

### ภาคผนวกที่ 3

ใบรายงานผลการวิเคราะห์จากห้องปฏิบัติการ

## ANALYSIS REPORT

**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Maptaphut, Muang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Sampling Source** : Stack Air Quality  
**Sampling Point** : ปล่องที่ผ่านโรงกำจัดฝุ่น (Fume Plant # 1)  
**GPS. Coordinate** : UTM (WGS84) 47P 0733506 E, 1402545 N  
**Sampling Date** : July 16, 2022  
**Sampling Time** : 10:50 – 11:50  
**Sampling Method** : US.EPA. Method 1-4, 5, 6, 7, 10  
**Sample Condition** : Good  
**Sampling By** : Mr.Chayanut Boongantong, Registration No.จ-099-จ-7675  
**Analyzed By** : Environment Research & Technology Co., Ltd. Laboratory Registration No.จ-099

**Analysis No.** : ST719/2565  
**Received Date** : July 16, 2022  
**Analytical Date** : July 16 – August 1, 2022  
**Report Date** : August 4, 2022


Item	Description	Method of Analysis	Unit	Result	Standard		
					2/	3/	4/
1	Fuel Type	-	-	Electric Furnace	-	-	-
2	Combustion System	-	-	Open	-	-	-
3	Stack Height	Measuring Tape	m.	30.0	-	-	-
4	Stack Diameter	Measuring Tape	m.	4.50	-	-	-
5	Flue Gas Temperature	Thermocouple	°C	75	-	-	-
6	Pressure in Stack	Incline Manometer	mmHg	758	-	-	-
7	Oxygen Rate	Electrochemical Sensor	%	20.9	-	-	-
8	Moisture	Condensation Method	%	2.7	-	-	-
9	Air Velocity	Type S Pitot Tube	m/s	14.6	-	-	-
10	Volume Metric Flow Rate <sup>1/</sup>	Calculate	Nm <sup>3</sup> /hr	714,038	-	-	-
			m <sup>3</sup> /hr	836,267	-	-	-
11	Sulfur Dioxide <sup>1/</sup>	Absorption, Barium-Thorin Titrimetric Method	ppm	<1.3	800	60	-
			mg/Nm <sup>3</sup>	<3.4	2,096	157	-
12	Oxide of Nitrogen <sup>1/</sup>	Absorption, Phenoldisulfonic Acid Method	ppm	<2.1	200	200	-
			mg/Nm <sup>3</sup>	<3.9	376	376	-
13	Total Suspended Particulate <sup>1/</sup>	Isokinetic, Gravimetric Method	mg/Nm <sup>3</sup>	2.5	240	320	40
14	Carbon Monoxide <sup>1/</sup>	Instrumental Analyzer Method	ppm	1.9	-	690	-
			mg/Nm <sup>3</sup>	2.2	-	790	-

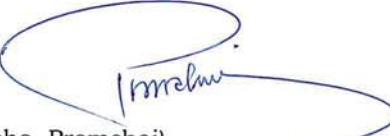
**Remark :** <sup>1/</sup> Reference condition is 25 degree Celsius at 1 Atmosphere and Dry Basis.

<sup>2/</sup> Notification of the Ministry of Science Technology and Environment dated March 9, B.E.2544 (2001), published in the Royal Government Gazette, Vol.118 Part 37D dated May 8, B.E.2544 (2001). (Existing Source)

<sup>3/</sup> Notification of the Ministry of Industry B.E.2549 (2006), issued under Factory Act B.E.2535 (1992), published in the Royal Government Gazette No.123 Special Part 125D dated December 4, B.E.2549 (2006).

<sup>4/</sup> มาตรฐานที่กำหนดตามผลการพิจารณาการให้ระบายนํ้าเสียของโรงงานซึ่งมีผลใช้บังคับ โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง ของบริษัท เหล็กก่อสร้างสยาม จำกัด (ปัจจุบันเปลี่ยนชื่อเป็นบริษัท ทาทา สตีล การมีผล (ประเทศไทย) จำกัด (มหาชน) สาขาลำดับที่ 00005)

  
(Ms.Natnicha Sermmatiwong)  
Laboratory Reviewer No.จ-099-จ-7666

  
(Ms.Panicha Promchai)  
Laboratory Supervisor No.จ-099-จ-2414

## ANALYSIS REPORT

**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Maptaphut, Muang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Sampling Source** : Stack Air Quality  
**Sampling Point** : ปล่องที่ผ่านโรงกำจัดฝุ่น (Fume Plant # 2)  
**GPS. Coordinate** : UTM (WGS84) 47P 0733518 E, 1402528 N  
**Sampling Date** : July 16, 2022  
**Sampling Time** : 09:30 – 10:30  
**Sampling Method** : US.EPA. Method 1-4, 5, 6, 7, 10  
**Sample Condition** : Good  
**Sampling By** : Mr.Chayanut Boongantong, Registration No.จ-099-จ-7675  
**Analyzed By** : Environment Research & Technology Co., Ltd. Laboratory Registration No.จ-099

**Analysis No.** : ST720/2565  
**Received Date** : July 16, 2022  
**Analytical Date** : July 16 – August 1, 2022  
**Report Date** : August 4, 2022

Item	Description	Method of Analysis	Unit	Result	Standard		
					2/	3/	4/
1	Fuel Type	-	-	Electric Furnace	-	-	-
2	Combustion System	-	-	Open	-	-	-
3	Stack Height	Measuring Tape	m.	30.0	-	-	-
4	Stack Diameter	Measuring Tape	m.	3.70	-	-	-
5	Flue Gas Temperature	Thermocouple	°C	77	-	-	-
6	Pressure in Stack	Incline Manometer	mmHg	758	-	-	-
7	Oxygen Rate	Electrochemical Sensor	%	20.9	-	-	-
8	Moisture	Condensation Method	%	2.3	-	-	-
9	Air Velocity	Type S Pitot Tube	m/s	16.8	-	-	-
10	Volume Metric Flow Rate <sup>1/</sup>	Calculate	Nm <sup>3</sup> /hr	552,290	-	-	-
			m <sup>3</sup> /hr	650,549	-	-	-
11	Sulfur Dioxide <sup>1/</sup>	Absorption, Barium-Thorin Titrimetric Method	ppm	<1.3	800	60	-
			mg/Nm <sup>3</sup>	<3.4	2,096	157	-
12	Oxide of Nitrogen <sup>1/</sup>	Absorption, Phenoldisulfonic Acid Method	ppm	<2.1	200	200	-
			mg/Nm <sup>3</sup>	<3.9	376	376	-
13	Total Suspended Particulate <sup>1/</sup>	Isokinetic, Gravimetric Method	mg/Nm <sup>3</sup>	3.8	240	320	40
14	Carbon Monoxide <sup>1/</sup>	Instrumental Analyzer Method	ppm	<1.0	-	690	-
			mg/Nm <sup>3</sup>	<1.1	-	790	-

**Remark :** <sup>1/</sup> Reference condition is 25 degree Celsius at 1 Atmosphere and Dry Basis.

<sup>2/</sup> Notification of the Ministry of Science Technology and Environment dated March 9, B.E.2544 (2001), published in the Royal Government Gazette, Vol.118 Part 37D dated May 8, B.E.2544 (2001). (Existing Source)

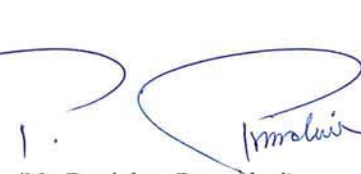
<sup>3/</sup> Notification of the Ministry of Industry B.E.2549 (2006), issued under Factory Act B.E.2535 (1992), published in the Royal Government Gazette No.123 Special Part 125D dated December 4, B.E.2549 (2006).

<sup>4/</sup> มาตรฐานที่กำหนดผลการพิจารณาการวิเคราะห์ผลการประเมินสิ่งแวดล้อม โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง ของบริษัท เหล็กก่อสร้างสยาม จำกัด (ปัจจุบันเปลี่ยนชื่อเป็นบริษัท สยาม สตีล การผลิต (ประเทศไทย) จำกัด (มหาชน) สาขาถ่านหินที่ 00005)



(Ms. Natnicha Sermmatiwong)

Laboratory Reviewer No.จ-099-จ-7666

(Ms. Panicha Promchai)

Laboratory Supervisor No.จ-099-จ-2414



## ANALYSIS REPORT

**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Maptaphut, Muang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Sampling Source** : Stack Air Quality  
**Sampling Point** : ปล่องของเตาอบเหล็กแท่ง (RHF)  
**GPS. Coordinate** : UTM (WGS84) 47P 0733486 E, 1402419 N  
**Sampling Date** : July 16, 2022  
**Sampling Time** : 09:30 – 10:40  
**Sampling Method** : US.EPA. Method 1-4, 5, 6, 7, 10  
**Sample Condition** : Good  
**Sampling By** : Mr.Watcharangkun Kongsang, Registration No.ว-099-จ-7672  
**Analyzed By** : Environment Research & Technology Co., Ltd. Laboratory Registration No.ว-099

**Analysis No.** : ST718/2565  
**Received Date** : July 16, 2022  
**Analytical Date** : July 16 – August 1, 2022  
**Report Date** : August 4, 2022

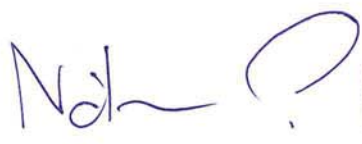
Item	Description	Method of Analysis	Unit	Result		Standard		
				Actual Condition	Convert to Excess Oxygen 7%	2/	3/	4/
1	Fuel Type	-	-	Natural Gas		-	-	-
2	Combustion System	-	-	Close		-	-	-
3	Stack Height	Measuring Tape	m.	63.0		-	-	-
4	Stack Diameter	Measuring Tape	m.	1.80		-	-	-
5	Flue Gas Temperature	Thermocouple	°C	389	-	-	-	-
6	Pressure in Stack	Incline Manometer	mmHg	758	-	-	-	-
7	Oxygen Rate	Electrochemical Sensor	%	10.5	-	-	-	-
8	Moisture	Condensation Method	%	6.7	-	-	-	-
9	Air Velocity	Type S Pitot Tube	m/s	16.9	-	-	-	-
10	Volume Metric Flow Rate <sup>1/</sup>	Calculate	Nm <sup>3</sup> /hr	69,518	-	-	-	-
			m <sup>3</sup> /hr	154,881	-	-	-	-
11	Sulfur Dioxide <sup>1/</sup>	Absorption, Barium-Thorin	ppm	<1.3	<1.3	800	60	60
		Titrimetric Method	mg/Nm <sup>3</sup>	<3.4	<3.4	2,096	157	157
12	Oxide of Nitrogen <sup>1/</sup>	Absorption, Phenoldisulfonic	ppm	<2.1	<2.1	200	200	150
		Acid Method	mg/Nm <sup>3</sup>	<3.9	<3.9	376	376	282
13	Total Suspended Particulate <sup>1/</sup>	Isokinetic, Gravimetric Method	mg/Nm <sup>3</sup>	12	16	240	320	-
14	Carbon Monoxide <sup>1/</sup>	Instrumental Analyzer	ppm	<1.0	<1.0	-	690	-
		Method	mg/Nm <sup>3</sup>	<1.1	<1.1	-	790	-


Remark : <sup>1/</sup> Reference condition is 25 degree Celsius at 1 Atmosphere and Dry Basis.

<sup>2/</sup> Notification of the Ministry of Science Technology and Environment dated March 9, B.E. 2544 (2001), published in the Royal Government Gazette, Vol. 118 Special Part 37 dated May 8, B.E.2544 (2001). (Existing Source)

<sup>3/</sup> Notification of the Ministry of Industry B.E.2549 (2006), issued under Factory Act B.E.2535 (1992), published in the Royal Government Gazette No.123 Special Part 125D dated December 4, B.E.2549 (2006).

<sup>4/</sup> มาตราฐานที่กำหนดตามผลการพิจารณาการเปลี่ยนแปลงระดับขีดจำกัดของค่าเฉลี่ยรายชั่วโมงของมลพิษทางอากาศ โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง ของบริษัท เหล็กก่อสร้างสยาม จำกัด (ปัจจุบันเปลี่ยนชื่อเป็นบริษัท ทาทา สตีล การผลิต (ประเทศไทย) จำกัด (มหาชน) สาขาฉะเชิงเทรา 00005)

  
(Ms.Natnicha Sermmatiwong)  
Laboratory Reviewer No.ว-099-จ-7666

  
(Ms.Panicha Promchai)  
Laboratory Supervisor No.ว-099-จ-2414



## ANALYSIS REPORT

**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Sampling Source** : Stack Air Quality  
**Sampling Point** : ปล่องที่ผ่านโรงกำจัดฝุ่น (Fume Plant # 1)  
**GPS. Coordinate** : UTM (WGS84) 47P 0733506 E, 1402545 N  
**Sampling Date** : October 17, 2022  
**Sampling Time** : 11:10-12:10  
**Sampling Method** : US.EPA. Method 1-4, 5, 6C, 7E, 10  
**Sampling By** : Mr.Chayanut Boongantong, Registration No. ว-099-จ-7675  
**Analyzed By** : Environment Research & Technology Co., Ltd. Laboratory  
Registration No.ว-099

**Quotation No.** : 2022-00059  
**Analysis No.** : 2022-AD908-001  
**Received Date** : October 20, 2022  
**Analytical Date** : October 26, 2022  
**Report No.** : 2022-RAAI261  
**Report Date** : November 8, 2022

Item	Description	Method of Analysis	Unit	Result	Standard <sup>2'</sup>	Standard <sup>3'</sup>	Standard <sup>4'</sup>
1	Fuel Type	-	-	Electric Furnace	-	-	-
2	Combustion System	-	-	Open	-	-	-
3	Stack Height	Measuring Tape	m	30.0	-	-	-
4	Stack Diameter	Measuring Tape	m	4.50	-	-	-
5	Flue Gas Temperature	Thermocouple	°C	71	-	-	-
6	Pressure in Stack	Incline Manometer	mmHg	758	-	-	-
7	Oxygen Rate	Electrochemical Sensor	%	20.6	-	-	-
8	Moisture	Condensation Method	%	4.7	-	-	-
9	Air Velocity	Type S Pitot Tube	m/s	10.6	-	-	-
10	Volume Metric Flow Rate	Calculate	Nm <sup>3</sup> /hr	526,001	-	-	-
11	Volume Metric Flow Rate	Calculate	m <sup>3</sup> /hr	608,817	-	-	-
12	Sulfur Dioxide (SO <sub>2</sub> ) <sup>1'</sup>	Instrumental Analyzer Method	ppm	<1.0	800	60	-
13	Sulfur Dioxide (SO <sub>2</sub> ) <sup>1'</sup>	Instrumental Analyzer Method	mg/m <sup>3</sup>	<2.6	2,096	157	-
14	Oxide of Nitrogen (NOx) <sup>1'</sup>	Instrumental Analyzer Method	ppm	3.7	200	200	-
15	Oxide of Nitrogen (NOx) <sup>1'</sup>	Instrumental Analyzer Method	mg/m <sup>3</sup>	7.0	376	376	-
16	Total Suspended Particulate <sup>1'</sup>	Isokinetic, Gravimetric	mg/m <sup>3</sup>	2.6	240	320	40
17	Carbon Monoxide (CO) <sup>1'</sup>	Instrumental Analyzer Method	ppm	4.4	-	690	-
18	Carbon Monoxide (CO) <sup>1'</sup>	Instrumental Analyzer Method	mg/m <sup>3</sup>	5.0	-	790	-

**Remark :** <sup>1'</sup> Reference condition is 25 degree Celsius at 1 Atmosphere and Dry Basis.

<sup>2'</sup> Notification of the Ministry of Science Technology and Environment dated March 9, B.E.2544 (2001), published in the Royal Government Gazette, Vol.118 Part 37D dated May 8, B.E.2544 (2001). (Existing Source)

<sup>3'</sup> Notification of the Ministry of Industry B.E.2549 (2006), issued under Factory Act B.E.2535 (1992), published in the Royal Government Gazette No.123 Special Part 125D dated December 4, B.E.2549 (2006).

<sup>4'</sup> มาตรฐานที่กำหนดตามผลการพิจารณาการวิเคราะห์ผลกระทบสิ่งแวดล้อม โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง ของบริษัท เหล็กก่อสร้างสยาม จำกัด (ปัจจุบันเปลี่ยนชื่อเป็นบริษัท ทาทา สตีล การผลิต (ประเทศไทย) จำกัด (มหาชน) สาขาลำดับที่ 00005)

(Ms.Natnicha Sermmatiwong)  
Laboratory Reviewer No. ว-099-ค-7666

(Ms.Ramita Taengthai)  
Laboratory Supervisor No. ว-099-ค-7664


## ANALYSIS REPORT

**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Sampling Source** : Stack Air Quality  
**Sampling Point** : ปล่องที่ผ่านโรงกำจัดฝุ่น (Fume Plant # 2)  
**GPS. Coordinate** : UTM (WGS84) 47P 0733518 E, 1402528 N  
**Sampling Date** : October 17, 2022  
**Sampling Time** : 09:50-10:50  
**Sampling Method** : US.EPA. Method 1-4, 5, 6C, 7E, 10  
**Sampling By** : Mr.Chayanut Boongantong, Registration No. ว-099-จ-7675  
**Analyzed By** : Environment Research & Technology Co., Ltd. Laboratory  
Registration No.ว-099

**Quotation No.** : 2022-00059  
**Analysis No.** : 2022-AD908-002  
**Received Date** : October 17, 2022  
**Analytical Date** : October 27, 2022  
**Report No.** : 2022-RAAI262  
**Report Date** : November 8, 2022

Item	Description	Method of Analysis	Unit	Result	Standard <sup>2'</sup>	Standard <sup>3'</sup>	Standard <sup>4'</sup>
1	Fuel Type	-	-	Electric Furnace	-	-	-
2	Combustion System	-	-	Open	-	-	-
3	Stack Height	Measuring Tape	m	30.0	-	-	-
4	Stack Diameter	Measuring Tape	m	3.70	-	-	-
5	Flue Gas Temperature	Thermocouple	°C	98	-	-	-
6	Pressure in Stack	Incline Manometer	mmHg	759	-	-	-
7	Oxygen Rate	Electrochemical Sensor	%	20.7	-	-	-
8	Moisture	Condensation Method	%	4.4	-	-	-
9	Air Velocity	Type S Pitot Tube	m/s	15.2	-	-	-
10	Volume Metric Flow Rate	Calculate	Nm <sup>3</sup> /hr	473,746	-	-	-
11	Volume Metric Flow Rate	Calculate	m <sup>3</sup> /hr	590,366	-	-	-
12	Sulfur Dioxide (SO <sub>2</sub> ) <sup>1'</sup>	Instrumental Analyzer Method	ppm	<1.0	800	60	-
13	Sulfur Dioxide (SO <sub>2</sub> ) <sup>1'</sup>	Instrumental Analyzer Method	mg/m <sup>3</sup>	<2.6	2,096	157	-
14	Oxide of Nitrogen (NOx) <sup>1'</sup>	Instrumental Analyzer Method	ppm	2.6	200	200	-
15	Oxide of Nitrogen (NOx) <sup>1'</sup>	Instrumental Analyzer Method	mg/m <sup>3</sup>	4.9	376	376	-
16	Total Suspended Particulate <sup>1'</sup>	Isokinetic, Gravimetric	mg/m <sup>3</sup>	<1.0	240	320	40
17	Carbon Monoxide (CO) <sup>1'</sup>	Instrumental Analyzer Method	ppm	8.9	-	690	-
18	Carbon Monoxide (CO) <sup>1'</sup>	Instrumental Analyzer Method	mg/m <sup>3</sup>	10	-	790	-

**Remark :** <sup>1'</sup> Reference condition is 25 degree Celsius at 1 Atmosphere and Dry Basis.  
<sup>2'</sup> Notification of the Ministry of Science Technology and Environment dated March 9, B.E.2544 (2001), published in the Royal Government Gazette, Vol.118 Part 37D dated May 8, B.E.2544 (2001). (Existing Source)  
<sup>3'</sup> Notification of the Ministry of Industry B.E.2549 (2006), issued under Factory Act B.E.2535 (1992), published in the Royal Government Gazette No.123 Special Part 125D dated December 4, B.E.2549 (2006).  
<sup>4'</sup> มาตรฐานที่กำหนดตามผลการพิจารณาการวิเคราะห์ผลกระทบสิ่งแวดล้อม โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง ของบริษัท เหล็กก่อสร้างสยาม จำกัด (ปัจจุบันเปลี่ยนชื่อเป็นบริษัท ทาทา สตีล การผลิต (ประเทศไทย) จำกัด (มหาชน) สาขาลำดับที่ 00005)

  
(Ms.Natricha Sermmatiwong)  
Laboratory Reviewer No. ว-099-ค-7666

  
(Ms.Ramita Taengthai)  
Laboratory Supervisor No. ว-099-ค-7664



## ANALYSIS REPORT

**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Sampling Source** : Stack Air Quality  
**Sampling Point** : ปล่องของเตาอบเหล็กแห่ง (RHF)  
**GPS. Coordinate** : UTM (WGS84) 47P 0733481 E, 1402417 N  
**Sampling Date** : October 17, 2022  
**Sampling Time** : 12:50-13:50  
**Sampling Method** : US.EPA. Method 1-4, 5, 6C, 7E, 10  
**Sampling By** : Mr.Chayanut Boongantong, Registration No. ว-099-จ-7675  
**Analyzed By** : Environment Research & Technology Co., Ltd. Laboratory  
Registration No.ว-099

**Quotation No.** : 2022-00059  
**Analysis No.** : 2022-AD908-004  
**Received Date** : October 20, 2022  
**Analytical Date** : October 20-November 16, 2022  
**Report No.** : 2022-RAAI814  
**Report Date** : November 16, 2022


Item	Description	Method of Analysis	Unit	Result		Standard <sup>2'</sup>	Standard <sup>3'</sup>	Standard <sup>4'</sup>
				Actual Condition	Convert to Excess Oxygen 7%			
1	Fuel Type	-	-	Natural Gas		-	-	-
2	Combustion System	-	-	Close		-	-	-
3	Stack Height	Measuring Tape	m	63.0		-	-	-
4	Stack Diameter	Measuring Tape	m	1.80		-	-	-
5	Flue Gas Temperature	Thermocouple	°C	390	-	-	-	-
6	Pressure in Stack	Incline Manometer	mmHg	758	-	-	-	-
7	Oxygen Rate	Electrochemical Sensor	%	9.7	-	-	-	-
8	Moisture	Condensation Method	%	5.7	-	-	-	-
9	Air Velocity	Type S Pitot Tube	m/s	10.9	-	-	-	-
10	Volume Metric Flow Rate <sup>1'</sup>	Calculate	Nm <sup>3</sup> /hr	44,920	-	-	-	-
11	Volume Metric Flow Rate	Calculate	m <sup>3</sup> /hr	100,282	-	-	-	-
12	Sulfur Dioxide (SO <sub>2</sub> ) <sup>1'</sup>	Instrumental Analyzer Method	ppm	<1.0	<1.0	800	60	60
13	Sulfur Dioxide (SO <sub>2</sub> ) <sup>1'</sup>	Instrumental Analyzer Method	mg/m <sup>3</sup>	<2.6	<2.6	2,096	157	157
14	Oxide of Nitrogen (NO <sub>x</sub> ) <sup>1'</sup>	Instrumental Analyzer Method	ppm	33	41	200	200	150
15	Oxide of Nitrogen (NO <sub>x</sub> ) <sup>1'</sup>	Instrumental Analyzer Method	mg/m <sup>3</sup>	63	78	376	376	282
16	Total Suspended Particulate <sup>1'</sup>	Isokinetic, Gravimetric	mg/m <sup>3</sup>	6.2	7.7	240	320	-
17	Carbon Monoxide (CO) <sup>1'</sup>	Instrumental Analyzer Method	ppm	7.1	8.8	-	690	-
18	Carbon Monoxide (CO) <sup>1'</sup>	Instrumental Analyzer Method	mg/m <sup>3</sup>	8.1	10.1	-	790	-

**Remark :** <sup>1'</sup> Reference condition is 25 degree Celsius at 1 Atmosphere and Dry Basis.  
<sup>2'</sup> Notification of the Ministry of Science Technology and Environment dated March 9, B.E.2544 (2001), published in the Royal Government Gazette, Vol.118 Part 37D dated May 8, B.E.2544 (2001). (Existing Source)  
<sup>3'</sup> Notification of the Ministry of Industry B.E.2549 (2006), issued under Factory Act B.E.2535 (1992), published in the Royal Government Gazette No.123 Special Part 125D dated December 4, B.E.2549 (2006).  
<sup>4'</sup> มาตรฐานที่กำหนดตามผลการพิจารณาการวิเคราะห์ผลกระทบสิ่งแวดล้อม โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง ของบริษัท เหล็กก่อสร้างสยาม จำกัด (ปัจจุบันเปลี่ยนชื่อเป็นบริษัท ทาทา สตีล การผลิต (ประเทศไทย) จำกัด (มหาชน) สาขาลำดับที่ 00005)

  
(Ms.Natnicha Sermmatiwong)

Laboratory Reviewer No. ว-099-ค-7666



  
(Ms.Ramita Taengthai)

Laboratory Supervisor No. ว-099-ค-7664

## ANALYSIS REPORT

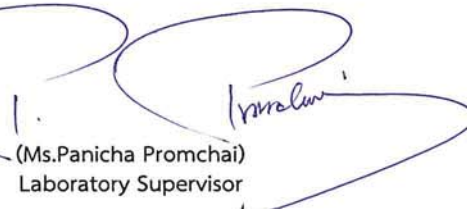
**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Sampling Source** : Work Place Air Quality  
**Sampling Date** : October 17, 2022 **Analysis No.** : WA603/2565  
**Sampling Time** : 09:33 - 11:46 **Received Date** : October 20, 2022  
**Sampling Method** : NIOSH, OSHA **Analytical Date** : October 20 - 21, 2022  
**Sampling Condition** : Good **Report Date** : October 24, 2022  
**Sampling By** : Mr.Natthapon Suttimon (Personnel of Environment Research & Technology Co., Ltd.)

Item	Sampling Area	Parameter	Method of Analysis	Unit	Result	Standard	
						Thai <sup>1/</sup>	ACGIH <sup>2/</sup>
1	บริเวณหน้าเตาหลอมเหล็ก EAF	Inhalable Dust	Gravimetric	mg/m <sup>3</sup>	8.7	-	10
		Respirable Dust	Gravimetric	mg/m <sup>3</sup>	1.8	-	3
2	บริเวณจุดปฏิบัติงาน CCM	Inhalable Dust	Gravimetric	mg/m <sup>3</sup>	2.8	-	10
		Respirable Dust	Gravimetric	mg/m <sup>3</sup>	1.5	-	3
3	บริเวณลานแท่นรีด	Inhalable Dust	Gravimetric	mg/m <sup>3</sup>	0.19	-	10
		Respirable Dust	Gravimetric	mg/m <sup>3</sup>	<0.10	-	3
4	บริเวณลานนับเหล็กของผู้รับเหมา	Inhalable Dust	Gravimetric	mg/m <sup>3</sup>	<0.10	-	10
		Respirable Dust	Gravimetric	mg/m <sup>3</sup>	<0.10	-	3

**Remark :** 1/ The Announcement of the Department of Labour Protection and Welfare, issued under the Labour Ministerial Regulation, B.E.2556 (2013), published in the Royal Government Gazette Volume 134 Special Part 198D dated August 3, B.E.2560 (2017).  
2/ ACGIH = American Conference of Governmental Industrial Hygienists, 2021.

  
(Ms.Natnicha Sermmatiwong)  
Laboratory Reviewer



  
(Ms.Panicha Promchai)  
Laboratory Supervisor




## ANALYSIS REPORT

**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Sampling Source** : Ambient Air Quality  
**Sampling Point** : บริเวณโรงพยาบาลส่งเสริมสุขภาพตำบลมาตาพุด ตำบลมาตาพุด อำเภอเมืองระยอง จังหวัดระยอง (ทางทิศเหนือของโครงการ)  
**GPS. Coordinate** : UTM (WGS84) 47P 0735195 E, 1405887 N  
**Sampling Date** : October 17-20, 2022  
**Sampling Time** : 10:45  
**Sampling Method** : U.S. EPA 40 CFR Part 50  
**Sample Condition** : Good  
**Sampling By** : Mr.Assada Chaiyawong  
**Analyzed By** : Environment Research & Technology Co., Ltd.

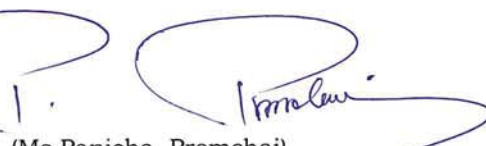
**Analysis No.** : AB1252/2565  
**Received Date** : October 21, 2022  
**Analytical Date** : October 21-27, 2022  
**Report Date** : November 4, 2022

Parameter	Unit	Method of Analysis	Result			Standard <sup>1/</sup>
			Oct 17-18, 22	Oct 18-19, 22	Oct 19-20, 22	
Total Suspended Particulate (TSP) 24 Hours Average	mg/m <sup>3</sup>	High-Volume, Gravimetric Method	0.101	0.108	0.107	0.330
Particulate Size Less Than 10 Micron (PM10) 24 Hours Average	mg/m <sup>3</sup>	PM10 Size Selective, High-Volume, Gravimetric Method	0.058	0.065	0.065	0.120
Sulfur Dioxide (SO <sub>2</sub> ) 24 Hours Average	ppm	Pararosaniline Method	<0.003	<0.003	<0.003	0.120

**Remark :** <sup>1/</sup> Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 42D dated May 25, B.E.2538 (1995) and Notification No.24, B.E.2547 (2004), published in the Royal Government Gazette No.121 Special Part 104D dated September 22, B.E.2547 (2004), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).

  
(Ms.Natnicha Sermmatiwong)  
Laboratory Reviewer



  
(Ms.Panicha Promchai)  
Laboratory Supervisor

## ANALYSIS REPORT

**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Sampling Source** : Ambient Air Quality  
**Sampling Point** : บริเวณริมรั้วโรงงานทางด้านทิศเหนือ  
**GPS. Coordinate** : UTM (WGS84) 47P 0733501 E, 1402603 N  
**Sampling Date** : October 17-20, 2022  
**Sampling Time** : 12:00  
**Sampling Method** : U.S. EPA 40 CFR Part 50  
**Sample Condition** : Good  
**Sampling By** : Mr.Assada Chaiyawong  
**Analyzed By** : Environment Research & Technology Co., Ltd.


**Analysis No.** : AB1253/2565  
**Received Date** : October 21, 2022  
**Analytical Date** : October 21-27, 2022  
**Report Date** : November 4, 2022

Parameter	Unit	Method of Analysis	Result			Standard <sup>1/</sup>
			Oct 17-18, 22	Oct 18-19, 22	Oct 19-20, 22	
Total Suspended Particulate (TSP) 24 Hours Average	mg/m <sup>3</sup>	High-Volume, Gravimetric Method	0.099	0.107	0.103	0.330
Particulate Size Less Than 10 Micron (PM10) 24 Hours Average	mg/m <sup>3</sup>	PM10 Size Selective, High-Volume, Gravimetric Method	0.058	0.070	0.063	0.120
Sulfur Dioxide (SO <sub>2</sub> ) 24 Hours Average	ppm	Pararosaniline Method	<0.003	<0.003	<0.003	0.120

**Remark :** <sup>1/</sup> Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 42D dated May 25, B.E.2538 (1995) and Notification No.24, B.E.2547 (2004), published in the Royal Government Gazette No.121 Special Part 104D dated September 22, B.E.2547 (2004), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).

  
(Ms.Natnicha Sermmatiwong)  
Laboratory Reviewer



  
(Ms.Panicha Promchai)  
Laboratory Supervisor




## ANALYSIS REPORT

**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Sampling Source** : Ambient Air Quality  
**Sampling Point** : บริเวณริมรั้วโรงงานทางด้านทิศใต้  
**GPS. Coordinate** : UTM (WGS84) 47P 0733148 E, 1402364 N  
**Sampling Date** : October 17-20, 2022  
**Sampling Time** : 12:40  
**Sampling Method** : U.S. EPA 40 CFR Part 50  
**Sample Condition** : Good  
**Sampling By** : Mr.Assada Chaiyawong  
**Analyzed By** : Environment Research & Technology Co., Ltd.

**Analysis No.** : AB1254/2565  
**Received Date** : October 21, 2022  
**Analytical Date** : October 21-27, 2022  
**Report Date** : November 4, 2022

Parameter	Unit	Method of Analysis	Result			Standard <sup>1/</sup>
			Oct 17-18, 22	Oct 18-19, 22	Oct 19-20, 22	
Total Suspended Particulate (TSP) 24 Hours Average	mg/m <sup>3</sup>	High-Volume, Gravimetric Method	0.176	0.195	0.171	0.330
Particulate Size Less Than 10 Micron (PM10) 24 Hours Average	mg/m <sup>3</sup>	PM10 Size Selective, High-Volume, Gravimetric Method	0.087	0.089	0.083	0.120
Sulfur Dioxide (SO <sub>2</sub> ) 24 Hours Average	ppm	Pararosaniline Method	0.010	0.007	0.007	0.120

**Remark :** <sup>1/</sup> Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 42D dated May 25, B.E.2538 (1995) and Notification No.24, B.E.2547 (2004), published in the Royal Government Gazette No.121 Special Part 104D dated September 22, B.E.2547 (2004), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).

  
(Ms.Natnicha Sermmatiwong)  
Laboratory Reviewer



  
(Ms.Panicha Promchai)  
Laboratory Supervisor

## ANALYSIS REPORT

**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Measured Source** : Ambient Air Quality  
**Measured Point** : บริเวณโรงพยาบาลส่งเสริมสุขภาพตำบลมาตาพุด ตำบลมาตาพุด อำเภอเมืองระยอง จังหวัดระยอง (ทางทิศเหนือของโครงการ)  
**GPS. Coordinate** : UTM (WGS84) 47P 0735195 E, 1405887 N  
**Measured Date** : October 17-20, 2022  
**Measured By** : Mr.Assada Chaiyawong  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Measured Instrument** : NOx Chemiluminescence Analyzer Horiba Model APNA-370 Serial Number U65W031M  
**Reported Number** : ASA092-NO<sub>2</sub>-2565 **Report Date** : November 4, 2022

Interval Time	Result NO <sub>2</sub> (ppm)			Standard <sup>1/</sup>
	Oct 17-18, 22	Oct 18-19, 22	Oct 19-20, 22	
11:00 - 12:00	0.0149	0.0159	0.0219	
12:00 - 13:00	0.0160	0.0158	0.0173	
13:00 - 14:00	0.0159	0.0151	0.0187	
14:00 - 15:00	0.0149	0.0176	0.0184	
15:00 - 16:00	0.0262	0.0169	0.0201	
16:00 - 17:00	0.0381	0.0163	0.0187	
17:00 - 18:00	0.0420	0.0238	0.0261	
18:00 - 19:00	0.0403	0.0421	0.0358	
19:00 - 20:00	0.0214	0.0415	0.0448	
20:00 - 21:00	0.0289	0.0373	0.0474	
21:00 - 22:00	0.0343	0.0376	0.0399	
22:00 - 23:00	0.0373	0.0476	0.0442	
23:00 - 00:00	0.0410	0.0430	0.0444	
00:00 - 01:00	0.0283	0.0366	0.0343	
01:00 - 02:00	0.0212	0.0305	0.0224	
02:00 - 03:00	0.0204	0.0204	0.0181	
03:00 - 04:00	0.0177	0.0183	0.0157	
04:00 - 05:00	0.0178	0.0174	0.0133	
05:00 - 06:00	0.0174	0.0163	0.0147	
06:00 - 07:00	0.0207	0.0195	0.0186	
07:00 - 08:00	0.0300	0.0243	0.0265	
08:00 - 09:00	0.0297	0.0253	0.0271	
09:00 - 10:00	0.0223	0.0235	0.0231	
10:00 - 11:00	0.0168	0.0185	0.0196	
<b>24 Hours Average</b>	<b>0.0256</b>	<b>0.0259</b>	<b>0.0263</b>	-
<b>1 Hour Maximum</b>	<b>0.0420</b>	<b>0.0476</b>	<b>0.0474</b>	NO <sub>2</sub> ≤ 0.17

**Remark :** <sup>1/</sup> Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 42D dated May 25, B.E.2538 (1995), Notification No.28, B.E.2550 (2007), published in the Royal Government Gazette No.124 Special Part 58D dated May 14, B.E.2550 (2007) and Notification No.33, B.E.2552 (2009), published in the Royal Government Gazette No.126 Special Part 114D dated August 14, B.E.2552 (2009), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).

(Ms.Thiranat Khunngoen)  
Laboratory Reviewer



(Ms.Panicha Promchai)  
Laboratory Supervisor



## ANALYSIS REPORT

**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Measured Source** : Ambient Air Quality  
**Measured Point** : บริเวณโรงพยาบาลส่งเสริมสุขภาพตำบลมาตาพุด ตำบลมาตาพุด อำเภอเมืองระยอง จังหวัดระยอง (ทางทิศเหนือของโครงการ)  
**GPS. Coordinate** : UTM (WGS84) 47P 0735195 E, 1405887 N  
**Measured Date** : October 17-20, 2022  
**Measured By** : Mr.Assada Chaiyawong  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Measured Instrument** : CO NDIR Analyzer Horiba Model APMA-370 Serial Number 4N02XP27  
**Reported Number** : ASA092-CO-2565 **Report Date** : November 4, 2022

Interval Time	Result CO (ppm)						Standard <sup>1/</sup>
	Oct 17-18, 22		Oct 18-19, 22		Oct 19-20, 22		
	1 hr Avg	8 hr Avg	1 hr Avg	8 hr Avg	1 hr Avg	8 hr Avg	
11:00 - 12:00	0.3	-	0.3	0.4	0.4	0.5	
12:00 - 13:00	0.3	-	0.3	0.4	0.4	0.5	
13:00 - 14:00	0.3	-	0.3	0.4	0.4	0.5	
14:00 - 15:00	0.3	-	0.3	0.4	0.4	0.5	
15:00 - 16:00	0.4	-	0.3	0.4	0.4	0.4	
16:00 - 17:00	0.4	-	0.4	0.3	0.4	0.4	
17:00 - 18:00	0.5	-	0.5	0.4	0.5	0.4	
18:00 - 19:00	0.7	0.4	0.7	0.4	0.8	0.5	
19:00 - 20:00	0.5	0.4	0.9	0.5	1.2	0.6	
20:00 - 21:00	0.6	0.5	0.7	0.5	1.2	0.7	
21:00 - 22:00	0.8	0.5	0.8	0.6	0.9	0.7	
22:00 - 23:00	0.8	0.6	0.8	0.6	1.0	0.8	
23:00 - 00:00	0.7	0.6	0.7	0.7	0.8	0.9	
00:00 - 01:00	0.6	0.7	0.7	0.7	0.6	0.9	
01:00 - 02:00	0.5	0.7	0.5	0.7	0.5	0.9	
02:00 - 03:00	0.4	0.6	0.4	0.7	0.4	0.8	
03:00 - 04:00	0.4	0.6	0.4	0.6	0.4	0.7	
04:00 - 05:00	0.4	0.6	0.4	0.6	0.4	0.6	
05:00 - 06:00	0.4	0.5	0.4	0.5	0.4	0.6	
06:00 - 07:00	0.4	0.5	0.5	0.5	0.4	0.5	
07:00 - 08:00	0.6	0.5	0.6	0.5	0.5	0.5	
08:00 - 09:00	0.5	0.5	0.6	0.5	0.6	0.5	
09:00 - 10:00	0.4	0.4	0.5	0.5	0.5	0.5	
10:00 - 11:00	0.4	0.4	0.4	0.5	0.4	0.5	
24 Hours Average	0.5	-	0.5	-	0.6	-	-
1 Hour Maximum	0.8	-	0.9	-	1.2	-	30
8 Hours Maximum	-	0.7	-	0.7	-	0.9	9

Remark : <sup>1/</sup> Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 42D dated May 25, B.E.2538 (1995), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).

(Ms.Thiranat Khunngoen)  
Laboratory Reviewer

(Ms.Panicha Promchai)  
Laboratory Supervisor



## ANALYSIS REPORT

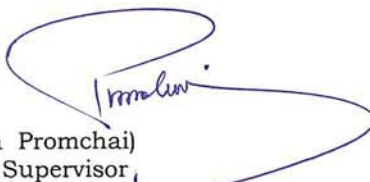
**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Measured Source** : Ambient Air Quality  
**Measured Point** : บริเวณริมรั้วโรงงานทางด้านทิศเหนือ  
**GPS. Coordinate** : UTM (WGS84) 47P 0733501 E, 1402603 N  
**Measured Date** : October 17-20, 2022  
**Measured By** : Mr.Assada Chaiyawong  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Measured Instrument** : NOx Chemiluminescence Analyzer Horiba Model APNA-370 Serial Number M4286P23  
**Reported Number** : ASA093-NO<sub>2</sub>-2565 **Report Date** : November 4, 2022

Interval Time	Result NO <sub>2</sub> (ppm)			Standard <sup>1/</sup>
	Oct 17-18, 22	Oct 18-19, 22	Oct 19-20, 22	
12:00 - 13:00	0.0209	0.0104	0.0074	
13:00 - 14:00	0.0163	0.0079	0.0174	
14:00 - 15:00	0.0469	0.0213	0.0173	
15:00 - 16:00	0.0158	0.0282	0.0404	
16:00 - 17:00	0.0144	0.0127	0.0282	
17:00 - 18:00	0.0158	0.0095	0.0135	
18:00 - 19:00	0.0175	0.0107	0.0199	
19:00 - 20:00	0.0128	0.0175	0.0119	
20:00 - 21:00	0.0179	0.0211	0.0208	
21:00 - 22:00	0.0280	0.0206	0.0130	
22:00 - 23:00	0.0279	0.0295	0.0157	
23:00 - 00:00	0.0296	0.0310	0.0184	
00:00 - 01:00	0.0270	0.0304	0.0184	
01:00 - 02:00	0.0323	0.0218	0.0153	
02:00 - 03:00	0.0145	0.0166	0.0198	
03:00 - 04:00	0.0133	0.0297	0.0328	
04:00 - 05:00	0.0256	0.0425	0.0285	
05:00 - 06:00	0.0321	0.0349	0.0331	
06:00 - 07:00	0.0404	0.0299	0.0334	
07:00 - 08:00	0.0385	0.0320	0.0316	
08:00 - 09:00	0.0435	0.0353	0.0368	
09:00 - 10:00	0.0186	0.0257	0.0265	
10:00 - 11:00	0.0132	0.0170	0.0155	
11:00 - 12:00	0.0114	0.0156	0.0106	
<b>24 Hours Average</b>	<b>0.0239</b>	<b>0.0230</b>	<b>0.0219</b>	-
<b>1 Hour Maximum</b>	<b>0.0469</b>	<b>0.0425</b>	<b>0.0404</b>	<b>NO<sub>2</sub> ≤ 0.17</b>

**Remark :** <sup>1/</sup> Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 42D dated May 25, B.E.2538 (1995), Notification No.28, B.E.2550 (2007), published in the Royal Government Gazette No.124 Special Part 58D dated May 14, B.E.2550 (2007) and Notification No.33, B.E.2552 (2009), published in the Royal Government Gazette No.126 Special Part 114D dated August 14, B.E.2552 (2009), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).

  
(Ms.Thiranat Khunngoen)  
Laboratory Reviewer



  
(Ms.Panicha Promchai)  
Laboratory Supervisor



## ANALYSIS REPORT

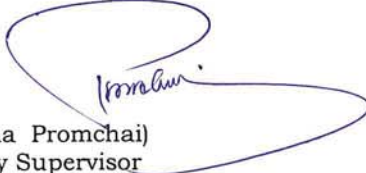
**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Measured Source** : Ambient Air Quality  
**Measured Point** : บริเวณริมรั้วโรงงานทางด้านทิศเหนือ  
**GPS. Coordinate** : UTM (WGS84) 47P 0733501 E, 1402603 N  
**Measured Date** : October 17-20, 2022  
**Measured By** : Mr.Assada Chaiyawong  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Measured Instrument** : CO NDIR Analyzer Horiba Model APMA-370 Serial Number RBBRW0L3  
**Reported Number** : ASA093-CO-2565 **Report Date** : November 4, 2022

Interval Time	Result CO (ppm)						Standard <sup>1/</sup>
	Oct 17-18, 22		Oct 18-19, 22		Oct 19-20, 22		
	1 hr Avg	8 hr Avg	1 hr Avg	8 hr Avg	1 hr Avg	8 hr Avg	
12:00 - 13:00	0.5	-	0.4	0.4	0.4	0.5	
13:00 - 14:00	0.4	-	0.4	0.4	0.5	0.5	
14:00 - 15:00	0.4	-	0.4	0.4	0.5	0.5	
15:00 - 16:00	0.4	-	0.4	0.4	0.5	0.5	
16:00 - 17:00	0.4	-	0.4	0.4	0.5	0.5	
17:00 - 18:00	0.4	-	0.4	0.4	0.4	0.5	
18:00 - 19:00	0.5	-	0.4	0.4	0.5	0.5	
19:00 - 20:00	0.5	0.4	0.4	0.4	0.4	0.5	
20:00 - 21:00	0.5	0.4	0.4	0.4	0.5	0.5	
21:00 - 22:00	0.5	0.5	0.5	0.4	0.5	0.5	
22:00 - 23:00	0.6	0.5	0.7	0.5	0.6	0.5	
23:00 - 00:00	0.7	0.5	0.7	0.5	0.6	0.5	
00:00 - 01:00	0.6	0.5	0.8	0.5	0.6	0.5	
01:00 - 02:00	0.5	0.6	0.2	0.5	0.5	0.5	
02:00 - 03:00	0.5	0.6	0.5	0.5	0.5	0.5	
03:00 - 04:00	0.5	0.6	0.5	0.5	0.5	0.5	
04:00 - 05:00	0.5	0.6	0.5	0.6	0.4	0.5	
05:00 - 06:00	0.4	0.5	0.5	0.6	0.5	0.5	
06:00 - 07:00	0.4	0.5	0.5	0.5	0.5	0.5	
07:00 - 08:00	0.5	0.5	0.5	0.5	0.5	0.5	
08:00 - 09:00	0.5	0.5	0.5	0.5	0.5	0.5	
09:00 - 10:00	0.5	0.5	0.5	0.5	0.5	0.5	
10:00 - 11:00	0.4	0.5	0.5	0.5	0.5	0.5	
11:00 - 12:00	0.4	0.5	0.4	0.5	0.4	0.5	
24 Hours Average	0.5	-	0.5	-	0.5	-	-
1 Hour Maximum	0.7	-	0.8	-	0.6	-	30
8 Hours Maximum	-	0.6	-	0.6	-	0.5	9

Remark : <sup>1/</sup> Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 42D dated May 25, B.E.2538 (1995), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).

  
(Ms. Thirarat Khunngoen)  
Laboratory Reviewer



  
(Ms. Panicha Promchai)  
Laboratory Supervisor

## ANALYSIS REPORT

**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Measured Source** : Ambient Air Quality  
**Measured Point** : บริเวณริมรั้วโรงงานทางด้านทิศใต้  
**GPS. Coordinate** : UTM (WGS84) 47P 0733148 E, 1402364 N  
**Measured Date** : October 17-20, 2022  
**Measured By** : Mr.Assada Chaiyawong  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Measured Instrument** : NOx Chemiluminescence Analyzer Horiba Model APNA-370 Serial Number J6GUBA4N  
**Reported Number** : ASA094-NO<sub>2</sub>-2565 **Report Date** : November 4, 2022

Interval Time	Result NO <sub>2</sub> (ppm)			Standard <sup>1/</sup>
	Oct 17-18, 22	Oct 18-19, 22	Oct 19-20, 22	
13:00 - 14:00	0.0145	0.0203	0.0173	
14:00 - 15:00	0.0211	0.0224	0.0295	
15:00 - 16:00	0.0182	0.0245	0.0440	
16:00 - 17:00	0.0283	0.0190	0.0373	
17:00 - 18:00	0.0302	0.0225	0.0245	
18:00 - 19:00	0.0363	0.0236	0.0276	
19:00 - 20:00	0.0341	0.0339	0.0391	
20:00 - 21:00	0.0334	0.0363	0.0267	
21:00 - 22:00	0.0433	0.0475	0.0373	
22:00 - 23:00	0.0491	0.0365	0.0300	
23:00 - 00:00	0.0339	0.0445	0.0250	
00:00 - 01:00	0.0256	0.0320	0.0295	
01:00 - 02:00	0.0455	0.0243	0.0234	
02:00 - 03:00	0.0345	0.0183	0.0432	
03:00 - 04:00	0.0341	0.0323	0.0454	
04:00 - 05:00	0.0435	0.0398	0.0443	
05:00 - 06:00	0.0423	0.0426	0.0396	
06:00 - 07:00	0.0428	0.0417	0.0435	
07:00 - 08:00	0.0511	0.0395	0.0473	
08:00 - 09:00	0.0463	0.0456	0.0458	
09:00 - 10:00	0.0269	0.0452	0.0377	
10:00 - 11:00	0.0191	0.0409	0.0221	
11:00 - 12:00	0.0212	0.0301	0.0192	
12:00 - 13:00	0.0169	0.0313	0.0066	
<b>24 Hours Average</b>	<b>0.0330</b>	<b>0.0331</b>	<b>0.0327</b>	-
<b>1 Hour Maximum</b>	<b>0.0511</b>	<b>0.0475</b>	<b>0.0473</b>	NO <sub>2</sub> ≤ 0.17

**Remark :** <sup>1/</sup> Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 42D dated May 25, B.E.2538 (1995), Notification No.28, B.E.2550 (2007), published in the Royal Government Gazette No.124 Special Part 58D dated May 14, B.E.2550 (2007) and Notification No.33, B.E.2552 (2009), published in the Royal Government Gazette No.126 Special Part 114D dated August 14, B.E.2552 (2009), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).

  
(Ms.Thiranat Khunngoen)  
Laboratory Reviewer



  
(Ms.Panicha Promchai)  
Laboratory Supervisor



## ANALYSIS REPORT

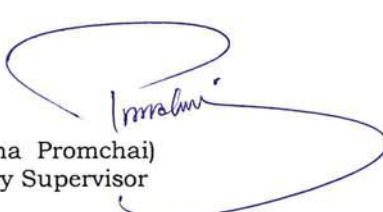
**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Measured Source** : Ambient Air Quality  
**Measured Point** : บริเวณริมรั้วโรงงานทางด้านทิศใต้  
**GPS. Coordinate** : UTM (WGS84) 47P 0733148 E, 1402364 N  
**Measured Date** : October 17-20, 2022  
**Measured By** : Mr.Assada Chaiyawong  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Measured Instrument** : CO NDIR Analyzer Horiba Model APMA-370 Serial Number YKAC090F  
**Reported Number** : ASA094-CO-2565 **Report Date** : November 4, 2022

Interval Time	Result CO (ppm)						Standard <sup>1/</sup>
	Oct 17-18, 22		Oct 18-19, 22		Oct 19-20, 22		
	1 hr Avg	8 hr Avg	1 hr Avg	8 hr Avg	1 hr Avg	8 hr Avg	
13:00 - 14:00	0.4	-	0.5	0.6	0.6	0.9	
14:00 - 15:00	0.6	-	0.5	0.6	0.6	0.8	
15:00 - 16:00	0.6	-	0.5	0.6	0.6	0.8	
16:00 - 17:00	0.6	-	0.6	0.6	0.6	0.7	
17:00 - 18:00	0.6	-	0.5	0.6	0.6	0.7	
18:00 - 19:00	0.6	-	0.6	0.6	0.7	0.7	
19:00 - 20:00	0.6	-	0.6	0.6	0.6	0.6	
20:00 - 21:00	0.6	0.6	0.6	0.6	0.6	0.6	
21:00 - 22:00	0.7	0.6	0.8	0.6	0.7	0.6	
22:00 - 23:00	0.7	0.6	0.7	0.6	0.8	0.7	
23:00 - 00:00	0.8	0.7	0.6	0.6	0.7	0.7	
00:00 - 01:00	0.7	0.7	0.7	0.6	0.8	0.7	
01:00 - 02:00	0.7	0.7	0.7	0.7	0.8	0.7	
02:00 - 03:00	0.6	0.7	0.7	0.7	0.9	0.7	
03:00 - 04:00	0.6	0.7	0.8	0.7	0.8	0.8	
04:00 - 05:00	0.6	0.7	0.9	0.7	0.9	0.8	
05:00 - 06:00	0.8	0.7	1.0	0.8	0.9	0.8	
06:00 - 07:00	0.6	0.7	1.2	0.8	0.8	0.8	
07:00 - 08:00	0.6	0.7	1.0	0.9	0.8	0.8	
08:00 - 09:00	0.6	0.6	1.1	0.9	0.8	0.8	
09:00 - 10:00	0.6	0.6	0.9	1.0	0.7	0.8	
10:00 - 11:00	0.6	0.6	0.9	1.0	0.6	0.8	
11:00 - 12:00	0.6	0.6	0.7	1.0	0.6	0.8	
12:00 - 13:00	0.6	0.6	0.8	1.0	0.6	0.7	
24 Hours Average	0.6	-	0.7	-	0.7	-	-
1 Hour Maximum	0.8	-	1.2	-	0.9	-	30
8 Hours Maximum	-	0.7	-	1.0	-	0.9	9

**Remark :** <sup>1/</sup> Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 42D dated May 25, B.E.2538 (1995), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).

  
(Ms.Thiranat Khunngoen)  
Laboratory Reviewer



  
(Ms.Panicha Promchai)  
Laboratory Supervisor

## ANALYSIS REPORT


**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Sampling Source** : Wastewater Sampling  
**Sampling Point** : Irrigation Pond  
**GPS. Coordinate** : UTM (WGS84) 47P 0733538 E, 1402609 N  
**Sampling Date** : July 16, 2022  
**Sampling Time** : 11:05  
**Sampling Method** : Grab  
**Sampling By** : Mr. Watcharangkun Kongsang, Registration No. ว-099-จ-7672  
**Analyzed By** : Environment Research & Technology Co., Ltd. Laboratory  
Registration No. ว-099  
**Physical Properties** : Turbid, Light Yellow, Sediment, Odor

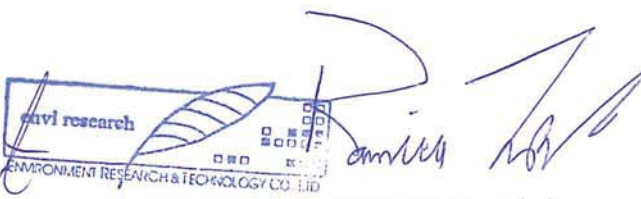
**Quotation No.** : 2022-00059  
**Analysis No.** : 2022-AC527-001  
**Received Date** : July 18, 2022  
**Analytical Date** : July 18-25, 2022  
**Report No.** : 2022-RAAE637  
**Report Date** : September 2, 2022

Parameter	Unit	Method of Analysis <sup>1'</sup>	Result	Standard <sup>2'</sup>
pH	-	Electrometric	7.9	5.5-9.0
Temperature	°C	Certified Thermometer	32.3	40
Color (ADMI)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	15	300
Color (at pH 7)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	16	300
Total Suspended Solids	mg/L	Dried at 103-105°C	10	50
Biochemical Oxygen Demand	mg/L	5-Day BOD Test, Membrane Electrode	3.6	20
Fat Oil and Grease	mg/L	Liquid-Liquid Partition, Gravimetric	<1.0	5

Remark : <sup>1'</sup> Standard Method for Examination of Water and Wastewater, 23<sup>rd</sup> Edition, 2017.

<sup>2'</sup> Notification of the Ministry of Industry, B.E.2560 (2017), issued under Factory Act B.E.2535 (1992), published in the Royal Government Gazette No.134 Part 153D dated June 7, B.E.2560 (2017).

  
(Ms. Raiwin Posit)  
Laboratory Reviewer No. ว-099-จ-7665

  
(Ms. Ramita Taengthai)  
Laboratory Supervisor No. ว-099-จ-7664



## ANALYSIS REPORT

**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Sampling Source** : Wastewater Sampling  
**Sampling Point** : บริเวณรางระบายน้ำหน้าโรงงาน  
**GPS. Coordinate** : UTM (WGS84) 47P 0733149 E, 1402320 N  
**Sampling Date** : July 16, 2022  
**Sampling Time** : 11:20  
**Sampling Method** : Grab  
**Sampling By** : Mr.Watcharangkun Kongsang, Registration No.ว-099-จ-7672  
**Analyzed By** : Environment Research & Technology Co., Ltd. Laboratory  
Registration No.ว-099  
**Physical Properties** : Turbid, Light Yellow, Sediment, Odor

**Quotation No.** : 2022-00059  
**Analysis No.** : 2022-AC527-002  
**Received Date** : July 18, 2022  
**Analytical Date** : July 18-25, 2022  
**Report No.** : 2022-RAAE638  
**Report Date** : September 2, 2022

Parameter	Unit	Method of Analysis <sup>1'</sup>	Result	Standard <sup>2'</sup>
pH	-	Electrometric	7.1	5.5-9.0
Temperature	°C	Certified Thermometer	30.6	40
Color (ADMI)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	16	300
Color (at pH 7)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	18	300
Total Suspended Solids	mg/L	Dried at 103-105°C	17	50
Biochemical Oxygen Demand	mg/L	5-Day BOD Test, Membrane Electrode	2.9	20
Fat Oil and Grease	mg/L	Liquid-Liquid Partition, Gravimetric	<1.0	5

Remark : <sup>1'</sup> Standard Method for Examination of Water and Wastewater, 23<sup>rd</sup> Edition, 2017.

<sup>2'</sup> Notification of the Ministry of Industry, B.E.2560 (2017), issued under Factory Act B.E.2535 (1992), published in the Royal Government Gazette No.134 Part 153D dated June 7, B.E.2560 (2017).

  
(Ms.Raiwin Posit)  
Laboratory Reviewer No. ว-099-ค-7665

  
(Ms.Ramita Taengthai)  
Laboratory Supervisor No. ว-099-ค-7664

## ANALYSIS REPORT

**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Sampling Source** : Wastewater Sampling  
**Sampling Point** : บริเวณรางระบายน้ำหลังโรงงาน  
**GPS. Coordinate** : UTM (WGS84) 47P 0736738 E, 1402360 N  
**Sampling Date** : July 16, 2022  
**Sampling Time** : 11:10  
**Sampling Method** : Grab  
**Sampling By** : Mr.Watcharangkun Kongsang, Registration No.ว-099-จ-7672  
**Analyzed By** : Environment Research & Technology Co., Ltd. Laboratory  
Registration No.ว-099  
**Physical Properties** : Clear, Light Yellow, Sediment, Odor

**Quotation No.** : 2022-00059  
**Analysis No.** : 2022-AC527-003  
**Received Date** : July 18, 2022  
**Analytical Date** : July 18-25, 2022  
**Report No.** : 2022-RAAE639  
**Report Date** : September 2, 2022

Parameter	Unit	Method of Analysis <sup>1'</sup>	Result	Standard <sup>2'</sup>
pH	-	Electrometric	8.1	5.5-9.0
Temperature	°C	Certified Thermometer	30.7	40
Color (ADMI)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	18	300
Color (at pH 7)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	20	300
Total Suspended Solids	mg/L	Dried at 103-105°C	9.0	50
Biochemical Oxygen Demand	mg/L	5-Day BOD Test, Membrane Electrode	<2.0	20
Fat Oil and Grease	mg/L	Liquid-Liquid Partition, Gravimetric	<1.0	5

Remark : <sup>1'</sup> Standard Method for Examination of Water and Wastewater, 23<sup>rd</sup> Edition, 2017.

<sup>2'</sup> Notification of the Ministry of Industry, B.E.2560 (2017), issued under Factory Act B.E.2535 (1992), published in the Royal Government Gazette No.134 Part 153D dated June 7, B.E.2560 (2017).

  
(Ms.Raiwin Posit)

  
(Ms.Ramita Taengthai)

Laboratory Reviewer No. ว-099-ก-7665

Laboratory Supervisor No. ว-099-ก-7664



## ANALYSIS REPORT

**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Sampling Source** : Wastewater Sampling  
**Sampling Point** : Irrigation Pond  
**GPS. Coordinate** : UTM (WGS84) 47P 0733537 E, 1402608 N  
**Sampling Date** : August 1, 2022  
**Sampling Time** : 09:53  
**Sampling Method** : Grab  
**Sampling By** : Mr.Natthapon Suttimon, Registration No.จ-099-จ-8841  
**Analyzed By** : Environment Research & Technology Co., Ltd. Laboratory  
Registration No.จ-099  
**Physical Properties** : Turbid, Light Yellow, Sediment, Odorless

**Quotation No.** : 2022-00059  
**Analysis No.** : 2022-AC743-001  
**Received Date** : August 2, 2022  
**Analytical Date** : August 2-15, 2022  
**Report No.** : 2022-RAAE897  
**Report Date** : September 1, 2022

Parameter	Unit	Method of Analysis <sup>1'</sup>	Result	Standard <sup>2'</sup>
pH	-	Electrometric	8.2	5.5-9.0
Temperature	°C	Certified Thermometer	28.3	40
Color (ADMI)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	20	300
Color (at pH 7)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	20	300
Total Suspended Solids	mg/L	Dried at 103-105°C	18	50
Biochemical Oxygen Demand	mg/L	5-Day BOD Test, Membrane Electrode	3.6	20
Oil and Grease	mg/L	Liquid-Liquid Partition, Gravimetric	4.4	5
Arsenic	mg/L	Digestion, Hydride Generation Atomic Absorption Spectrometry	<0.0005	0.25
Mercury	mg/L	Digestion, Cold-Vapor Atomic Absorption Spectrometry	0.0005	0.005
Cadmium	mg/L	Digestion, Inductively Coupled Plasma (ICP-OES)	<0.01	0.03
Lead	mg/L	Digestion, Electrothermal Atomic Absorption Spectrometry	0.053	0.2

Remark : <sup>1'</sup> Standard Method for Examination of Water and Wastewater, 23<sup>rd</sup> Edition, 2017.

<sup>2'</sup> Notification of the Ministry of Industry, B.E.2560 (2017), issued under Factory Act B.E.2535 (1992), published in the Royal Government Gazette No.134 Part 153D dated June 7, B.E.2560 (2017).



(Ms.Sudarat Khejonrak)

Laboratory Reviewer No. จ-099-จ-7037




(Ms.Ramita Taengthai)

Laboratory Supervisor No. จ-099-จ-7664

## ANALYSIS REPORT


**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Sampling Source** : Wastewater Sampling  
**Sampling Point** : Irrigation Pond  
**GPS. Coordinate** : UTM (WGS84) 47P 0733537 E, 1402608 N  
**Sampling Date** : August 1, 2022  
**Sampling Time** : 09:35  
**Sampling Method** : Grab  
**Sampling By** : Mr.Natthapon Suttimon  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Physical Properties** : Turbid, Light Yellow, Sediment, Odorless

**Quotation No.** : 2022-00059  
**Analysis No.** : 2022-AC743-004  
**Received Date** : August 2, 2022  
**Analytical Date** : August 2-15, 2022  
**Report No.** : 2022-RAAE903  
**Report Date** : September 1, 2022


Parameter	Unit	Method of Analysis <sup>1'</sup>	Result	Standard <sup>2'</sup>
Chromium	mg/L	Digestion, Inductively Coupled Plasma (ICP-OES)	<0.01	-

Remark : <sup>1'</sup> Standard Method for Examination of Water and Wastewater, 23<sup>rd</sup> Edition, 2017.

<sup>2'</sup> Notification of the Ministry of Industry, B.E.2560 (2017), issued under Factory Act B.E.2535 (1992), published in the Royal Government Gazette No.134 Part 153D dated June 7, B.E.2560 (2017).

  
(Ms.Sudarat Khejonrak)  
Laboratory Reviewer



  
(Mr.Virat Hemvannanukul)  
Laboratory Supervisor



## ANALYSIS REPORT


**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Sampling Source** : Wastewater Sampling  
**Sampling Point** : รางระบายน้ำหน้าโรงงาน  
**GPS. Coordinate** : UTM (WGS84) 47P 0733150 E, 1402327 N  
**Sampling Date** : August 1, 2022  
**Sampling Time** : 10:11  
**Sampling Method** : Grab  
**Sampling By** : Mr.Natthapon Suttimon, Registration No.จ-099-จ-8841  
**Analyzed By** : Environment Research & Technology Co., Ltd. Laboratory  
Registration No.จ-099  
**Physical Properties** : Turbid, Light Yellow, Sediment, Odorless


**Quotation No.** : 2022-00059  
**Analysis No.** : 2022-AC743-002  
**Received Date** : August 2, 2022  
**Analytical Date** : August 2-15, 2022  
**Report No.** : 2022-RAAE898  
**Report Date** : September 1, 2022

Parameter	Unit	Method of Analysis <sup>1'</sup>	Result	Standard <sup>2'</sup>
pH	-	Electrometric	7.2	5.5-9.0
Temperature	°C	Certified Thermometer	29.7	40
Color (ADMI)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	19	300
Color (at pH 7)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	18	300
Total Suspended Solids	mg/L	Dried at 103-105°C	20	50
Biochemical Oxygen Demand	mg/L	5-Day BOD Test, Membrane Electrode	7.5	20
Oil and Grease	mg/L	Liquid-Liquid Partition, Gravimetric	2.2	5
Arsenic	mg/L	Digestion, Hydride Generation Atomic Absorption Spectrometry	0.0041	0.25
Mercury	mg/L	Digestion, Cold-Vapor Atomic Absorption Spectrometry	<0.0005	0.005
Cadmium	mg/L	Digestion, Inductively Coupled Plasma (ICP-OES)	<0.01	0.03
Lead	mg/L	Digestion, Electrothermal Atomic Absorption Spectrometry	0.005	0.2

Remark : <sup>1'</sup> Standard Method for Examination of Water and Wastewater, 23<sup>rd</sup> Edition, 2017.

<sup>2'</sup> Notification of the Ministry of Industry, B.E.2560 (2017), issued under Factory Act B.E.2535 (1992), published in the Royal Government Gazette No.134 Part 153D dated June 7, B.E.2560 (2017).

  
(Ms.Sudarat Khejonrak)  
Laboratory Reviewer No. จ-099-จ-7037

  
(Ms.Ramita Taengthai)  
Laboratory Supervisor No. จ-099-จ-7664

## ANALYSIS REPORT

<b>Customer Name</b>	: Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)	<b>Quotation No.</b>	: 2022-00059
<b>Address</b>	: 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150	<b>Analysis No.</b>	: 2022-AC743-005
<b>Project Name</b>	: โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง	<b>Received Date</b>	: August 2, 2022
<b>Sampling Source</b>	: Wastewater Sampling	<b>Analytical Date</b>	: August 2-15, 2022
<b>Sampling Point</b>	: รางระบายน้ำหน้าโรงงาน	<b>Report No.</b>	: 2022-RAAE911
<b>GPS. Coordinate</b>	: UTM (WGS84) 47P 0733150 E, 1402327 N	<b>Report Date</b>	: September 1, 2022
<b>Sampling Date</b>	: August 1, 2022		
<b>Sampling Time</b>	: 10:11		
<b>Sampling Method</b>	: Grab		
<b>Sampling By</b>	: Mr.Natthapon Suttimon		
<b>Analyzed By</b>	: Environment Research & Technology Co., Ltd.		
<b>Physical Properties</b>	: Turbid, Light Yellow, Sediment, Odorless		

Parameter	Unit	Method of Analysis <sup>1'</sup>	Result	Standard <sup>2'</sup>
Chromium	mg/L	Digestion, Inductively Coupled Plasma (ICP-OES)	<0.01	-

Remark : <sup>1'</sup> Standard Method for Examination of Water and Wastewater, 23<sup>rd</sup> Edition, 2017.

<sup>2'</sup> Notification of the Ministry of Industry, B.E.2560 (2017), Issued under Factory Act B.E.2535 (1992), published in the Royal Government Gazette No.134 Part 153D dated June 7, B.E.2560 (2017).



(Ms.Sudarat Khejonrak)  
Laboratory Reviewer




(Mr.Virat Hemvannanukul)  
Laboratory Supervisor



## ANALYSIS REPORT


**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Sampling Source** : Wastewater Sampling  
**Sampling Point** : รางระบายน้ำหลังโรงงาน  
**GPS. Coordinate** : UTM (WGS84) 47P 0733736 E, 1402366 N  
**Sampling Date** : August 1, 2022  
**Sampling Time** : 10:01  
**Sampling Method** : Grab  
**Sampling By** : Mr.Natthapon Suttimon, Registration No.ว-099-จ-8841  
**Analyzed By** : Environment Research & Technology Co., Ltd. Laboratory  
Registration No.ว-099  
**Physical Properties** : Clear, Light Yellow, Sediment, Odorless

**Quotation No.** : 2022-00059  
**Analysis No.** : 2022-AC743-003  
**Received Date** : August 2, 2022  
**Analytical Date** : August 2-15, 2022  
**Report No.** : 2022-RAAE899  
**Report Date** : September 5, 2022


Parameter	Unit	Method of Analysis <sup>1'</sup>	Result	Standard <sup>2'</sup>
pH	-	Electrometric	8.1	5.5-9.0
Temperature	°C	Certified Thermometer	28.6	40
Color (ADMI)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	13	300
Color (at pH 7)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	16	300
Total Suspended Solids	mg/L	Dried at 103-105°C	<5.0	50
Biochemical Oxygen Demand	mg/L	5-Day BOD Test, Membrane Electrode	2.0	20
Oil and Grease	mg/L	Liquid-Liquid Partition, Gravimetric	2.2	5
Arsenic	mg/L	Digestion, Hydride Generation Atomic Absorption Spectrometry	<0.0005	0.25
Mercury	mg/L	Digestion, Cold-Vapor Atomic Absorption Spectrometry	<0.0005	0.005
Cadmium	mg/L	Digestion, Inductively Coupled Plasma (ICP-OES)	<0.01	0.03
Lead	mg/L	Digestion, Electrothermal Atomic Absorption Spectrometry	0.016	0.2

Remark : <sup>1'</sup> Standard Method for Examination of Water and Wastewater, 23<sup>rd</sup> Edition, 2017.

<sup>2'</sup> Notification of the Ministry of Industry, B.E.2560 (2017), issued under Factory Act B.E.2535 (1992), published in the Royal Government Gazette No.134 Part 153D dated June 7, B.E.2560 (2017).



(Ms.Sudarat Khejonrak)  
Laboratory Reviewer No. ว-099-จ-7037

(Ms.Ramita Taengthai)  
Laboratory Supervisor No. ว-099-จ-7664

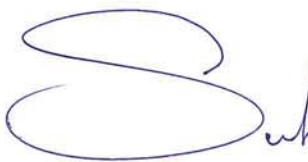
## ANALYSIS REPORT

<b>Customer Name</b>	: Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)	<b>Quotation No.</b>	: 2022-00059
<b>Address</b>	: 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150	<b>Analysis No.</b>	: 2022-AC743-006
<b>Project Name</b>	: โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง	<b>Received Date</b>	: August 2, 2022
<b>Sampling Source</b>	: Wastewater Sampling	<b>Analytical Date</b>	: August 2-15, 2022
<b>Sampling Point</b>	: รางระบายน้ำหลังโรงงาน	<b>Report No.</b>	: 2022-RAAE912
<b>GPS. Coordinate</b>	: UTM (WGS84) 47P 0733736 E, 1402366 N	<b>Report Date</b>	: August 25, 2022
<b>Sampling Date</b>	: August 1, 2022		
<b>Sampling Time</b>	: 10:01		
<b>Sampling Method</b>	: Grab		
<b>Sampling By</b>	: Mr.Natthapon Suttimon		
<b>Analyzed By</b>	: Environment Research & Technology Co., Ltd.		
<b>Physical Properties</b>	: Clear, Light Yellow, Sediment, Odorless		

Parameter	Unit	Method of Analysis <sup>1'</sup>	Result	Standard <sup>2'</sup>
Chromium	mg/L	Digestion, Inductively Coupled Plasma (ICP-OES)	<0.01	-

Remark : <sup>1'</sup> Standard Method for Examination of Water and Wastewater, 23<sup>rd</sup> Edition, 2017.

<sup>2'</sup> Notification of the Ministry of Industry, B.E.2560 (2017), issued under Factory Act B.E.2535 (1992), published in the Royal Government Gazette No.134 Part 153D dated June 7, B.E.2560 (2017).

  
(Ms.Sudarat Khejonrak)  
Laboratory Reviewer



  
(Mr.Virat Hemvannanukul)  
Laboratory Supervisor



## ANALYSIS REPORT


**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Sampling Source** : Wastewater Sampling  
**Sampling Point** : Irrigation Pond  
**GPS. Coordinate** : UTM (WGS84) 47P 0733539 E, 1402608 N  
**Sampling Date** : September 9, 2022  
**Sampling Time** : 10:53  
**Sampling Method** : Grab  
**Sampling By** : Mr.Assada Chaiyawong, Registration No.จ-099-จ-0008  
**Analyzed By** : Environment Research & Technology Co., Ltd. Laboratory  
Registration No.จ-099  
**Physical Properties** : Clear, Light Yellow, Sediment, Odor

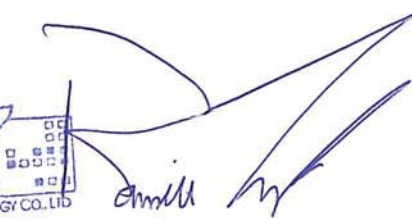
**Quotation No.** : 2022-00059  
**Analysis No.** : 2022-AD390-001  
**Received Date** : September 13, 2022  
**Analytical Date** : September 13-22, 2022  
**Report No.** : 2022-RAAG157  
**Report Date** : September 23, 2022

Parameter	Unit	Method of Analysis <sup>1'</sup>	Result	Standard <sup>2'</sup>
pH	-	Electrometric	7.8	5.5-9.0
Temperature	°C	Certified Thermometer	29.6	40
Color (ADMI)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	13	300
Color (at pH 7)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	15	300
Suspended Solids	mg/L	Dried at 103-105°C	13	50
Biochemical Oxygen Demand	mg/L	5-Day BOD Test, Membrane Electrode	2.8	20
Fat Oil and Grease	mg/L	Liquid-Liquid Partition, Gravimetric	2.2	5

**Remark :** <sup>1'</sup> Standard Method for Examination of Water and Wastewater, 23<sup>rd</sup> Edition, 2017.

<sup>2'</sup> Notification of the Ministry of Industry, B.E.2560 (2017), issued under Factory Act B.E.2535 (1992), published in the Royal Government Gazette No.134 Part 153D dated June 7, B.E.2560 (2017).

  
(Ms. Raiwin Posit)  
Laboratory Reviewer No. จ-099-ก-7665

  
(Ms. Ramita Taengthai)  
Laboratory Supervisor No. จ-099-ก-7664

## ANALYSIS REPORT

**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Sampling Source** : Wastewater Sampling  
**Sampling Point** : รางระบายน้ำหน้าโรงงาน  
**GPS. Coordinate** : UTM (WGS84) 47P 0733148 E, 1402327 N  
**Sampling Date** : September 9, 2022  
**Sampling Time** : 11:09  
**Sampling Method** : Grab  
**Sampling By** : Mr.Assada Chaiyawong, Registration No.จ-099-จ-0008  
**Analyzed By** : Environment Research & Technology Co., Ltd. Laboratory  
Registration No.จ-099  
**Physical Properties** : Turbid, Light Yellow, Sediment, Odor

**Quotation No.** : 2022-00059  
**Analysis No.** : 2022-AD390-002  
**Received Date** : September 13, 2022  
**Analytical Date** : September 13-22, 2022  
**Report No.** : 2022-RAAG158  
**Report Date** : September 23, 2022

Parameter	Unit	Method of Analysis <sup>1'</sup>	Result	Standard <sup>2'</sup>
pH	-	Electrometric	6.9	5.5-9.0
Temperature	°C	Certified Thermometer	30.8	40
Color (ADMI)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	22	300
Color (at pH 7)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	20	300
Total Suspended Solids	mg/L	Dried at 103-105°C	34	50
Biochemical Oxygen Demand	mg/L	5-Day BOD Test, Membrane Electrode	3.6	20
Fat Oil and Grease	mg/L	Liquid-Liquid Partition, Gravimetric	<1.0	5

**Remark :** <sup>1'</sup> Standard Method for Examination of Water and Wastewater, 23<sup>rd</sup> Edition, 2017.

<sup>2'</sup> Notification of the Ministry of Industry, B.E.2560 (2017), issued under Factory Act B.E.2535 (1992), published in the Royal Government Gazette No.134 Part 153D dated June 7, B.E.2560 (2017).

  
(Ms.Raiwin Posit)  
Laboratory Reviewer No. จ-099-ค-7665

  
(Ms.Ramita Taengthai)  
Laboratory Supervisor No. จ-099-ค-7664



## ANALYSIS REPORT


**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Sampling Source** : Wastewater Sampling  
**Sampling Point** : รางระบายน้ำหลังโรงงาน  
**GPS. Coordinate** : UTM (WGS84) 47P 0733737 E, 1402364 N  
**Sampling Date** : September 9, 2022  
**Sampling Time** : 11:00  
**Sampling Method** : Grab  
**Sampling By** : Mr.Assada Chaiyawong, Registration No.ว-099-จ-0008  
**Analyzed By** : Environment Research & Technology Co., Ltd. Laboratory  
Registration No.ว-099  
**Physical Properties** : Clear, Light Yellow, No Sediment, Odor


**Quotation No.** : 2022-00059  
**Analysis No.** : 2022-AD390-003  
**Received Date** : September 13, 2022  
**Analytical Date** : September 13-22, 2022  
**Report No.** : 2022-RAAG160  
**Report Date** : September 23, 2022

Parameter	Unit	Method of Analysis <sup>1'</sup>	Result	Standard <sup>2'</sup>
pH	-	Electrometric	8.3	5.5-9.0
Temperature	°C	Certified Thermometer	30.8	40
Color (ADMI)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	18	300
Color (at pH 7)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	18	300
Total Suspended Solids	mg/L	Dried at 103-105°C	6.8	50
Biochemical Oxygen Demand	mg/L	5-Day BOD Test, Membrane Electrode	<2.0	20
Fat Oil and Grease	mg/L	Liquid-Liquid Partition, Gravimetric	<1.0	5

**Remark :** <sup>1'</sup> Standard Method for Examination of Water and Wastewater, 23<sup>rd</sup> Edition, 2017.

<sup>2'</sup> Notification of the Ministry of Industry, B.E.2560 (2017), issued under Factory Act B.E.2535 (1992), published in the Royal Government Gazette No.134 Part 153D dated June 7, B.E.2560 (2017).

  
 (Ms.Raiwin Posit)  
 Laboratory Reviewer No. ว-099-ค-7665

  
 (Ms.Ramita Taengthai)  
 Laboratory Supervisor No. ว-099-ค-7664

## ANALYSIS REPORT


**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Sampling Source** : Wastewater Sampling  
**Sampling Point** : Irrigation Pond  
**GPS. Coordinate** : UTM (WGS84) 47P 0733539 E, 1402607 N  
**Sampling Date** : October 19, 2022  
**Sampling Time** : 09:44  
**Sampling Method** : Grab  
**Sampling By** : Mr.Assada Chaipayong, Registration No.ว-099-จ-0008  
**Analyzed By** : Environment Research & Technology Co., Ltd. Laboratory  
Registration No.ว-099  
**Physical Properties** : Clear, Light Yellow, Sediment, Odor


**Quotation No.** : 2022-00059  
**Analysis No.** : 2022-AD899-001  
**Received Date** : October 20, 2022  
**Analytical Date** : October 20-November 12, 2022  
**Report No.** : 2022-RAAH672  
**Report Date** : December 21, 2022

Parameter	Unit	Method of Analysis <sup>1'</sup>	Result	Standard <sup>2'</sup>
pH	-	Electrometric	8.0	5.5-9.0
Temperature	°C	Certified Thermometer	28.0	40
Color (ADMI)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	15	300
Color (at pH 7)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	16	300
Total Suspended Solids	mg/L	Dried at 103-105°C	14	50
Biochemical Oxygen Demand	mg/L	5-Day BOD Test, Membrane Electrode	3.0	20
Oil and Grease	mg/L	Liquid-Liquid Partition, Gravimetric	2.3	5

Remark : <sup>1'</sup> Standard Method for Examination of Water and Wastewater, 23<sup>rd</sup> Edition, 2017.

<sup>2'</sup> Notification of the Ministry of Industry, B.E.2560 (2017), issued under Factory Act B.E.2535 (1992), published in the Royal Government Gazette No.134 Part 153D dated June 7, B.E.2560 (2017).

  
 (Ms. Raiwin Posit)  
 Laboratory Reviewer No. ว-099-ค-7665

  
 (Ms. Ramita Taengthai)  
 Laboratory Supervisor No. ว-099-ค-7664



## ANALYSIS REPORT

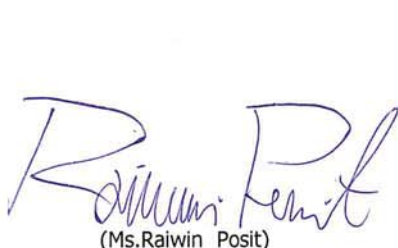
**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Sampling Source** : Wastewater Sampling  
**Sampling Point** : รางระบายน้ำหน้าโรงงาน  
**GPS. Coordinate** : UTM (WGS84) 47P 0733149 E, 1402322 N  
**Sampling Date** : October 19, 2022  
**Sampling Time** : 10:10  
**Sampling Method** : Grab  
**Sampling By** : Mr.Assada Chaiyawong, Registration No.ว-099-จ-0008  
**Analyzed By** : Environment Research & Technology Co., Ltd. Laboratory  
Registration No.ว-099  
**Physical Properties** : Turbid, Light Yellow, Sediment, Odor

**Quotation No.** : 2022-00059  
**Analysis No.** : 2022-AD899-002  
**Received Date** : October 20, 2022  
**Analytical Date** : October 20-November 12, 2022  
**Report No.** : 2022-RAAH675  
**Report Date** : December 20, 2022

Parameter	Unit	Method of Analysis <sup>1'</sup>	Result	Standard <sup>2'</sup>
pH	-	Electrometric	7.3	5.5-9.0
Temperature	°C	Certified Thermometer	30.0	40
Color (ADMI)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	15	300
Color (at pH 7)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	16	300
Total Suspended Solids	mg/L	Dried at 103-105°C	27	50
Biochemical Oxygen Demand	mg/L	5-Day BOD Test, Membrane Electrode	2.2	20
Oil and Grease	mg/L	Liquid-Liquid Partition, Gravimetric	<1.0	5

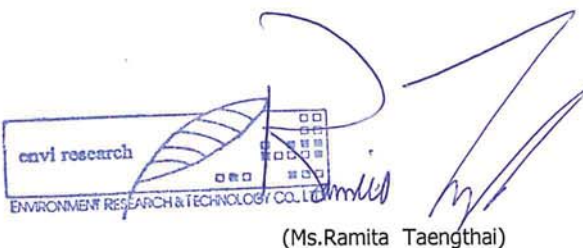
**Remark :** <sup>1'</sup> Standard Method for Examination of Water and Wastewater, 23<sup>rd</sup> Edition, 2017.

<sup>2'</sup> Notification of the Ministry of Industry, B.E.2560 (2017), issued under Factory Act B.E.2535 (1992), published in the Royal Government Gazette No.134 Part 153D dated June 7, B.E.2560 (2017).



(Ms.Raiwin Posit)

Laboratory Reviewer No. ว-099-ค-7665



(Ms.Ramita Taengthai)

Laboratory Supervisor No. ว-099-ค-7664

## ANALYSIS REPORT


**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Sampling Source** : Wastewater Sampling  
**Sampling Point** : รางระบายน้ำหลังโรงงาน  
**GPS. Coordinate** : UTM (WGS84) 47P 0733737 E, 1402365 N  
**Sampling Date** : October 19, 2022  
**Sampling Time** : 10:03  
**Sampling Method** : Grab  
**Sampling By** : Mr.Assada Chaiyawong, Registration No.จ-099-จ-0008  
**Analyzed By** : Environment Research & Technology Co., Ltd. Laboratory  
Registration No.จ-099  
**Physical Properties** : Clear, Light Yellow, Sediment, Odor

**Quotation No.** : 2022-00059  
**Analysis No.** : 2022-AD899-003  
**Received Date** : October 20, 2022  
**Analytical Date** : October 20-November 12, 2022  
**Report No.** : 2022-RAAH679  
**Report Date** : December 21, 2022

Parameter	Unit	Method of Analysis <sup>1'</sup>	Result	Standard <sup>2'</sup>
pH	-	Electrometric	8.8	5.5-9.0
Temperature	°C	Certified Thermometer	26.0	40
Color (ADMI)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	18	300
Color (at pH 7)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	25	300
Total Suspended Solids	mg/L	Dried at 103-105°C	14	50
Biochemical Oxygen Demand	mg/L	5-Day BOD Test, Membrane Electrode	2.0	20
Oil and Grease	mg/L	Liquid-Liquid Partition, Gravimetric	<1.0	5

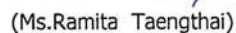
**Remark :** <sup>1'</sup> Standard Method for Examination of Water and Wastewater, 23<sup>rd</sup> Edition, 2017.

<sup>2'</sup> Notification of the Ministry of Industry, B.E.2560 (2017), issued under Factory Act B.E.2535 (1992), published in the Royal Government Gazette No.134 Part 153D dated June 7, B.E.2560 (2017).

  
(Ms.Raiwin Posit)

Laboratory Reviewer No. จ-099-ค-7665



  
(Ms.Ramita Taengthai)

Laboratory Supervisor No. จ-099-ค-7664



## ANALYSIS REPORT

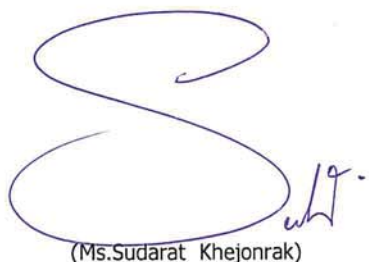
**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Sampling Source** : Wastewater Sampling  
**Sampling Point** : Irrigation Pond  
**GPS. Coordinate** : UTM (WGS84) 47P 0733538 E, 1402611 N  
**Sampling Date** : November 1, 2022  
**Sampling Time** : 09:14  
**Sampling Method** : Grab  
**Sampling By** : Mr. Watcharangkun Kongsang, Registration No. ว-099-จ-7672  
**Analyzed By** : Environment Research & Technology Co., Ltd. Laboratory Registration No. ว-099  
**Physical Properties** : Clear, Light Yellow, Sediment, Odorless

**Quotation No.** : 2022-00059  
**Analysis No.** : 2022-AE078-001  
**Received Date** : November 2, 2022  
**Analytical Date** : November 2-9, 2022  
**Report No.** : 2022-RAAI408  
**Report Date** : December 20, 2022

Parameter	Unit	Method of Analysis <sup>1'</sup>	Result	Standard <sup>2'</sup>
pH	-	Electrometric	8.4	5.5-9.0
Temperature	°C	Certified Thermometer	29.0	40
Color (ADMI)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	20	300
Color (at pH 7)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	17	300
Total Suspended Solids	mg/L	Dried at 103-105°C	26	50
Biochemical Oxygen Demand	mg/L	5-Day BOD Test, Membrane Electrode	6.6	20
Oil and Grease	mg/L	Liquid-Liquid Partition, Gravimetric	<1.0	5

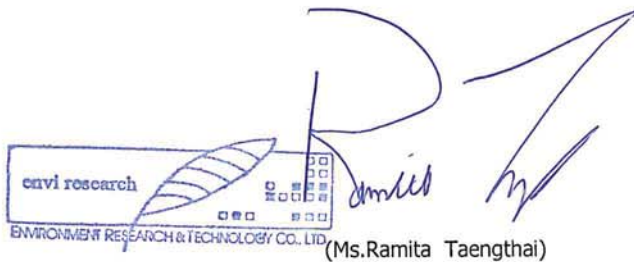
**Remark :** <sup>1'</sup> Standard Method for Examination of Water and Wastewater, 23<sup>rd</sup> Edition, 2017.

<sup>2'</sup> Notification of the Ministry of Industry, B.E.2560 (2017), issued under Factory Act B.E.2535 (1992), published in the Royal Government Gazette No.134 Part 153D dated June 7, B.E.2560 (2017).



(Ms. Sudarat Khejonrak)

Laboratory Reviewer No. ว-099-จ-7037



(Ms. Ramita Taengthai)

Laboratory Supervisor No. ว-099-ค-7664

## ANALYSIS REPORT

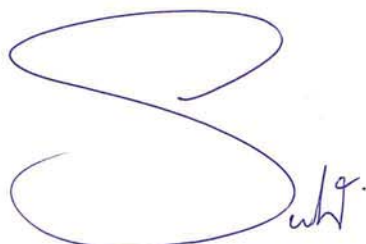
**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Sampling Source** : Wastewater Sampling  
**Sampling Point** : รางระบายน้ำหน้าโรงงาน  
**GPS. Coordinate** : UTM (WGS84) 47P 0733151 E, 1402315 N  
**Sampling Date** : November 1, 2022  
**Sampling Time** : 09:30  
**Sampling Method** : Grab  
**Sampling By** : Mr. Watcharangkun Kongsang, Registration No. ว-099-จ-7672  
**Analyzed By** : Environment Research & Technology Co., Ltd. Laboratory Registration No. ว-099  
**Physical Properties** : Clear, Light Yellow, Sediment, Odorless

**Quotation No.** : 2022-00059  
**Analysis No.** : 2022-AE078-002  
**Received Date** : November 2, 2022  
**Analytical Date** : November 2-9, 2022  
**Report No.** : 2022-RAAI409  
**Report Date** : December 20, 2022

Parameter	Unit	Method of Analysis <sup>1'</sup>	Result	Standard <sup>2'</sup>
pH	-	Electrometric	6.6	5.5-9.0
Temperature	°C	Certified Thermometer	27.0	40
Color (ADMI)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	17	300
Color (at pH 7)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	16	300
Total Suspended Solids	mg/L	Dried at 103-105°C	18	50
Biochemical Oxygen Demand	mg/L	5-Day BOD Test, Membrane Electrode	2.1	20
Oil and Grease	mg/L	Liquid-Liquid Partition, Gravimetric	<1.0	5

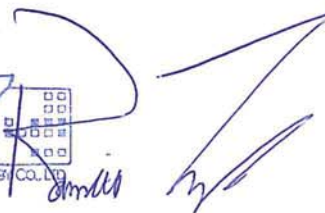
**Remark :** <sup>1'</sup> Standard Method for Examination of Water and Wastewater, 23<sup>rd</sup> Edition, 2017.

<sup>2'</sup> Notification of the Ministry of Industry, B.E.2560 (2017), issued under Factory Act B.E.2535 (1992), published in the Royal Government Gazette No.134 Part 153D dated June 7, B.E.2560 (2017).



(Ms. Sudarat Khejonrak)

Laboratory Reviewer No. ว-099-จ-7037

(Ms. Ramita Taengthai)

Laboratory Supervisor No. ว-099-ค-7664



## ANALYSIS REPORT

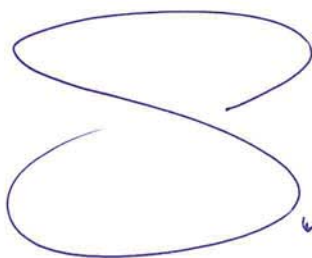
**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Sampling Source** : Wastewater Sampling  
**Sampling Point** : รางระบายน้ำหลังโรงงาน  
**GPS. Coordinate** : UTM (WGS84) 47P 0733739 E, 1402362 N  
**Sampling Date** : November 1, 2022  
**Sampling Time** : 09:21  
**Sampling Method** : Grab  
**Sampling By** : Mr.Watcharangkun Kongsang, Registration No.จ-099-จ-7672  
**Analyzed By** : Environment Research & Technology Co., Ltd. Laboratory Registration No.จ-099  
**Physical Properties** : Clear, Light Yellow, No Sediment, Odorless

**Quotation No.** : 2022-00059  
**Analysis No.** : 2022-AE078-003  
**Received Date** : November 2, 2022  
**Analytical Date** : November 2-9, 2022  
**Report No.** : 2022-RAAI410  
**Report Date** : December 20, 2022

Parameter	Unit	Method of Analysis <sup>1'</sup>	Result	Standard <sup>2'</sup>
pH	-	Electrometric	8.0	5.5-9.0
Temperature	°C	Certified Thermometer	24.5	40
Color (ADMI)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	25	300
Color (at pH 7)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	23	300
Total Suspended Solids	mg/L	Dried at 103-105°C	<5.0	50
Biochemical Oxygen Demand	mg/L	5-Day BOD Test, Membrane Electrode	2.6	20
Oil and Grease	mg/L	Liquid-Liquid Partition, Gravimetric	<1.0	5

Remark : <sup>1'</sup> Standard Method for Examination of Water and Wastewater, 23<sup>rd</sup> Edition, 2017.


<sup>2'</sup> Notification of the Ministry of Industry, B.E.2560 (2017), issued under Factory Act B.E.2535 (1992), published in the Royal Government Gazette No.134 Part 153D dated June 7, B.E.2560 (2017).



(Ms.Sudarat Khejonrak)

Laboratory Reviewer No. จ-099-จ-7037





(Ms.Ramita Taengthai)

Laboratory Supervisor No. จ-099-จ-7664

## ANALYSIS REPORT

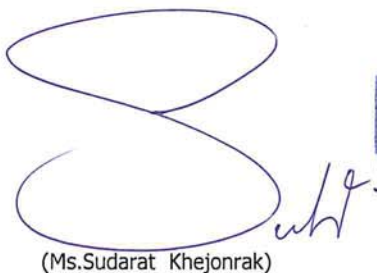
**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Sampling Source** : Wastewater Sampling  
**Sampling Point** : Irrigation Pond  
**GPS. Coordinate** : UTM (WGS84) 47P 0733538 E, 1402605 N  
**Sampling Date** : December 3, 2022  
**Sampling Time** : 09:55  
**Sampling Method** : Grab  
**Sampling By** : Mr.Konlayut Inkum, Registration No.ว-099-จ-8847  
**Analyzed By** : Environment Research & Technology Co., Ltd. Laboratory  
Registration No.ว-099  
**Physical Properties** : Turbid, Light Yellow, Sediment, Odor

**Quotation No.** : 2022-00059  
**Analysis No.** : 2022-AE657-001  
**Received Date** : December 6, 2022  
**Analytical Date** : December 6-21, 2022  
**Report No.** : 2022-RAAK595  
**Report Date** : January 4, 2023

Parameter	Unit	Method of Analysis <sup>1'</sup>	Result	Standard <sup>2'</sup>
pH	-	Electrometric	8.5	5.5-9.0
Temperature	°C	Certified Thermometer	29.0	40
Color (ADMI)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	14	300
Color (at pH 7)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	15	300
Total Suspended Solids	mg/L	Dried at 103-105°C	11	50
Biochemical Oxygen Demand	mg/L	5-Day BOD Test, Membrane Electrode	4.4	20
Oil and Grease	mg/L	Liquid-Liquid Partition, Gravimetric	1.7	5
Arsenic	mg/L	Digestion, Hydride Generation Atomic Absorption Spectrometry	<0.0005	0.25
Mercury	mg/L	Digestion, Cold-Vapor Atomic Absorption Spectrometry	0.0006	0.005
Cadmium	mg/L	Digestion, Inductively Coupled Plasma (ICP-OES)	<0.003	0.03
Lead	mg/L	Digestion, Electrothermal Atomic Absorption Spectrometry	0.026	0.2

**Remark :** <sup>1'</sup> Standard Method for Examination of Water and Wastewater, 23<sup>rd</sup> Edition, 2017.

<sup>2'</sup> Notification of the Ministry of Industry, B.E.2560 (2017), Issued under Factory Act B.E.2535 (1992), published in the Royal Government Gazette No.134 Part 153D dated June 7, B.E.2560 (2017).



(Ms.Sudarat Khejonrak)

Laboratory Reviewer No. ว-099-จ-7037




(Ms.Ramita Taengthai)

Laboratory Supervisor No. ว-099-ก-7664



## ANALYSIS REPORT

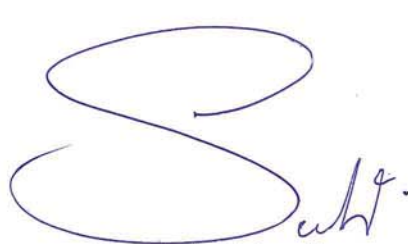
**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Sampling Source** : Wastewater Sampling  
**Sampling Point** : Irrigation Pond  
**GPS. Coordinate** : UTM (WGS84) 47P 0733538 E, 1402605 N  
**Sampling Date** : December 3, 2022  
**Sampling Time** : 09:55  
**Sampling Method** : Grab  
**Sampling By** : Mr.Konlayut Inkum  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Physical Properties** : Turbid, Light Yellow, Sediment, Odor

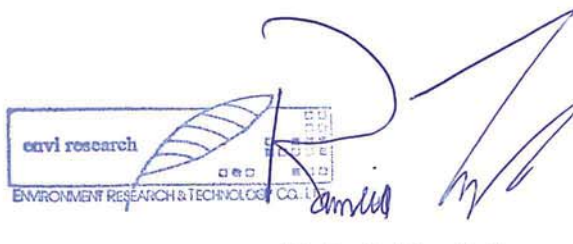
**Quotation No.** : 2022-00059  
**Analysis No.** : 2022-AE657-004  
**Received Date** : December 6, 2022  
**Analytical Date** : December 6-21, 2022  
**Report No.** : 2022-RAAK598  
**Report Date** : January 4, 2023

Parameter	Unit	Method of Analysis <sup>1'</sup>	Result	Standard <sup>2'</sup>
Chromium	mg/L	Digestion, Inductively Coupled Plasma (ICP-OES)	<0.01	-

Remark : <sup>1'</sup> Standard Method for Examination of Water and Wastewater, 23<sup>rd</sup> Edition, 2017.

<sup>2'</sup> Notification of the Ministry of Industry, B.E.2560 (2017), issued under Factory Act B.E.2535 (1992), published in the Royal Government Gazette No.134 Part 153D dated June 7, B.E.2560 (2017).

  
(Ms.Sudarat Khejonrak)  
Laboratory Reviewer

  
(Ms.Ramita Taengthai)  
Laboratory Supervisor

## ANALYSIS REPORT


**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Sampling Source** : Wastewater Sampling  
**Sampling Point** : รางระบายน้ำหน้าโรงงาน  
**GPS. Coordinate** : UTM (WGS84) 47P 0733150 E, 1402319 N  
**Sampling Date** : December 3, 2022  
**Sampling Time** : 10:17  
**Sampling Method** : Grab  
**Sampling By** : Mr.Konlayut Inkum, Registration No.ว-099-จ-8847  
**Analyzed By** : Environment Research & Technology Co., Ltd. Laboratory  
Registration No.ว-099  
**Physical Properties** : Turbid, Light Yellow, Sediment, Odor

**Quotation No.** : 2022-00059  
**Analysis No.** : 2022-AE657-002  
**Received Date** : December 6, 2022  
**Analytical Date** : December 6-21, 2022  
**Report No.** : 2022-RAAK596  
**Report Date** : January 4, 2023

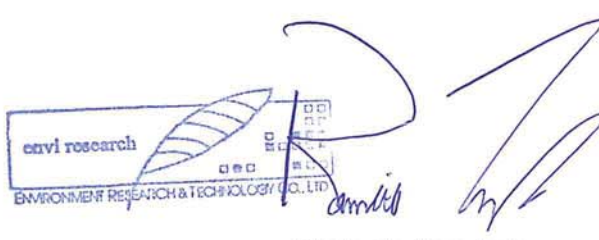
Parameter	Unit	Method of Analysis <sup>1'</sup>	Result	Standard <sup>2'</sup>
pH	-	Electrometric	7.1	5.5-9.0
Temperature	°C	Certified Thermometer	28.0	40
Color (ADMI)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	15	300
Color (at pH 7)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	14	300
Total Suspended Solids	mg/L	Dried at 103-105°C	26	50
Biochemical Oxygen Demand	mg/L	5-Day BOD Test, Membrane Electrode	3.8	20
Oil and Grease	mg/L	Liquid-Liquid Partition, Gravimetric	1.2	5
Arsenic	mg/L	Digestion, Hydride Generation Atomic Absorption Spectrometry	0.0054	0.25
Mercury	mg/L	Digestion, Cold-Vapor Atomic Absorption Spectrometry	0.0006	0.005
Cadmium	mg/L	Digestion, Inductively Coupled Plasma (ICP-OES)	<0.003	0.03
Lead	mg/L	Digestion, Electrothermal Atomic Absorption Spectrometry	0.003	0.2

Remark : <sup>1'</sup> Standard Method for Examination of Water and Wastewater, 23<sup>rd</sup> Edition, 2017.

<sup>2'</sup> Notification of the Ministry of Industry, B.E.2560 (2017), issued under Factory Act B.E.2535 (1992), published in the Royal Government Gazette No.134 Part 153D dated June 7, B.E.2560 (2017).



(Ms.Sudarat Khejonrak)  
Laboratory Reviewer No. ว-099-จ-7037



(Ms.Ramita Taengthai)  
Laboratory Supervisor No. ว-099-ก-7664



## ANALYSIS REPORT

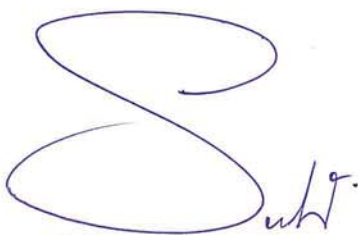
**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Sampling Source** : Wastewater Sampling  
**Sampling Point** : รางระบายน้ำหน้าโรงงาน  
**GPS. Coordinate** : UTM (WGS84) 47P 0733150 E, 1402319 N  
**Sampling Date** : December 3, 2022  
**Sampling Time** : 10:17  
**Sampling Method** : Grab  
**Sampling By** : Mr.Konlayut Inkum  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Physical Properties** : Turbid, Light Yellow, Sediment, Odor

**Quotation No.** : 2022-00059  
**Analysis No.** : 2022-AE657-005  
**Received Date** : December 6, 2022  
**Analytical Date** : December 6-21, 2022  
**Report No.** : 2022-RAAK599  
**Report Date** : January 4, 2023

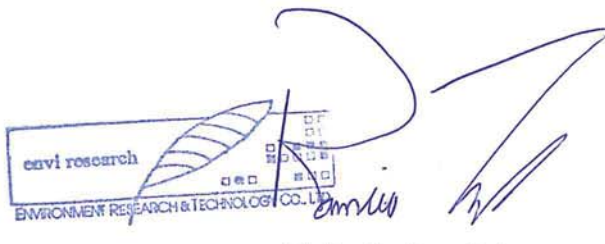
Parameter	Unit	Method of Analysis <sup>1'</sup>	Result	Standard <sup>2'</sup>
Chromium	mg/L	Digestion, Inductively Coupled Plasma (ICP-OES)	<0.01	-

Remark : <sup>1'</sup> Standard Method for Examination of Water and Wastewater, 23<sup>rd</sup> Edition, 2017.

<sup>2'</sup> Notification of the Ministry of Industry, B.E.2560 (2017), issued under Factory Act B.E.2535 (1992), published in the Royal Government Gazette No.134 Part 153D dated June 7, B.E.2560 (2017).



(Ms.Sudarat Khejonrak)  
Laboratory Reviewer



(Ms.Ramita Taengthai)  
Laboratory Supervisor

## ANALYSIS REPORT

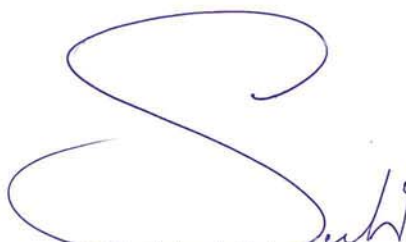
**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Sampling Source** : Wastewater Sampling  
**Sampling Point** : รางระบายน้ำหลังโรงงาน  
**GPS. Coordinate** : UTM (WGS84) 47P 0733739 E, 1402364 N  
**Sampling Date** : December 3, 2022  
**Sampling Time** : 10:05  
**Sampling Method** : Grab  
**Sampling By** : Mr.Konlayut Inkum, Registration No.ว-099-จ-8847  
**Analyzed By** : Environment Research & Technology Co., Ltd. Laboratory  
Registration No.ว-099  
**Physical Properties** : Turbid, Light Yellow, Sediment, Odor

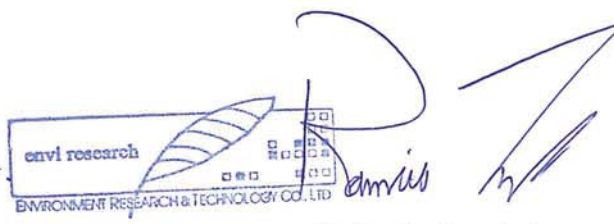
**Quotation No.** : 2022-00059  
**Analysis No.** : 2022-AE657-003  
**Received Date** : December 6, 2022  
**Analytical Date** : December 6-21, 2022  
**Report No.** : 2022-RAAK597  
**Report Date** : January 4, 2023

Parameter	Unit	Method of Analysis <sup>1'</sup>	Result	Standard <sup>2'</sup>
pH	-	Electrometric	8.1	5.5-9.0
Temperature	°C	Certified Thermometer	29.0	40
Color (ADMI)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	17	300
Color (at pH 7)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	17	300
Total Suspended Solids	mg/L	Dried at 103-105°C	6.7	50
Biochemical Oxygen Demand	mg/L	5-Day BOD Test, Membrane Electrode	2.7	20
Oil and Grease	mg/L	Liquid-Liquid Partition, Gravimetric	1.5	5
Arsenic	mg/L	Digestion, Hydride Generation Atomic Absorption Spectrometry	<0.0005	0.25
Mercury	mg/L	Digestion, Cold-Vapor Atomic Absorption Spectrometry	<0.0005	0.005
Cadmium	mg/L	Digestion, Inductively Coupled Plasma (ICP-OES)	<0.003	0.03
Lead	mg/L	Digestion, Electrothermal Atomic Absorption Spectrometry	0.019	0.2

Remark : <sup>1'</sup> Standard Method for Examination of Water and Wastewater, 23<sup>rd</sup> Edition, 2017.

<sup>2'</sup> Notification of the Ministry of Industry, B.E.2560 (2017), issued under Factory Act B.E.2535 (1992), published in the Royal Government Gazette No.134 Part 153D dated June 7, B.E.2560 (2017).

  
(Ms.Sudarat-Khejornrak)  
Laboratory Reviewer No. ว-099-จ-7037

  
(Ms.Ramita Taengthai)  
Laboratory Supervisor No. ว-099-ค-7664



## ANALYSIS REPORT

**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Sampling Source** : Wastewater Sampling  
**Sampling Point** : รางระบายน้ำหลังโรงงาน  
**GPS. Coordinate** : UTM (WGS84) 47P 0733739 E, 1402364 N  
**Sampling Date** : December 3, 2022  
**Sampling Time** : 10:05  
**Sampling Method** : Grab  
**Sampling By** : Mr.Konlayut Inkum  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Physical Properties** : Turbid, Light Yellow, Sediment, Odor

**Quotation No.** : 2022-00059  
**Analysis No.** : 2022-AE657-006  
**Received Date** : December 6, 2022  
**Analytical Date** : December 6-21, 2022  
**Report No.** : 2022-RAAK600  
**Report Date** : January 4, 2023

Parameter	Unit	Method of Analysis <sup>1'</sup>	Result	Standard <sup>2'</sup>
Chromium	mg/L	Digestion, Inductively Coupled Plasma (ICP-OES)	<0.01	-

Remark : <sup>1'</sup> Standard Method for Examination of Water and Wastewater, 23<sup>rd</sup> Edition, 2017.

<sup>2'</sup> Notification of the Ministry of Industry, B.E.2560 (2017), issued under Factory Act B.E.2535 (1992), published in the Royal Government Gazette No.134 Part 153D dated June 7, B.E.2560 (2017).

(Ms.Sudarat Khejonrak)  
Laboratory Reviewer

(Ms.Ramita Taengthai)  
Laboratory Supervisor


## ANALYSIS REPORT

**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Sampling Source** : Solid Waste Sampling  
**Sampling Point** : ฝุ่นอัดเม็ด (Fume Plant) (ฝุ่นจากเตาหลอมเหล็ก)  
**GPS. Coordinate** : UTM (WGS84) 47P 0733533 E, 1402529 N  
**Sampling Date** : October 19, 2022  
**Sampling Time** : 09:39  
**Sampling Method** : Grab  
**Sampling By** : Mr.Assada Chaiyawong, Registration No.ว-099-จ-0008  
**Analyzed By** : Environment Research & Technology Co., Ltd. Laboratory  
Registration No.ว-099  
**Physical Properties** : -

**Quotation No.** : 2022-00059  
**Analysis No.** : 2022-AD899-004  
**Received Date** : October 20, 2022  
**Analytical Date** : October 20-November 12, 2022  
**Report No.** : 2022-RAAH680  
**Report Date** : January 5, 2023

Parameter	Unit	Method of Analysis	Result	Standard <sup>1'</sup>	
				TTLIC	STLC*
Arsenic	mg/kg	Digestion, Inductively Coupled Plasma (ICP-OES)	19	500	5.0
Cadmium	mg/kg	Digestion, Inductively Coupled Plasma (ICP-OES)	129	100	1.0
Chromium	mg/kg	Digestion, Inductively Coupled Plasma (ICP-OES)	2,090	2,500	5
Lead	mg/kg	Digestion, Inductively Coupled Plasma (ICP-OES)	13,789	1,000	5.0
Mercury	mg/kg	Digestion, Cold-Vapor Atomic Absorption Spectrometry	3.7	20	0.2

**Remark :** <sup>1'</sup> Notification of the Ministry of Industry, B.E.2548 (2005), dated December 27, B.E.2548 (2005) issued under Factory Act B.E.2535 (1992), published in the Royal Government Gazette No.123 Part 11D dated January 25, B.E.2549 (2006).  
\* The unit of STLC is mg/l

  
(Ms. Raiwin Posit)  
Laboratory Reviewer No. ว-099-ค-7665

  
(Ms. Ramita Taengthai)  
Laboratory Supervisor No. ว-099-ค-7664



## ANALYSIS REPORT


**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Sampling Source** : Solid Waste Sampling  
**Sampling Point** : ภาคตะกอนจากระบบบำบัดน้ำเสีย (Sludge Drying Bed)  
**GPS. Coordinate** : UTM (WGS84) 47P 0733517 E, 1402580 N  
**Sampling Date** : October 19, 2022  
**Sampling Time** : 09:42  
**Sampling Method** : Grab  
**Sampling By** : Mr.Assada Chaiyawong, Registration No.ว-099-จ-0008  
**Analyzed By** : Environment Research & Technology Co., Ltd. Laboratory  
Registration No.ว-099  
**Physical Properties** : -

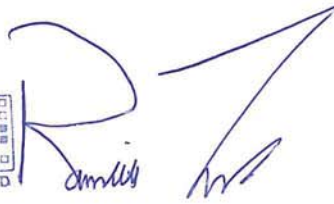
**Quotation No.** : 2022-00059  
**Analysis No.** : 2022-AD899-007  
**Received Date** : October 20, 2022  
**Analytical Date** : October 20-November 12, 2022  
**Report No.** : 2022-RAAH798  
**Report Date** : January 5, 2023

Parameter	Unit	Method of Analysis	Result	Standard <sup>1'</sup>	
				TTLIC	STLC*
Arsenic	mg/kg	Digestion, Inductively Coupled Plasma (ICP-OES)	47	500	5.0
Cadmium	mg/kg	Digestion, Inductively Coupled Plasma (ICP-OES)	20	100	1.0
Chromium	mg/kg	Digestion, Inductively Coupled Plasma (ICP-OES)	1,555	2,500	5
Lead	mg/kg	Digestion, Inductively Coupled Plasma (ICP-OES)	67	1,000	5.0
Mercury	mg/kg	Digestion, Cold-Vapor Atomic Absorption Spectrometry	0.1	20	0.2

**Remark :** <sup>1'</sup> Notification of the Ministry of Industry, B.E.2548 (2005), dated December 27, B.E.2548 (2005) issued under Factory Act B.E.2535 (1992), published in the Royal Government Gazette No.123 Part 11D dated January 25, B.E.2549 (2006).

\* The unit of STLC is mg/l

  
(Ms. Raiwin Posit)  
Laboratory Reviewer No. ว-099-ค-7665

  
(Ms. Ramita Taengthai)  
Laboratory Supervisor No. ว-099-ค-7664

## ANALYSIS REPORT

**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Sampling Source** : Solid Waste Sampling  
**Sampling Point** : ถาดตะกอนจากระบบบำบัดน้ำเสีย (Sludge Drying Bed)  
**GPS. Coordinate** : UTM (WGS84) 47P 0733517 E, 1402580 N  
**Sampling Date** : October 19, 2022  
**Sampling Time** : 09:42  
**Sampling Method** : Grab  
**Sampling By** : Mr.Assada Chaiyawong  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Physical Properties** : -

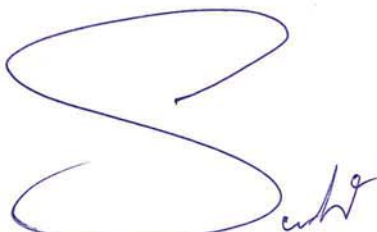
**Quotation No.** : 2022-00059  
**Analysis No.** : 2022-AD899-007  
**Received Date** : October 20, 2022  
**Analytical Date** : October 20-November 12, 2022  
**Report No.** : 2022-RAAI658  
**Report Date** : January 5, 2023

Parameter	Unit	Method of Analysis	Result	Standard <sup>1'</sup>	
				TTLIC	STLC*
Oil & Grease <sup>2'</sup>	%	Soxhlet Extraction	2.35	-	-

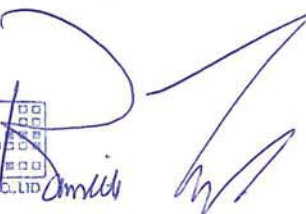
**Remark :** <sup>1'</sup> Notification of the Ministry of Industry, B.E.2548 (2005), dated December 27, B.E.2548 (2005) issued under Factory Act B.E.2535 (1992), published in the Royal Government Gazette No.123 Part 11D dated January 25, B.E.2549 (2006).

\* The unit of STLC is mg/l

<sup>2'</sup> Analyzed by Subcontractor Laboratory.

  
(Ms.Sudarat Khejonrak)  
Laboratory Reviewer



  
(Ms.Ramita Taengthai)  
Laboratory Supervisor




## ANALYSIS REPORT

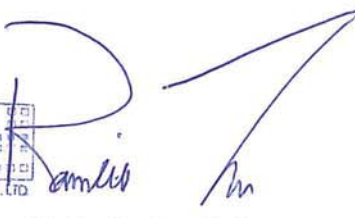
**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Sampling Source** : Solid Waste Sampling  
**Sampling Point** : ภาชนะเหล็ก (Slag)  
**GPS. Coordinate** : UTM (WGS84) 47P 0733685 E, 1402588 N  
**Sampling Date** : October 19, 2022  
**Sampling Time** : 09:58  
**Sampling Method** : Grab  
**Sampling By** : Mr.Assada Chaiyawong, Registration No.ว-099-จ-0008  
**Analyzed By** : Environment Research & Technology Co., Ltd. Laboratory  
Registration No.ว-099  
**Physical Properties** : -

**Quotation No.** : 2022-00059  
**Analysis No.** : 2022-AD899-005  
**Received Date** : October 20, 2022  
**Analytical Date** : October 20-November 12, 2022  
**Report No.** : 2022-RAAH796  
**Report Date** : January 5, 2023

Parameter	Unit	Method of Analysis	Result	Standard <sup>1'</sup>	
				TtLC	STLC*
Arsenic	mg/kg	Digestion, Inductively Coupled Plasma (ICP-OES)	5.4	500	5.0
Cadmium	mg/kg	Digestion, Inductively Coupled Plasma (ICP-OES)	4.8	100	1.0
Chromium	mg/kg	Digestion, Inductively Coupled Plasma (ICP-OES)	861	2,500	5
Lead	mg/kg	Digestion, Inductively Coupled Plasma (ICP-OES)	213	1,000	5.0
Mercury	mg/kg	Digestion, Cold-Vapor Atomic Absorption Spectrometry	<0.1	20	0.2

**Remark :** <sup>1'</sup> Notification of the Ministry of Industry, B.E.2548 (2005), dated December 27, B.E.2548 (2005) issued under Factory Act B.E.2535 (1992), published in the Royal Government Gazette No.123 Part 11D dated January 25, B.E.2549 (2006).  
\* The unit of STLC is mg/l

  
(Ms. Raiwin Posit)  
Laboratory Reviewer No. ว-099-ค-7665

  
(Ms. Ramita Taengthai)  
Laboratory Supervisor No. ว-099-ค-7664

## ANALYSIS REPORT

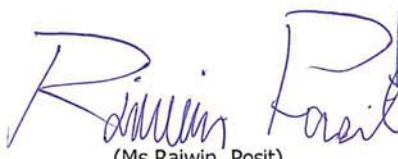
**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Sampling Source** : Solid Waste Sampling  
**Sampling Point** : ภาคตะกั่ว (Scale)  
**GPS. Coordinate** : UTM (WGS84) 47P 0733459 E, 1402411 N  
**Sampling Date** : October 19, 2022  
**Sampling Time** : 09:33  
**Sampling Method** : Grab  
**Sampling By** : Mr.Assada Chaiyawong, Registration No.ว-099-จ-0008  
**Analyzed By** : Environment Research & Technology Co., Ltd. Laboratory  
Registration No.ว-099  
**Physical Properties** : -

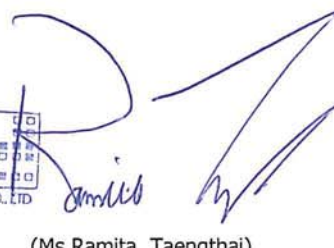
**Quotation No.** : 2022-00059  
**Analysis No.** : 2022-AD899-006  
**Received Date** : October 20, 2022  
**Analytical Date** : October 20-November 12, 2022  
**Report No.** : 2022-RAAH797  
**Report Date** : January 5, 2023

Parameter	Unit	Method of Analysis	Result	Standard <sup>1'</sup>	
				TTLIC	STLC*
Arsenic	mg/kg	Digestion, Inductively Coupled Plasma (ICP-OES)	50	500	5.0
Cadmium	mg/kg	Digestion, Inductively Coupled Plasma (ICP-OES)	15	100	1.0
Chromium	mg/kg	Digestion, Inductively Coupled Plasma (ICP-OES)	1,580	2,500	5
Lead	mg/kg	Digestion, Inductively Coupled Plasma (ICP-OES)	32	1,000	5.0
Mercury	mg/kg	Digestion, Cold-Vapor Atomic Absorption Spectrometry	<0.1	20	0.2

**Remark :** <sup>1'</sup> Notification of the Ministry of Industry, B.E.2548 (2005), dated December 27, B.E.2548 (2005) Issued under Factory Act B.E.2535 (1992), published in the Royal Government Gazette No.123 Part 11D dated January 25, B.E.2549 (2006).

\* The unit of STLC is mg/l

  
(Ms. Raiwin Posit)  
Laboratory Reviewer No. ว-099-ก-7665

  
(Ms. Ramita Taengthai)  
Laboratory Supervisor No. ว-099-ก-7664



## ANALYSIS REPORT

**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Measured Source** : Work Place Air Temperature  
**Measured Date** : October 17, 2022  
**Measured By** : Mr.Natthapon Suttimon  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Measured Instrument** : Heat Stress Monitor, Metrosnics Model hs-32 Serial Number MCF010006  
**Reported Number** : HSA055/2565

Item	Measured Location	Employee Name	Duration	Measurement Temperature: °C				Work Load, WL		
				T <sub>nwb</sub>	T <sub>db</sub>	T <sub>gr</sub>	WBGT (Avg.) <sup>1/</sup>	Metabolic Rate (Kcal/hr)	Metabolic Rate Average (Kcal/hr)	Workload Rate
1	- ห้องควบคุม (Indoor) - บริเวณหน้าเตาหลอมเหล็ก EAF (Indoor)	คุณดิเรก เว็ดชู	13:17-14:57	20.4	27.1	27.8	24.4			
			14:57-15:17	29.5	39.3	42.9	33.5	35.0	126.0	Light
				-	-	-	-	31.0		
				-	-	-	-	60.0		

**Remark :** T<sub>nwb</sub> = Nature Wet Bulb Temperature, T<sub>db</sub> = Dry Bulb Temperature, T<sub>gr</sub> = Globe Temperature, WBGT = Wet Bulb Globe Temperature Index.

<sup>1/</sup> Calculate by ((WBGT x Time<sub>1</sub>) + ... + (WBGT x Time<sub>n</sub>)) / (Time<sub>1</sub> + ... + Time<sub>n</sub>)  
<sup>2/</sup> Ministerial Regulation of the Ministry of Labour, B.E.2559 (2016), published in the Royal Government Gazette No.133, Part 91A dated October 17, B.E.2559 (2016).



(Ms. Supawan Suwannapa)  
Laboratory Reviewer




(Ms. Thanida Bunngrueang)  
Laboratory Supervisor

## ANALYSIS REPORT

**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Measured Source** : Work Place Air Temperature  
**Measured Date** : October 17, 2022  
**Measured By** : Mr.Natthapon Suttimon  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Measured Instrument** : Heat Stress Monitor, Metrosonics Model hs-32 Serial Number MCB030006  
**Reported Number** : HSA055/2565

Item	Measured Location	Employee Name	Duration	Measurement Temperature: °C				Job Description/ Activities	Work Load, WL		Std. 2/ Workload Rate
				T <sub>WB</sub>	T <sub>DB</sub>	T <sub>Gr</sub>	WBGT (Avg.) <sup>1/</sup>		Metabolic Rate (Kcal/hr)	Metabolic Rate Average (Kcal/hr)	
2	- ห้องพักพนักงาน CCM (Indoor) - บริเวณจุดปฏิบัติงาน CCM (Indoor)	คุณนิทัศน์ เนินปลอด	13:13-14:13	20.0	24.9	25.9	21.8	สังเกตการทำงานของเครื่องจักร - นั่ง	9.0	116.0	Light 34.0
			14:13-15:13	28.4	38.3	38.6	31.5	สังเกตการทำงานของเครื่องจักร - นั่ง	6.0		
								เตรียมเหล็ก			
								- ยืน ทำงานด้วยร่างกายทุกส่วน (เบา)	41.0		
			-	-	-	-	-	การเผาผลาญพื้นฐานของร่างกาย	60.0		

**Remark :** T<sub>WB</sub> = Nature Wet Bulb Temperature, T<sub>DB</sub> = Dry Bulb Temperature, T<sub>Gr</sub> = Globe Temperature, WBGT = Wet Bulb Globe Temperature Index.  
1/ Calculate by  $((WBGT \times Time_1) + (WBGT_2 \times Time_2) + \dots + (WBGT_n \times Time_n)) / (Time_1 + Time_2 + \dots + Time_n)$   
2/ Ministerial Regulation of the Ministry of Labour, B.E.2559 (2016), published in the Royal Government Gazette No.133, Part 91A dated October 17, B.E.2559 (2016).



(Ms. Supawan Suwannapa)  
Laboratory Reviewer




(Ms. Thanida Bunrungrueang)  
Laboratory Supervisor

DO NOT COPY PARTIAL OF THIS ANALYSIS REPORT WITHOUT OFFICIAL APPROVAL  
REPORT ANALYSIS REFERS TO SUBMITTED SAMPLE (S) ONLY



## ANALYSIS REPORT

**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Measured Source** : Work Place Air Temperature  
**Measured Date** : October 17, 2022  
**Measured By** : Mr.Natthapon Suttimon  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Measured Instrument** : Heat Stress Monitor, Metrosonics Model hs-32 Serial Number MCB030006  
**Reported Number** : HSA055/2565

Item	Measured Location	Employee Name	Duration	Measurement Temperature: °C				Job Description/ Activities	Work Load, WL		Std.2/ Workload Rate
				T <sub>NWB</sub>	T <sub>DB</sub>	T <sub>GT</sub>	WBGT (Avg.) <sup>1/</sup>		Metabolic Rate (Kcal/hr)	Metabolic Rate Average (Kcal/hr)	
3	บริเวณลาน آهنรีด (Indoor)	คุณสมโภชน์ บุตรงาม	10:17-12:17	24.0	33.3	35.4	27.4	ตรวจสอบการทำงานของเครื่องจักร - เดินบนพื้นราบ	20.0	285.0	Moderate 32.0
								ซ่อมเครื่องจักร	205.0		
								ยืน ทำงานด้วยร่างกายทุกส่วน (เบา) การเผาผลาญพื้นฐานของร่างกาย	60.0		

**Remark :** T<sub>NWB</sub> = Nature Wet Bulb Temperature, T<sub>DB</sub> = Dry Bulb Temperature, T<sub>GT</sub> = Globe Temperature, WBGT = Wet Bulb Globe Temperature Index.

1/ Calculate by  $((WBGT_1 \times Time_1) + (WBGT_2 \times Time_2) + \dots + (WBGT_n \times Time_n)) / (Time_1 + Time_2 + \dots + Time_n)$

2/ Ministerial Regulation of the Ministry of Labour, B.E.2559 (2016), published in the Royal Government Gazette No.133, Part 91A dated October 17, B.E.2559 (2016).



(Ms. Supawan Suwannapa)  
Laboratory Reviewer




(Ms. Thanida Bunrungrueang)  
Laboratory Supervisor

## ANALYSIS REPORT

**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Measured Source** : Work Place Air Temperature  
**Measured Date** : October 17, 2022  
**Measured By** : Mr.Natthapon Suttimon  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Measured Instrument** : Heat Stress Monitor, Metrosionics Model hs-32 Serial Number MCF010006  
**Reported Number** : HSA055/2565

Item	Measured Location	Employee Name	Duration	Measurement Temperature, °C				Job Description/ Activities	Work Load, WL		Std. 2/
				T <sub>NWB</sub>	T <sub>DB</sub>	T <sub>GT</sub>	WBGT (Avg.) <sup>1/</sup>		Metabolic Rate (Kcal/hr)	Metabolic Rate Average (Kcal/hr)	
4	บริเวณ Pendulum Shear (Indoor)	Chen	10:14-12:14	25.7	37.0	40.3	30.1	ควบคุมเครื่องตัดเหล็ก - ยืน ทำงานด้วยแขนทั้ง 2 ข้าง (เบา)	126.0	186.0	Light 34.0
				-	-	-	-	การเผาผลาญพื้นฐานของร่างกาย	60.0		

**Remark :** T<sub>NWB</sub> = Nature Wet Bulb Temperature, T<sub>DB</sub> = Dry Bulb Temperature, T<sub>GT</sub> = Globe Temperature, WBGT = Wet Bulb Globe Temperature Index.

<sup>1/</sup> Calculate by  $((WBGT \times Time_1) + (WBGT_2 \times Time_2) + \dots + (WBGT_n \times Time_n)) / (Time_1 + Time_2 + \dots + Time_n)$   
<sup>2/</sup> Ministerial Regulation of the Ministry of Labour, B.E.2559 (2016), published in the Royal Government Gazette No.133, Part 91A dated October 17, B.E.2559 (2016).



(Ms. Supawan Suwannapa)  
Laboratory Reviewer




(Ms. Thanida Bunrungrueang)  
Laboratory Supervisor



## ANALYSIS REPORT

**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Measured Source** : Work Place Air Temperature  
**Measured Date** : October 17, 2022  
**Measured By** : Mr.Natthapon Suttimon  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Measured Instrument** : Heat Stress Monitor, Quest Technologies Model QT-34 Serial Number TEH040040  
**Reported Number** : HSA055/2565

Item	Measured Location	Employee Name	Duration	Measurement Temperature; °C				Work Load, WL			Std. <sup>2/</sup>
				T <sub>nwb</sub>	T <sub>db</sub>	T <sub>gr</sub>	WBGT (Avg.) <sup>1/</sup>	Metabolic Rate (Kcal/hr)	Metabolic Rate Average (Kcal/hr)	Workload Rate	
5	บริเวณลานหน้าเหล็กของผู้รับเหมา (Indoor)	คุณวิฑูรย์ แก้วกึ่ง	10:08-12:08	22.9	32.8	32.9	25.9	108.0	168.0	Light	34.0
				-	-	-	-	60.0			

**Remark :** T<sub>nwb</sub> = Nature Wet Bulb Temperature, T<sub>db</sub> = Dry Bulb Temperature, T<sub>gr</sub> = Globe Temperature, WBGT = Wet Bulb Globe Temperature Index.

<sup>1/</sup> Calculate by  $((WBGT \times Time_1) + \dots + (WBGT \times Time_n)) / (Time_1 + \dots + Time_n)$

<sup>2/</sup> Ministerial Regulation of the Ministry of Labour, B.E.2559 (2016), published in the Royal Government Gazette No.133, Part 91A dated October 17, B.E.2559 (2016).



(Ms. Supawan Suwannapa)  
Laboratory Reviewer




(Ms. Thanida Bunngrueang)  
Laboratory Supervisor

## ANALYSIS REPORT

**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Measured Source** : Work Place Air Temperature  
**Measured Date** : October 17, 2022  
**Measured By** : Mr.Natthapon Suttimon  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Measured Instrument** : Heat Stress Monitor, Quest Technologies Model QT-34 Serial Number TEH070023  
**Reported Number** : HSA055/2565

Item	Measured Location	Employee Name	Duration	Measurement Temperature: °C				Job Description/ Activities	Work Load, WL		Std. 2/
				T <sub>NWB</sub>	T <sub>DB</sub>	T <sub>Or</sub>	WBGT (Avg.) <sup>1/</sup>		Metabolic Rate Average (Kcal/hr)	Metabolic Rate Average (Kcal/hr)	
6	บริเวณจุดผลิตเหล็กเส้นขึ้นรูป (Indoor)	คุณจันทร์ ชุก	10:27-12:27	23.7	32.3	33.9	26.8	ควบคุมเครื่องจักร - ยืน ทำงานด้วยแขนทั้ง 2 ข้าง (เบา) การเผาผลาญพื้นฐานของร่างกาย	126.0	186.0	34.0
				-	-	-	-		60.0		

**Remark :** T<sub>WB</sub> = Nature Wet Bulb Temperature, T<sub>DB</sub> = Dry Bulb Temperature, T<sub>or</sub> = Globe Temperature, WBGT = Wet Bulb Globe Temperature Index.  
<sup>1/</sup> Calculate by ((WBGT<sub>1</sub> × Time<sub>1</sub>) + ... + (WBGT<sub>n</sub> × Time<sub>n</sub>)) / (Time<sub>1</sub> + Time<sub>2</sub> + ... + Time<sub>n</sub>)  
<sup>2/</sup> Ministerial Regulation of the Ministry of Labour, B.E.2559 (2016), published in the Royal Government Gazette No.133, Part 91A dated October 17, B.E.2559 (2016).



(Ms. Supawan Suwannapa)  
Laboratory Reviewer




(Ms. Thanida Bunrungrueang)  
Laboratory Supervisor

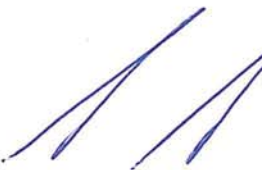



## ANALYSIS REPORT

**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Maptaphut, Muang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Measured Source** : Work Place Noise  
**Measured Date** : July 23, 2022  
**Measured By** : Mr.Natthapon Suttimon  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Measured Instrument** : Integrating Sound Level Meter Type II, ACO Model 6236 Serial Number 222118  
**Reported Number** : NHA134/2565

Measured Location	Interval Time	Equivalent Level; dB(A)	Maximum Level; dB(A)	Standard <sup>1/</sup>
บริเวณเตาหลอมเหล็ก EAF ห้องควบคุม	08:27 - 09:27	73.8	85.2	-
	09:27 - 10:27	70.5	81.6	-
	10:27 - 11:27	72.9	87.1	-
	11:27 - 12:27	70.6	86.3	-
	12:27 - 13:27	70.7	82.1	-
	13:27 - 14:27	70.7	83.0	-
	14:27 - 15:27	73.2	84.4	-
	15:27 - 16:27	72.4	82.3	-
	<b>Equivalent Level 8 hrs (Leq 8 hrs)</b>	<b>72.0</b>		<b>90</b>
	<b>Maximum Level (Lmax)</b>	<b>87.1</b>		<b>140</b>

**Remark :** <sup>1/</sup> Notification of the Ministry of Industry regarding Working Environment, Occupation Health and Safety Measurements issued under Factory Act B.E.2535 (1992), published in the Royal Government Gazette, Vol.120, Part 138D dated December 3, B.E.2546 (2003).

  
(Ms. Supawan Suwannapa)  
Laboratory Reviewer

  
(Ms. Thanida Bunrungrueang)  
Laboratory Supervisor

## ANALYSIS REPORT

**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Maptaphut, Muang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Measured Source** : Work Place Noise  
**Measured Date** : July 23, 2022  
**Measured By** : Mr.Natthapon Suttimon  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Measured Instrument** : Integrating Sound Level Meter Type II, ACO Model 6236 Serial Number 222121  
**Reported Number** : NHA135/2565

Measured Location	Interval Time	Equivalent Level; dB(A)	Maximum Level; dB(A)	Standard <sup>1/</sup>
บริเวณเครื่องหล่อเหล็กแท่ง ห้องควบคุม	09:03 - 10:03	68.1	90.6	-
	10:03 - 11:03	65.4	82.5	-
	11:03 - 12:03	66.1	82.7	-
	12:03 - 13:03	64.0	80.7	-
	13:03 - 14:03	68.1	88.3	-
	14:03 - 15:03	63.6	83.0	-
	15:03 - 16:03	75.4	99.4	-
	16:03 - 17:03	72.3	82.2	-
	Equivalent Level 8 hrs (Leq 8 hrs)	69.8		90
	Maximum Level (Lmax)	99.4		140

**Remark :** <sup>1/</sup> Notification of the Ministry of Industry regarding Working Environment, Occupation Health and Safety Measurements issued under Factory Act B.E.2535 (1992), published in the Royal Government Gazette, Vol.120, Part 138D dated December 3, B.E.2546 (2003).

(Ms.Supawan Suwannapa)  
Laboratory Reviewer



(Ms.Thanida Bunrungrueang)  
Laboratory Supervisor



## ANALYSIS REPORT

**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Maptaphut, Muang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Measured Source** : Work Place Noise  
**Measured Date** : July 23, 2022  
**Measured By** : Mr.Natthapon Suttimon  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Measured Instrument** : Integrating Sound Level Meter Type II, ACO Model 6236 Serial Number 222112  
**Reported Number** : NHA136/2565

Measured Location	Interval Time	Equivalent Level; dB(A)	Maximum Level; dB(A)	Standard <sup>1/</sup>
บริเวณแท่นรีดเหล็ก ห้องควบคุม	09:11 - 10:11	71.4	78.3	-
	10:11 - 11:11	71.9	85.8	-
	11:11 - 12:11	70.9	82.8	-
	12:11 - 13:11	71.8	81.2	-
	13:11 - 14:11	71.1	77.7	-
	14:11 - 15:11	71.5	78.1	-
	15:11 - 16:11	71.1	78.2	-
	16:11 - 17:11	71.9	78.0	-
	<b>Equivalent Level 8 hrs (Leq 8 hrs)</b>	<b>71.5</b>		<b>90</b>
	<b>Maximum Level (Lmax)</b>	<b>85.8</b>		<b>140</b>

**Remark :** <sup>1/</sup> Notification of the Ministry of Industry regarding Working Environment, Occupation Health and Safety Measurements issued under Factory Act B.E.2535 (1992), published in the Royal Government Gazette, Vol.120, Part 138D dated December 3, B.E.2546 (2003).

(Ms.Supawan Suwannapa)  
Laboratory Reviewer



(Ms.Thanida Bunrungrueang)  
Laboratory Supervisor

## ANALYSIS REPORT

**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Maptaphut, Muang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Measured Source** : Work Place Noise  
**Measured Date** : July 23, 2022  
**Measured By** : Mr.Natthapon Suttimon  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Measured Instrument** : Integrating Sound Level Meter Type II, ACO Model 6236 Serial Number 222106  
**Reported Number** : NHA137/2565

Measured Location	Interval Time	Equivalent Level; dB(A)	Maximum Level; dB(A)	Standard <sup>1/</sup>
บริเวณ Pendulum Shear ห้องควบคุม	09:15 - 10:15	69.4	83.8	-
	10:15 - 11:15	71.2	84.6	-
	11:15 - 12:15	69.8	83.2	-
	12:15 - 13:15	68.7	77.8	-
	13:15 - 14:15	69.6	83.9	-
	14:15 - 15:15	71.0	86.9	-
	15:15 - 16:15	69.4	85.8	-
	16:15 - 17:15	68.7	78.7	-
	<b>Equivalent Level 8 hrs (Leq 8 hrs)</b>	<b>69.8</b>		<b>90</b>
	<b>Maximum Level (Lmax)</b>	<b>86.9</b>		<b>140</b>

**Remark :** <sup>1/</sup> Notification of the Ministry of Industry regarding Working Environment, Occupation Health and Safety Measurements issued under Factory Act B.E.2535 (1992), published in the Royal Government Gazette, Vol.120, Part 138D dated December 3, B.E.2546 (2003).

(Ms.Supawan Suwannapa)  
Laboratory Reviewer



(Ms.Thanida Bunrungrueang)  
Laboratory Supervisor



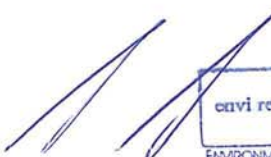
## ANALYSIS REPORT


**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Measured Source** : Work Place Noise  
**Measured Date** : October 17, 2022  
**Measured By** : Mr.Natthapon Suttimon  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Measured Instrument** : Integrating Sound Level Meter Type II, ACO Model 6236 Serial Number 222116

**Quotation No.** : 2022-00059  
**Analysis No.** : 2022-AD971-014  
**Report No.** : 2022-RAAH781  
**Report Date** : November 2, 2022

Measured Location	Interval Time	Equivalent Level; dB(A)	Maximum Level; dB(A)	Standard <sup>1'</sup>
บริเวณเตาหลอมเหล็ก EAF ห้องควบคุม	09:28 - 10:28	70.0	82.2	-
	10:28 - 11:28	69.4	82.2	-
	11:28 - 12:28	69.0	84.3	-
	12:28 - 13:28	70.2	83.1	-
	13:28 - 14:28	72.2	88.0	-
	14:28 - 15:28	72.1	87.5	-
	15:28 - 16:28	68.9	86.2	-
	16:28 - 17:28	69.0	82.6	-
	Equivalent Level 8 hrs (Leq 8 hrs)	70.3		90
	Maximum Level (Lmax)	88.0		140

Remark : <sup>1'</sup> Notification of the Ministry of Industry regarding Working Environment, Occupation Health and Safety Measurements issued under Factory Act B.E.2535 (1992), published in the Royal Government Gazette, Vol.120, Part 138D dated December 3, B.E.2546 (2003).

  
(Ms. Supawan Suwannapa)  
Laboratory Reviewer

  
(Ms. Thanida Bunrungrueang)  
Laboratory Supervisor


## ANALYSIS REPORT


**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Measured Source** : Work Place Noise  
**Measured Date** : October 17, 2022  
**Measured By** : Mr.Natthapon Suttimon  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Measured Instrument** : Integrating Sound Level Meter Type II, ACO Model 6236 Serial Number 222118

**Quotation No.** : 2022-00059  
**Analysis No.** : 2022-AD971-015  
**Report No.** : 2022-RAAH782  
**Report Date** : November 2, 2022

Measured Location	Interval Time	Equivalent Level; dB(A)	Maximum Level; dB(A)	Standard <sup>1'</sup>
บริเวณเครื่องหล่อเหล็กแท่ง ห้องควบคุม	10:02 - 11:02	64.7	86.7	-
	11:02 - 12:02	63.5	78.0	-
	12:02 - 13:02	65.6	95.3	-
	13:02 - 14:02	70.6	87.5	-
	14:02 - 15:02	67.4	85.7	-
	15:02 - 16:02	74.6	94.1	-
	16:02 - 17:02	71.2	92.9	-
	17:02 - 18:02	62.0	80.1	-
	Equivalent Level 8 hrs (Leq 8 hrs)	69.4		90
	Maximum Level (Lmax)	95.3		140

**Remark :** <sup>1'</sup> Notification of the Ministry of Industry regarding Working Environment, Occupation Health and Safety Measurements issued under Factory Act B.E.2535 (1992), published in the Royal Government Gazette, Vol.120, Part 138D dated December 3, B.E.2546 (2003).

  
(Ms. Supawan Suwannapa)  
Laboratory Reviewer

  
(Ms. Thanida Bunrungrueang)  
Laboratory Supervisor



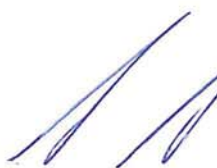
## ANALYSIS REPORT

**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Measured Source** : Work Place Noise  
**Measured Date** : October 17, 2022  
**Measured By** : Mr.Natthapon Suttimon  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Measured Instrument** : Integrating Sound Level Meter Type II, ACO Model 6236 Serial Number 222117

**Quotation No.** : 2022-00059  
**Analysis No.** : 2022-AD971-017  
**Report No.** : 2022-RAAH783  
**Report Date** : November 2, 2022

Measured Location	Interval Time	Equivalent Level; dB(A)	Maximum Level; dB(A)	Standard <sup>1'</sup>
บริเวณแท่นรีดเหล็ก ห้องควบคุม	10:39 - 11:39	68.4	79.7	-
	11:39 - 12:39	68.8	80.2	-
	12:39 - 13:39	69.8	81.0	-
	13:39 - 14:39	69.0	80.5	-
	14:39 - 15:39	68.9	81.9	-
	15:39 - 16:39	66.6	85.5	-
	16:39 - 17:39	60.4	74.4	-
	17:39 - 18:39	60.7	74.1	-
	Equivalent Level 8 hrs (Leq 8 hrs)	67.7		90
	Maximum Level (Lmax)	85.5		140

Remark : <sup>1'</sup> Notification of the Ministry of Industry regarding Working Environment, Occupation Health and Safety Measurements issued under Factory Act B.E.2535 (1992), published in the Royal Government Gazette, Vol.120, Part 138D dated December 3, B.E.2546 (2003).



(Ms. Supawan Suwannapa)  
Laboratory Reviewer




(Ms. Thanida Bunrungrueang)  
Laboratory Supervisor


## ANALYSIS REPORT

**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Measured Source** : Work Place Noise  
**Measured Date** : October 17, 2022  
**Measured By** : Mr.Natthapon Suttimon  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Measured Instrument** : Integrating Sound Level Meter Type II, ACO Model 6236 Serial Number 222114

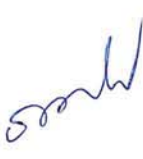
**Quotation No.** : 2022-00059  
**Analysis No.** : 2022-AD971-016  
**Report No.** : 2022-RAAH784  
**Report Date** : November 2, 2022

Measured Location	Interval Time	Equivalent Level; dB(A)	Maximum Level; dB(A)	Standard <sup>1'</sup>
บริเวณ Pendulum Shear ห้องควบคุม	10:34 - 11:34	67.1	84.0	-
	11:34 - 12:34	67.3	82.7	-
	12:34 - 13:34	65.8	84.8	-
	13:34 - 14:34	65.8	85.0	-
	14:34 - 15:34	66.5	83.1	-
	15:34 - 16:34	65.6	84.0	-
	16:34 - 17:34	50.2	67.1	-
	17:34 - 18:34	50.2	66.9	-
	Equivalent Level 8 hrs (Leq 8 hrs)	65.2		90
	Maximum Level (Lmax)	85.0		140

Remark : <sup>1'</sup> Notification of the Ministry of Industry regarding Working Environment, Occupation Health and Safety Measurements issued under Factory Act B.E.2535 (1992), published in the Royal Government Gazette, Vol.120, Part 138D dated December 3, B.E.2546 (2003).



(Ms. Supawan Suwannapa)  
Laboratory Reviewer



(Ms. Thanida Bunrungrueang)  
Laboratory Supervisor



## ANALYSIS REPORT

**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Maptaphut, Muang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Measured Source** : Personal Noise Dose  
**Measured By** : Mr.Natthapon Suttimon  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Reported Number** : NDA023/2565

Item	Measured Location	Employee Name	Working Time		Measured Date	Measured Time		Serial Number of Noise Dosimeter	Summary of Measurement Results <sup>1/</sup>	
			Interval Time	Period (Hr)		Interval Time	Period (Hr)		Project Dose (%)	Time Weighted Average 8 hrs (dB(A))
1	บริเวณหน้าเตาหลอมเหล็ก EAF	คุณกิตติการณ์ ก้อนเงิน	08:00 – 16:00	8	23/07/65	08:30 – 15:54	7.24	190800266	68.10	83.3
2	บริเวณเตาหลอมเหล็ก LF	คุณชาติพร พรมพินิจ	08:00 – 16:00	8	23/07/65	08:40 – 16:03	7.23	190600236	193.80*	87.9*
3	บริเวณจุดปฏิบัติงาน CCM	คุณยุทธพงษ์ นวอุดม	08:00 – 16:00	8	23/07/65	09:02 – 16:02	7.00	190600222	376.00*	90.7*
4	บริเวณลานแท่นรีด	คุณวันชัย ศรีรินทร์	08:00 – 16:00	8	23/07/65	09:18 – 16:19	7.01	190600235	1.20	65.9
5	บริเวณ Pendulum Shear	คุณดนัย บึงหมู	08:00 – 16:00	8	23/07/65	09:20 – 16:22	7.02	17862	15.76	77.0
6	บริเวณลานนับเหล็กของผู้รับเหมา	คุณหนูไกร สัตติ	08:00 – 16:00	8	23/07/65	09:25 – 16:28	7.03	190800268	76.70	83.9
7	บริเวณจุดผลิตเหล็กเส้นขั้วรูป	คุณชาญชัย จันทร์หอม	08:00 – 16:00	8	23/07/65	09:33 – 16:33	7.00	17570	246.10*	88.9*
Standard <sup>2/</sup>									100	85

**Remark :** <sup>1/</sup> Using 3 dB Energy Exchange Rate, Slow Response, 85 dB Criteria Level, 80 dB Threshold Level.  
<sup>2/</sup> The Announcement of the Department of Labour Protection and Welfare, issued under the Labour Ministerial Regulation, B.E.2559 (2016), published in the Royal Government Gazette Volume 135 Special Part 19D dated January 26, B.E.2561 (2018) and published in the Royal Government Gazette Volume 135 Special Part 57D dated March 12, B.E.2561 (2018).  
\* Not within Standard.

(Ms.Supawan Suwannapa)  
Laboratory Reviewer



(Ms.Thanida Bunrungrueang)  
Laboratory Supervisor

DO NOT COPY PARTIAL OF THIS ANALYSIS REPORT WITHOUT OFFICIAL APPROVAL  
REPORT ANALYSIS REFERS TO SUBMITTED SAMPLE (S) ONLY  
Page 1 / 1

## ANALYSIS REPORT

**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นถ่วง  
**Measured Source** : Personal Noise Dose  
**Measured By** : Mr.Natthapon Suttimon  
**Analyzed By** : Environment Research & Technology Co., Ltd.

**Quotation No.** : 2022-00059  
**Analysis No.** : 2022-AD971  
**Report No.** : 2022-RAAH771  
**Report Date** : November 2, 2022

Item	Measured Location	Employee Name	Working Time		Measured Date	Measured Time		Serial Number of Noise Dosimeter	Summary of Measurement Results <sup>1/</sup>	
			Interval Time	Period (Hr)		Interval Time	Period (Hr)		Project Dose (%)	Time Weighted Average 8 hrs (dB(A))
1	บริเวณหน้าเตาหลอมเหล็ก EAF	คุณเดวิด เบ็คซ์	08:00 – 16:00	8.00	17/10/65	09:29 – 17:05	7.36	17860	157.50*	87.0*
2	บริเวณเตาหลอมเหล็ก LF	คุณเชียนชัย ทองน้อย	08:00 – 16:00	8.00	17/10/65	09:38 – 17:07	7.29	190600222	247.00*	88.9*
3	บริเวณจุดปฏิบัติงาน CCM	คุณพิศนัย เปรมปลอด	08:00 – 16:00	8.00	17/10/65	10:04 – 17:14	7.10	190600235	22.90	78.6
4	บริเวณลานแท่นรีด	คุณสมโภชน์ บุตรงาน	08:00 – 16:00	8.00	17/10/65	10:49 – 17:49	7.00	190600234	10.10	75.1
5	บริเวณ Pendulum Shear	คุณเดวิด ร้องหนู	08:00 – 16:00	8.00	17/10/65	10:35 – 17:45	7.10	190600233	2.50	69.0
6	บริเวณลานนับเหล็กของผู้รับเหมา	คุณบัวตม แก้วกั้ง	08:00 – 16:00	8.00	17/10/65	10:25 – 17:49	7.24	17861	74.36	83.7
7	บริเวณจุดผลิตเหล็กเส้นรูป	คุณสมโภช เหลืองสุวรรณ	08:00 – 16:00	8.00	17/10/65	10:16 – 17:22	7.06	180200311	62.00	82.9
Standard <sup>2/</sup>									100	85

**Remark :** <sup>1/</sup> Using 3 dB Energy Exchange Rate, Slow Response, 85 dB Criteria Level, 80 dB Threshold Level.

<sup>2/</sup> The Announcement of the Department of Labour Protection and Welfare, issued under the Labour Ministerial Regulation, B.E.2559 (2016), published in the Royal Government Gazette Volume 135 Special Part 19D dated January 26, B.E.2561 (2018) and published in the Royal Government Gazette Volume 135 Special Part 57D dated March 12, B.E.2561 (2018).

\* Not within Standard.



(Ms. Supawan Suwannapa)  
Laboratory Reviewer




(Ms. Thanida Bunrungrueang)  
Laboratory Supervisor

DO NOT COPY PARTIAL OF THIS ANALYSIS REPORT WITHOUT OFFICIAL APPROVAL  
REPORT ANALYSIS REFERS TO SUBMITTED SAMPLE (S) ONLY