USE RENDERING TROWEL** apply the first layer of **weberdry top** on substrate and apply the second layer fresh on fresh at the consumption of 2 kg/m^2

□ Leave the area for 24 hours before tiling or install other covering materials **weberdry top** can be left bare in case of apply as internal lining of water tank. The lining of **weberdry top** should be left for 3 days before cleaning and filling in with water.

RECOMMENDATION OF USE

1. Substrate working temperature is 5˚C – 45˚C
2. Not recommended to use on very cold substrate
3. Avoid the application on very hot substrate with direct sunlight
4. Do not damp the surface after applying the first layer. Wipe off any water residues.
5. Tools should be clean immediately after use
6. In case of waterproof water tank, the tank should be flushed with clean water before use for the purity and cleanliness.

OR

Product / Tile adhesive for swimming pool	webertai gres	webercolor poxy
Mixing ratio	1:4 by weight 1:3 by volume (water : tile adhesive)	1:3 by volume upper part (small container inside) : lower part
Pot life	4 hours	30 minutes

SUBSTRATE PREPARATION

- ☐ For new substrate: it should be sound, clean, level and flat, dry with normal absorption.
- ☐ For existing substrate: check the adhesion. Peel off the lose paint, take off any unsound tiles and re-tiling. Clean the surface until free from dust, grease, or any other stain.
- ☐ In case of porous substrate (high absorption): it's necessary to damp the surface until having normal-absorption substrate before laying tiles.
- ☐ In case of new screed or render: it should be cured for 7 days per 1 cm thickness before any application including tiling.

TILES PREPARATION

- ☐ Do not put tiles in water because this will decrease bonding strength of the adhesive and can cause tiles on wall to slip.
- ☐ Tiles must be clean and dry before the application

TILES ADHESIVE PREPARATION

webertai gres

- ☐ Put 5 liters of clean water in mixing bucket.
- ☐ Gradually add 20 kg of **webertai gres** into the water. Stir until being homogeneous
  Mixing ratio of water : **webertai gres** is;
  1 : 4 by weight
  1 : 3 by volume (use when partially mix)
- ☐ Mix by using slow speed (500 rpm) electrical mixer until getting homogeneous lump-free paste.
- ☐ If mixing partially by using traditional trowel, gradually add and mix tile adhesive with water for the ease of getting homogeneous and lump-free paste.
- ☐ Leave the mixture for 3 – 4 minutes before use for chemical curing
- ☐ The mixture of **webertai gres** can be used within 4 hours when not exposing to heat and sunlight.

TILES ADHESIVE PREPARATION

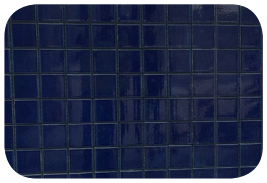
webercolor poxy

- ☐ Mix the two parts together by using 1 upper part (small container inside) and 3 lower parts and then stir until being homogeneous.
- ☐ Leave the mixture for 3 – 4 minutes before use for chemical curing.

The mixture of weber.color poxy should be used up within 30 minutes when not exposing to heat and sunlight.

Tile adhesive application for swimming pool

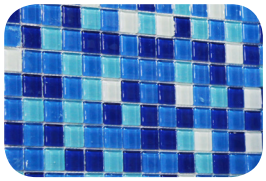
APPLICATION OF TILES ADHESIVE



- Apply some adhesive on substrate, and then use notched trowel to spread out the adhesive. The depth of notched trowel is to control the constancy and quantity of adhesive.
    - o Application on floor : use notched trowel on the substrate
    - o Application on wall : notch the trowel horizontally (as per the picture) on the substrate
- Using notched trowel ensures better transfer of adhesive onto tiles' back and the substrate than using traditional trowel
- If tile is bigger than 25 x 25 cm (10" x 10"), it is recommended to have tile adhesive buttered at the back of the tile to ensure overall covering and no bubble underneath laid tiles.
- Lay tiles on the adhesive and knock with rubber hammer over the entire area to spread the notches of the adhesive equally and ensure a good contact.
- Wipe off any excess adhesive coming up through the joints. If there is stain of tile adhesive on tiles, use damp sponge to clean tile surface when the adhesive is still soft.
- When using **webercolor poxy**, any stain or excess adhesive must be clean with warm water or sponge with warm water.
- The tiles can be adjusted within 15 minutes after laying.
- Leave for 24 hours before grouting with **webercolor HR** or **webercolor poxy**
- When laying mosaic or tile by using **webercolor poxy** as tile adhesive, **webercolor poxy** should be used as tile grout.

APPLICATION

webercolor poxy



RECOMMENDATION FOR TILING

- Avoid laying tile, esp. big size tile, and level the floor at the same time by using thick layer of sand cement. This traditionally method will lead to problem of fragility and vault effect of the tiles. Therefore, the floor should be properly leveled before laying tiles in order to prevent tiles from debonding and from the shrinkage of fresh cement (if it relates to structure, consult structural engineer for appropriate solution)
- Avoid laying tiles on very hot substrate or in direct sunlight.

OR

Tile grout for swimming pool / Product	webercolor HR	webercolor poxy
Mixing ratio	1:1 (admixture : tile grout)	1:3 by volume upper part (small container inside) : lower part
Pot life	20-30 minutes Do not add more water, which could cause the problem of not properly set of the grout	30 minutes
Waiting time to wipe off excess grout	10-20 minutes *By using damp sponge	15-20 minutes after apply epoxy grout onto 1 m^2 area By using sponge with warm water
Time before traffic	3 days before filling in the pool with water	3 days before filling in the pool with water

SUBSTRATE PREPARATION

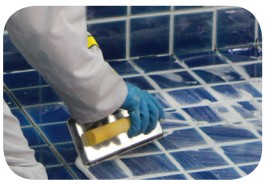
- ☐ Properly clean the joints until free from any dirt to make sure of good bonding and color uniformity
- ☐ Avoid the application in direct sunlight, cover the areas to have shade when working

webercolor HR

- ☐ **Mixing**
  - Put 1 bag of admixture in mixing bucket
  - Gradually add 1 bag of **webercolor HR** powder into the bucket and mix until obtaining homogeneous lump-free paste
  - Do not add any other substances including water
  - The mixture of **webercolor HR** can be used within 20 – 30 minutes after mixing when placing in shade

webercolor HR

- ☐ **Grouting**
  - Use rubber trowel or grout trowel to diagonally fill up the joints.
  - Wipe off excess grout with damp sponge 10 – 20 minutes before the grout sets.
  - Leave for 1 hours and then clean tiles' surface with clean cloth
  - Wait 12 hours for the grout to set and then sprinkle water thoroughly for 2 – 3 days for curing
  - Leave for 3 days before filling in with water for reaching high resistance property and good bonding



Tile grout application for swimming pool

TILE GROUT PREPARATION

webercolor poxy

- ☐ Mix the 2 components together with the ratio of 1:3, upper part (small container insiede) : lower part, without adding water. Stir until getting homogeneous paste
- ☐ Leave the mixture for 3 – 4 minutes before use for chemical curing
  - The mixture of **webercolor poxy** should be used up within 30 minutes when not expose to heat or sunlight

APPLICATION

webercolor poxy

- ☐ Application on wall: use Weber rubber trowel or any appropriate tool to diagonally fill the grout in tile joints
- ☐ Application on floor: for efficiency, apply the grout onto 1 m^2 area and then use the rubber trowel to diagonally fill the joints
- ☐ Wipe off excess grout with warm damp sponge 15 – 20 minutes after grouting on the area of 1 m^2
- ☐ Wipe off excess grout again with warm damp sponge
- ☐ Clean tiles surface with warm damp sponge again to ensure of no stain of epoxy being left
- ☐ Leave the area to set for 4 – 8 hours before using
- ☐ The most appropriate waiting time is 4 days at 20˚C and 8 days at 10˚C in order to fully gain chemical resistance

RECOMMENDATION FOR GROUTING

webercolor poxy

- ☐ Working temperature is between +10˚C and +40˚C
- ☐ Wipe off any excess epoxy grout with warm water before the grout sets
- ☐ Clean the tools after use
- ☐ Wearing glove during application
- ☐ Avoid the contact to skin and into eyes

☒ Caution

- For waterproof **weberdry tex** and **weberdry top**
  Tile adhesive **webertai gres**
  Tile grout **webercolor HR**
- Contains cement, which may lead to allergy
- Avoid direct contact to skin and into eyes
- Dress properly, wearing glove and mask to prevent dust inhaling
- Work in ventilated area
- If contact with skin : Clean the contact area with soap and clean water immediately
- If contact with eyes : Clean the eyes with large amount of clean water and seek medical advice
- Keep out of children's reach

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PERMEABILITY TEST IN ACCORDANCE WITH DIN 1048

SPECIMEN FROM : บริษัท แซง - โกแบ็ง เวเบอร์ จำกัด
PROJECT NAME : ผลิตภัณฑ์ เวเบอร์ . ดราย เท็ค (WEBER.DRY TEX)
TYPE OF SPECIMEN : Cube
DATE OF TESTING : 12 October 2011

SPEC NO.	SPECIMEN NAME	OVEN DRY WEIGHT OF SPECIMEN (kg.)	WEIGHT OF SPECIMEN AFTER TESTED (kg.)	WEIGHT OF PERMEATED WATER (kg.)	REMARKS	
1	ชุดคอนกรีตที่มีการเคลือบผิว	8.12	8.16	0.04	Mean = 0.11 kg	PASS
2	ด้วยเวเบอร์.ดราย เท็ค และอัด	7.96	8.22	0.26	SD = 0.13 kg	
3	แรงดันน้ำด้านบน	8.28	8.31	0.03		

REMARKS : ในการทดสอบ ก้อนตัวอย่างถูกอัดที่ผิวด้านหนึ่งด้วยน้ำที่ความดัน 0.5 Mpa เป็น เวลา 72 ชั่วโมง แล้วตรวจวัดค่าน้ำหนักของน้ำที่ซึมผ่านเข้าไปในก้อนตัวอย่าง

Tested by : (Nirand Petchploy)
Checked by : (Manote Sappakittipakorn)
Department Head : (Kevin Tanlsevi)

Remarks
1. The testing results are good only for those specimens tested.
2. Not valid unless signed and sealed.

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PERMEABILITY TEST IN ACCORDANCE WITH DIN 1048

SPECIMEN FROM : บริษัท แซง - โกแบ็ง เวเบอร์ จำกัด
PROJECT NAME : ผลิตภัณฑ์ เวเบอร์ . ดราย เท็ค (WEBER.DRY TEX)
TYPE OF SPECIMEN : Cube
DATE OF TESTING : 14 November 2011

SPEC NO.	SPECIMEN NAME	OVEN DRY WEIGHT OF SPECIMEN (kg.)	WEIGHT OF SPECIMEN AFTER TESTED (kg.)	WEIGHT OF PERMEATED WATER (kg.)	REMARKS	
1	ชุดคอนกรีตที่มีการเคลือบผิว	8.14	8.14	0.00	Mean = 0 kg	PASS
2	ด้วยเวเบอร์.ดราย เท็ค และอัด	8.19	8.19	0.00	SD = 0 kg	
3	แรงดันน้ำด้านบวก	8.26	8.26	0.00		

REMARKS : ในการทดสอบ ก้อนตัวอย่างถูกอัดที่ผิวด้านหนึ่งด้วยน้ำที่ความดัน 0.5 Mpa เป็น เวลา 72 ชั่วโมง แล้วตรวจวัดค่าน้ำหนักของน้ำที่ซึมผ่านเข้าไปในก้อนตัวอย่าง

Tested by : (Nirand Petchploy)
Checked by : (Manote Sappakittipakorn)
Department Head : (Kevin Tanlsevi)

Remarks
1. The testing results are good only for those specimens tested.
2. Not valid unless signed and sealed.

Doc. No. S0186A-13

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STRUCTURAL ENGINEERING LABORATORY
STRUCTURAL ENGINEERING FIELD OF STUDY
SCHOOL OF ENGINEERING AND TECHNOLOGY

TYPE OF TEST: INITIAL ADHESION STRENGTH

TEST SPECIMEN: Ten (10) specimens of " weber.dry tex " having a size of 50 x 50 x 2 mm. were prepared in the SE laboratory. The mix proportion of water to " weber.dry tex " ratio was 25.0 % by weight.

CLIENT: SAINT - GOBAIN WEBER CO., LTD.

DATE OF TEST: February 26, 2013

TEST METHOD: After finish the preparation, the test units were placed in standard conditions for 27 days. Bond the pull head plate to the tile with the high strength epoxy and keep the test units for a further 24 hour in standard condition. Determine the tensile adhesive strength.

TEST RESULTS:

Specimen No.	Width of Specimen (mm.)	Length of Specimen (mm.)	Area (mm^2)	Maximum Load (N.)	Tensile Adhesion Strength (N/mm^2)	Remarks
1	50	50	2,500	3,786	1.51	Cohesive failure within the adhesive
2	50	50	2,500	3,815	1.53	Cohesive failure within the adhesive
3	50	50	2,500	3,795	1.52	Cohesive failure within the adhesive
4	50	50	2,500	3,011	1.20	Cohesive failure within the adhesive
5	50	50	2,500	3,580	1.43	Cohesive failure within the adhesive
6	50	50	2,500	4,305	1.72	Cohesive failure within the adhesive
7	50	50	2,500	4,609	1.84	Cohesive failure within the adhesive
8	50	50	2,500	3,070	1.23	Cohesive failure within the adhesive
9	50	50	2,500	3,432	1.37	Cohesive failure within the adhesive
10	50	50	2,500	3,531	1.41	Cohesive failure within the adhesive
				Average	1.48	

Note: This report certifies the adequacy and representative character of the test sample(s) only.

TESTED BY:
MR. APIRAK POORAT
TECHNICIAN

CHECKED BY:
MR. EKKACHAI YOOPRASERTCHAI
RESEARCH ASSOCIATE

APPROVED BY:
DR. PENNUNG WARNITCHAI
LEADER OF CIVIL AND INFRASTRUCTURE ENGINEERING GROUP
April 18, 2013

Doc. No. S0099A-13

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STRUCTURAL ENGINEERING LABORATORY
STRUCTURAL ENGINEERING FIELD OF STUDY
SCHOOL OF ENGINEERING AND TECHNOLOGY

TYPE OF TEST: INITIAL ADHESION STRENGTH (EN 14891:2004)

TEST SPECIMEN: Ten (10) specimens of Ceramic tile of size 50 x 50 x 5 mm. installed by using " weber.dry tex " were prepared in the SE laboratory. The mix proportion of water to " weber.dry tex " ratio was 25.0 % by weight.

CLIENT: SAINT - GOBAIN WEBER CO., LTD.

DATE OF TEST: January 26, 2013

TEST METHOD: After finish the preparation, the test units were placed in standard conditions for 27 days. Bond the pull head plate to the tile with the high strength epoxy and keep the test units for a further 24 hour in standard condition. Determine the tensile adhesive strength.

TEST RESULTS:

Specimen No.	Width of Specimen (mm.)	Length of Specimen (mm.)	Area (mm^2)	Maximum Load (N.)	Tensile Adhesion Strength (N/mm^2)	Remarks
1	50	50	2,500	3,707	1.48	Cohesive failure within the adhesive
2	50	50	2,500	3,854	1.54	Cohesive failure within the adhesive
3	50	50	2,500	3,334	1.33	Cohesive failure within the adhesive
4	50	50	2,500	3,560	1.42	Adhesive failure between tile and adhesive
5	50	50	2,500	4,560	1.82	Cohesive failure within the adhesive
6	50	50	2,500	4,305	1.72	Cohesive failure within the adhesive
7	50	50	2,500	4,658	1.86	Cohesive failure within the adhesive
8	50	50	2,500	4,541	1.82	Cohesive failure within the adhesive
9	50	50	2,500	3,815	1.53	Cohesive failure within the adhesive
10	50	50	2,500	3,119	1.25	Cohesive failure within the adhesive
				Average	1.58	

Note: This report certifies the adequacy and representative character of the test sample(s) only.

TESTED BY:
MR. APIRAK POORAT
TECHNICIAN

CHECKED BY:
MR. EKKACHAI YOOPRASERTCHAI
RESEARCH ASSOCIATE

APPROVED BY:
DR. PENNUNG WARNITCHAI
LEADER OF CIVIL AND INFRASTRUCTURE ENGINEERING THEMATIC (CIE)
April 5, 2013

weberdry tex

Doc. No. S0099B-13

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STRUCTURAL ENGINEERING LABORATORY
STRUCTURAL ENGINEERING FIELD OF STUDY
SCHOOL OF ENGINEERING AND TECHNOLOGY

TYPE OF TEST: ADHESIVE STRENGTH AFTER WATER IMMERSION (EN14891:2004)

TEST SPECIMEN: Ten (10) specimens of Ceramic tile of size 50 x 50 x 5 mm. installed by using " weber.dry tex " were prepared in the SE laboratory. The mix proportion of water to " weber.dry tex " ratio was 25.0 % by weight.

CLIENT: SAINT - GOBAIN WEBER CO., LTD.

DATE OF TEST: March 27, 2013

TEST METHOD: After finish the preparation, the test units were placed in standard conditions for 7 days and stored in water for 20 days. Bond the pull head plate to the tile with the high strength epoxy and keep the test units for a further 24 hour in in water at the standard temperature. Determine the tensile adhesive strength.

TEST RESULTS:

Specimen No.	Width of Specimen (mm.)	Length of Specimen (mm.)	Area (mm^2)	Maximum Load (N.)	Tensile Adhesion Strength (N/mm^2)	Remarks
1	50	50	2,500	2,128	0.85	Cohesive failure within the adhesive
2	50	50	2,500	2,207	0.88	Cohesive failure within the adhesive
3	50	50	2,500	1,893	0.76	Cohesive failure within the adhesive
4	50	50	2,500	3,089	1.24	Cohesive failure within the adhesive
5	50	50	2,500	3,021	1.21	Cohesive failure within the adhesive
6	50	50	2,500	3,256	1.30	Cohesive failure within the adhesive
7	50	50	2,500	2,991	1.20	Cohesive failure within the adhesive
8	50	50	2,500	2,795	1.12	Cohesive failure within the adhesive
9	50	50	2,500	2,334	0.93	Cohesive failure within the adhesive
10	50	50	2,500	2,109	0.84	Cohesive failure within the adhesive
				Average	**1.03**	

Note: This report certifies the adequacy and representative character of the test sample(s) only.

TESTED BY:
MR. APIRAK POORAT
TECHNICIAN

CHECKED BY:
MR. EKKACHAI YOOPRASERTCHAI
RESEARCH ASSOCIATE

APPROVED BY:
DR. PENNUNG WARNITCHAI
LEADER OF CIVIL AND INFRASTRUCTURE ENGINEERING THEMATIC (CIE)
April 5, 2013

Doc. No. S0099D-13

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STRUCTURAL ENGINEERING LABORATORY
STRUCTURAL ENGINEERING FIELD OF STUDY
SCHOOL OF ENGINEERING AND TECHNOLOGY

TYPE OF TEST: ADHESIVE STRENGTH AFTER CONTACT WITH CHLORINATED WATER (EN14891:2004)

TEST SPECIMEN: Ten (10) specimens of Ceramic tile of size 50 x 50 x 5 mm. installed by using " weber.dry tex " were prepared in the SE laboratory. The mix proportion of water to " weber.dry tex " ratio was 25.0 % by weight.

CLIENT: SAINT - GOBAIN WEBER CO., LTD.

DATE OF TEST: March 5, 2013

TEST METHOD: After finish the preparation, the test units were placed in standard conditions for 28 days and stored in chlorine water for 7 days. Bond the pull head plate to the tile with the high strength epoxy and keep the test units for a further 24 hour in in standard condition. Determine the tensile adhesive strength.

TEST RESULTS:

Specimen No.	Width of Specimen (mm.)	Length of Specimen (mm.)	Area (mm^2)	Maximum Load (N.)	Tensile Adhesion Strength (N/mm^2)	Remarks
1	50	50	2,500	2,452	0.98	Cohesive failure within the adhesive
2	50	50	2,500	3,138	1.26	Cohesive failure within the adhesive
3	50	50	2,500	2,952	1.18	Cohesive failure within the adhesive
4	50	50	2,500	3,325	1.33	Cohesive failure within the adhesive
5	50	50	2,500	3,766	1.51	Cohesive failure within the adhesive
6	50	50	2,500	4,707	1.88	Cohesive failure within the adhesive
7	50	50	2,500	4,335	1.73	Cohesive failure within the adhesive
8	50	50	2,500	3,648	1.46	Cohesive failure within the adhesive
9	50	50	2,500	3,325	1.33	Cohesive failure within the adhesive
10	50	50	2,500	2,815	1.13	Cohesive failure within the adhesive
				Average	**1.38**	

Note: This report certifies the adequacy and representative character of the test sample(s) only.

TESTED BY:
MR. APIRAK POORAT
TECHNICIAN

CHECKED BY:
MR. EKKACHAI YOOPRASERTCHAI
RESEARCH ASSOCIATE

APPROVED BY:
DR. PENNUNG WARNITCHAI
LEADER OF CIVIL AND INFRASTRUCTURE ENGINEERING THEMATIC (CIE)
April 5, 2013

weberdry top

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STRUCTURAL ENGINEERING LABORATORY
STRUCTURAL ENGINEERING FIELD OF STUDY
SCHOOL OF ENGINEERING AND TECHNOLOGY

TYPE OF TEST: ADHESIVE STRENGTH AFTER CONTACT WITH LIME WATER (EN14891:2004)

TEST SPECIMEN: Ten (10) specimens of Ceramic tile of size 50 x 50 x 5 mm. installed by using " weber.dry tex " were prepared in the SE laboratory. The mix proportion of water to " weber.dry tex " ratio was 25.0 % by weight.

CLIENT: SAINT - GOBAIN WEBER CO., LTD.

DATE OF TEST: March 5, 2013

TEST METHOD: After finish the preparation, the test units were placed in standard conditions for 28 days and stored in lime water(pH>12) at 40 °C for 7 days. Bond the pull head plate to the tile with the high strength epoxy and keep the test units for a further 24 hour in in standard condition. Determine the tensile adhesive strength.

TEST RESULTS:

Specimen No.	Width of Specimen (mm.)	Length of Specimen (mm.)	Area (mm^2)	Maximum Load (N.)	Tensile Adhesion Strength (N/mm^2)	Remarks
1	50	50	2,500	3,089	1.24	Cohesive failure within the adhesive
2	50	50	2,500	2,530	1.01	Cohesive failure within the adhesive
3	50	50	2,500	2,991	1.20	Cohesive failure within the adhesive
4	50	50	2,500	3,070	1.23	Cohesive failure within the adhesive
5	50	50	2,500	3,501	1.40	Cohesive failure within the adhesive
6	50	50	2,500	4,364	1.75	Cohesive failure within the adhesive
7	50	50	2,500	2,726	1.09	Cohesive failure within the adhesive
8	50	50	2,500	2,766	1.11	Cohesive failure within the adhesive
9	50	50	2,500	2,520	1.01	Cohesive failure within the adhesive
10	50	50	2,500	3,040	1.22	Cohesive failure within the adhesive
				Average	**1.22**	

Note: 1) This report certifies the adequacy and representative character of the test sample(s) only.
2) The test units were stored in lime water(pH>12) at room temperature.

TESTED BY:
MR. APIRAK POORAT
TECHNICIAN

CHECKED BY:
MR. EKKACHAI YOOPRASERTCHAI
RESEARCH ASSOCIATE

APPROVED BY:
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April 5, 2013

Doc.no.S0855B-08

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STRUCTURAL ENGINEERING LABORATORY
STRUCTURAL ENGINEERING AND CONSTRUCTION PROGRAM
SCHOOL OF CIVIL ENGINEERING

TYPE OF TEST: PERMEABILITY TEST IN ACCORDANCE WITH JIS A 1404

TEST SPECIMEN: One(1) specimen of cylindrical concrete having a 150 mm. in diameter and 40 mm. in thickness were given by the client. All specimens were coated with the waterproof material with "weber.dry top".

CLIENT: Saint Gobain Weber Company Limited

DATE OF TEST: October 21, 2008

TEST MACHINE: The Mortar Permeability Test Apparatus: CH-15.

TEST RESULTS:

Specimen Name	Oven Dry Weight of Specimen (g.)	Weight of Specimen After Tested (g.)	Weight of Permeated Water (g.)	Depth of Water Penetration (mm.)	Penetrated Area (m^2)	Coefficient of Permeability K_w (m^2)	Coefficient of Water Permeability K_w* (m/s)
Weber.dry top	1,900.40	1,900.90	0.50	0.00	0.001963	0.00E+00	0.00E+00

Note: All specimens were tested under the application of 3.0 $kg./cm^2$ hydraulic pressure for 1 hour.

Checked and Approved
DR. SUN SAYAMPUK
Senior Laboratory Supervisor
October 28, 2008

Doc. No. S0168B-13

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STRUCTURAL ENGINEERING LABORATORY

STRUCTURAL ENGINEERING FIELD OF STUDY

SCHOOL OF ENGINEERING AND TECHNOLOGY

TYPE OF TEST: INITIAL ADHESION STRENGTH

TEST SPECIMEN: Ten (10) specimens of " weber.dry top " having a size of 50 x 50 x 2 mm. were prepared in the SE laboratory. The mix proportion of " weber.dry top " is 78 g. of powder form to 22 g. of liquid resin by weight.

CLIENT: SAINT - GOBAIN WEBER CO., LTD.

DATE OF TEST: February 26, 2013

TEST METHOD: After finish the preparation, the test units were placed in standard conditions for 27 days. Bond the pull head plate to the tile with the high strength epoxy and keep the test units for a further 24 hour in standard condition. Determine the tensile adhesive strength.

TEST RESULTS:

Specimen No.	Width of Specimen (mm.)	Length of Specimen (mm.)	Area (mm^2)	Maximum Load (N.)	Tensile Adhesion Strength (N/mm^2)	Remarks
1	50	50	2,500	2,550	1.02	Cohesive failure within the adhesive
2	50	50	2,500	2,305	0.92	Cohesive failure within the adhesive
3	50	50	2,500	2,383	0.95	Cohesive failure within the adhesive
4	50	50	2,500	2,648	1.06	Cohesive failure within the adhesive
5	50	50	2,500	2,520	1.01	Cohesive failure within the adhesive
6	50	50	2,500	2,207	0.88	Cohesive failure within the adhesive
7	50	50	2,500	2,471	0.99	Cohesive failure within the adhesive
8	50	50	2,500	2,077	1.07	Cohesive failure within the adhesive
9	50	50	2,500	2,579	1.03	Cohesive failure within the adhesive
10	50	50	2,500	2,354	0.94	Cohesive failure within the adhesive
				Average	**0.99**	

Note: This report certifies the adequacy and representative character of the test sample(s) only.

TESTED BY:
MR. APIRAK POORAT
TECHNICIAN

CHECKED BY:
MR. EKKACHAI YOOPRASERTCHAI
RESEARCH ASSOCIATE

APPROVED BY:
DR. PENNUNG WARNITCHAI
LEADER OF CIVIL AND INFRASTRUCTURE
ENGINEERING GROUP
May 17, 2013

Doc. No. S0099F-13

AIT

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STRUCTURAL ENGINEERING LABORATORY

STRUCTURAL ENGINEERING FIELD OF STUDY

SCHOOL OF ENGINEERING AND TECHNOLOGY

TYPE OF TEST: INITIAL ADHESION STRENGTH (EN 14891:2004)

TEST SPECIMEN: Ten (10) specimens of Ceramic tile of size 50 x 50 x 5 mm. installed by using " weber.dry top " were prepared in the SE laboratory. The mix proportion of " weber.dry top " is 78 g. of powder form to 22 g. of liquid resin by weight.

CLIENT: SAINT - GOBAIN WEBER CO., LTD.

DATE OF TEST: January 28, 2013

TEST METHOD: After finish the preparation, the test units were placed in standard conditions for 27 days. Bond the pull head plate to the tile with the high strength epoxy and keep the test units for a further 24 hour in standard condition. Determine the tensile adhesive strength.

TEST RESULTS:

Specimen No.	Width of Specimen (mm.)	Length of Specimen (mm.)	Area (mm^2)	Maximum Load (N.)	Tensile Adhesion Strength (N/mm^2)	Remarks
1	50	50	2,500	2,207	0.88	Cohesive failure within the adhesive
2	50	50	2,500	2,100	0.84	Adhesive failure between tile and adhesive
3	50	50	2,500	2,040	0.82	Adhesive failure between tile and adhesive
4	50	50	2,500	2,383	0.95	Adhesive failure between tile and adhesive
5	50	50	2,500	1,991	0.80	Adhesive failure between tile and adhesive
6	50	50	2,500	2,216	0.89	Adhesive failure between tile and adhesive
7	50	50	2,500	1,912	0.76	Cohesive failure within the adhesive
8	50	50	2,500	1,991	0.80	Adhesive failure between tile and adhesive
9	50	50	2,500	1,834	0.73	Adhesive failure between tile and adhesive
10	50	50	2,500	1,991	0.80	Cohesive failure within the adhesive
				Average	**0.83**	

Note: This report certifies the adequacy and representative character of the test sample(s) only.

TESTED BY:
MR. APIRAK POORAT
TECHNICIAN

CHECKED BY:
MR. EKKACHAI YOOPRASERTCHAI
RESEARCH ASSOCIATE

APPROVED BY:
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May 17, 2013

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STRUCTURAL ENGINEERING LABORATORY

STRUCTURAL ENGINEERING FIELD OF STUDY

SCHOOL OF ENGINEERING AND TECHNOLOGY

TYPE OF TEST: ADHESIVE STRENGTH AFTER CONTACT WITH CHLORINATED WATER (EN14891:2004)

TEST SPECIMEN: Ten (10) specimens of Ceramic tile of size 50 x 50 x 5 mm. installed by using " weber.dry top " were prepared in the SE laboratory. The mix proportion of " weber.dry top " is 78 g. of powder form to 22 g. of liquid resin by weight.

CLIENT: SAINT - GOBAIN WEBER CO., LTD.

DATE OF TEST: March 5, 2013

TEST METHOD: After finish the preparation, the test units were placed in standard conditions for 28 days and stored in chlorine water for 7 days. Bond the pull head plate to the tile with the high strength epoxy and keep the test units for a further 24 hour in in standard condition. Determine the tensile adhesive strength.

TEST RESULTS:

Specimen No.	Width of Specimen (mm.)	Length of Specimen (mm.)	Area (mm^2)	Maximum Load (N.)	Tensile Adhesion Strength (N/mm^2)	Remarks
1	50	50	2,500	1,599	0.64	Cohesive failure within the adhesive
2	50	50	2,500	1,893	0.76	Cohesive failure within the adhesive
3	50	50	2,500	1,530	0.61	Cohesive failure within the adhesive
4	50	50	2,500	1,334	0.53	Cohesive failure within the adhesive
5	50	50	2,500	1,687	0.67	Cohesive failure within the adhesive
6	50	50	2,500	1,942	0.78	Cohesive failure within the adhesive
7	50	50	2,500	1,481	0.59	Cohesive failure within the adhesive
8	50	50	2,500	1,550	0.62	Cohesive failure within the adhesive
9	50	50	2,500	1,814	0.73	Cohesive failure within the adhesive
10	50	50	2,500	1,618	0.65	Adhesive failure between tile and adhesive
				Average	**0.66**	

Note: This report certifies the adequacy and representative character of the test sample(s) only.

TESTED BY:
MR. APIRAK POORAT
TECHNICIAN

CHECKED BY:
MR. EKKACHAI YOOPRASERTCHAI
RESEARCH ASSOCIATE

APPROVED BY:
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Doc. No. S0099J-13

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STRUCTURAL ENGINEERING LABORATORY

STRUCTURAL ENGINEERING FIELD OF STUDY

SCHOOL OF ENGINEERING AND TECHNOLOGY

TYPE OF TEST: ADHESIVE STRENGTH AFTER CONTACT WITH LIME WATER (EN14891:2004)

TEST SPECIMEN: Ten (10) specimens of Ceramic tile of size 50 x 50 x 5 mm. installed by using " weber.dry top " were prepared in the SE laboratory. The mix proportion of " weber.dry top " is 78 g. of powder form to 22 g. of liquid resin by weight.

CLIENT: SAINT - GOBAIN WEBER CO., LTD.

DATE OF TEST: March 5, 2013

TEST METHOD: After finish the preparation, the test units were placed in standard conditions for 28 days and stored in lime water(pH>12) at 40 °C for 7 days. Bond the pull head plate to the tile with the high strength epoxy and keep the test units for a further 24 hour in in standard condition. Determine the tensile adhesive strength.

TEST RESULTS:

Specimen No.	Width of Specimen (mm.)	Length of Specimen (mm.)	Area (mm^2)	Maximum Load (N.)	Tensile Adhesion Strength (N/mm^2)	Remarks
1	50	50	2,500	2,059	0.82	Cohesive failure within the adhesive
2	50	50	2,500	1,638	0.66	Cohesive failure within the adhesive
3	50	50	2,500	1,432	0.57	Cohesive failure within the adhesive
4	50	50	2,500	1,569	0.63	Cohesive failure within the adhesive
5	50	50	2,500	1,785	0.71	Cohesive failure within the adhesive
6	50	50	2,500	1,942	0.78	Cohesive failure within the adhesive
7	50	50	2,500	1,697	0.68	Cohesive failure within the adhesive
8	50	50	2,500	1,402	0.56	Cohesive failure within the adhesive
9	50	50	2,500	1,471	0.59	Cohesive failure within the adhesive
10	50	50	2,500	1,481	0.59	Cohesive failure within the adhesive
				Average	**0.66**	

Note: 1) This report certifies the adequacy and representative character of the test sample(s) only.
2) The test units were stored in lime water(pH>12) at room temperature.

TESTED BY:
MR. APIRAK POORAT
TECHNICIAN

CHECKED BY:
MR. EKKACHAI YOOPRASERTCHAI
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APPROVED BY:
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May 17, 2013

Doc. No. S0161M-13

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STRUCTURAL ENGINEERING LABORATORY

STRUCTURAL ENGINEERING FIELD OF STUDY

SCHOOL OF ENGINEERING AND TECHNOLOGY

TYPE OF TEST: INITIAL ADHESION STRENGTH (EN 1348:2007)

TEST SPECIMEN: Ten (10) specimens of Ceramic tile of size 50 x 50 x 5 mm. installed by using " weber.tai gres " were prepared in the SE laboratory. The mix proportion of water to " weber.tai gres " ratio was 25.0 % by weight.

CLIENT: SAINT - GOBAIN WEBER CO., LTD.

DATE OF TEST: February 26, 2013

TEST METHOD: After finish the preparation, the test units were placed in standard conditions for 27 days. Bond the pull head plate to the tile with the high strength epoxy and keep the test units for a further 24 hour in standard condition. Determine the tensile adhesive strength.

TEST RESULTS:

Specimen No.	Width of Specimen (mm.)	Length of Specimen (mm.)	Area (mm^2)	Maximum Load (N.)	Tensile Adhesion Strength (N/mm^2)	Remarks
1	50	50	2,500	4,962	1.98	Adhesive failure between tile and adhesive
2	50	50	2,500	4,992	2.00	Cohesive failure within the adhesive
3	50	50	2,500	5,021	2.01	Cohesive failure within the adhesive
4	50	50	2,500	4,501	1.80	Cohesive failure within the adhesive
5	50	50	2,500	6,002	2.40	Cohesive failure within the adhesive
6	50	50	2,500	5,031	2.01	Adhesive failure between tile and adhesive
7	50	50	2,500	3,942	1.58	Adhesive failure between tile and adhesive
8	50	50	2,500	4,698	1.88	Adhesive failure between tile and adhesive
9	50	50	2,500	6,757	2.70	Cohesive failure within the adhesive
10	50	50	2,500	5,678	2.27	Cohesive failure within the adhesive
				Average	**2.06**	

Note: This report certifies the adequacy and representative character of the test sample(s) only.

TESTED BY:
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TECHNICIAN

CHECKED BY:
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April 3, 2013

webertai gres

Doc. No. S0161N-13

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STRUCTURAL ENGINEERING LABORATORY

STRUCTURAL ENGINEERING FIELD OF STUDY

SCHOOL OF ENGINEERING AND TECHNOLOGY

TYPE OF TEST: ADHESIVE STRENGTH AFTER WATER IMMERSION (EN1348:2007)

TEST SPECIMEN: Ten (10) specimens of Ceramic tile of size 50 x 50 x 5 mm. installed by using " weber.tai gres " were prepared in the SE laboratory. The mix proportion of water to " weber.tai gres " ratio was 25.0 % by weight.

CLIENT: SAINT - GOBAIN WEBER CO., LTD.

DATE OF TEST: February 26, 2013

TEST METHOD: After finish the preparation, the test units were placed in standard conditions for 7 days and stored in water for 20 days. Bond the pull head plate to the tile with the high strength epoxy and keep the test units for a further 24 hour in in water at the standard temperature. Determine the tensile adhesive strength.

TEST RESULTS:

Specimen No.	Width of Specimen (mm.)	Length of Specimen (mm.)	Area (mm^2)	Maximum Load (N.)	Tensile Adhesion Strength (N/mm^2)	Remarks
1	50	50	2,500	3,393	1.36	Adhesive failure between tile and adhesive
2	50	50	2,500	4,580	1.83	Cohesive failure within the adhesive
3	50	50	2,500	3,727	1.49	Adhesive failure between tile and adhesive
4	50	50	2,500	4,237	1.69	Adhesive failure between tile and adhesive
5	50	50	2,500	4,011	1.60	Adhesive failure between tile and adhesive
6	50	50	2,500	4,796	1.92	Cohesive failure within the adhesive
7	50	50	2,500	3,874	1.55	Cohesive failure within the adhesive
8	50	50	2,500	3,511	1.40	Adhesive failure between tile and adhesive
9	50	50	2,500	4,021	1.61	Cohesive failure within the adhesive
10	50	50	2,500	3,844	1.54	Cohesive failure within the adhesive
				Average	**1.60**	

Note: This report certifies the adequacy and representative character of the test sample(s) only.

TESTED BY:

MR. APIRAK POORAT
TECHNICIAN

CHECKED BY:

MR. EKKACHAI YOOPRASERTCHAI
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April 3, 2013

Doc. No. S0161P-13

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STRUCTURAL ENGINEERING LABORATORY

STRUCTURAL ENGINEERING FIELD OF STUDY

SCHOOL OF ENGINEERING AND TECHNOLOGY

TYPE OF TEST: OPEN TIME (EN1346)

TEST SPECIMEN: Thirty (30) specimens of Ceramic tile of size 50 x 50 x 5 mm. installed by using " weber.tai gres " were prepared in the SE laboratory. The mix proportion of water to " weber.tai gres " ratio was 25.0 % by weight.

CLIENT: SAINT - GOBAIN WEBER CO., LTD.

DATE OF TEST: February 26, 2013

TEST METHOD: Apply a thin layer of the adhesive to the concrete slab with a straight edge trowel. After 5, 10 and 20 minutes place the tiles on the adhesive and storage them under standard conditions for 27 days. Bond the pull head plates to the tiles with the high strength epoxy and keep the test units for a further 24 hour in standard condition. Determine the tensile adhesive strength.

TEST RESULTS:

Specimen No.	Tensile adhesion strength of specimen in different open time (N/mm^2)		
	5 (min.)	10 (min.)	20 (min.)
1	1.57	1.22	0.82
2	1.71	1.03	0.80
3	2.14	1.29	0.95
4	1.79	0.97	0.81
5	1.66	1.33	0.89
6	1.97	1.27	0.87
7	1.82	1.41	0.72
8	1.91	1.15	0.76
9	1.56	1.14	0.79
10	1.58	1.26	0.90
Average	1.77	1.21	0.83

Note: This report certifies the adequacy and representative character of the test sample(s) only.

TESTED BY:

MR. APIRAK POORAT
TECHNICIAN

CHECKED BY:

MR. EKKACHAI YOOPRASERTCHAI
RESEARCH ASSOCIATE

APPROVED BY:

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April 3, 2013

webercolor HR

Doc. No. S0182K-13

AIT

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STRUCTURAL ENGINEERING LABORATORY

STRUCTURAL ENGINEERING FIELD OF STUDY

SCHOOL OF ENGINEERING AND TECHNOLOGY

TYPE OF TEST: DETERMINATION OF RESISTANCE TO ABRASION (EN 12808-2)

TEST SPECIMEN: Three (3) specimens in cubic shape having a nominal size of 100x100x10 mm. were prepared in SE laboratory. The mix proportion of water to " weber color HR " ratio was 20.0 % by weight.

CLIENT: SAINT - GOBAIN WEBER CO., LTD.

DATE OF TEST: February 21, 2013

TEST RESULTS:

Specimen	Length Point 1 (mm.)	Length Point 2 (mm.)	Length Point 3 (mm.)	Volume Point 1 (mm^3.)	Volume Point 2 (mm^3.)	Volume Point 3 (mm^3.)
weber color HR	32.50	32.50	33.50	288.00	288.00	316.00

Note: 1) The test performed by a manufacturer's laboratory, which uses own test equipment. AIT was witness for this test.
2) This report certifies the adequacy and representative character of the test sample(s) only.

TESTED BY:

MR. APIRAK POORAT
TECHNICIAN

CHECKED BY:

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April 18, 2013

Doc. No. S0182A-13

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STRUCTURAL ENGINEERING LABORATORY

STRUCTURAL ENGINEERING FIELD OF STUDY

SCHOOL OF ENGINEERING AND TECHNOLOGY

TYPE OF TEST: COMPRESSIVE STRENGTH TEST (EN 12808-3)

TEST SPECIMEN: Three (3) cubes having a nominal size of 40x40x40 mm made of " weber color HR " were prepared in SE laboratory. The mix proportion of water to " weber color HR " ratio was 20.0 % by weight.

CLIENT: SAINT-GOBAIN WEBER CO., LTD.

DATE OF TEST: February 21, 2013

TEST METHOD: Test the prism halves broken in flexion. Centtre the prism halves laterally to the platens of machine and longitudinally such that the end face of the prism overhangs the platens or auxiliary plates by about 10 mm. Increase the load until fracture.

TEST RESULTS: The compressive strength of specimens at the age of 28 days are shown as follows.

Specimen No.	Date of Cast	Date of Test	Age of Specimen (days)	Cross Sectional Area (mm^2)	Maximum Load (N)	Compressive Strength (N/mm^2)	Remarks
1	24/01/13	21/02/13	28	1,600	45,235	28.27	
2	24/01/13	21/02/13	28	1,600	44,280	27.68	
3	24/01/13	21/02/13	28	1,600	41,492	25.93	
					Average	**27.29**	

Note: 1) This testing machine was calibrated by Calibration Laboratory Co., Ltd, at the date of January 11, 2013
2) This report certifies the adequacy and representative character of the test sample(s) only.

TESTED BY:

MR. APIRAK POORAT
TECHNICIAN

CHECKED BY:

MR. EKKACHAI YOOPRASERTCHAI
RESEARCH ASSOCIATE

APPROVED BY:

DR. PENNUNG WARNITCHAI
LEADER OF CIVIL AND INFRASTRUCTURE ENGINEERING THEMATIC (CIE)
April 17, 2013

Doc. No. S0182B-13

AIT

Asian Institute of Technology
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STRUCTURAL ENGINEERING LABORATORY

STRUCTURAL ENGINEERING FIELD OF STUDY

SCHOOL OF ENGINEERING AND TECHNOLOGY

TYPE OF TEST: **FLEXURAL STRENGTH TEST (EN 12808-3)**

TEST SPECIMEN: Three (3) cubes having a nominal size of 40x40x160 mm made of " weber color HR " were prepared in SE laboratory. The mix proportion of water to " weber color HR " ratio was 20.0 % by weight.

CLIENT: **SAINT-GOBAIN WEBER CO., LTD.**

DATE OF TEST: February 21, 2013

TEST METHOD: Keep the demolded prism in standard conditions for 27 days. After conditioning hass been completed, place the prism in the testing machine. Apply the load until fracture.

TEST RESULTS: The flexural strength of specimens at the age of 28 days are shown as follows.

Specimen No.	Date of Cast	Date of Test	Age of Specimen (days)	Span Length (mm)	Maximum Load (N)	Flexural Strength (N/mm^2)	Remarks
1	24/01/13	21/02/13	28	100	2,600	6.09	
2	24/01/13	21/02/13	28	100	3,000	7.03	
3	24/01/13	21/02/13	28	100	2,300	5.39	
					Average	**6.17**	

Note: 1) This testing machine was calibrated by Calibration Laboratory Co., Ltd, at the date of January 11, 2013
2) This report certifies the adequacy and representative character of the test sample(s) only.

TESTED BY:

MR. APIRAK POORAT
TECHNICIAN

CHECKED BY:

MR. EKKACHAI YOOPRASERTCHAI
RESEARCH ASSOCIATE

APPROVED BY:

DR. PENNUNG WARNITCHAI
LEADER OF CIVIL AND INFRASTRUCTURE ENGINEERING THEMATIC (CIE)
April 17, 2013

Doc. No. S0182F-13

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STRUCTURAL ENGINEERING LABORATORY

STRUCTURAL ENGINEERING FIELD OF STUDY

SCHOOL OF ENGINEERING AND TECHNOLOGY

TYPE OF TEST: **DETERMINATION OF SHRINKAGE (EN 12808-4)**

TEST SPECIMEN: Three (3) specimens in prism shape were prepared in the SE laboratory. The mix proportion of water to " weber color HR " ratio was 20.0 % by weight.

CLIENT: **SAINT - GOBAIN WEBER CO., LTD.**

DATE OF TEST: January 28, 2013 - February 25, 2013

TEST RESULTS: The shrinkage of specimens at the age of 28 days are shown as follows.

Specimen No.	Intial Measurement (mm.)	Final Measurement (mm.)	Drying Shrinkage of specimen (mm./m.)
1	14.24	14.08	1.00
2	15.37	15.10	1.69
3	12.88	12.69	1.19

Note: 1) The test performed by a manufacturer's laboratory, which uses own test equipment. AIT was witness for this test.
2) This report certifies the adequacy and representative character of the test sample(s) only.

TESTED BY:

MR. APIRAK POORAT
TECHNICIAN

CHECKED BY:

MR. EKKACHAI YOOPRASERTCHAI
RESEARCH ASSOCIATE

APPROVED BY:

DR. PENNUNG WARNITCHAI
LEADER OF CIVIL AND INFRASTRUCTURE ENGINEERING GROUP
April 18, 2013

Doc. No. S0182H-13

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STRUCTURAL ENGINEERING LABORATORY

STRUCTURAL ENGINEERING FIELD OF STUDY

SCHOOL OF ENGINEERING AND TECHNOLOGY

TYPE OF TEST: **WATER ABSORPTION TEST (EN 12808-5)**

TEST SPECIMEN: Three (3) specimens of standard prisms shape made of " weber color HR " were prepared in SE laboratory. ratio was 20.0 % by weight.

CLIENT: **SAINT-GOBAIN WEBER CO., LTD.**

DATE OF TEST: February 21, 2013

TEST RESULTS:

Specimen No.	Weight of Surface-dried Specimen After Immersion 30 min (g)	Weight of Surface-dried Specimen After Immersion 240 min (g)	Weight of the dry Specimen (g)	Water Absorption of Specimen 30 min (g)	Water Absorption of Specimen 240 min (g)
1	442.00	442.20	442.00	0.00	0.20
2	446.00	446.10	446.00	0.00	0.10
3	452.50	452.70	452.30	0.20	0.40
			Average	**0.07**	**0.23**

Note: This report certifies the adequacy and representative character of the test sample(s) only.

TESTED BY:

MR. APIRAK POORAT
TECHNICIAN

CHECKED BY:

MR. EKKACHAI YOOPRASERTCHAI
RESEARCH ASSOCIATE

APPROVED BY:

DR. PENNUNG WARNITCHAI
LEADER OF CIVIL & INFRASTRUCTURE ENGINEERING GROUP
April 18, 2013

Doc. No. S0182M-13

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STRUCTURAL ENGINEERING LABORATORY

STRUCTURAL ENGINEERING FIELD OF STUDY

SCHOOL OF ENGINEERING AND TECHNOLOGY

TYPE OF TEST: **DETERMINATION OF RESISTANCE TO ABRASION (EN 12808-2)**

TEST SPECIMEN: Three (3) specimens in cubic shape having a nominal size of 100x100x10 mm. were prepared in SE laboratory. The mix proportion of water to " weber color poxy " ratio of A : B = 1 : 3 by weight.

CLIENT: **SAINT - GOBAIN WEBER CO., LTD.**

DATE OF TEST: February 21, 2013

TEST RESULTS:

Specimen	Length Point 1 (mm.)	Length Point 2 (mm.)	Length Point 3 (mm.)	Volume Point 1 (mm^3.)	Volume Point 2 (mm^3.)	Volume Point 3 (mm^3.)
weber color poxy	20.00	20.00	20.00	67.00	67.00	67.00

Note: 1) The test performed by a manufacturer's laboratory, which uses own test equipment. AIT was witness for this test.
2) This report certifies the adequacy and representative character of the test sample(s) only.

TESTED BY:

MR. APIRAK POORAT
TECHNICIAN

CHECKED BY:

MR. EKKACHAI YOOPRASERTCHAI
RESEARCH ASSOCIATE

APPROVED BY:

DR. PENNUNG WARNITCHAI
LEADER OF CIVIL & INFRASTRUCTURE ENGINEERING GROUP
April 18, 2013

Reference No. SPT-31/56

FACULTY OF ENGINEERING
CHULALONGKORN UNIVERSITY

Type of test : COMPRESSIVE STRENGTH TEST (EN 12808-3)
Test specimen : Three (3) specimens in prism shape were cast in the laboratory.
The mix proporting of "weber.color poxy" epoxy hardener 1 part : epoxy resin 3 part by volume.
Client : SAINT-GOBAIN WEBER CO., LTD.
Date of test : March 22, 2013
Test method : After flexural test, the halves broken specimens were keeped in standard condition until conducting the compression test.
Test results : The compressive strength of specimens at the age of 28 days are shown as follows.
(The test results are good only for those specimens tested.)

Specimen No.	Date of cast	Date of test	Age of Specimen (days)	Cross section area (cm^2)	Maximum Load (kgf)	Compressive Strength (ksc)	Remarks
1	22-Feb-2013	22-Mar-2013	28	16	10,700	668.8	1 kgf/cm^2 = 0.0981 N/mm^2
2	22-Feb-2013	22-Mar-2013	28	16	10,700	668.8	
3	22-Feb-2013	22-Mar-2013	28	16	10,100	631.3	Average compressive strength of
					Average	656.3	samples = 64 N/mm2

Note: This results certify the adequacy and representative character of the test samples only.

(Assoc. Prof. Dr. Tirawat Boonyatee)
On Behalf of Head of Civil Engineering Departmen

Tested by :
(Assist. Prof. Dr. Boonchai Sangpetngam)

CHULALONGKORN UNIVERSITY Department of Civil Engineering, Faculty of Engineering
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Reference No. SPT-31/56

FACULTY OF ENGINEERING
CHULALONGKORN UNIVERSITY

Type of test : FLEXURAL STRENGTH TEST (EN 12808-3)
Test specimen : Five (5) specimens in prism shape were cast in the laboratory.
The mix proporting of "weber.color poxy" epoxy hardener 1 part : epoxy resin 3 part by volume.
Client : SAINT-GOBAIN WEBER CO., LTD.
Date of test : March 22, 2013
Test method : After mixing them thoroughly, the specimen was cast in the standard molds having a size of 40x40x160 mm.
The specimens are cured for 24 hours in molds, then stripped and cured in standard condition until conducting the test.
Test results : The flexural strength of specimens at the age of 28 days are shown as follows.
(The test results are good only for those specimens tested.)

Specimen No.	Width of Specimen, B (cm)	Thickness of Specimen, D (cm)	Length of Specimen (cm)	Maximum Load P (kgf)	Flexural Strength (ksc)	Remarks
1	4.05	3.96	16.05	1,390	328.3	The flexural strength, Sf=3 P l / (2 B D^2)
2	4.06	3.95	16.30	1,300	307.9	where l (span length) is 10 cm.
3	4.04	4.00	16.14	1,270	294.7	1 kgf/cm^2 = 0.0981 N/mm^2
4	4.00	3.95	16.20	1,220	293.2	Average flexural strength = 30 N/mm2
5	4.03	3.98	16.07	1,230	289.0	
				Average	302.6	

Note: This results certify the adequacy and representative character of the test samples only.

(Assoc. Prof. Dr. Tirawat Boonyatee)
On Behalf of Head of Civil Engineering Department

Tested by :
(Assist. Prof. Dr. Boonchai Sangpetngam)

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STRUCTURAL ENGINEERING LABORATORY
STRUCTURAL ENGINEERING FIELD OF STUDY
SCHOOL OF ENGINEERING AND TECHNOLOGY

TYPE OF TEST: DETERMINATION OF SHRINKAGE (EN 12808-4)
TEST SPECIMEN: Three (3) specimens in prism shape were prepared in the SE laboratory. The " weber color poxy " consists of two components with mixing ratio of A : B = 1 : 3 by weight.
CLIENT: SAINT - GOBAIN WEBER CO., LTD.
DATE OF TEST: January 24, 2013 - February 21, 2013
TEST RESULTS: The shrinkage of specimens at the age of 28 days are shown as follows.

Specimen No.	Intial Measurement (mm.)	Final Measurement (mm.)	Drying Shrinkage of specimen (mm./m.)
1	14.52	14.43	0.56
2	15.19	15.13	0.38
3	12.04	11.97	0.44

Note: 1) The test performed by a manufacturer's laboratory, which uses own test equipment. AIT was witness for this test.
2) This report certifies the adequacy and representative character of the test sample(s) only.

TESTED BY:
MR. APIRAK POORAT
TECHNICIAN

CHECKED BY:
MR. EKKACHAI YOOPRASERTCHAI
RESEARCH ASSOCIATE

APPROVED BY:
DR. PENNUNG WARNITCHAI
LEADER OF CIVIL AND INFRASTRUCTURE ENGINEERING GROUP
April 18, 2013

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STRUCTURAL ENGINEERING LABORATORY
STRUCTURAL ENGINEERING FIELD OF STUDY
SCHOOL OF ENGINEERING AND TECHNOLOGY

TYPE OF TEST: WATER ABSORPTION TEST (EN 12808-5)
TEST SPECIMEN: Three (3) specimens of standard prisms shape made of " weber color poxy " were prepared in SE laboratory. ratio of A : B = 1 : 3 by weight.
CLIENT: SAINT-GOBAIN WEBER CO., LTD.
DATE OF TEST: February 21, 2013
TEST RESULTS:

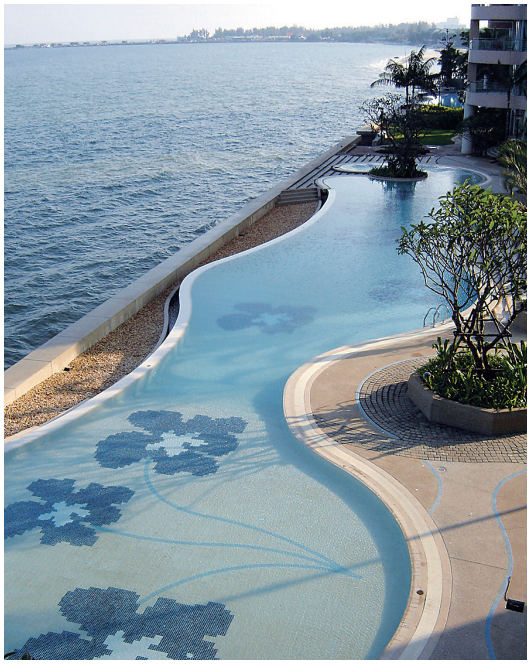
Specimen No.	Weight of Surface-dried Specimen After Immersion 30 min (g)	Weight of Surface-dried Specimen After Immersion 240 min (g)	Weight of the dry Specimen (g)	Water Absorption of Specimen 30 min (g)	Water Absorption of Specimen 240 min (g)
1	423.10	423.10	423.10	0.00	0.00
2	432.30	432.30	432.30	0.00	0.00
3	431.90	431.90	431.90	0.00	0.00
			Average	**0.00**	**0.00**

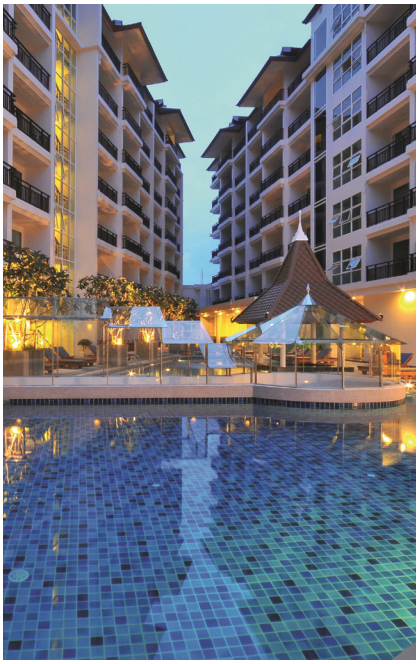
Note: This report certifies the adequacy and representative character of the test sample(s) only.

TESTED BY:
MR. APIRAK POORAT
TECHNICIAN

CHECKED BY:
MR. EKKACHAI YOOPRASERTCHAI
RESEARCH ASSOCIATE

APPROVED BY:
DR. PENNUNG WARNITCHAI
LEADER OF CIVIL & INFRASTRUCTURE ENGINEERING GROUP
April 18, 2013





HOTELS

o Dusit Thani Laguna	Phuket
o Laguna Beach Resort	Phuket
o Angsana Laguna	Phuket
o Anantara	Phuket
o Novotel	Phuket
o Cape Panwa	Phuket
o Baan Bua Resort	Phuket
o Indigo Pearl	Phuket
o Kata Rock	Phuket
o Le tong Beach	Phuket
o Graceland Patong	Phuket
o Marriott	Phuket
o Graceland สวหผีเสื้อ	Phuket
o The Sand	Phuket
o The Charm Patong	Phuket
o Aleenta Resort&Spa	Phang Nga
o Graceland	Phang Nga
o Chongfah Beach Resort	Phang Nga
o Rue Rasada	Trang
o Samui Orchid Suite	Koh Samui
o Nora Buri Resort&Spa	Koh Samui
o Samujana	Koh Samui
o Anantara	Koh Samui
o Mercure	Koh Samui
o Centara Grand	Koh Samui
o Jean Pool Villa	Koh Samui
o Marina Villa	Koh Samui
o Good Day Beach Resort	Koh Lanta
o Purimantra Resort&Spa	HuaHin
o Royal Princess	HuaHin
o Baan Khao Tao	HuaHin
o The Panorama Villas	Huahin
o Malibu Khao Tao	Huahin

RESIDENTIAL PROJECTS

o The Room	Ladphrao
o The Room	Sukhumvit 62
o The Room	Asoke (Sukhumvit 21)
o The Trus	Rama 3
o The Crest	Ruamrudee
o The Address	Sathorn
o U-Delight	On-Nuch
o The Key	Phaholyothin
o The Key	Prachachuen
o The Key	Changwattana
o The Rog 3	Sukhumvit 101/1
o D25 condo	Thonglor
o Tempo condo	Ratchada
o Ideo Mobi	Rama 9
o Star Estate	@Narathiwas
o Parkland Grand	Taksin
o Parkland Grand	Kaerai
o Supalai Premier	Rama 3

o Housing Project Magnolia
o Housing Project of Q-House
o Condominium Projects of Supalai
o Baan Sansiri Sukhumvit 67

ACADEMIC PROJECTS AND OTHERS

o Sport Complex: Chulalongkorn University
o Songkhla Rajabhat University
o British International School Phuket
o British Club
o Nawathani Club
o Sport Club of Post Engineer Department; Royal Thai Army, Bangkok
o Sport Club of Post Engineer Department; Royal Thai Army, Pranburi
o Ratchapruek Club, Vibhavadi
o Kasintorn Academy, Puttamonton Sai 3

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