

# OPTIMUS-TDZ

STAINLESS STEEL PIPE & STAINLESS STEEL PRESS-FITTINGS  
GRADE 304 & 316





## ENTERPRISE INTRODUCTION

TE DEUM Engineering Pte Ltd was incorporated in Singapore on 15<sup>th</sup> July 1989 specialising in Marketing M&E products relating to Electrical, Mechanical, Plumbing, Fire Protection and System Integration.

Together with our team of experience and dedicated staffs, we, TE DEUM Engineering have over the years spread our business to regional markets and strategically positioned ourselves to be One Stop building solution provider to serve the needs of valuable customers with our innovative and competitive products range.


Looking forward to the growth of building industries in this region, we strongly believe our strength and preserverance together with our excellent customer support will meet our company expectations for many more years to come.







## CERTIFICATION



**SETCO SERVICES PTE LTD**

**Serial No. : SSP/TC0083/18-Rev 03**  
 Date issued : 12 Dec 2018

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## TEST CERTIFICATE

This certificate is a summary of the test and the required test results

**TESTER: CHEN CHENGCHANG PTE LTD**  
 10-06-14\* at site, Brq  
 10-1-03-08  
 Singapore 140047

**SIZE: 18" API 5L**

**FOR:**

**Brand : OPTHEUS-T02**  
**Test Standard : BS EN 10312-2002, ASME B31.3-2008**  
**Product Type : Stainless steel pipe**  
**Date Submitted : 28 Mar 2010, 05 Nov 2015, 20 March 2016, 20 Sept 2016**

Product	Form	Visual Examination	Dimensional Examination	Leakage Examination	Penetration Examination	Fluorescence	Tensile Test	Chemical Examination	Hardness
<b>18" Optheus-T02</b> Brand: OPTHEUS-T02 Size: 18" API 5L	18" API 5L 18" API 5L	18" API 5L 18" API 5L	18" API 5L 18" API 5L	18" API 5L 18" API 5L	18" API 5L 18" API 5L	18" API 5L 18" API 5L	18" API 5L 18" API 5L	18" API 5L 18" API 5L	18" API 5L 18" API 5L
<b>18" Optheus-T02</b> Brand: OPTHEUS-T02 Size: 18" API 5L	18" API 5L 18" API 5L	18" API 5L 18" API 5L	18" API 5L 18" API 5L	18" API 5L 18" API 5L	18" API 5L 18" API 5L	18" API 5L 18" API 5L	18" API 5L 18" API 5L	18" API 5L 18" API 5L	18" API 5L 18" API 5L
<b>18" Optheus-T02</b> Brand: OPTHEUS-T02 Size: 18" API 5L	18" API 5L 18" API 5L	18" API 5L 18" API 5L	18" API 5L 18" API 5L	18" API 5L 18" API 5L	18" API 5L 18" API 5L	18" API 5L 18" API 5L	18" API 5L 18" API 5L	18" API 5L 18" API 5L	18" API 5L 18" API 5L

Setco Services Pte Ltd  
10-06-14\* at site, Brq  
10-1-03-08  
Singapore 140047

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## 304 Pipe Certificate

[illegible]

## 316 Pipe Certificate

## TEST CERTIFICATE

## TEST CERTIFICATE

TS Global Packaging Pte Ltd  
Block 181 Kallang Way  
#01-0208  
Singapore 349267  
Attn: Mr. John Chan

cost

Product Type: Stainless Steel 204 Pass Piling  
Data last updated: 08 Nov 2018, 30 Aug 2015, 06 Mar 2015, 30 Nov 2014, 14 Nov 2010

[illegible]

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### 304 Fitting Certificate

## TEST CERTIFICATE

**TEST CERTIFICATE**  
The contents of this document shall not be used for any purpose.

TO DELTA ENGINEERING PTE LTD  
Block 101 Peking Way  
#01-43/44  
Singapore 262247  
Attn: Mr. Ivan Goh



Brand: Cosmos-TEJ  
Tool Standard: ISO 541-7/1947+1988 AS 3000-2008, AS-PLUS 4020-2005 56 375-2007, BS 2770-1988  
Product Type: Stamping Shop 310 Press 1 Tonn  
Date fabricated: 10 Nov 2015, 20 Aug 2017, 04 Nov 2018

[illegible]

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### 316 Fitting Certificate



## CHARACTERISTIC OF STAINLESS STEEL PRESS-FITTINGS & PIPE



### High strength material

Grade 304 & 316 stainless steel pipe has tensile strength  $\geq 520\text{MPa}$ , 2-10 times stronger than ordinary pipe, greatly reduce the possibility of leakage caused by external forces, so that conserve water resources.

### Corrosion-resistant, long service life

Stainless steel pipe can react with oxidants to form a thin and dense protective oxide layer. The corrosion resistance is far better than ordinary metal pipes'. The service life is about one hundred years.

### Wearproof, temperature resistant, low flow resistance, heavy pressure

The inwall of stainless steel pipe is very smooth, with low flow resistance, wear-resistant, shock resistance, anti-aging, high and low temperature resistant, and can withstand high pressure, which is beyond comparison than other pipe.

### Healthy, environment-friendly material can bring clean water

Plastic Pipe: can not with stand high temperature, not suitable for low temperature environment, easy aging, and may disorganize regular hormone secretion.

Galvanized pipe: rust and scale easily, red and black water may sometimes flow out, which cause secondary pollution. Galvanized pipe has been expressly prohibited by our country to be used as domestic water system piping.

Copper pipe: When copper pipe encounter carbon dioxide and sulfur dioxide verdigris will be produced. It is harmful to health. (Mainly composed of copper sulfate and copper carbonate).

Stainless steel pipe: unique performance will not cause secondary pollution on water, no red or green water caused by rusting and scaling, no strange smell, no harmful substance is produced. The water quality is clean and healthy, fully meet the national drinking water quality standards, and the whole pipe network can be 100% recycled.

## ■ Easy construction, safe connection

Installing press-fittings is quick and easy. Just use special tool to compress in the correct position after inserting the pipe. It is 4-5 times more efficient than traditional welding method or screw fittings. And the connection part is safe and reliable, so avoid leakage caused by house shock, water hammer quiver, pipe resonance and even earthquake. Therefore, it shortens the construction time and decreases risks.

## ■ Suitable for embedded installation, save maintenance worry

Press-fittings meet the requirement of embedded installation. The connection part is so reliable to greatly low down leaking possibility at secluded place. And it will not damage the building wall, so it can reduce risks of maintenance and renovation.

## ■ Low comprehensive cost

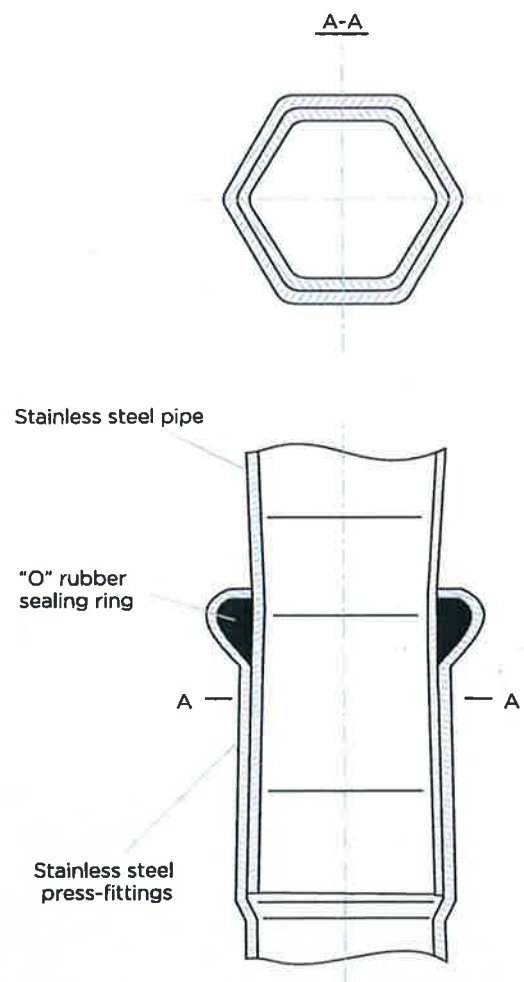
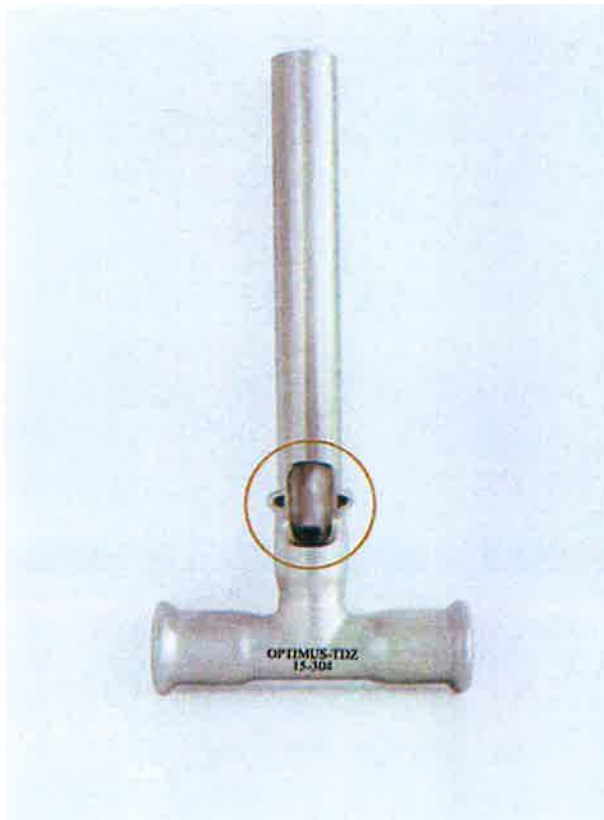
Financially speaking, Water supply piping construction cost is an extremely small percentage in building construction cost. The initial cost of stainless steel press-fittings and pipe combination project which has reliable and long service life seems 2-2.5 times more expensive than plastic pipe. But actually, it is a one-time expense that is with no further maintenance trouble and almost no maintenance cost. So the comprehensive cost is lower than the cost of any other type of pipe. If correspondents choose inappropriate piping material, the future losses will be ten times more than the initial investment. Such losses include: maintenance cost caused by leakage, property loss etc.



## PRINCIPLE AND STRUCTURE OF STAINLESS STEEL PRESS-FITTINGS

Compression-type connection technology existed since the end of 50's last century. It has gradually been widely used around the world, and become one of the standard methods of piping connection.

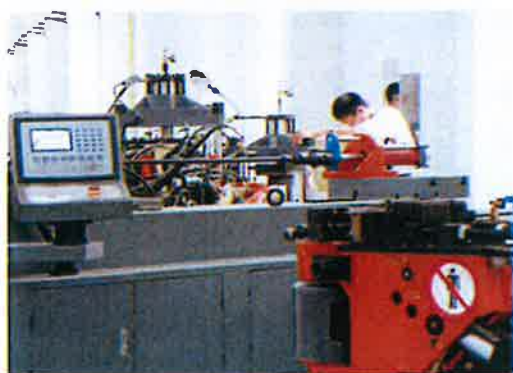
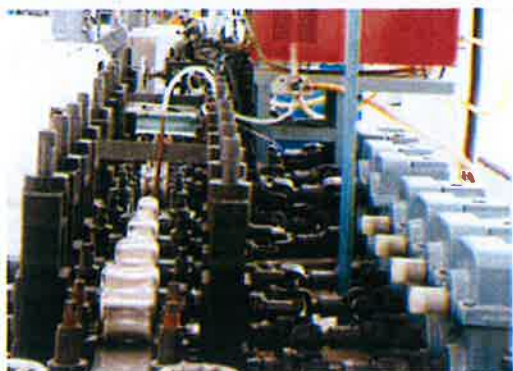
There is a special rubber sealing ring inside the U shape position of the press-fittings. In installation, insert the stainless steel pipe into the bell mouth till it reaches the positioning stage. Use the special compression tool to tighten one side or both sides of the U-slot and U-groove. The rubber sealing ring will work after squeezed. It plays a role in fixed positioning through shrinking and deforming the compression part of fitting and pipe at the same time (section plane formed a hexagonal shape), so that the stainless steel pipe connections can be achieved effectively.





OPTIMUS

ADVANCED  
PRODUCTION FACILITIES



## CRITICAL PRODUCTION PROCESSES



### [Gas shielded process]

Under the protection from the gas, nickel and chrome on the surface of stainless steel will not be damaged during welding, and temper color will be removed. It retains stainless steel's original characteristics and corrosion resistance.



### [Pickling process/ Solid solution process]

Pickling and solid solution process are all key measures to prevent corrosion of stainless steel material.

**Pickling process:** Pickling can produce a thin, dense and hard passive film on the inner and outer surface of stainless steel pipe. Passive film is the primary cause to prevent corrosion of stainless steel material.

**Solid solution process:** For pressure processing workpiece, solid solution process can eliminate the work hardening and internal stress caused by distortion, thus to prevent possibility of stress corrosion; For welding workpiece, solid solution process can transform the cylindrical crystal to equiaxed crystal, dissolve carbide in austenite at grain boundary of weld heat-affected zone, so as to prevent the possibility of intergranular corrosion and stress corrosion; For casting workpiece, solid solution process can avoid producing a lot of high-temperature ferrite, thus to prevents adverse effects on performance of austenitic stainless steel.

Fittings with solid solution process is allowed not to do pickling.



## “O” RUBBER SEALING RING

Color	Sealing Material	Temperature Scope	Application Field
Black	Ethylene-Propylene-Diene Monomer (EPDM)	-20°C ~ 110°C	Water system: drinking water, running water, hot water
Brown	Viton (FKM)	-30°C ~ 170°C	Steam, high temperature water
Yellow	Nitrile rubber (NBR, HNBR)	-20°C ~ 110°C	Gas, fuel, oil

## APPLICATION FIELDS

- DRINKING WATER SYSTEM
- WATER SUPPLY SYSTEM
- HOT WATER SYSTEM



## REGULAR SPECIFICATION AND MODEL NO. OF STAINLESS STEEL PIPE (GRADE 304 & 316)

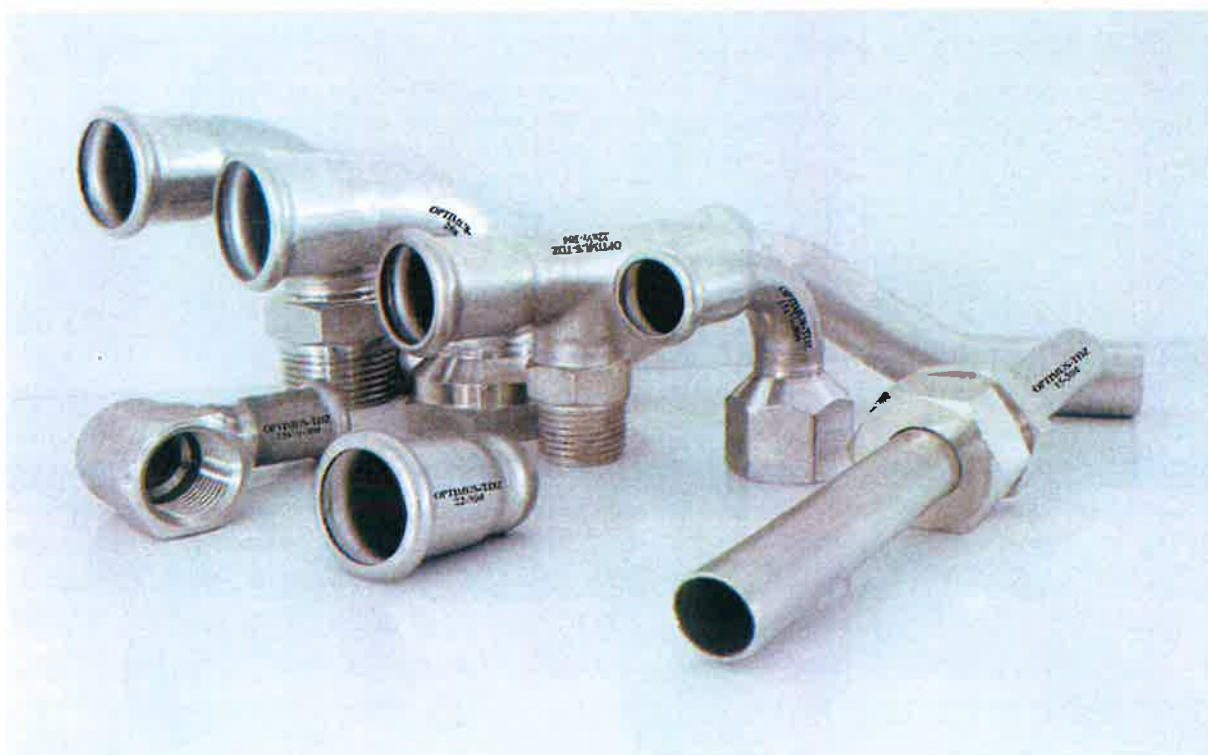
Item Code	Item Description	OD	UOM
U/TDZ-SSP15*5.75	STAINLESS STEEL PIPE OD 15 MMX5750 MM	15X5.75	LENGTH
U/TDZ-SSP22*5.75	STAINLESS STEEL PIPE OD 22 MMX5750 MM	22X5.75	LENGTH
U/TDZ-SSP28*5.75	STAINLESS STEEL PIPE OD 28 MMX5750 MM	28X5.75	LENGTH
U/TDZ-SSP35*5.75	STAINLESS STEEL PIPE OD 35 MMX5750 MM	35X5.75	LENGTH
U/TDZ-SSP42*5.75	STAINLESS STEEL PIPE OD 42 MMX5750 MM	42X5.75	LENGTH
U/TDZ-SSP54*5.75	STAINLESS STEEL PIPE OD 54 MMX5750 MM	54X5.75	LENGTH
U/TDZ-SSP66.7*5.75	STAINLESS STEEL PIPE OD 66.7 MMX5750 MM	66.7X5.75	LENGTH
U/TDZ-SSP76.1*5.75	STAINLESS STEEL PIPE OD 76.1 MMX5750 MM	76.1X5.75	LENGTH
U/TDZ-SSP88.9*5.75	STAINLESS STEEL PIPE OD 88.9 MMX5750 MM	88.9X5.75	LENGTH
U/TDZ-SSP108*5.75	STAINLESS STEEL PIPE OD 108 MMX5750 MM	108X5.75	LENGTH



# REGULAR SPECIFICATION AND MODEL NO.OF STAINLESS STEEL PRESS-FITTINGS (GRADE 304 & 316)

## GB I Series

Dw	T	PN(MPa)
15.0	1.5	1.6
18.0	1.5	1.6
22.0	1.5	1.6
28.0	1.5	1.6
35.0	1.5	1.6
42.0	1.5	1.6
54.0	1.5	1.6
66.7	1.5	1.6
76.1	2.0	1.6
88.9	2.0	1.6
108.0	2.0	1.6




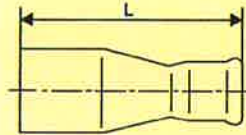

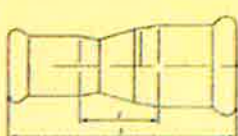





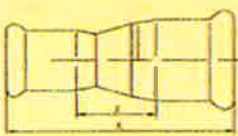
# OPTIMUS TDZ PRODUCTS LISTING (GRADE 304 & 316)


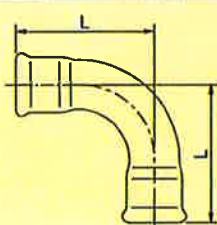
(GB/T 19228.1, GB/T 19228.2, refer to BS EN 10312)


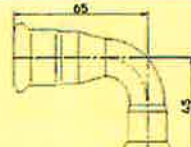
## GB I Product List (BS EN 10312)


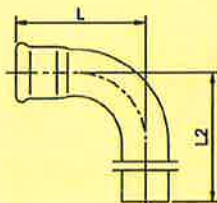
Equal Coupling	C(S)	Item Code	OD	L
		U/TDZ-EC15	15	48
		U/TDZ-EC22	22	50
		U/TDZ-EC28	28	54
		U/TDZ-EC35	35	62
		U/TDZ-EC42	42	71
		U/TDZ-EC54	54	83
		U/TDZ-EC66.7	66.7	120
		U/TDZ-EC76.1	76.1	141
		U/TDZ-EC108	108	194
Reducing Coupling-B	C(R)-B	Item Code	OD	L
		U/TDZ-RCB22*15	22x15	58
		U/TDZ-RCB28*15	28x15	65
		U/TDZ-RCB28*22	28x22	60
		U/TDZ-RCB35*15	35x15	76
		U/TDZ-RCB35*22	35x22	76
		U/TDZ-RCB35*28	35x28	74
		U/TDZ-RCB42*15	42x15	93
		U/TDZ-RCB42*22	42x22	92
		U/TDZ-RCB42*28	42x28	84
		U/TDZ-RCB42*35	42x35	82
		U/TDZ-RCB54*15	54x15	104
		U/TDZ-RCB54*22	54x22	103
		U/TDZ-RCB54*28	54x28	104
		U/TDZ-RCB54*35	54x35	97
		U/TDZ-RCB54*42	54x42	97
		U/TDZ-RCB66.7*28	66.7x28	125
		U/TDZ-RCB66.7*35	66.7x35	138
		U/TDZ-RCB66.7*42	66.7x42	141
		U/TDZ-RCB66.7*54	66.7x54	150
		U/TDZ-RCB76.1*28	76.1x28	135
		U/TDZ-RCB76.1*35	76.1x35	148
		U/TDZ-RCB76.1*42	76.1x42	151
		U/TDZ-RCB76.1*54	76.1x54	140
		U/TDZ-RCB108*42	108x42	155
		U/TDZ-RCB108*54	108x54	177
		U/TDZ-RCB108*66.7	108x66.7	185
		U/TDZ-RCB108*76.1	108x76.1	198
Reducing Coupling-A	C(R)-A	Item Code	OD	L
		U/TDZ-RCA22*15	22x15	59
		U/TDZ-RCA28*15	28x15	66
		U/TDZ-RCA28*22	28x22	60
		U/TDZ-RCA35*15	35x15	82
		U/TDZ-RCA35*22	35x22	71
		U/TDZ-RCA35*28	35x28	68
		U/TDZ-RCA42*15	42x15	91
		U/TDZ-RCA42*22	42x22	98
		U/TDZ-RCA42*28	42x28	99
		U/TDZ-RCA42*35	42x35	77


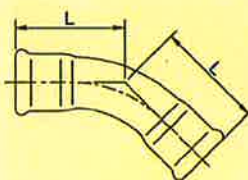
\*Sizes from 66.7 onwards is subject to indent basis.

Reducing Coupling-A		C(R)-A	Item Code	OD	L
		U/TDZ-RCA54*15	54x15	104	
		U/TDZ-RCA54*22	54x22	95	
		U/TDZ-RCA54*28	54x28	110	
		U/TDZ-RCA54*35	54x35	117	
		U/TDZ-RCA54*42	54x42	92	
		U/TDZ-RCA66.7*28	66.7x28	125	
		U/TDZ-RCA66.7*35	66.7x35	138	
		U/TDZ-RCA66.7*42	66.7x42	141	
		U/TDZ-RCA66.7*54	66.7x54	150	
		U/TDZ-RCA76.1*28	76.1x28	135	
		U/TDZ-RCA76.1*35	76.1x35	148	
		U/TDZ-RCA76.1*42	76.1x42	151	
		U/TDZ-RCA76.1*54	76.1x54	140	
		U/TDZ-RCA108*42	108x42	155	
		U/TDZ-RCA108*54	108x54	194	
		U/TDZ-RCA108*66.7	108x66.7	185	
		U/TDZ-RCA108*76.1	108x76.1	184	


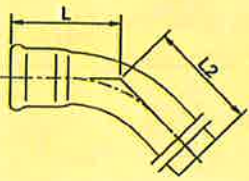
90° Equal Elbow		90E-A	Item Code	OD	L
		U/TDZ-90EE15	15	49	
		U/TDZ-90EE22	22	61	
		U/TDZ-90EE28	28	72	
		U/TDZ-90EE35	35	86	
		U/TDZ-90EE42	42	112	
		U/TDZ-90EE54	54	138	
		U/TDZ-90EE66.7	66.7	139	
		U/TDZ-90EE76.1	76.1	190	
		U/TDZ-90EE108	108	260	


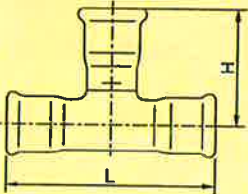
90° Reducing Elbow		90RE	Item Code	OD	L	L2
		U/TDZ-90RE22*15	54x28	100	68	
		U/TDZ-90RE28*15	28x15	71	45	
		U/TDZ-90RE54*28	22x15	65	45	


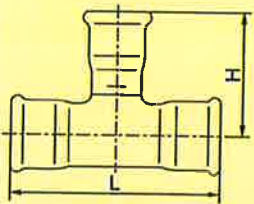
90° Plain Elbow		90E-B	Item Code	OD	L	L2
		U/TDZ-90PE15	15	49	59	
		U/TDZ-90PE22	22	61	70	
		U/TDZ-90PE28	28	72	79	
		U/TDZ-90PE35	35	86	95	
		U/TDZ-90PE42	42	112	122	
		U/TDZ-90PE54	54	138	149	
		U/TDZ-90PE66.7	66.7	139	148	
		U/TDZ-90PE76.1	76.1	190	205	
		U/TDZ-90PE108	108	260	277	

45° Equal Elbow		45E-A	Item Code	OD	L
		U/TDZ-45EE15	15	36	
		U/TDZ-45EE22	22	42	
		U/TDZ-45EE28	28	48	
		U/TDZ-45EE35	35	54	
		U/TDZ-45EE42	42	75	
		U/TDZ-45EE54	54	91	
		U/TDZ-45EE66.7	66.7	89	
		U/TDZ-45EE76.1	76.1	123	
		U/TDZ-45EE108	108	166	



45° Plain Elbow	45E-B	Item Code	OD	L	L <sub>2</sub>
		U/TDZ-45PE15	15	36	45
		U/TDZ-45PE22	22	42	50
		U/TDZ-45PE28	28	48	53
		U/TDZ-45PE35	35	54	63
		U/TDZ-45PE42	42	75	78
		U/TDZ-45PE54	54	91	94
		U/TDZ-45PE66.7	66.7	96	99
		U/TDZ-45PE76.1	76.1	123	138
		U/TDZ-45PE108	108	166	183

Equal Tee	T(S)	Item Code	OD	L	H
		U/TDZ-ET15	15	64	38
		U/TDZ-ET22	22	74	42
		U/TDZ-ET28	28	84	47
		U/TDZ-ET35	35	100	54
		U/TDZ-ET42	42	114	63
		U/TDZ-ET54	54	138	74
		U/TDZ-ET66.7	66.7	185	95
		U/TDZ-ET76.1	76.1	230	110
		U/TDZ-ET108	108	310	153

Reducing Tee	T(R)	Item Code	OD	L	H
		U/TDZ-RT22*15	22x15	74	42
		U/TDZ-RT28*15	28x15	84	45
		U/TDZ-RT28*22	28x22	84	45
		U/TDZ-RT35*15	35x15	100	49
		U/TDZ-RT35*22	35x22	100	49
		U/TDZ-RT35*28	35x28	100	51
		U/TDZ-RT42*15	42x15	114	52
		U/TDZ-RT42*22	42x22	114	52
		U/TDZ-RT42*28	42x28	114	54
		U/TDZ-RT42*35	42x35	114	57
		U/TDZ-RT54*15	54x15	138	58
		U/TDZ-RT54*22	54x22	138	58
		U/TDZ-RT54*28	54x28	138	61
		U/TDZ-RT54*35	54x35	138	63
		U/TDZ-RT54*42	54x42	138	69
		U/TDZ-RT66.7*28	66.7x28	185	70
		U/TDZ-RT66.7*35	66.7x35	185	73
		U/TDZ-RT66.7*42	66.7x42	185	75
		U/TDZ-RT66.7*54	66.7x54	185	85
		U/TDZ-RT76.1*22	76.1x22	230	68
		U/TDZ-RT76.1*28	76.1x28	230	70
		U/TDZ-RT76.1*35	76.1x35	230	73
		U/TDZ-RT76.1*42	76.1x42	230	79
		U/TDZ-RT76.1*54	76.1x54	230	84
		U/TDZ-RT108*22	108x22	310	84
		U/TDZ-RT108*28	108x28	310	86
		U/TDZ-RT108*35	108x35	310	89
		U/TDZ-RT108*42	108x42	310	95
		U/TDZ-RT108*54	108x54	310	100
		U/TDZ-RT108*66.7	108x66.7	310	110
		U/TDZ-RT108*76.1	108x76.1	310	126

\*Sizes from 66.7 onwards is subject to indent basis.




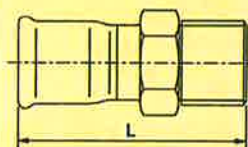
Pipe Cap	CAP	Item Code	OD	L
		U/TDZ-PC15	15	32
		U/TDZ-PC22	22	34
		U/TDZ-PC28	28	37
		U/TDZ-PC35	35	41
		U/TDZ-PC42	42	50
		U/TDZ-PC54	54	59
		U/TDZ-PC66.7	66.7	120
		U/TDZ-PC76.1	76.1	90
		U/TDZ-PC108	108	125


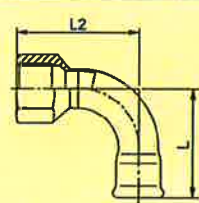
Adjustable Coupling	KC	Item Code	OD	L
		U/TDZ-AC15	15	80
		U/TDZ-AC22	22	82
		U/TDZ-AC28	28	91
		U/TDZ-AC35	35	100
		U/TDZ-AC42	42	114
		U/TDZ-AC54	54	138
		U/TDZ-AC66.7	66.7	120
		U/TDZ-AC76.1	76.1	230
		U/TDZ-AC108	108	310


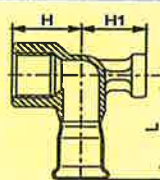
Female Threaded Coupling	ITC <sub>2</sub>	Item Code	OD	L
		U/TDZ-FTC15*RP1/2	15xRp1/2	53
		U/TDZ-FTC15*RP3/4	15xRp3/4	55
		U/TDZ-FTC22*RP1/2	22xRp1/2	54
		U/TDZ-FTC22*RP3/4	22xRp3/4	56
		U/TDZ-FTC22*RP1	22xRp1	60
		U/TDZ-FTC28*RP3/4	28xRp3/4	55
		U/TDZ-FTC28*RP1	28xRp1	61
		U/TDZ-FTC28*RP1-1/4	28xRp1-1/4	65
		U/TDZ-FTC35*RP1	35xRp1	64
		U/TDZ-FTC35*RP1-1/4	35xRp1-1/4	66
		U/TDZ-FTC35*RP1-1/2	35xRp1-1/2	68
		U/TDZ-FTC42*RP1-1/4	42xRp1-1/4	72
		U/TDZ-FTC42*RP1-1/2	42xRp1-1/2	73
		U/TDZ-FTC42*RP2	42xRp2	75
		U/TDZ-FTC54*RP1-1/2	54xRp1-1/2	78
		U/TDZ-FTC54*RP2	54xRp2	82


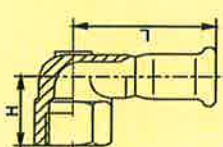
Rotatable Coupling	ZL	Item Code	OD	L
		U/TDZ-RC15*G1/2	15xG1/2	46
		U/TDZ-RC15*G3/4	15xG3/4	52
		U/TDZ-RC22*G3/4	22xG3/4	53
		U/TDZ-RC22*G1	22xG1	53
		U/TDZ-RC28*G1	28xG1	58
		U/TDZ-RC28*G1-1/4	28xG1-1/4	60
		U/TDZ-RC35*G1-1/4	35xG1-1/4	65
		U/TDZ-RC35*G1-1/2	35xG1-1/2	63
		U/TDZ-RC42*G1-1/2	42xG1-1/2	71
		U/TDZ-RC42*G2	42xG2	75
		U/TDZ-RC54*G2	54xG2	84


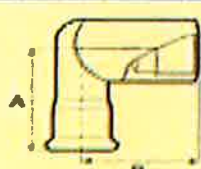
\*Sizes from 66.7 onwards is subject to indent basis.

Male Threaded Coupling		ETC	Item Code	OD	L
		U/TDZ-MTC15*R1/2	15xR1/2	50	
		U/TDZ-MTC15*R3/4	15xR3/4	54	
		U/TDZ-MTC22*R1/2	22xR1/2	53	
		U/TDZ-MTC22*R3/4	22xR3/4	55	
		U/TDZ-MTC22*R1	22xR1	61	
		U/TDZ-MTC28*R1/2	28xR1/2	60	
		U/TDZ-MTC28*R3/4	28xR3/4	57	
		U/TDZ-MTC28*R1	28xR1	63	
		U/TDZ-MTC35*R1	35xR1	64	
		U/TDZ-MTC35*R1-1/4	35xR1-1/4	67	
		U/TDZ-MTC35*R1-1/2	35xR1-1/2	69	
		U/TDZ-MTC42*R1-1/4	42xR1-1/4	74	
		U/TDZ-MTC42*R1-1/2	42xR1-1/2	75	
		U/TDZ-MTC54*R1-1/2	54xR1-1/2	82	
		U/TDZ-MTC54*R2	54xR2	85	
		U/TDZ-MTC66.7*R2-1/2	66.7xR2-1/2	90	
		U/TDZ-MTC76.1*R3	76.1xR3	123	
		U/TDZ-MTC108*R4	108xR4	162	


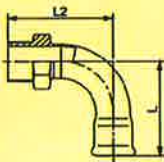

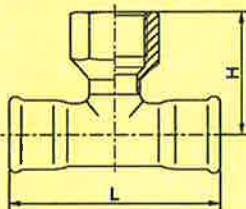

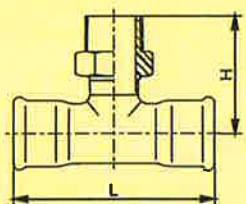
Female Threaded Elbow		ITC90E2	Item Code	OD	L	L2
		U/TDZ-FTE15*RP1/2	15xRp1/2	49	51	
		U/TDZ-FTE22*RP1/2	22xRp1/2	61	61	
		U/TDZ-FTE22*RP3/4	22xRp3/4	61	63	
		U/TDZ-FTE28*RP1	28xRp1	72	76	
		U/TDZ-FTE35*RP1-1/2	35xR1-1/2	80	82	
		U/TDZ-FTE35*RP1-1/4	35xRp1-1/4	86	88	
		U/TDZ-FTE42*RP1-1/2	42xRp1-1/2	112	110	
		U/TDZ-FTE54*RP2	54xRp2	138	134	

Based Female Elbow		TC90E3	Item Code	OD	L	H
		U/TDZ-BFE15*RP1/2	15xRp1/2	47	27	
		U/TDZ-BFE22*RP3/4	22xRp3/4	54	35	


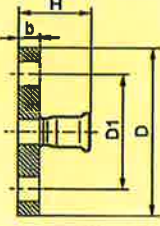
Short Female Elbow		ITC90E4	Item Code	OD	L	H
		U/TDZ-SFE15*RP1/2	15xRp1/2	50	28	
		U/TDZ-SFE22*RP3/4	22xRp3/4	55	34	


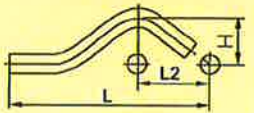
Short Male Elbow		SME90	Item Code	OD	L	H
		U/TDZ-SME15*R1/2	15xR1/2	63	36	
		U/TDZ-SME15*R3/4	22xR3/4	58	40	





Male Threaded Elbow	ETC90E	Item Code	OD	L	L <sub>2</sub>
		U/TDZ-MTE15*R1/2	15xR1/2	49	48
		U/TDZ-MTE22*R1/2	22xR1/2	61	56
		U/TDZ-MTE22*R3/4	22xR3/4	61	62
		U/TDZ-MTE28*R1/2	28xR1/2	72	76
		U/TDZ-MTE28*R1	28xR1	72	78
		U/TDZ-MTE35*R1-1/4	35xR1-1/4	86	89
		U/TDZ-MTE42*R3/4	42xR3/4	112	96
		U/TDZ-MTE42*R1	42xR1	112	100
		U/TDZ-MTE42*R1-1/2	42xR1-1/2	112	112
		U/TDZ-MTE54*R1-1/2	54xR1-1/2	138	134
		U/TDZ-MTE54*R2	54xR2	138	137
Female Threaded Tee	ITCT <sub>2</sub>	Item Code	OD	L	H
		U/TDZ-FTT15*RP1/2	15xRp1/2	64	39
		U/TDZ-FTT22*RP1/2	22xRp1/2	74	42
		U/TDZ-FTT22*RP3/4	22xRp3/4	74	44
		U/TDZ-FTT28*RP1/2	28xRp1/2	84	45
		U/TDZ-FTT28*RP3/4	28xRp3/4	84	47
		U/TDZ-FTT28*RP1	28xRp1	84	50
		U/TDZ-FTT35*RP1/2	35xRp1/2	100	49
		U/TDZ-FTT35*RP3/4	35xRp3/4	100	51
		U/TDZ-FTT35*RP1-1/4	35xRp1-1/4	100	52
		U/TDZ-FTT42*RP1/2	42xRp1/2	114	52
		U/TDZ-FTT42*RP3/4	42xRp3/4	114	54
		U/TDZ-FTT42*RP1	42xRp1	114	55
		U/TDZ-FTT42*RP1-1/4	42xRp1-1/4	114	56
		U/TDZ-FTT54*RP1/2	54xRp1/2	138	58
		U/TDZ-FTT54*RP3/4	54xRp3/4	138	60
		U/TDZ-FTT54*RP1-1/4	54xRp1-1/4	138	64
		U/TDZ-FTT54*RP1-1/2	54xRp1-1/2	138	66
		U/TDZ-FTT54*RP2	54xRp2	138	70
		U/TDZ-FTT54*RP1	54xRp1	138	62
		U/TDZ-FTT66.7*RP3/4	66.7xRp3/4	145	66
		U/TDZ-FTT66.7*RP2	66.7xRp2	145	74
		U/TDZ-FTT76.1*RP3/4	76.1xRp3/4	230	70
		U/TDZ-FTT76.1*RP2	76.1xRp2	230	80
		U/TDZ-FTT108*RP3/4	108xRp3/4	310	86
		U/TDZ-FTT108*RP2	108xRp2	310	96
Male Threaded Tee	ETCT	Item Code	OD	L	H
		U/TDZ-MTT15*R1/2	15xR1/2	64	36
		U/TDZ-MTT22*R1/2	22xR1/2	74	42
		U/TDZ-MTT22*R3/4	22xR3/4	74	43
		U/TDZ-MTT28*R1/2	28xR1/2	84	45
		U/TDZ-MTT28*R3/4	28xR3/4	84	47
		U/TDZ-MTT28*R1	28xR1	84	52
		U/TDZ-MTT35*R3/4	35xR3/4	100	54
		U/TDZ-MTT35*R1	35xR1	100	56
		U/TDZ-MTT35*R1-1/4	35xR1-1/4	100	57
		U/TDZ-MTT42*R3/4	42xR3/4	114	54
		U/TDZ-MTT42*R1	42xR1	114	55
		U/TDZ-MTT42*R1-1/4	42xR1-1/4	114	56
		U/TDZ-MTT42*R1-1/2	42xR1-1/2	114	57
		U/TDZ-MTT54*R1/2	54xR1/2	138	58
		U/TDZ-MTT54*R3/4	54xR3/4	138	60
		U/TDZ-MTT54*R1	54xR1	138	62
		U/TDZ-MTT54*R1-1/4	54xR1-1/4	138	64
		U/TDZ-MTT54*R1-1/2	54xR1-1/2	138	66
		U/TDZ-MTT54*R2	54xR2	138	70



Flange	F(A)	Item Code	OD	D	D1	H	b
		U/TDZ-F15	15	95	65	42	14
		U/TDZ-F22	22	105	75	45	16
		U/TDZ-F28	28	115	85	47	18
		U/TDZ-F35	35	140	100	52	18
		U/TDZ-F42	42	150	110	58	20
		U/TDZ-F54	54	165	125	65	20
		U/TDZ-F66.7	66.7	170	130	70	25
		U/TDZ-F76.1	76.1	185	145	91	20
		U/TDZ-F108	108	220	180	120	22

Pipe Bridge	B	Item Code	OD	L	L2	H
		U/TDZ-PB15	15	158	57	37
		U/TDZ-PB22	22	178	65	44
		U/TDZ-PB28	28	210	74	50

Joint Connector Male	JOM	Item Code	OD	L
		U/TDZ-JCM15*R1/2	15xR1/2	64
		U/TDZ-JCM22*R3/4	22xR3/4	68
		U/TDZ-JCM28*R1	28xR1	78
		U/TDZ-JCM35*R1-1/4	35xR1-1/4	85
		U/TDZ-JCM42*R1-1/2	42xR1-1/2	90
		U/TDZ-JCM54*R2	54xR2	103

## ASSEMBLY METHOD & ATTENTIONS

### ■ Pipe cutting

Use special cutting equipment to cut pipe vertically according to the construction size. Then remove burrs on the cutting surface by utilizing special file or deburring device to make sure the pipe end and outer surface are smooth, clean and without oil stain.



### ■ Connect preparation

Make a circle at the end of the pipe by using special scriber. Ensure O sealing ring is fixed in the correct position before inserting the pipe. And never use lubricant for installation. Pipe should be inserted into press fitting vertically, so as to avoid pricking the O sealing ring or falling it out. After inserting the pipe, if the DN is 10-25mm, the pipe marking line should be 3mm away from the pipe end; if the DN is 32-100mm, the pipe marking line should be 5mm away from the pipe end.



### ■ Compression connection

Read Carefully the instruction of the compression tool before handling. Let the groove of the special compression tool approach the convex part of the fitting closely. Make sure the plier is perpendicular to the pipe, then start compressing operation. When connecting inner and outer bread exchange joint, it should tighten the bread and then compress.



### ■ Test

After compression, use special hexagonal gauge to test the compression connection. If the compression connection is not proper, use special tool to compress again, and measure by hexagonal gauge again.

After the whole pipeline is installed, use water pressure test or gas pressure test to do the pressure test. The pressure of water pressure test should be 1.5 times larger than working pressure. And the pressure of gas pressure test should be 1.05 times larger than working pressure.



## ATTENTIONS

- » Do not prick the O-rubber sealing ring of the press-fittings.
- » Ensure the pipe is positioned at the right place where is marked.
- » Do not forget the compression operation.
- » During transport and construction, keep the pipe, fittings and rubber sealing ring free from pollution, and preserve cleanliness and hygiene.



# ORIGINAL



## TEST REPORT

(This Report is issued subject to the terms & conditions set out below)

SetSCO Services Pte Ltd  
18 Teban Gardens Crescent  
Singapore 608925  
Tel : (65) 6566 7777  
Fax: (65) 6566 7718  
www.setsco.com  
Business Reg. No. 196900269D

Date: 01<sup>st</sup> November 2017

Your Ref: -

Our Ref: MM-61080/MA

Page 1 of 2

**Subject** : Hydrostatic Pressure Test (Burst Pressure) on Stainless Steel Press-Fit pipes & fittings assembly submitted by Te Deum Engineering Pte Ltd on 26<sup>th</sup> October 2017.

**Client** : **TE DEUM ENGINEERING PTE LTD**  
Block 161, Kallang Way  
#01-03/08  
Singapore 349247

**Attn:** Mr. John Goh

**Date & Place of Test** : 01<sup>st</sup> November 2017 at SetSCO Laboratory

**Method of Test** : Hydrostatic Pressure Test (Burst Pressure)  
The test samples were assembled by client.  
The test assembly was filled up with water & connected to a hydraulic pump.  
Hydrostatic pressure was gradually applied till first leak is observed or burst pressure occurs.  
Observations were then recorded.

**Description of Sample** : One (01) set of Stainless Steel Press-Fit pipes & fittings assembly (refer to photos attached) was received as follows:

S/No.	Sample Reference	Qty
1	Stainless Steel Press-Fit pipes & fittings assembly	1

**Results** : Hydrostatic Pressure Test  
Refer to table 1.

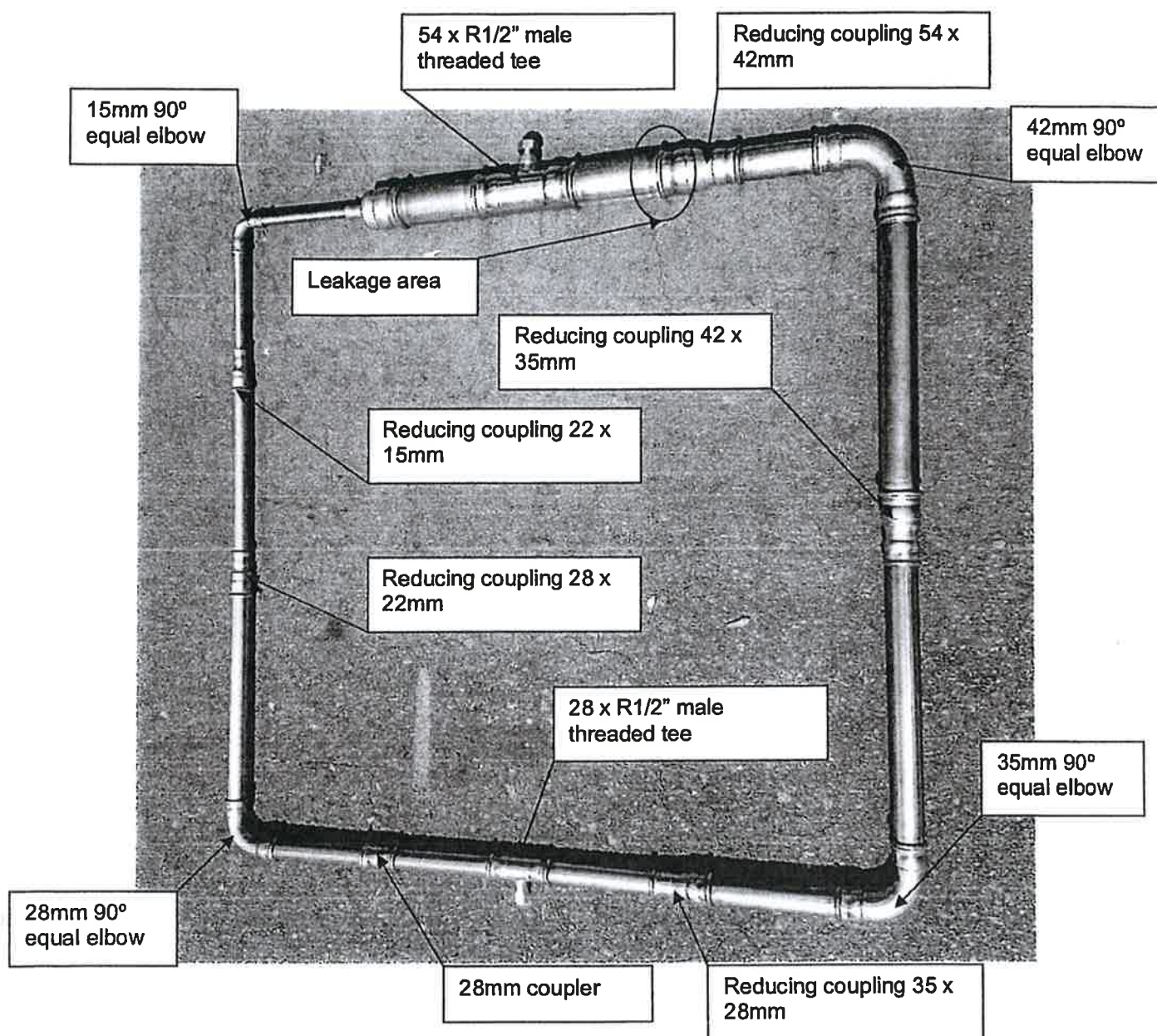
  
MOHAMMAD AZAM  
Testing Officer

  
CHEN YU  
Assistant Manager (Mechanical Testing)  
Mechanical Technology Division

### Terms & Conditions:

- (1) The Report is prepared for the sole use of the Client and is prepared based upon the item submitted, the services required by the Client and the conditions under which the Services are performed by SETSCO. The Report is not intended to be representative of similar or equivalent Services on similar or equivalent items. The Report does not constitute an endorsement by SETSCO of the item.
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- (4) The Report may not be used in any publicity material without the written consent of SETSCO.
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Photograph showing sample submitted






SETSCO SERVICES PTE LTD

Serial No. : MP/TC0052/16-Rev 02  
Date Issued: 12 Dec 2016

# TEST CERTIFICATE

This certificate is a summary of the test and test reports as stated below:

TE DEUM ENGINEERING PTE LTD  
Block 161 Kallang Way  
#01-03/08  
Singapore 349247

Attn: Mr. John Goh

FOR

Brand : OPTIMUS-TDZ  
Test Standard : BS EN 10312:2002; AS/NZS 4020:2005  
Product Type : Stainless steel pipe  
Date Submitted : 08 Mar 2016, 05 Nov 2015, 30 March 2016, 30 Sept 2016

Product	Tests	Visual Examination	Dimensional Measurement	Leak-tightness	Drift expanding	Flattening	Tensile test	Chemical Composition	Metal Extraction
304 Stainless steel pipe Brand: OPTIMUS-TDZ Size: Ø15x0.6mm	Instructions If done, Pass/Fail	Pass See MM-52282/CCH/1	Pass See MM-52282/CCH/1	Pass See MM-52282/CCH/2	Pass See MM-52282/CCH/1	Pass See MM-52282/CCH/1	Pass See MM-52282/CCH/1	-	-
	If not done, reference	-	-	-	-	-	-	Pass See MM-48760/1-2/CCH	Pass See MM-48760/2-1/DJ
	If not done, no reference	-	-	-	-	-	-	-	-
304 Stainless steel pipe Brand: OPTIMUS-TDZ Size: Ø22x0.7mm	Instructions If done, Pass/Fail	Pass See MM-52282/CCH/1	Pass See MM-52282/CCH/1	Pass See MM-52282/CCH/2	Pass See MM-52282/CCH/1	Pass See MM-52282/CCH/1	Pass See MM-52282/CCH/1	-	-
	If not done, reference	-	-	-	-	-	-	Pass See MM-48760/1-2/CCH	Pass See MM-48760/2-1/DJ
	If not done, no reference	-	-	-	-	-	-	-	-
304 Stainless steel pipe Brand: OPTIMUS-TDZ Size: Ø26x0.8mm	Instructions If done, Pass/Fail	Pass See MM-52282/CCH/1	Pass See MM-52282/CCH/1	Pass See MM-52282/CCH/2	Pass See MM-52282/CCH/1	Pass See MM-52282/CCH/1	Pass See MM-52282/CCH/1	-	-
	If not done, reference	-	-	-	-	-	-	Pass See MM-48760/1-2/CCH	Pass See MM-48760/2-1/DJ
	If not done, no reference	-	-	-	-	-	-	-	-

Product	Tests		Visual Examination	Dimensional Measurement	Leak- tightness	Orb expanding	Flattening	Tensile test	Chemical composition	Metal extraction
	Instructions	If done, Pass/Fail								
304 Stainless steel pipe Brand: OPTIMUS- TDZ Size: Ø35x1.0mm		Pass See MM-48760/1- 3/CCH	Pass See MM-48760/1- 3/CCH	Pass See MM-48760/1- 3/CCH	Pass See MM-48760/1- 3/CCH	Pass See MM-48760/1- 3/CCH	Pass See MM-48760/1- 3/CCH	Pass See MM-48760/1- 3/CCH	Pass See MM-48760/1- 2/CCH	Pass See MM-48760/2- 1/DJ
	If not done, reference	-	-	-	-	-	-	-	-	-
	If not done, no reference	-	-	-	-	-	-	-	-	-
304 Stainless steel pipe Brand: OPTIMUS- TDZ Size: Ø42x1.1mm		Pass See MM-52282/CCH/1	Pass See MM-52282/CCH/1	Pass See MM-52282/CCH/2	Pass See MM-52282/CCH/1	Pass See MM-52282/CCH/1	Pass See MM-52282/CCH/1	Pass See MM-52282/CCH/1	Pass See MM-48760/1- 2/CCH	Pass See MM-48760/2- 1/DJ
	If not done, reference	-	-	-	-	-	-	-	-	-
	If not done, no reference	-	-	-	-	-	-	-	-	-
304 Stainless steel pipe Brand: OPTIMUS- TDZ Size: Ø54x1.2mm		Pass See MM-48760/1- 3/CCH	Pass See MM-48760/1- 3/CCH	Pass See MM-48760/1- 3/CCH	Pass See MM-48760/1- 3/CCH	Pass See MM-48760/1- 3/CCH	Pass See MM-48760/1- 3/CCH	Pass See MM-48760/1- 3/CCH	Pass See MM-48760/1- 2/CCH	Pass See MM-48760/2- 1/DJ
	If not done, reference	-	-	-	-	-	-	-	-	-
	If not done, no reference	-	-	-	-	-	-	-	-	-
304 Stainless steel pipe Brand: OPTIMUS- TDZ Size: Ø76.1x1.5mm		Pass See MM-48760/1- 3/CCH	Pass See MM-48760/1- 3/CCH	Pass See MM-48760/1- 3/CCH	Pass See MM-48760/1- 3/CCH	Pass See MM-48760/1- 3/CCH	Pass See MM-48760/1- 3/CCH	Pass See MM-48760/1- 3/CCH	Pass See MM-48760/1- 2/CCH	Pass See MM-48760/2- 1/DJ
	If not done, reference	-	-	-	-	-	-	-	-	-
	If not done, no reference	-	-	-	-	-	-	-	-	-



Product	Tests	Visual Examination	Dimensional Measurement	Leak-tightness	Drift expanding	Flattening	Tensile test	Chemical composition	Metal extraction
304 Stainless steel pipe Brand: OPTIMUS-TDZ Size: Ø88.9x2.0mm	Instructions								
	If done, Pass/Fail	Pass See MM-48760/1-5/CCH	Pass See MM-48760/1-5/CCH	Pass See MM-48760/1-10/CCH	Pass See MM-48760/1-5/CCH	Pass See MM-48760/1-5/CCH	Pass See MM-48760/1-5/CCH	Pass See MM-48760/1-2/CCH	Pass See MM-48760/2-1/DJ
	If not done, reference	-	-	-	-	-	-	-	-
304 Stainless steel pipe Brand: OPTIMUS-TDZ Size: Ø108x1.5mm	If not done, no reference	-	-	-	-	-	-	-	-
	If done, Pass/Fail	Pass See MM-48760/1-3/CCH	Pass See MM-48760/1-3/CCH	Pass See MM-48760/1-3/CCH	Pass See MM-48760/1-3/CCH	Pass See MM-48760/1-3/CCH	Pass See MM-48760/1-3/CCH	Pass See MM-48760/1-2/CCH	Pass See MM-48760/2-1/DJ
	If not done, reference	-	-	-	-	-	-	-	-
304 Stainless steel pipe Brand: OPTIMUS-TDZ Size: Ø66.7x1.2mm	If not done, no reference	-	-	-	-	-	-	-	-
	If done, Pass/Fail	Pass See MM-55975/CCH	Pass See MM-55975/CCH	Pass See MM-55975/CCH	Pass See MM-55975/CCH	Pass See MM-55975/CCH	Pass See MM-55975/CCH	Pass See MM-48760/1-2/CCH	Pass See MM-48760/2-1/DJ
	If not done, reference	-	-	-	-	-	-	-	-

Note: This certificate supersedes Certificate No. MP/TC0052/16-Rev 01 dated 21 April 2016.



CHEN YU  
Assistant Manager  
Mechanical Technology Division



SETSCO SERVICES PTE LTD

Serial No. : MP/TC0041/16\_Rev.01  
Date Issued : 12<sup>th</sup> December 2016

## TEST CERTIFICATE

This certificate is a summary of the test and test reports as stated below:

TE DEUM ENGINEERING PTE LTD

Block 161 Kallang Way

#01-03/08

Singapore 349247

Attn: Mr. John Goh

FOR

Brand : Optimus-TDZ

Test Standard : BS EN 1254-2:1998, AS 3688:2006, AS/NZS 4020:2005, SS 375:2001, SS 270:1996

Product Type : Stainless Steel 304 Press Fitting

Date Submitted : 05 Nov 2015, 20 Aug 2015, 09 Nov 2015, 30 Sep 2016, 14 Nov 2016

Product	Tests		Leaktightness under internal hydrostatic pressure	Resistance to pull out	Leaktightness under internal hydrostatic pressure whilst subjected to bending	Stress corrosion resistance	Determination of mean depth of dezincification	Strength of joints assembly	Resistance to pull-out of assembled	Method of determining compatibility of fitting with pipe	Elastomeric seals	Metal Extraction	Toxicity
	Instructions												
Stainless Steel 304 Press Fitting Brand: Optimus-TDZ Type: 45° plain elbow Size: 15, 22, 28, 35, 42, 54, 66, 7, 76, 1, 88, 9, 108	If done, Pass/Fail	Pass See MM-48760/1-6/CY & MM-55976/MA/3				NA	NA						
	If not done reference	Pass See MM-48760/1-6/CY & MM-55976/MA/1				NA	NA		Pass See MM-48760/1-7/CY & MM-55976/MA/2		Pass See MM-48760/1-1/CY	Pass See MM-48760/2-1/DJ	Pass See MM-48760/3/T
	If not done no reference					NA	NA						

Terms and Conditions  
This certificate will remain in full force unless changed or manipulated in any way.



SETSCO SERVICES PTE LTD

SETSCO

Serial No. : MP/TC0041/16\_Rev.01  
Date Issued : 12<sup>th</sup> December 2016

Product	Test Instructions	Leak tightness under internal hydrostatic pressure	Resistance to pull out	Leak tightness under internal hydrostatic pressure whilst subjected to bending	Stress corrosion resistance	Determination of mean droplet of desiccation	Strength of joints assembly	Resistance to pull-out of assembled	Method of determining compatibility of filling with pipe	Elastomeric seals	Metal Extraction	Toxicity
Stainless Steel 304 Press Fitting Brand: Optimus-TDZ Type: Adjustable coupling Size: 15, 22, 28, 35, 42, 54, 66, 76, 1.88.9, 108	If done, Pass/Fail	Pass See MM-48760/1-6/CY & MM-55976/MA/3			NA	NA						
	If not done, reference	Pass See MM-48760/1-6/CY & MM-55976/MA/1	Pass See MM-48760/1-7/CY & MM-55976/MA/2		NA	NA				Pass See MM-48760/1-1/CY	Pass See MM-48760/2-1/DJ	Pass See MM-48760/3/T
	If not done, no reference				NA	NA						
Stainless Steel 304 Press Fitting Brand: Optimus-TDZ Type: 90° plain elbow Size: 15, 22, 28, 35, 42, 54, 66, 76, 1.88.9, 108	If done, Pass/Fail	Pass See MM-48760/1-6/CY & MM-55976/MA/3			NA	NA						
	If not done, reference	Pass See MM-48760/1-6/CY & MM-55976/MA/1	Pass See MM-48760/1-7/CY & MM-55976/MA/2		NA	NA				Pass See MM-48760/1-1/CY	Pass See MM-48760/2-1/DJ	Pass See MM-48760/3/T
	If not done, no reference				NA	NA						
Stainless Steel 304 Press Fitting Brand: Optimus-TDZ Type: Equal Coupling Size: 15, 22, 28, 35, 42, 54, 66, 76, 1.88.9, 108	If done, Pass/Fail	Pass See MM-48760/1-6/CY & MM-55976/MA/3			NA	NA						
	If not done, reference	Pass See MM-48760/1-6/CY & MM-55976/MA/1	Pass See MM-48760/1-7/CY & MM-55976/MA/2		NA	NA				Pass See MM-48760/1-1/CY	Pass See MM-48760/2-1/DJ	Pass See MM-48760/3/T
	If not done, no reference				NA	NA						



Product	Tests	Leaktightness under internal hydrostatic pressure	Resistance to pull out	Leaktightness under internal hydrostatic pressure whilst subjected to bending	Stress corrosion resistance	Distortion of mean depth of dentification	Strength of joints assembly	Resistance to pull-out of assembled	Method of fitting with pipe	Elastomeric seals	Metal Extraction	Toxicity
Stainless Steel 304 Press Fitting Brand: Optimus-TDZ Type: 1/2" male threaded tee Size: 15, 22, 28, 36, 42, 54, 66, 78, 1.105	Instructions											
	If done, Pass/Fail	Pass See MM-48760/1-6/CY & MM-55976/MA/3			NA	NA						
	If not done, reference		Pass See MM-48760/1-8/CY & MM-55976/MA/1		NA	NA		Pass See MM-48760/1-7/CY & MM-55976/MA/2		Pass See MM-48760/1-1/CY	Pass See MM-48760/2-1/DJ	Pass See MM-48760/3/T
	If not done, no reference				NA	NA						
Stainless Steel 304 Press Fitting Brand: Optimus-TDZ Type: 1/2" Female coupling Size 15	Instructions											
	If done, Pass/Fail	Pass See MM-48760/1-6/CY			NA	NA						
	If not done, reference		Pass See MM-48760/1-8/CY & MM-55976/MA/1		NA	NA		Pass See MM-48760/1-7/CY		Pass See MM-48760/1-1/CY	Pass See MM-48760/2-1/DJ	Pass See MM-48760/3/T
	If not done, no reference				NA	NA						
Stainless Steel 304 Press Fitting Brand: Optimus-TDZ Type: 1/2" male threaded elbow Size 15	Instructions											
	If done, Pass/Fail	Pass See MM-48760/1-6/CY			NA	NA						
	If not done, reference		Pass See MM-48760/1-8/CY & MM-55976/MA/1		NA	NA		Pass See MM-48760/1-7/CY		Pass See MM-48760/1-1/CY	Pass See MM-48760/2-1/DJ	Pass See MM-48760/3/T
	If not done, no reference				NA	NA						



SETSCO SERVICES PTE LTD

SETSCO

Serial No. : MP/TC0041/16\_Rev.01  
Date issued : 12<sup>th</sup> December 2016

Product	Tests	Leaktightness under internal hydrostatic pressure	Resistance to pull out	Leaktightness under internal hydrostatic pressure whilst subjected to bending	Stress corrosion resistance	Determination of mean depth of dezincification	Strength of joints assembly	Resistance to pull-out of assembled	Method of filling with pipe compatibility of filling with pipe	Elastomeric seals	Metal Extraction	Toxicity
Stainless Steel 304 Press Fitting Brand: Optimus-TDZ Type: Equal Tee Size: 15, 22, 28, 35, 42, 54, 66, 7, 76.1, 88.9, 108	Instructions											
	If done, Pass/Fail	Pass See MM-48760/1-6/CY & MM-55976/MAV3			NA	NA						
	If not done, reference		Pass See MM-48760/1-6/CY & MM-55976/MAV1		NA	NA		Pass See MM-48760/1-7/CY & MM-55976/MAV2		Pass See MM-48760/1-1/CY	Pass See MM-48760/2-1/DJ	Pass See MM-48760/3/T
Stainless Steel 304 Press Fitting Brand: Optimus-TDZ Type: Pipe Cap Size: 15, 22, 28, 35, 42, 54, 66, 7, 76.1, 88.9, 108	If not done, no reference				NA	NA						
	If done, Pass/Fail	Pass See MM-48760/1-6/CY & MM-55976/MAV3			NA	NA						
	If not done, reference		Pass See MM-48760/1-6/CY & MM-55976/MAV1		NA	NA		Pass See MM-48760/1-7/CY & MM-55976/MAV2		Pass See MM-48760/1-1/CY	Pass See MM-48760/2-1/DJ	Pass See MM-48760/3/T
Stainless Steel 304 Press Fitting Brand: Optimus-TDZ Type: 1/2" female threaded elbow Size: 15	If not done, no reference				NA	NA						
	If done, Pass/Fail	Pass See MM-48760/1-6/CY			NA	NA						
	If not done, reference		Pass See MM-48760/1-6/CY & MM-55976/MAV1		NA	NA		Pass See MM-48760/1-7/CY & MM-55976/MAV2		Pass See MM-48760/1-1/CY	Pass See MM-48760/2-1/DJ	Pass See MM-48760/3/T

Product	Test	Instructions	Leaktightness under internal hydrostatic pressure	Resistance to pull out	Leaktightness under internal hydrostatic pressure whilst subjected to bending	Stress corrosion resistance	Determination of mean depth of dezincification	Strength of joints assembly	Resistance to pull-out of assembled	Method of fitting with pipe compatibility of fitting with pipe	Elastomeric seals	Metal Extraction	Toxicity
Stainless Steel 304 Press Fitting Brand: Optimus-TDZ Type: 1/2" male coupling Size: 15	If done, Pass/Fail	Pass See MM-48760/1-6/CY	-	-	-	NA	NA	-	-	-	-	-	-
	If not done, reference	Pass See MM-48760/1-6/CY	Pass See MM-48760/1-6/CY	Pass See MM-48760/1-6/CY	Pass See MM-48760/1-6/CY	NA	NA	Pass See MM-48760/1-7/CY	Pass See MM-48760/1-7/CY	Pass See MM-48760/1-7/CY	Pass See MM-48760/1-1/CY	Pass See MM-48760/2-1/DJ	Pass See MM-48760/3/T
	If not done, no reference	-	-	-	-	NA	NA	-	-	-	-	-	-
Stainless Steel 304 Press Fitting Brand: Optimus-TDZ Type: 1/2" female threaded tee Size: 15, 22, 28, 35, 42, 54, 66, 77, 88, 91, 108	If done, Pass/Fail	Pass See MM-48760/1-6/CY & MM-55976/MA/3	-	-	-	NA	NA	-	-	-	-	-	-
	If not done, reference	Pass See MM-48760/1-6/CY & MM-55976/MA/1	Pass See MM-48760/1-6/CY & MM-55976/MA/2	Pass See MM-48760/1-7/CY & MM-55976/MA/2	Pass See MM-48760/1-6/CY & MM-55976/MA/1	NA	NA	Pass See MM-48760/1-7/CY	Pass See MM-48760/1-7/CY	Pass See MM-48760/1-7/CY	Pass See MM-48760/1-1/CY	Pass See MM-48760/2-1/DJ	Pass See MM-48760/3/T
	If not done, no reference	-	-	-	-	NA	NA	-	-	-	-	-	-
Stainless Steel 304 Press Fitting Brand: Optimus-TDZ Type: reducing tee Size: 22x15, 28x22, 35x22, 42x28, 54x28	If done, Pass/Fail	Pass See MM-48760/1-6/CY	-	-	-	NA	NA	-	-	-	-	-	-
	If not done, reference	Pass See MM-48760/1-6/CY	Pass See MM-48760/1-6/CY	Pass See MM-48760/1-6/CY	Pass See MM-48760/1-6/CY	NA	NA	Pass See MM-48760/1-7/CY	Pass See MM-48760/1-7/CY	Pass See MM-48760/1-7/CY	Pass See MM-48760/1-1/CY	Pass See MM-48760/2-1/DJ	Pass See MM-48760/3/T
	If not done, no reference	-	-	-	-	NA	NA	-	-	-	-	-	-





SETSCO SERVICES PTE LTD

Serial No. : MP/TC0041/16 Rev.01  
Date Issued : 12<sup>th</sup> December 2016

SETSCO

Product	Tests	Instructions	Leaktightness under internal hydrostatic pressure	Resistance to pull out	Leaktightness under internal hydrostatic pressure whilst subjected to bending	Stress corrosion resistance	Determination of mean depth of dezincification	Strength of joints assembly	Resistance to pull-out of assembled	Method of determining compatibility of filling with pipe	Elastomeric seals	Metal Extraction	Toxicity
Stainless Steel 304 Press Fitting Brand: Optimus-TDZ Type: reducing coupling Size: 22x15 28x22, 35x22 42x28, 54x28	If done, Pass/Fail If not done, reference If not done, no reference	Pass See MM-48750/1-6/CY	-	Pass See MM-48750/1-6/CY	Pass See MM-48750/1-6/CY	NA	NA	Pass See MM-48750/1-7/CY	Pass See MM-48750/1-7/CY	Pass See MM-48750/1-7/CY	Pass See MM-48750/2-1/0J	Pass See MM-48750/2-1/0J	Pass See MM-48750/3/T
Stainless Steel 304 Press Fitting Brand: Optimus-TDZ Type: 1/2" rotatable female coupling Size: 22	If done, Pass/Fail If not done, reference If not done, no reference	Pass See MM-48750/1-6/CY	-	Pass See MM-48750/1-6/CY	Pass See MM-48750/1-6/CY	NA	NA	Pass See MM-48750/1-7/CY	Pass See MM-48750/1-7/CY	Pass See MM-48750/1-7/CY	Pass See MM-48750/2-1/0J	Pass See MM-48750/2-1/0J	Pass See MM-48750/3/T
Stainless Steel 304 Press Fitting Brand: Optimus-TDZ Type: 1/2" female coupling Size: 22	If done, Pass/Fail If not done, reference If not done, no reference	Pass See MM-48750/1-6/CY	-	Pass See MM-48750/1-6/CY	Pass See MM-48750/1-6/CY	NA	NA	Pass See MM-48750/1-7/CY	Pass See MM-48750/1-7/CY	Pass See MM-48750/1-7/CY	Pass See MM-48750/2-1/0J	Pass See MM-48750/2-1/0J	Pass See MM-48750/3/T

Product	Tests	Leaktightness under internal hydrostatic pressure	Resistance to pull out	Leaktightness under internal hydrostatic pressure whilst subjected to bending	Stress corrosion resistance	Determination of mean depth of dezincification	Strength of joints assembly	Resistance to pull-out of assembled	Method of determining compatibility of fitting with pipe	Elastomeric seals	Metal Extrinsic	Toxicity
Stainless Steel 304 Press Fitting Brand: Optimus-TDZ Type: ½" male threaded elbow Size: 22	Instructions											
	If done, Pass/Fail	Pass See MM-48760/1-6/CY			NA	NA						
	If not done, reference	Pass See MM-48760/1-6/CY	Pass See MM-48760/1-6/CY	Pass See MM-48760/1-6/CY	NA	NA	Pass See MM-48760/1-7/CY	Pass See MM-48760/1-7/CY	Pass See MM-48760/1-7/CY	Pass See MM-48760/1-7/CY	Pass See MM-48760/2-1/DJ	Pass See MM-48760/3/T
Stainless Steel 304 Press Fitting Brand: Optimus-TDZ Type: ¾" female threaded elbow Size: 22	If not done, no reference				NA	NA						
	If done, Pass/Fail	Pass See MM-48760/1-6/CY			NA	NA						
	If not done, reference	Pass See MM-48760/1-6/CY	Pass See MM-48760/1-6/CY	Pass See MM-48760/1-6/CY	NA	NA	Pass See MM-48760/1-7/CY	Pass See MM-48760/1-7/CY	Pass See MM-48760/1-7/CY	Pass See MM-48760/1-7/CY	Pass See MM-48760/2-1/DJ	Pass See MM-48760/3/T
Stainless Steel 304 Press Fitting Brand: Optimus-TDZ Type: ¾" male coupling Size: 22	If not done, no reference				NA	NA						
	If done, Pass/Fail	Pass See MM-48760/1-6/CY			NA	NA						
	If not done, reference	Pass See MM-48760/1-6/CY	Pass See MM-48760/1-6/CY	Pass See MM-48760/1-6/CY	NA	NA	Pass See MM-48760/1-7/CY	Pass See MM-48760/1-7/CY	Pass See MM-48760/1-7/CY	Pass See MM-48760/1-7/CY	Pass See MM-48760/2-1/DJ	Pass See MM-48760/3/T



SEISCO SERVICES PTE LTD

Serial No. : MP/TC0041/16\_Rev.01  
Date Issued : 12<sup>th</sup> December 2016

SEISCO

Product	Tests	Leaktightness under internal hydrostatic pressure	Resistance to pull out	Leaktightness under internal hydrostatic pressure whilst subjected to bending	Stress corrosion resistance	Determination of mean depth of dezincification	Strength of joints assembly	Resistance to pull-out of assembled	Method of fitting with pipe compatibility of fitting with pipe	Elastomeric seals	Metal Extraction	Toxicity
Stainless Steel 304 Press Fitting Brand: Optimus- TDZ Type: 1" female coupling Size: 28	Instructions											
	If done, Pass/Fail	Pass See MM-48760/1-6/CY			NA	NA						
	If not done, reference		Pass See MM- 48760/1- 6/CY	Pass See MM- 48760/1- 6/CY	NA	NA	Pass See MM- 48760/1- 7/CY	Pass See MM- 48760/1- 7/CY	Pass See MM- 48760/1- 7/CY	Pass See MM- 48760/2- 1/DJ	Pass See MM- 48760/2- 1/DJ	Pass See MM- 48760/3/T
Stainless Steel 304 Press Fitting Brand: Optimus- TDZ Type: 1" male threaded elbow Size: 28	If not done, no reference				NA	NA						
	If done, Pass/Fail	Pass See MM-48760/1-6/CY			NA	NA						
	If not done, reference		Pass See MM- 48760/1- 6/CY	Pass See MM- 48760/1- 6/CY	NA	NA	Pass See MM- 48760/1- 7/CY	Pass See MM- 48760/1- 7/CY	Pass See MM- 48760/1- 7/CY	Pass See MM- 48760/2- 1/DJ	Pass See MM- 48760/2- 1/DJ	Pass See MM- 48760/3/T
Stainless Steel 304 Press Fitting Brand: Optimus- TDZ Type: 1" female threaded elbow Size: 28	If not done, no reference				NA	NA						
	If done, Pass/Fail	Pass See MM-48760/1-6/CY			NA	NA						
	If not done, reference		Pass See MM- 48760/1- 6/CY	Pass See MM- 48760/1- 6/CY	NA	NA	Pass See MM- 48760/1- 7/CY	Pass See MM- 48760/1- 7/CY	Pass See MM- 48760/1- 7/CY	Pass See MM- 48760/2- 1/DJ	Pass See MM- 48760/2- 1/DJ	Pass See MM- 48760/3/T





SETSCO SERVICES PTE LTD

Serial No. : MP/TC0041/16\_Rev.01  
Date Issued : 12<sup>th</sup> December 2016

Product	Testis	Leaktightness under internal hydrostatic pressure	Resistance to pull out	Leaktightness under internal hydrostatic pressure without subjected to bending	Stress corrosion resistance	Determination of mean depth of dezincification	Strength of joints assembly	Resistance to pull-out of assembled	Method of determining compatibility of fitting with pipe	Elastomeric seats	Metall Extraction	Toxicity
Stainless Steel 304 Press Fitting Brand: Optimus- TDZ Type: 1" male coupling Size: 28	Instructions											
	If done, Pass/Fail	Pass See MM-48760/1-5/CY			NA	NA						
	If not done, reference	-	Pass See MM- 48760/1- 5/CY	Pass See MM- 48760/1- 5/CY	NA	NA	Pass See MM- 48760/1- 7/CY	Pass See MM- 48760/1- 7/CY	Pass See MM- 48760/1- 7/CY	Pass See MM- 48760/1- 1/CY	Pass See MM- 48760/2- 1/DJ	Pass See MM- 48760/3/T
Stainless Steel 304 Press Fitting Brand: Optimus- TDZ Type: 3/4" male threaded tee Size: 88.9, 102	Instructions											
	If done, Pass/Fail	Pass See MM-48760/1-5/CY			NA	NA						
	If not done, reference	-	Pass See MM- 48760/1- 5/CY	Pass See MM- 48760/1- 5/CY	NA	NA	Pass See MM- 48760/1- 7/CY	Pass See MM- 48760/1- 7/CY	Pass See MM- 48760/1- 7/CY	Pass See MM- 48760/1- 1/CY	Pass See MM- 48760/2- 1/DJ	Pass See MM- 48760/3/T
	If not done, no reference	-			NA	NA						
	If not done, no reference	-			NA	NA						

Note: This certificate supersedes Certificate No. MP/TC0041/16 dated 31<sup>st</sup> March 2016.

CHEN YU  
Assistant Manager  
Mechanical Technology Division



45 Genting Lane #02-02 Genting Complex, Singapore 349557, Tel: (65) 6742 1848 / 6744 0271, Fax: (65) 6742 6403

Email: julie@tedeum.com.sg Website: www.tedeum.com.sg

Co. Reg. No: 02890/1989-N

## JOB REFERENCES

No.	Project	M & E Consultants	Plumber	Units	Year of Completion
<b><u>Apartments</u></b>					
1	Parc Centros @ Punggol Central	Rankine & Hill	King Wan	618	2014
2	One Dusun Residences @ 1 Jalan Dusun	PCA Consultants	Acmes King	154	2014
3	Bentley Residences @ 30 Kovan Road	K G Goh Consultants	Yi Chye	48	2015
4	Sim's Urban Oasis @ Sims Drive	United Project Consultants	KingWan	1024	2017
5	27 Charlton Road (27 Units of Terrace)	PCA Consultants	Wne One	27	2015
6	Space @ Kovan (Mix Development 28 sty 155 units and 76 shops units)	PCA Consultants	Acmes King	231	2014
7	Yishun North Point City (Phase 1)	Aecom Singapore	ANS	950	2018
8	HDB Carpark @ Kaki Bukit Estate C6	Rankine & Hill	P & W		2017
9	HDB Carpark @ Chua Chu Kang N1C5	Rankine & Hill	P & W		2017
10	A&A Work for HDB Town Council Jurong West Blk 643 to 647 and Blk 686 to Blk 695	Town Council	Nam plumbing		2018
11	A&A Work for HDB Town Council serangoon North Ave 5 Blk 548 to 554	Town Council	Goh & Feng		2018
12	A&A Work for HDB Town Council Pasir Ris St 11 Blk 123	Town Council	C.P.Lee		2018
13	A&A work for HDB Town Council Campassvale Walk Blk 228B	Town Council	C.P.Lee		2018
14	A&A Work for HDB Town Council Tampines St 52 Blk 405E	Town Council	Goh & Feng		2018
15	A&A Work for HDB Town Council 10 Block at New Market Street	Town Council	ISO Team, TNS Alliance		2018
16	HDB 8 Block of 26 Storey Apartment at Punggol Northshore Contract 1 & 2	HDB	Chew plumbing	1694	2020
17	11 Block of 12 Storey HDB Apt @ Sembawang N1 C6 & C12	HDB	Chew plumbing		2018
18	HDB 4 Block of 17 Storey Apartment at Sengkang	HDB	Chew plumbing	511	2018
19	Residential unit and Terrace house at Faber Walk		FT Plumbing	210	2017
20	HDB Willington and HDB River vale Crescent	NTH Construction	NTH Construction		2017
21	HDB Town Council		Chan Weng Wah		2017
22	HDB 19 Storey @ Circuit road C43B	Surbana Jurong Consultants	Alpha & Omega Engineering Services Pte Ltd	750	2019
23	Condo at 21 Paya Lebar Crescent		Northway Fire Protection		2018
24	HDB 9 Blk 13/14 storey apartment and 2 Blk 5/6 storey carpark at sengkang N4C30	United Project Consultants	KW Construction	1100	2019
25	HDB 1 Blk of 29 storey apartment at Choa Chu Kang N1C15	United Project Consultants	KW Construction	300	2018
26	HDB @ Choa Chu Kang	Rankine & Hill	PNW Engineering Pte Ltd		2018
27	4 Blk of 3/9 Storey Apt with Shops at Yishun Ave 4 Wisteria	Surbana Jurong Consultants	Accise Engineering Pte Ltd		2018
28	Apt at West Coast Vale (Parc Riveira)	Conteem Engineers Pte Ltd	Blue Moon Engineering Pte Ltd		2017
29	HDB Sengkang Neighbour 3 contract	Chew Plumbing	Chew Plumbing	511	2018
30	Bartley Rd Terrace House	DP Engineers Pte Ltd	Aspect	45	2017
31	29 Ridout rd @ 5 HDB viod Deck	NTH Construction	NTH Construction		2018



45 Genting Lane #02-02 Genting Complex, Singapore 349557. Tel: (65) 6742 1848 / 6744 0271, Fax: (65) 6742 6403

Email: julie@tedeum.com.sg Website: www.tedeum.com.sg

Co. Reg. No: 02890/1989-N

## JOB REFERENCES

No.	Project	M & E Consultants	Plumber	Units	Year of Completion
32	Duxton rd/ Bedok Resorvior/ Biopolis/ St Martin Dr	Power Jack	Power Jack		2017
33	12 Storey Apt @ 4 Bedok Rise	KTP Consultants	ANS Plumbing & Sanitary Pte Ltd	726	2018
34	18 Storey Apt @ 11 Kee Seng St	COEN Design International	ANS Plumbing & Sanitary Pte Ltd	56	2018
35	Apt at Bedok N4C9 @ Bedok North RD	KTP Consultants	Chern Seng Engineering Pte Ltd	660	2017
36	5 Sty Residential Flat Development with Attic with carpark and Communal/Ancillary Facilities @ 5 Still Rd	Elead Associate	Meng Hup Seng	60	2017
37	Choa Chu Kang Town Council - water pipes replacement	Surbana Jurong Consultants	Deluge Fire Protection Pte Ltd		2019
38	4 Buildings Apartments @ Fernvale Rd	Parsons Brinckerhoff Pte Ltd	King Wan Construction Pte Ltd	735	2019
39	20 Buliding of HDB Apt @ Tampines N6C8,9,10	Surbana Jurong Consultants	KW Construction	2022	
40	7 Buildings 15 sty Apartments (The Tapestry)	Belmacs Pte Ltd	Wang Kok Sewerage Construction Pte Ltd	861	2018
41	6 Buildings 14-15 sty Apartments (Park Colonial)	United Project Consultants	Wang Kok Sewerage Construction Pte Ltd	805	2019
42	8 sty Apartments (AKA THE ADDITION)	Elead Associate	Nam Fang Co (Pte) Ltd	26	2018
43	HDB 4 buildings 17 sty @ Punggol West C39	United Project Consultants	Chew Construction Pte Ltd	490	2018
44	2 Buildings 30sty Apartments (Sturdee Residences)	Elead Associate	Chew Construction Pte Ltd	305	2018
45	Terrace House - 2 sty 19 Bedok	Builders 265 Pte Ltd	NTH Construction		2018
46	Residential Estate - East Sectors, Zone 1		J.Keart Alliances Pte Ltd		2019
47	7 Building with Community Club @ Bedok South N3C27	Surbana Jurong Consultants	AAL Engineering Pte Ltd	940	2019
48	YuHua Constituency Town Council - water pipes replacement	EM Services	Deluge Fire Protection Pte Ltd		2019
49	Jurong Central Constituency Town Council - water pipes replacement	EM Services	Deluge Fire Protection Pte Ltd		2019
50	Taman Jurong Constituency Town Council - water pipes replacement	EM Services	Deluge Fire Protection Pte Ltd		2019
51	Marine Parade Constituency Town Council - water pipes replacement	EM Services	Deluge Fire Protection Pte Ltd		2019
52	Tampines Constituency Town Council - water pipes replacement	EM Services	Deluge Fire Protection Pte Ltd		2019
53	Bukit Batok Constituency Town Council - water pipes replacement	EM Services	Deluge Fire Protection Pte Ltd		2019
54	Ang Mo Kio Constituency Town Council - water pipes replacement	EM Services	Deluge Fire Protection Pte Ltd		2019
55	Bedok Town Centre Ave 1	KTP Consultants	Heng Yuan Engineering Pte Ltd	500	2019
56	Bukit Merah View (Town Council - 23 Building) Upgrading	EM Services	MKK Engineering Pte Ltd		2020
57	Tampines Central Mechanical work upgrading	EM Services	Deluge Fire Protection Pte Ltd		2021





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## JOB REFERENCES

No.	Project	M & E Consultants	Plumber	Units	Year of Completion
58	Tampines West Division upgrading	EM Services	Deluge Fire Protection Pte Ltd		2022
59	Apartments - Woodlands N7C27	Rankine & Hill	AAL Engineering Pte Ltd	629	2020
60	Apartments & Shops 2 Buildings 36 sty (WHISTLER GRAND)	United Project Consultants Pte Ltd	Wang Kok Sewerage Construction Pte Ltd	716	2019
61	Apartments & Shops 5 Buildings 16 sty (LE QUEST)	Rankine & Hill (S) Pte Ltd	Fire - Guard Engineering Pte Ltd	516 - 49	2019
62	5 sty Apartments (FORMER JERVOIS GREEN / JERVOIS PRIVE)	HPX Consulting Engineers	YCP Pte Ltd	45	2019
<b><u>Dormitory</u></b>					
1	Dormitory @ Punggol Timor (10 Blocks of 6 Stys)	Icon Engineerings	Teck Hien		2014
2	Dormitory @ 1A Short Street (6 Blocks)		Tai Hwee		2014
3	Worker's Dormitory		J.Keart Alliances Pte Ltd		2018
4	NUS	Indeco Engineers	ANS		2018
<b><u>Commercial</u></b>					
1	Fty @ 18A Sungei Kadut Loop		Acmes King		2013
2	Fty @ 34, 36 & 38 Senoko Drive		JK Plumbing		2014
3	Fty @ 25 Tanjong Kling Road		PNW		2014
4	Fty @ 24 Gul Crescent	Figtree Projects Pte Ltd	Wne One		2014
5	PSA @ Pasir Panjang		Jeson		2014
6	Panasonic Building @ Bedok		Cheang & Lee		2014
7	Nursing Home @ 5 Pearl's Hill Road				2015
8	Factory @ 22 Benoi circle		G & C		2015
9	Factory @ 30, 32 Kian Teck Road		M-stars		2015
10	Factory @ 11 Kian Teck Drive		PNW		2015
11	Factory @ No 16 Tuas Ave 10		Sunland		2015
12	Factory @ Bulim Ave, Jurong West St 22	Figtree Projects Pte Ltd	Wne One		2015
13	Factory @ 36 Tuas South St 3		Image M&E		2015
14	18 Tuas Ave 10		C.K Lim 2		2015
15	Civic Centre @ Toa Payoh Lorong 8		GPS Engineering		2015
16	Foodcourt @ Jalan Tukang Medtech Building		PNW		2015
17	2-Storey Social Service Office @ Taman Jurong		NTH		2015
18	SS@CITYLINK B1-63		De Ir Pte Ltd		2015
19	Woodlands Spectrum Tee		FullHouse Building		2015
20	NUS Museum				2015
21	Improvement to water distribution system @ defu industrial estate & amk industrial estate park 2	JM Pang & Seah	S & P		2018
22	164 Gul Circle (JTC)	Aurecon Singapore			2018
23	Factory @ Woodlands Industrial E9	One Engineering	ATP Engineering	100	2017
24	Community Centre 5 Storey @ Keat Hong	KJ Group Consultants	Acmes King		2017
25	Basement Carpark at Tan Ching Rd	M & P Consulting			2017
26	9 Storey factory at Woodlands	A build Construction	ATP Engineering		2017
27	Besco Industrial Building @ 26 Ubi Road 4 (A&A)		Active Fire Protection Pte Ltd		2017



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28	Senoko Way (A&A)		Active Fire Protection Pte Ltd		2017
29	Upgrading Chestnut Ave Water Work	Black & Veatch (SEA) Pte Ltd	J.Keart Alliances Pte Ltd		2017
30	A&A works on fire protection		J.Keart Alliances Pte Ltd		2017
31	Office/ Warehouse @ 348 Jalan Boon Lay	PDC Consulting Engineers	Northway Fire Protection Pte Ltd		2018
32	2 Storey Hawker Centre/ CarPark @ Pasir Ris Drive 3	CPG Consultants	ADES Engineering	113	2018
33	Water Venture club at Sembawang				2017
34	348 Jalan Boon Lay A&A				2017
35	New Water Plant	Yeung Yew	Yeung Yew		2017
36	Factory/ 9 Storey @ Tampines Ave 10	Aecom Singapore	ANS Plumbing & Sanitary Pte Ltd		2017
37	Hougang Community Club	HY M&E Consultancy	Sanyu Engineering		2018
38	Sembawang Water Venture Club @ Jln Mempurong		Kingston Sanitary & Plumbing Pte Ltd		2017
39	Data Centre @ Sunview Dr		ACM Contracting Pte Ltd		2018
40	Factory @ 41 Benoi rd		ANS Plumbing & Sanitary Pte Ltd		2017
41	Multiple Block of Office & Shops @ Woodlands Square	Alpha Consulting Engineers Pte Ltd	Millennium Plumbing & Sanitary Pte Ltd		2016
42	Kian Teck 2 Blk of 3 Sty Factory		PNW Engineering Pte Ltd		2018
43	Woodland Data Centre	Aurecon Singapore	S&P System Services Pte Ltd		2018
44	Factory @ woodland sector 2	A build Construction	ATP Engineering	100	2018
45	Factory @ 50 Senoko Dr	KJ Group Consultants	ACM Contracting Pte Ltd		2018
46	Industrial Park @ 243 Alexandra rd		CHK Sanitary / Deluge E&C		2018
47	Shophouse @ Chinatown- Smith St	ZPT Engineering Services	J.Keart Alliances Pte Ltd		2017
48	A&A Fire Work @ Paya Ubi Industrial Park		K.B.C Engineering Pte Ltd		2019
49	10 Blk of industrial building @ Tuas South Boulevard	Surbana Jurong	Deluge Fire Protection Pte Ltd		2019
50	4 sty factory extension (A&A) @ 23 Senoko South Rd	Azuri Engineers Pte Ltd	Dactt Engineers Pte Ltd		2018
51	10 sty of serviced Apts & shops @ 2 Serangoon Rd	KTP Consultants Pte Ltd	Yew Seng Heng		2018
52	Factory at Changi North		S&P System Services Pte Ltd		2019
53	Factory 6 sty Bedok Food City	Surbana Jurong	King Wan Construction Pte Ltd / Tong Loong Engineering Pte Ltd		2018
54	2 Warehouse 3&7 sty (JTC Logistics Hub)	Meinhardt (Singapore) Pte Ltd	Nam Fang Co Pte Ltd		2018



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55	Warehouse at Pasir Panjang	Soilbuild Group Holdings Pte Ltd	Fitterlab Engineering Pte Ltd		2018
56	6 sty office at 5 Science Park Dr	J Roger Preston (s) Pte Ltd	Fitterlab Engineering Pte Ltd		2018
57	2-8 sty Showroom (Wearnes Automotive Showroom)	Team Design Architects Pte Ltd	Chan Weng Wah Engineering Pte Ltd		2018
58	Sport Centre @ Yuan Ching	Zarch Collaboratives Pte Ltd	NTH Construction Pte Ltd		2018
59					
60	Tuas Incineration @ Tuas South Ave 2		J.Keart Alliances Pte Ltd		2019
61	3 sty Factory @ Tuas South Link 3	Gims & Associates aka GIMS Engineering Pte Ltd	Yew Seng Heng		2019
62	5 sty Factory Building @ Kranji Way	Engineers Alliances	Dactt Engineers Pte Ltd		2019

### Bungalow

1	Bungalow @ 14 Jalan Nipah		Pitney		2015
2	96 Jalan Bumbung		G & C		2015
3	5 Pearl Hill Road		FT Plumbing		2015
4	63 Paya Lebar Crescent		M-stars		2015
5	41 Princess of Wales		LW Plumbing		2015
6	3 Tanglin Hill		BSL Builders		2015
7	Transit Rd		Nam Fang		2017
8	Ridout Rd		Nam Fang		2018
9	8th sty Factory Kensington Park Bungalow		Chan Weng Wah Hardware		2019

### Hotel

1	Hotel @ 32 North Canal Road		C.K Lim 2		2015
2	Hotel @ 700 Beach Road	Elead Associates	Yong Tat		2015
3	Hotel A&A project - water system		Hong Lam		2018

### Shopping Mall

1	Yishun North Point City	Aecom Singapore Pte Ltd	ANS Plumbing & Sanitary Pte Ltd	268	2018
2	Yishun North Point Bus Depot LTA		ANS Plumbing & Sanitary Pte Ltd		2018
3	NTUC @ Toa Payoh		VSD Engineering Pte Ltd		2018
4	5 Towers of Suntec City		Millennium Plumbing		2019
5	Centrium Square	DP Engineers Pte Ltd	Nam Fang Co Pte Ltd	339	2018

### School

1	ST Joseph's Institution	Surbana International Consultants Pte Ltd	Teck Hien Engineering		2018
2	2-6 Storey building Waterway Primary School	Rankine & Hill (S) Pte Ltd	Teck Hien Engineering		2017
3	Dover court International school		Chan Weng Wah Hardware		2018





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4	A&A to existing 6th storey Central Library including existing 4th & 5th storey connection to existing 7th storey Central Library of the NUS	Beca Carter Holling & Ferner (S.E.Asia) Pte Ltd	Millennium Plumbing		2018
5	XingHua Primary School		Chan Weng Wah Hardware		2018
6	YangZheng Primary School		Chan Weng Wah Hardware		2018
7	ZhenHua Primary School		Chan Weng Wah Hardware		2018
<b><u>Military</u></b>					
1	Nee Soon Camp (A&A)		ANS Plumbing & Sanitary Pte Ltd		2017
2	246 Piccadilly / 323A Lorong Kebasi	Defence Science & Technology Agency	Northway Fire Protection Pte Ltd		2018
3	Military Facilities	Aedas Pte Ltd	Northway Fire Protection Pte Ltd		2019
4	Police Station @ Geylang NPC	Gims & Associates (aka GIMS Engineering Pte Ltd)	NTH Construction Pte Ltd		2018
<b><u>Church</u></b>					
1	5 Storey of Church building @ Tah Ching Road	M&P Consulting	Chan Weng Wah		2017
2	4 sty Mosque (Masjid Angullia)	Conteem Engineers Pte Ltd	NTH Construction Pte Ltd		2018
<b><u>Prison</u></b>					
1	Changi Prison @ Upper Changi Road North	CPG Consultants	MEC Engineering Pte Ltd		2017
<b><u>Transportation</u></b>					
1	MRT - Thomson Line Civil Contract T210	Gammon Construction Limited	Deluge Fire Protection Pte Ltd		2019
2	Irrigation system for flyover at MC01, SR03 & SR04		Ngee Chin Engineering Pte Ltd		2019
3	Thomson Line MRT T207 stage 1&2 (8 stations)	T Y Lin International	Deluge Fire Protection Pte Ltd		2019
4	T218 Thomson Line Stage 3 (13 Stations)	T Y Lin International	Deluge Fire Protection Pte Ltd		2019
5	KPE / CTC - TR286, Alarm Gong Fire System		Fab-5 Pte Ltd		2019
<b><u>Shipyard</u></b>					
1	Tuas South Shipyard	Sebana Jurong	Deluge Fire Protection Pte Ltd		2019
<b><u>Hospital</u></b>					
1	Woodland Intergrated Health Campus at Woodland Ave 12	Surbana Jurong Consultants Pte Ltd	King Wan Construction Pte Ltd		2019
2	Nursing Home Upgarde (Moral Home for the Aged Sick Limited)	CPG Consultants Pte Ltd	NTH Construction Pte Ltd		2018



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<u>Miscellaneous</u>					
1	Park Upgrading	Tan Consultants	NTH Construction Pte Ltd		2018
2	Changi Water Reclamation Plant - Contact C22B	CPG	Deluge Fire Protection (SEA) Pte Ltd		2020
3	SP Power Station @ Harbour Dr		J.Keart Alliances Pte Ltd		2019
4	Showroom 2-8-sty (Wearnes Automotive Showroom)	Team Design Architects Pte Ltd	Chan Weng Wah Engineering Pte Ltd		2019