

THE BEST OF BOND THE BEST OF BOND

ADHESIVE INJECTION

EPOXY-21

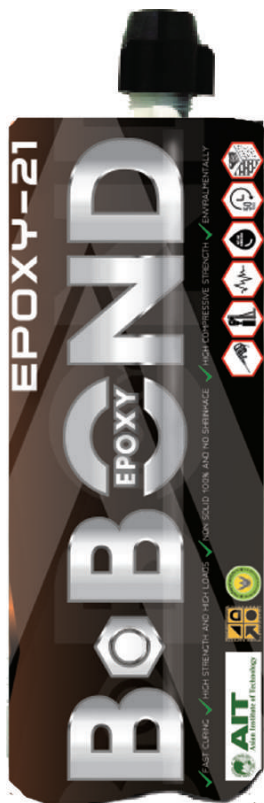
- ✓ FAST CURING
- ✓ HIGH STRENGTH AND HIGH LOADS
- ✓ NON SOLID 100% AND NO SHRINKAGE
- ✓ HIGH COMPRESSIVE STRENGTH
- ✓ ENVIRONMENTALLY

BOND EPOXY





According to data and features in the Asian Institute of Technology (AIT). The product is homologated for being used with a wide range of threaded rods (from M8 to M30) and rebar (diameter from 8mm to 32mm). You can use it in wet concrete and flooded hole without doubling the curing time. M8 to M30 for non-cracked concrete and installation in cracked concrete with rods from M12 to M24. It is certified for fixing with variable anchorage depths. This means that the project engineer has with this product a considerable flexibility in the design phase. For post installed rebar connections in accordance with maximum allowed depth of 2500 mm, certified installation with both drill and core-drill (dry/wet). Certified service temperatures are in the ranges $-40^{\circ}\text{C} / +40^{\circ}\text{C}$ (T° max long period = 24°C) and $-40^{\circ}\text{C} / +80^{\circ}\text{C}$ (T° max long period = 50°C).



Description

B-BOND are Pure Epoxy Resin non solid 100% with 2 part of epoxy resin and hardener. B-BOND are faster curing for Rebar fixing work and Threaded studs installation

Features and Benefits

- Fast curing
- High strength and high loads
- Non solid 100% and no shrinkage
- No tasting
- High compressive strength
- Can be use cold weather less than 5°C
- Easy to used compact in bottle

Uses

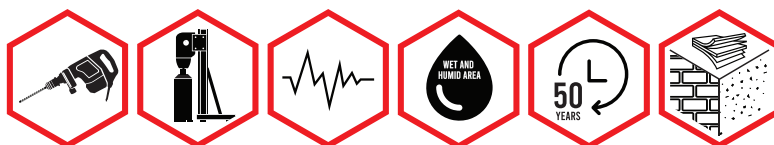
- For middle to big jobs of Rebar fixing with concrete
- Can be used for welding with Sign board, Bars, Shelft
- Can be used for welding with Steel, Pole or Lintel
- Can be used for welding with A part of concrete or Tile

Shelf Life

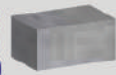
Long shelf life of 1 year in dual cartridge

Package

In cartridge 2 part (Resin+Hardener)
2:1 Size 450 ml.

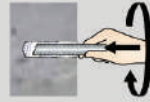


Working time and curing time



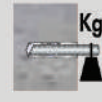
Temperature

5 c
10 c
20 c
30 c
40 c



Working Time

60 min
45 min
30 min
25 min
20 min



Curing Time

72 hr
48 hr
24 hr
12 hr
5 hr



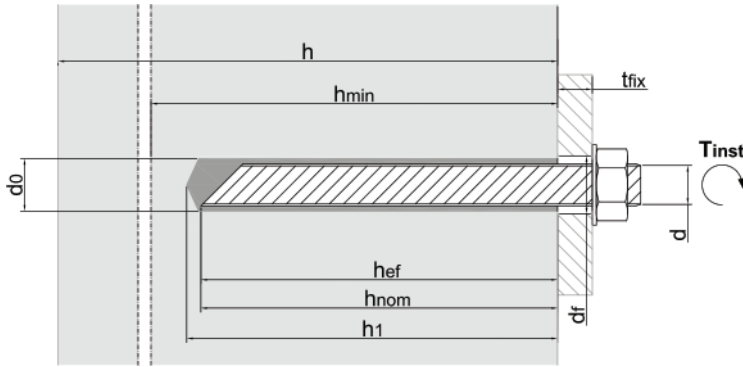
Number of fixing

Threaded stud	Hole	EPOXY-21
	do(mm) x h1(mm)	Fixings
M8	10 x 85	80
M10	12 x 95	60
M12	14 x 115	40
M16	18 x 130	24
M20	24 x 175	8
M24	28 x 215	6
M27	30 x 245	5
M30	35 x 275	3

Rebar	Hole	EPOXY-21
	do(mm) x h1(mm)	Fixings
DB10	14 x 100	40
DB12	16 x 120	18
DB16	20 x 160	10
DB20	25 x 200	6
DB25	32 x 250	4
DB28	35 x 300	2
DB32	40 x 350	1



WARNING: The number of fixings above mentioned has been calculated according to the theoretical volume needed to fill the hole (or sleeve) excluded the volume of the inserted metal rod. In the theoretical volume it is included a standard extra quantity but the real quantity of the product may be different than it in function of the real application of the product.



Threaded Stud Installation Data

- d [mm] = Rod diameter
- hmin [mm] = Minimum thickness of base material
- d0 [mm] = Hole diameter
- h1 [mm] = Hole depth
- hnom [mm] = Embedment depth
- hef [mm] = Effective anchorage range
- Scr [mm] = Characteristic spacing
- Ccr [mm] = Characteristic edge distance
- Smin [mm] = Minimum allowable spacing
- Cmin [mm] = Minimum allowable edge distance
- tfix [mm] = Fixture thickness
- df [mm] = Diameter of clearance hole in the fixture
- Sw [mm] = Key
- Tinst [Nm] = Installation torque

WARNING: Before use see this section and the complete procedure of installation reported in the next pages. We assume no liability for the not correct use of the product.

Concrete Strength = 25 N/mm² (~250 ksc)
(Yield Strength) = 400 N/mm² (~4000 ksc.)

For Anchor Rod Zinc Grade 5.8

Anchor Diameter	M8	M10	M12	M16	M20	M24	M27	M30
Hole Diameter (mm)	10	12	14	18	24	28	30	35
Hole Depth (mm)	85	95	115	130	175	215	245	275
Setting Depth (mm)	80	90	110	125	170	210	240	270
Tensile N _{rec} (kN)	8.5	14.1	19.6	31.5	47.6	68.6	83.3	102.5
Shear V _{rec} (kN)	5.1	8.3	11.8	22.4	34.5	50.8	66.9	81.0
Hole / Cartridge (Unit)	82	52	35	20	6	5	4	3

CURING TIME

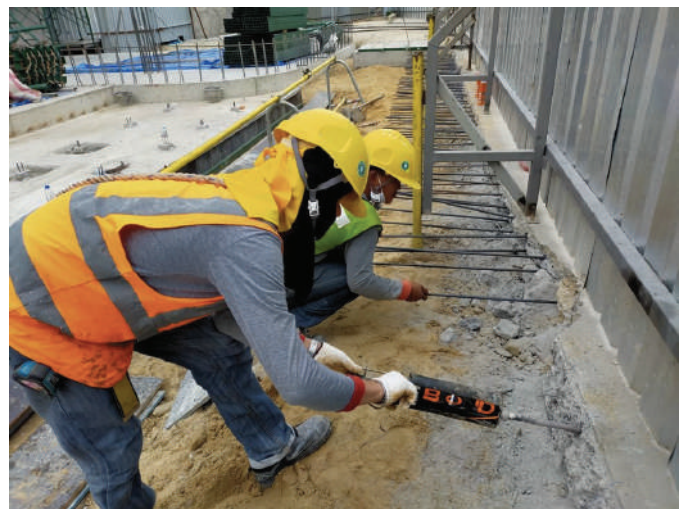
Material Temperature	Working Time	Curing Time
5°C	3 h	48 h
10°C	2 h	24 h
20°C	30 min	14 h
30°C	20 min	10 h
40°C	10 min	5 h

ค่ากำลังอัดของคอนกรีต (ทรงลูกบาศก์) = 25 N/mm (~250 ksc) เหล็กเสริม(SD 40) ได้มาตรฐาน มอก. 24-1993
ค่าแรงดึง รุ จุด ทรายของเหล็กเสริม (Yield Strength) = 400 N/mm (~4000 ksc.)

Rebar Size (d)		Recommended Tension Capacity Value (F) kN															Design	Depth to	
Hole Diameter (D)																	Rebar Yield	Develop Steel Yield	
Embedment Depth L _{inst} (mm)		100	120	140	160	180	200	220	250	300	350	400	450	500	550	600	700	(kN)	(mm)
d 10	F _V	17.7	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	120
D 14	V(ml)	9	11	12	14	16	18	20	22	27	31	35	40	44	49	53	62		
d 12	F _V		24.9	25.6	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	160
D 16	V(ml)		12	14	17	19	21	23	26	31	36	41	47	52	57	62	72		
d 16	F _V				36.0	40.8	44.2	48.1	48.1	48.1	48.1	48.1	48.1	48.1	48.1	48.1	48.1	48.1	220
D 20	V(ml)				21	24	27	29	33	40	47	53	60	67	73	80	93		
d 20	F _V					52.4	56.9	59.6	71.1	74.7	74.7	74.7	74.7	74.7	74.7	74.7	74.7	74.7	350
D 25	V(ml)					42	46	52	62	73	83	94	104	114	125	146			
d 25	F _V								70.2	73.3	82.6	95.4	108.8	115.0	115.0	115.0	115.0	115.0	500
D 32	V(ml)								92	111	129	147	166	184	203	221	258		
d 28	F _V									106.3	109.6	112.0	115.3	128.9	139.4	146.2	146.2	146.2	600
D 35	V(ml)									122	143	163	183	204	224	244	285		
d 32	F _V										120.1	126.7	131.3	146.0	161.5	176.8	193.2	193.2	670
D 40	V(ml)										186	213	240	266	293	319	373		

REMARK : Rec. working Tension Loading (F_{REC}) = F_V / SF
F_V

SF = Partial factor for concrete = 2.0



Asian Institute of Technology

Km. 42 Paholyothin Highway, Klong Luang, Pathumthani, Thailand 12120

P. O. Box 4 Klong Luang, Pathumthani 12120, Thailand. Tel. (66-2) 524-5527, 524-6427 Fax.(66-2) 524-5544

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

TYPE OF TEST: PULL-OUT TEST IN AXIAL TENSION**TEST SPECIMEN:** Three (3) " SKY DB12 SD40 " deformed bar bonded with " BBOND " in concrete block having a size of 400 x 400 x 400 mm. were tested.**CLIENT:** POWER CON CO., LTD.**DATE OF TEST:** March 9, 2016**TEST RESULTS:**

Specimen No.	Type of Specimen	Diameter of Drill hole (mm.)	Depth of Drill hole (mm.)	Span Length (mm.)	Maximum Load (kg.)	Mode of Failure
1	SKY DB12 SD40	16	120	300	6,430	-The deformed bar failure occurred when applied the maximum load.
2	SKY DB12 SD40	16	120	300	5,980	-The deformed bar failure occurred when applied the maximum load.
3	SKY DB12 SD40	16	120	300	5,930	-The deformed bar failure occurred when applied the maximum load.

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

TESTED BY:



MR. SAMWAI SORNSRIDA
TECHNICIAN

CHECKED & APPROVED BY:



DR. ANAWAT CHOTESUWAN
SENIOR LABORATORY SUPERVISOR
March 17, 2016

Asian Institute of Technology

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STRUCTURAL ENGINEERING FIELD OF STUDY
SCHOOL OF ENGINEERING AND TECHNOLOGY

TYPE OF TEST: PULL-OUT TEST IN AXIAL TENSION**TEST SPECIMEN:** Three (3) " KSTI DB16 SD40 " deformed bar bonded with " BBOND " in concrete block having a size of 500 x 500 x 500 mm. were tested.**CLIENT:** POWER CON CO., LTD.**DATE OF TEST:** March 9, 2016**TEST RESULTS:**

Specimen No.	Type of Specimen	Diameter of Drill hole (mm.)	Depth of Drill hole (mm.)	Span Length (mm.)	Maximum Load (kg.)	Mode of Failure
1	KSTI DB16 SD40	20	160	300	12,240	-The failure occurred due to concrete breakout when applied the maximum load.
2	KSTI DB16 SD40	20	160	300	12,240	-The failure occurred due to concrete breakout when applied the maximum load.
3	KSTI DB16 SD40	20	160	300	12,280	-The deformed bar failure occurred when applied the maximum load.

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

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TECHNICIAN

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SCHOOL OF ENGINEERING AND TECHNOLOGY

TYPE OF TEST: PULL-OUT TEST IN AXIAL TENSION**TEST SPECIMEN:** Three (3) " KSTI DB20 SD40 " deformed bar bonded with " BBOND " in concrete block having a size of 500 x 500 x 500 mm. were tested.**CLIENT:** POWER CON CO., LTD.**DATE OF TEST:** March 9, 2016**TEST RESULTS:**

Specimen No.	Type of Specimen	Diameter of Drill hole (mm.)	Depth of Drill hole (mm.)	Span Length (mm.)	Maximum Load (kg.)	Mode of Failure
1	KSTI DB20 SD40	25	200	300	18,330	-The failure occurred due to concrete breakout when applied the maximum load.
2	KSTI DB20 SD40	25	200	300	18,090	-The failure occurred due to concrete breakout when applied the maximum load.
3	KSTI DB20 SD40	25	200	300	17,360	-The failure occurred due to concrete breakout when applied the maximum load.

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

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TYPE OF TEST: PULL-OUT TEST IN AXIAL TENSION**TEST SPECIMEN:** Three (3) " SKY DB25 SD40 " deformed bar bonded with " BBOND " in concrete block having a size of 600 x 600 x 600 mm. were tested.**CLIENT:** POWER CON CO., LTD.**DATE OF TEST:** March 9, 2016**TEST RESULTS:**

Specimen No.	Type of Specimen	Diameter of Drill hole (mm.)	Depth of Drill hole (mm.)	Span Length (mm.)	Maximum Load (kg.)	Mode of Failure
1	SKY DB25 SD40	32	250	300	28,620	-The failure occurred due to concrete breakout when applied the maximum load.
2	SKY DB25 SD40	32	250	300	24,380	-The failure occurred due to concrete breakout when applied the maximum load.
3	SKY DB25 SD40	32	250	300	25,950	-The failure occurred due to concrete breakout when applied the maximum load.

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

TESTED BY:



MR. SAMWAI SORNSRIDA
TECHNICIAN

CHECKED & APPROVED BY:



DR. ANAWAT CHOTESUWAN
SENIOR LABORATORY SUPERVISOR
March 17, 2016

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STRUCTURAL ENGINEERING FIELD OF STUDY
SCHOOL OF ENGINEERING AND TECHNOLOGY

TYPE OF TEST: PULL-OUT TEST IN AXIAL TENSION**TEST SPECIMEN:** Three (3) " KSTI DB28 SD40 " deformed bar bonded with " BBOND " in concrete block having a size of 600 x 600 x 600 mm. were tested.**CLIENT:** POWER CON CO., LTD.**DATE OF TEST:** March 9, 2016**TEST RESULTS:**

Specimen No.	Type of Specimen	Diameter of Drill hole (mm.)	Depth of Drill hole (mm.)	Span Length (mm.)	Maximum Load (kg.)	Mode of Failure
1	KSTI DB28 SD40	35	300	300	28,980	-The failure occurred due to concrete breakout when applied the maximum load.
2	KSTI DB28 SD40	35	300	300	27,270	-The failure occurred due to concrete breakout when applied the maximum load.
3	KSTI DB28 SD40	35	300	300	31,210	-The failure occurred due to concrete breakout when applied the maximum load.

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

TESTED BY:



MR. SAMWAI SORNSRIDA
TECHNICIAN

CHECKED & APPROVED BY



DR. ANAWAT CHOTESUWAN
SENIOR LABORATORY SUPERVISOR
March 17, 2016



No. 0307/ **1162**

To Power cut (Thailand) Co., Ltd.

The Department of Science Service presents the test report for the sample named "BONDED TEST EPOXY BBOND WITH STEEL" Laboratory No. L63/00119.1 as the total of 1 sample with reference to the request No. L63/00119 dated 8 January 2020.

Enclosed herewith the following result avails for your acknowledgement.



Division of Engineering Materials

Tel. 0 2201 7130

Fax 0 2201 7127

E-mail : physics@dss.go.th



Department of Science Service

TEST REPORT

Department of Science Service

Sample's name
BONDED TEST EPOXY BBOND WITH
STEEL

Mark / Brand
-

Laboratory No.

L63/00119.1

Department of Science Service

Test Result

Department of Science Service

Shear strength, MPa

1.85

Department of Science Service

Customer's name Power cut (Thailand) Co., Ltd.

Customer's address 257/16-18 Floor 3 Ratchadaphisek Rd., Ratchadaphisek, Dindang,
Bangkok 10400

Sample's description Shear strength test piece (Brick+Steel)

Test date 8 January 2020

Test method TIS. 181-2530 (1987)

Department of Science Service

Department of Science Service

Approved by

Anon Pomprasit
(Mr. Anon Pomprasit)

Scientist, Senior Professional Level

Reported by

Aekapon Pokhum

(Mr. Aekapon Pokhum)

Mechanic, Operational Level

Department of Science Service

Department of Science Service

Department of Science Service

This report is only valid for the sample received. The above statement is not intended for advertising purposes and shall not be partially reproduced or manifested without the written permission from the Department of Science Service.

Department of Science Service, Ministry of Higher Education Science Research and Innovation

Rama VI Road, Ratchathewi, Bangkok 10400, Thailand



No. 0307/ **1163**

To Power cut (Thailand) Co., Ltd.

The Department of Science Service presents the test report for the sample named "BONDED TEST EPOXY BBOND WITH ALUMINIUM COMPOSITE" Laboratory No. L63/00120.1 as the total of 1 sample with reference to the request No. L63/00120 dated 8 January 2020.

Enclosed herewith the following result avails for your acknowledgement.



Division of Engineering Materials
Tel. 0 2201 7130
Fax 0 2201 7127
E-mail : physics@dss.go.th



Department of Science Service

TEST REPORT

Department of Science Service

Sample's name	Mark / Brand	Laboratory No.
BONDED TEST EPOXY BBOND WITH ALUMINIUM COMPOSITE	-	L63/00120.1

Department of Science Service

Test Result

Department of Science Service

Shear strength, MPa	1.03
---------------------	------

Department of Science Service

Customer's name	Power cut (Thailand) Co., Ltd.
Customer's address	257/16-18 Floor 3 Ratchadaphisek Rd., Ratchadaphisek, Dindang, Bangkok 10400
Sample's description	Shear strength test piece (Brick+Aluminium)
Test date	8 January 2020
Test method	TIS. 181-2530 (1987)

Department of Science Service

Department of Science Service

Approved by
Anon Pomprasit
 (Mr. Anon Pomprasit)
 Scientist, Senior Professional Level

Reported by
Aekapon Pokhum
 (Mr. Aekapon Pokhum)
 Mechanic, Operational Level

Department of Science Service

Department of Science Service

Department of Science Service

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Department of Science Service, Ministry of Higher Education Science Research and Innovation
 Rama VI Road, Ratchathewi, Bangkok 10400, Thailand

Certificate Approve



CERTIFICATE OF REGISTRATION

This is to certify that the management system of:

MFRP Engineering Sdn Bhd

Main Site: No. 8, Jalan PSS 2, Taman Perindustrian Sungai Sedu,
42700 Banting, Selangor Darul Ehsan, Malaysia

has been registered by Intertek as conforming to the requirements of:

ISO 14001:2015

The management system is applicable to:

Manufacture of Paints and Coatings

Certificate Number:
ES132388

Initial Certification Date:
19 January 2006

Date of Certification Decision:
26 December 2017

Issuing Date:
26 December 2017

Valid Until:
18 January 2021



EMS 06072002 CB 01

Calin Moldovean
President, Business Assurance

Intertek Certification International Sdn Bhd
D-28-3, Level 28, Menara Suezcap 1
No. 2, Jalan Kerinchi
Gerbang Kerinchi Lestari
59200 Kuala Lumpur
Malaysia



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Certificate Approve



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This is to certify that the management system of:

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Main Site: No. 8, Jalan PSS 2, Taman Perindustrian Sungai Sedu,
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18 January 2021



EMS 06072002 CB 01

Calin Moldovean
President, Business Assurance

Intertek Certification International Sdn Bhd
D-28-3, Level 28, Menara Suezcap 1
No. 2, Jalan Kerinchi
Gerbang Kerinchi Lestari
59200 Kuala Lumpur
Malaysia



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Reference Site

Project : Queen Sirikit National Convention Center, Bangkok
Main Contractor : Thai Obayashi Co.,Ltd.
Date : April 2020



Project : IKEA & Mega Bangna Shopping Mall , Bangkok
Main Contractor : Thai Takenaka Co.,Ltd.
Date : March 2020

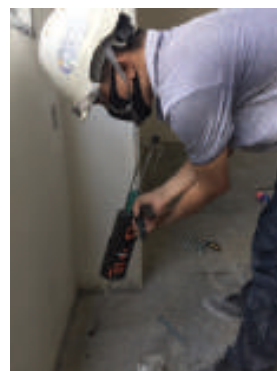


Reference Site

Project : Nipn Navanakorn, Pathumthani
Main Contractor : Thai Obayashi Co.,Ltd.
Date : April 2020



Project : Asahi Kasei Spunbond, Chonburi
Main Contractor : Thai Takenaka Co.,Ltd.
Date : March 2020



Reference Site

Project : Olarn Factory , Chonburi
Main Contractor : Thai Takenaka Co.,Ltd.
Date : January 2020



Project : Bang Pa-in Motor Way
Main Contractor : Ch.Karnchang - Tokyu Construction
Date : February 2020



Reference Site

Project : American University Alumni Association ,Bangkok
Main Contractor : McTric
Date : October 2019



Project : PEA Sainoi , Nakorn Pathom
Main Contractor : Kijruamka Ngamwongwan
Date : December 2016

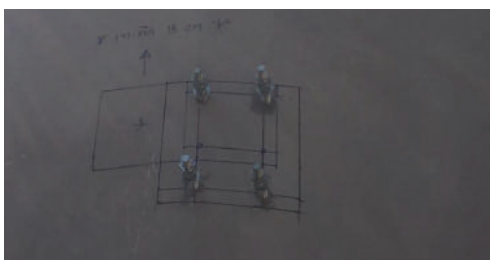


Reference Site

Project : Sittipol1991 HO Building Rama 3 ,Bangkok
Main Contractor : Thai Takenaka Co.,Ltd.
Date : June 2019



Project : Habor Land Project,Pattaya
Main Contractor : Tawinan Construction
Date : March 2019



Reference Site

Project : Highway Construction, Bang Pa-In - Nakornratchasima
Main Contractor : Ch.Karnchang - Tokyu Construction
Date : January 2019



Project : The Nest Condo Sukhumvit 77 ,Bangkok
Main Contractor : Jeerathana Korsrang Co.,Ltd.
Date : March 2019



Reference Site

Project : Samyan Mitrtown, Bangkok
Main Contractor : Thai Obayashi Co.,Ltd.
Date : February 2017

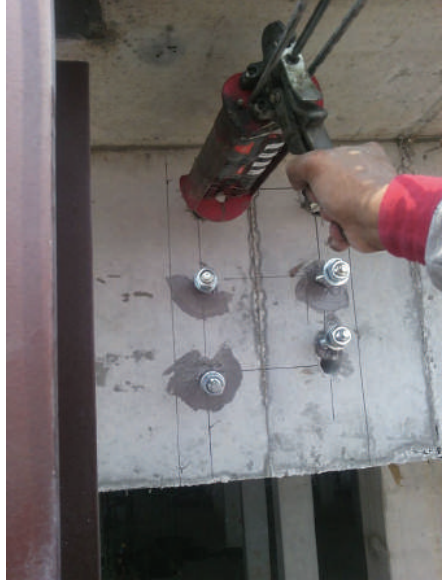


Project : Icon Siam , Bangkok
Main Contractor : Thai Obayashi Co.,Ltd.
Date : March 2018



Reference Site

Project : Continental, Bangkok
Main Contractor : Thai Takenaka Co.,Ltd.
Date : March 2018



Project : Thai-Japanese Association ,Chonburi
Main Contractor : Thai Takenaka Co.,Ltd.
Date : August 2016



Reference Site

Project : IQ, Surin
Main Contractor : Joe Service
Date : February 2018



Project : Air Asia Office Donmuang
Main Contractor : Christinee & Neilsen
Date : August 2016



BBOND Reference Site Update

Main Contractor : Jeerathana Engineering
- Common TU Condominium Pathumtani
- The Nest Condominium
- The Cube 107 Condominium

Main Contractor : Thai Obayashi
- Medical Center Ramindra

Main Contractor : Mctric Public Company Limited
- AUA Language Center
- Abpon Co.,Ltd.

Main Contractor : PK&TP Engineering
- Sathaporn Estate

Main Contractor : PM Construction
- Office Building Klong 3

Main Contractor : THS Development
- Big C Onnuch
- QS36 Ananda
- KNB Space Ratchayothin
- KNB Space Rama9
- Origin Park Phayathai

Main Contractor : Chipmong Ritta
- Grand Hyatt Hotel Phnom Penh

Installation Procedure

Survey set shear key refer control point of the track center line.

Mark position of the hole by using template to control spacing of shear connector hole.

Only shear connector of depot access track on the top portion of shear connector just coated with PR epoxy system which provided by civil contractor has put shear key on access track already.

a) Drill a hole by Rotary Hammer Drilling Machine to create a hole of 20 mm. diameter 160 mm. depth for depot installation shear connector.



b) Blow the hole clean with compressed air and use the blower cleaner to keep the dust for green environment. Brush the hole and blow it clean again. Hole should be clean and sound. They may be dry or dram but should be free of standing water.



c) Using material for rebar (shear connector) fixing will be following to manufacturer's instructions.


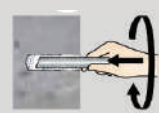



Installation Procedure

d) Push the shear connector into the hole while turning slightly to ensure positive distribution of the adhesive. Be sure the shear connector is fully seated at the depth required (150 mm.) of the hole and that some adhesive has flowed from the top of the hole. The shear connector used should be free of dirt, grease, oil or other foreign material. Shear key installation is shown.



e) Allow the adhesive to cure for the specified time prior to applying any load. Don't disturb or load the anchor until it is fully cured. Curing time of each grouting materials will be following to manufacturer's criteria.

 Temperature	 Working Time	 Curing Time
5 c	60 min	72 hr
10 c	45 min	48 hr
20 c	30 min	24 hr
30 c	25 min	12 hr
40 c	20 min	5 hr