

### ภาคผนวกที่ 3

ใบรายงานผลการวิเคราะห์จากห้องปฏิบัติการ

## 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** : February 4, 2023  
**Sampling Time** : 11:05-11:58  
**Sampling Method** : US.EPA. Method 1-4, 5, 6C, 7E, 10  
**Sampling By** : Mr.Siwawut Thamnita, Registration No. ว-099-จ-8840  
**Analyzed By** : Environment Research & Technology Co., Ltd. Laboratory Registration No.ว-099

**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AA356-001  
**Received Date** : February 4, 2023  
**Analytical Date** : February 4-20, 2023  
**Report No.** : 2023-RAAD187  
**Report Date** : April 5, 2023

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	78	-	-	-
6	Pressure in Stack	Incline Manometer	mmHg	760	-	-	-
7	Oxygen Rate	Electrochemical Sensor	%	20.3	-	-	-
8	Moisture	Condensation Method	%	4.9	-	-	-
9	Air Velocity	Type S Pitot Tube	m/s	10.5	-	-	-
10	Volume Metric Flow Rate	Calculate	Nm <sup>3</sup> /hr	509,189	-	-	-
11	Volume Metric Flow Rate	Calculate	m <sup>3</sup> /hr	599,705	-	-	-
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	6.2	200	200	-
15	Oxide of Nitrogen (NOx) <sup>1'</sup>	Instrumental Analyzer Method	mg/m <sup>3</sup>	12	376	376	-
16	Total Suspended Particulate <sup>1'</sup>	Isokinetic, Gravimetric	mg/m <sup>3</sup>	1.8	240	320	40
17	Carbon Monoxide (CO) <sup>1'</sup>	Instrumental Analyzer Method	ppm	19	-	690	-
18	Carbon Monoxide (CO) <sup>1'</sup>	Instrumental Analyzer Method	mg/m <sup>3</sup>	22	-	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)

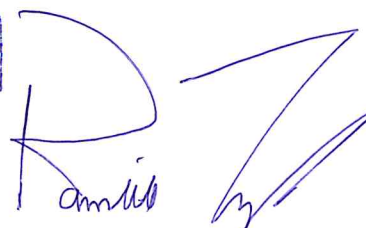
<sup>3'</sup> Notification of the Ministry of Industry B.E.2549 (2006), issued under Factory Act B.E.2535 (1992), published in the Royal Government Gazette No.123 Special Part 125D dated December 4, B.E.2549 (2006).

<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** : February 4, 2023  
**Sampling Time** : 10:00-10:58  
**Sampling Method** : US.EPA. Method 1-4, 5, 6C, 7E, 10  
**Sampling By** : Mr.Siwawut Thamnita, Registration No. ๖-099-๖-8840  
**Analyzed By** : Environment Research & Technology Co., Ltd. Laboratory Registration No.๖-099

**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AA356-002  
**Received Date** : February 4, 2023  
**Analytical Date** : February 4-20, 2023  
**Report No.** : 2023-RAAD188  
**Report Date** : April 5, 2023


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	91	-	-	-
6	Pressure in Stack	Incline Manometer	mmHg	770	-	-	-
7	Oxygen Rate	Electrochemical Sensor	%	20.6	-	-	-
8	Moisture	Condensation Method	%	4.5	-	-	-
9	Air Velocity	Type S Pitot Tube	m/s	15.5	-	-	-
10	Volume Metric Flow Rate	Calculate	Nm <sup>3</sup> /hr	498,758	-	-	-
11	Volume Metric Flow Rate	Calculate	m <sup>3</sup> /hr	601,729	-	-	-
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	5.9	200	200	-
15	Oxide of Nitrogen (NOx) <sup>1'</sup>	Instrumental Analyzer Method	mg/m <sup>3</sup>	11	376	376	-
16	Total Suspended Particulate <sup>1'</sup>	Isokinetic, Gravimetric	mg/m <sup>3</sup>	1.7	240	320	40
17	Carbon Monoxide (CO) <sup>1'</sup>	Instrumental Analyzer Method	ppm	12	-	690	-
18	Carbon Monoxide (CO) <sup>1'</sup>	Instrumental Analyzer Method	mg/m <sup>3</sup>	14	-	790	-

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

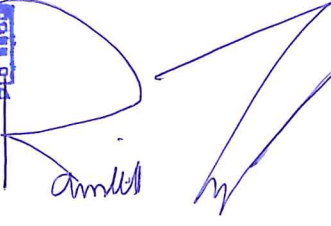
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(Ms.Natnicha Sermmatiwong)  
Laboratory Reviewer No. ๖-099-๖-7666



(Ms.Ramita Taengthai)  
Laboratory Supervisor No. ๖-099-๖-7664



## 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** : ปล่องของเตาอบเหล็กแท่ง (RHF)  
**GPS. Coordinate** : UTM (WGS84) 47P 0733481 E, 1402417 N  
**Sampling Date** : February 4, 2023  
**Sampling Time** : 10:00-11:00  
**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.** : 2023-00099  
**Analysis No.** : 2023-AA356-003  
**Received Date** : February 4, 2023  
**Analytical Date** : February 4-28, 2023  
**Report No.** : 2023-RAAD189  
**Report Date** : April 5, 2023

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	300	-	-	-	-
6	Pressure in Stack	Incline Manometer	mmHg	759	-	-	-	-
7	Oxygen Rate	Electrochemical Sensor	%	8.1	-	-	-	-
8	Moisture	Condensation Method	%	5.7	-	-	-	-
9	Air Velocity	Type S Pitot Tube	m/s	16.7	-	-	-	-
10	Volume Metric Flow Rate <sup>1'</sup>	Calculate	Nm <sup>3</sup> /hr	79,417	-	-	-	-
11	Volume Metric Flow Rate	Calculate	m <sup>3</sup> /hr	152,923	-	-	-	-
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 (NOx) <sup>1'</sup>	Instrumental Analyzer Method	ppm	46	50	200	200	150
15	Oxide of Nitrogen (NOx) <sup>1'</sup>	Instrumental Analyzer Method	mg/m <sup>3</sup>	87	94	376	376	282
16	Carbon Monoxide (CO) <sup>1'</sup>	Instrumental Analyzer Method	ppm	1.4	1.5	-	690	-
17	Carbon Monoxide (CO) <sup>1'</sup>	Instrumental Analyzer Method	mg/m <sup>3</sup>	1.6	1.7	-	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)

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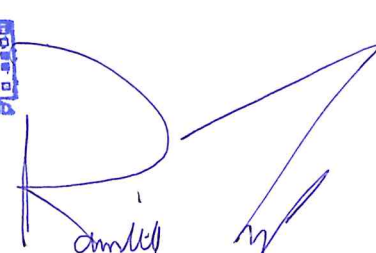
<sup>4'</sup> มาตรฐานที่กำหนดตามผลการพิจารณาการวิเคราะห์ผลกระทบสิ่งแวดล้อม โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง ของบริษัท เหล็กก่อสร้างสยาม จำกัด (ปัจจุบันเปลี่ยนชื่อเป็นบริษัท ทาทา สตีล การผลิต (ประเทศไทย) จำกัด (มหาชน) สาขาลำดับที่ 00005)





(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 # 1)  
**GPS. Coordinate** : UTM (WGS84) 47P 0733506 E, 1402545 N  
**Sampling Date** : April 21, 2023  
**Sampling Time** : 10:40-11:40  
**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.** : 2023-00099  
**Analysis No.** : 2023-AB428-001  
**Received Date** : April 21, 2023  
**Analytical Date** : April 21-May 3, 2023  
**Report No.** : 2023-RAAH789  
**Report Date** : May 8, 2023


Item	Description	Method of Analysis	Unit	Result	Standard <sup>2'</sup>	Standard <sup>3'</sup>	Standard <sup>4'</sup>
1	Fuel Type	-	-	Electeic 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	73	-	-	-
6	Pressure in Stack	Incline Manometer	mmHg	756	-	-	-
7	Oxygen Rate	Electrochemical Sensor	%	20.6	-	-	-
8	Moisture	Condensation Method	%	2.1	-	-	-
9	Air Velocity	Type S Pitot Tube	m/s	16.7	-	-	-
10	Volume Metric Flow Rate	Calculate	Nm <sup>3</sup> /hr	819,906	-	-	-
11	Volume Metric Flow Rate	Calculate	m <sup>3</sup> /hr	956,252	-	-	-
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	0.5	200	200	-
15	Oxide of Nitrogen (NOx) <sup>1'</sup>	Instrumental Analyzer Method	mg/m <sup>3</sup>	0.9	376	376	-
16	Total Suspended Particulate <sup>1'</sup>	Isokinetic, Gravimetric	mg/m <sup>3</sup>	1.2	240	320	40
17	Carbon Monoxide (CO) <sup>1'</sup>	Instrumental Analyzer Method	ppm	<1.0	-	690	-
18	Carbon Monoxide (CO) <sup>1'</sup>	Instrumental Analyzer Method	mg/m <sup>3</sup>	<1.1	-	790	-

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

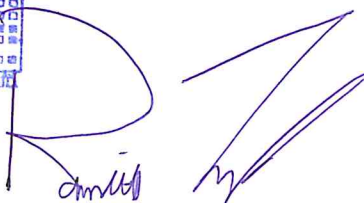
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Laboratory Reviewer No. ว-099-ค-7666

(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** : April 21, 2023  
**Sampling Time** : 09:20-10:20  
**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.** : 2023-00099  
**Analysis No.** : 2023-AB428-002  
**Received Date** : April 21, 2023  
**Analytical Date** : April 21-May 3, 2023  
**Report No.** : 2023-RAAH790  
**Report Date** : May 8, 2023

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	92	-	-	-
6	Pressure in Stack	Incline Manometer	mmHg	756	-	-	-
7	Oxygen Rate	Electrochemical Sensor	%	20.2	-	-	-
8	Moisture	Condensation Method	%	2.1	-	-	-
9	Air Velocity	Type S Pitot Tube	m/s	18.8	-	-	-
10	Volume Metric Flow Rate	Calculate	Nm <sup>3</sup> /hr	591,055	-	-	-
11	Volume Metric Flow Rate	Calculate	m <sup>3</sup> /hr	727,010	-	-	-
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	0.5	200	200	-
15	Oxide of Nitrogen (NOx) <sup>1'</sup>	Instrumental Analyzer Method	mg/m <sup>3</sup>	0.9	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	<1.0	-	690	-
18	Carbon Monoxide (CO) <sup>1'</sup>	Instrumental Analyzer Method	mg/m <sup>3</sup>	<1.1	-	790	-

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

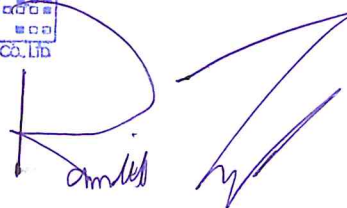
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<sup>4'</sup> มาตรฐานที่กำหนดตามผลการพิจารณาการวิเคราะห์ผลกระทบสิ่งแวดล้อม โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง ของบริษัท เหล็กก่อสร้างสยาม จำกัด (ปัจจุบันเปลี่ยนชื่อเป็นบริษัท ทาทา สตีล การผลิต (ประเทศไทย) จำกัด (มหาชน) สาขาลำดับที่ 00005)



(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** : ปล่องของเตาอบเหล็กแท่ง (RHF)  
**GPS. Coordinate** : UTM (WGS84) 47P 0733486 E, 1402419 N  
**Sampling Date** : April 21, 2023  
**Sampling Time** : 09:50-10:48  
**Sampling Method** : US.EPA. Method 1-4, 5, 6C, 7E, 10  
**Sampling By** : Mr.Siwawut Thamnita, Registration No. ว-099-จ-8840  
**Analyzed By** : Environment Research & Technology Co., Ltd. Laboratory Registration No.ว-099

**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AB428-003  
**Received Date** : April 21, 2023  
**Analytical Date** : April 21-May 3, 2023  
**Report No.** : 2023-RAAH791  
**Report Date** : May 8, 2023

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	378	-	-	-	-
6	Pressure in Stack	Incline Manometer	mmHg	757	-	-	-	-
7	Oxygen Rate	Electrochemical Sensor	%	12.6	-	-	-	-
8	Moisture	Condensation Method	%	7.0	-	-	-	-
9	Air Velocity	Type S Pitot Tube	m/s	12.0	-	-	-	-
10	Volume Metric Flow Rate <sup>1'</sup>	Calculate	Nm <sup>3</sup> /hr	50,020	-	-	-	-
11	Volume Metric Flow Rate	Calculate	m <sup>3</sup> /hr	109,774	-	-	-	-
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 (NOx) <sup>1'</sup>	Instrumental Analyzer Method	ppm	77	129	200	200	150
15	Oxide of Nitrogen (NOx) <sup>1'</sup>	Instrumental Analyzer Method	mg/m <sup>3</sup>	146	245	376	376	282
16	Carbon Monoxide (CO) <sup>1'</sup>	Instrumental Analyzer Method	ppm	31	52	-	690	-
17	Carbon Monoxide (CO) <sup>1'</sup>	Instrumental Analyzer Method	mg/m <sup>3</sup>	36	60	-	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)

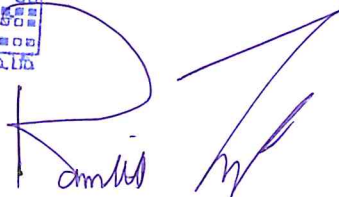
<sup>3'</sup> Notification of the Ministry of Industry B.E.2549 (2006), issued under Factory Act B.E.2535 (1992), published in the Royal Government Gazette No.123 Special Part 125D dated December 4, B.E.2549 (2006).

<sup>4'</sup> มาตรฐานที่กำหนดตามผลการพิจารณาการวิเคราะห์ผลกระทบสิ่งแวดล้อม โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง ของบริษัท เหล็กก่อสร้างสยาม จำกัด (ปัจจุบันเปลี่ยนชื่อเป็นบริษัท ทาทา สตีล การผลิต (ประเทศไทย) จำกัด (มหาชน) สาขาลาดับที่ 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** : April 21, 2023  
**Sampling Time** : 10:25-12:05  
**Sampling Method** : NIOSH  
**Sampling By** : Mr.Jirayuth Samart  
**Analyzed By** : Environment Research & Technology Co., Ltd.

**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AB421  
**Received Date** : April 24, 2023  
**Analytical Date** : April 24-26, 2023  
**Report No.** : 2023-RAAH579  
**Report Date** : May 4, 2023

Item	Sampling Area	Parameter	Method of Analysis	Unit	Result	Standard	
						Thai <sup>1'</sup>	ACGIH <sup>2'</sup>
1	หน้าเตาหลอมเหล็ก EAF	Inhalable Dust	Gravimetric	mg/m <sup>3</sup>	1.4	-	10
		Respirable Dust	Gravimetric	mg/m <sup>3</sup>	0.14	-	3
2	จุดปฏิบัติงาน CCM	Inhalable Dust	Gravimetric	mg/m <sup>3</sup>	1.3	-	10
		Respirable Dust	Gravimetric	mg/m <sup>3</sup>	0.15	-	3
3	ลานแท่นรีด	Inhalable Dust	Gravimetric	mg/m <sup>3</sup>	0.23	-	10
		Respirable Dust	Gravimetric	mg/m <sup>3</sup>	0.18	-	3
4	ลานนับเหล็กของผู้รับเหมา	Inhalable Dust	Gravimetric	mg/m <sup>3</sup>	0.13	-	10
		Respirable Dust	Gravimetric	mg/m <sup>3</sup>	<0.10	-	3

**Remark :** <sup>1'</sup> 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).

<sup>2'</sup> ACGIH = American Conference of Governmental Industrial Hygienists, 2021.



(Ms.Natnicha Sermmatiwong)  
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** : Ambient Air Quality  
**Sampling Point** : โรงพยาบาลส่งเสริมสุขภาพตำบลมาบตาพุด ตำบลมาบตาพุด อำเภอเมืองระยอง จังหวัดระยอง  
 (ทิศเหนือของโครงการ)  
**GPS. Coordinate** : UTM (WGS84) 47P 0735183 E, 1405877 N  
**Sampling Date** : April 18-21, 2023  
**Sampling Time** : 12:50  
**Sampling Method** : U.S. EPA 40 CFR Part 50  
**Sampling By** : Mr.Akarawat Kochobog  
**Analyzed By** : Environment Research & Technology Co., Ltd.

**Quotation No.** : 2023-00099  
**Folder No.** : 2023-AB436  
**Received Date** : April 24, 2023  
**Analytical Date** : April 24-27, 2023  
**Report No.** : 2023-RAAH313  
**Report Date** : April 28, 2023

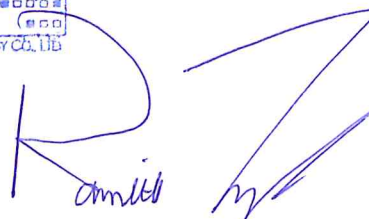
Parameter	Unit	Method of Analysis	Result			Standard <sup>1'</sup>
			Apr 18-19, 23	Apr 19-20, 23	Apr 20-21, 23	
Total Suspended Particulate (TSP) 24 Hours Average	mg/m <sup>3</sup>	In-house method: TM-LA-006	0.078	0.098	0.112	0.330
Particulate Size Less Than 10 Micron (PM10) 24 Hours Average	mg/m <sup>3</sup>	In-house method: TM-LA-009	0.050	0.064	0.072	0.120
Sulfur Dioxide (SO <sub>2</sub> ) 24 Hours Average	ppm	Absorption, Pararosaniline	<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.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** : Ambient Air Quality  
**Sampling Point** : ริมรั้วโรงงานทางด้านทิศเหนือ  
**GPS. Coordinate** : UTM (WGS84) 47P 0733501 E, 1402605 N  
**Sampling Date** : April 18-21, 2023  
**Sampling Time** : 14:24  
**Sampling Method** : U.S. EPA 40 CFR Part 50  
**Sampling By** : Mr.Akarawat Kochobog  
**Analyzed By** : Environment Research & Technology Co., Ltd.

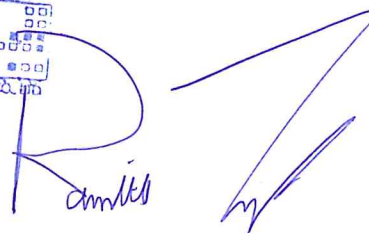
**Quotation No.** : 2023-00099  
**Folder No.** : 2023-AB436  
**Received Date** : April 24, 2023  
**Analytical Date** : April 24-27, 2023  
**Report No.** : 2023-RAAN356  
**Report Date** : July 14, 2023

Parameter	Unit	Method of Analysis	Result			Standard <sup>1'</sup>
			Apr 18-19, 23	Apr 19-20, 23	Apr 20-21, 23	
Total Suspended Particulate (TSP) 24 Hours Average	mg/m <sup>3</sup>	In-house method: TM-LA-006	0.088	0.101	0.190	0.330
Particulate Size Less Than 10 Micron (PM10) 24 Hours Average	mg/m <sup>3</sup>	In-house method: TM-LA-009	0.042	0.049	0.093	0.120
Sulfur Dioxide (SO <sub>2</sub> ) 24 Hours Average	ppm	Absorption, Pararosaniline	<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.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** : Ambient Air Quality  
**Sampling Point** : ริมรั้วโรงงานทางด้านทิศใต้  
**GPS. Coordinate** : UTM (WGS84) 47P 0733148 E, 1402389 N  
**Sampling Date** : April 18-21, 2023  
**Sampling Time** : 14:58  
**Sampling Method** : U.S. EPA 40 CFR Part 50  
**Sampling By** : Mr.Akarawat Kochobog  
**Analyzed By** : Environment Research & Technology Co., Ltd.


**Quotation No.** : 2023-00099  
**Folder No.** : 2023-AB436  
**Received Date** : April 24, 2023  
**Analytical Date** : April 24-27, 2023  
**Report No.** : 2023-RAAH312  
**Report Date** : April 28, 2023

Parameter	Unit	Method of Analysis	Result			Standard <sup>1'</sup>
			Apr 18-19, 23	Apr 19-20, 23	Apr 20-21, 23	
Total Suspended Particulate (TSP) 24 Hours Average	mg/m <sup>3</sup>	In-house method: TM-LA-006	0.086	0.149	0.135	0.330
Particulate Size Less Than 10 Micron (PM10) 24 Hours Average	mg/m <sup>3</sup>	In-house method: TM-LA-009	0.048	0.085	0.076	0.120
Sulfur Dioxide (SO <sub>2</sub> ) 24 Hours Average	ppm	Absorption, Pararosaniline	<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.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  
**Measured Source** : Ambient Air Quality  
**Measured Point** : โรงพยาบาลส่งเสริมสุขภาพตำบลมามาตพุด ตำบลมามาตพุด อำเภอเมืองระยอง จังหวัดระยอง (ทางทิศเหนือของโครงการ)  
**GPS. Coordinate** : UTM (WGS84) 47P 0735183 E, 1405877 N  
**Measured Date** : April 18-21, 2023  
**Measured By** : Mr.Akarawat Kochobog  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Measured Instrument** : NOx Chemiluminescence Analyzer Horiba Model APNA-370 Serial Number J6GUBA4N

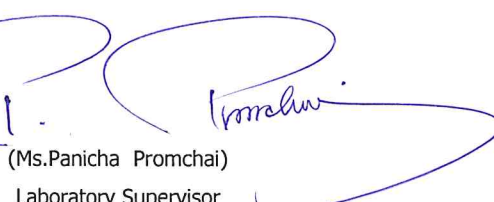
**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AB436-007  
**Report No.** : 2023-RAAH838  
**Report Date** : May 8, 2023

Interval Time	Result NO <sub>2</sub> (ppm)			Standard <sup>1'</sup>
	Apr 18-19, 23	Apr 19-20, 23	Apr 20-21, 23	
13:00-14:00	0.0125	0.0111	0.0333	
14:00-15:00	0.0143	0.0105	0.0301	
15:00-16:00	0.0223	0.0167	0.0303	
16:00-17:00	0.0096	0.0197	0.0224	
17:00-18:00	0.0089	0.0086	0.0159	
18:00-19:00	0.0103	0.0092	0.0098	
19:00-20:00	0.0134	0.0117	0.0106	
20:00-21:00	0.0112	0.0115	0.0087	
21:00-22:00	0.0103	0.0091	0.0088	
22:00-23:00	0.0078	0.0086	0.0071	
23:00-00:00	0.0085	0.0073	0.0073	
00:00-01:00	0.0057	0.0070	0.0073	
01:00-02:00	0.0065	0.0070	0.0074	
02:00-03:00	0.0083	0.0077	0.0073	
03:00-04:00	0.0069	0.0073	0.0071	
04:00-05:00	0.0065	0.0081	0.0080	
05:00-06:00	0.0064	0.0103	0.0131	
06:00-07:00	0.0149	0.0123	0.0210	
07:00-08:00	0.0223	0.0158	0.0237	
08:00-09:00	0.0204	0.0186	0.0267	
09:00-10:00	0.0157	0.0154	0.0229	
10:00-11:00	0.0115	0.0126	0.0196	
11:00-12:00	0.0105	0.0095	0.0162	
12:00-13:00	0.0105	0.0216	0.0268	
<b>24 Hours Average</b>	<b>0.0115</b>	<b>0.0116</b>	<b>0.0163</b>	-
<b>1 Hour Maximum</b>	<b>0.0223</b>	<b>0.0216</b>	<b>0.0333</b>	<b>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.Piyatida Pradangkho)  
 Laboratory Reviewer



  
 (Ms.Panicha Promchai)  
 Laboratory Supervisor

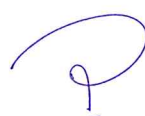
## ANALYSIS REPORT

**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** : โรงพยาบาลส่งเสริมสุขภาพตำบลมาตาพุด ตำบลมาตาพุด อำเภอเมืองระยอง จังหวัดระยอง (ทางทิศเหนือของโครงการ)  
**GPS. Coordinate** : UTM (WGS84) 47P 0735183 E, 1405877 N  
**Measured Date** : April 18-21, 2023  
**Measured By** : Mr.Akarawat Kochobog  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Measured Instrument** : CO NDIR Analyzer Horiba Model APMA-370 Serial Number 4N02XP27

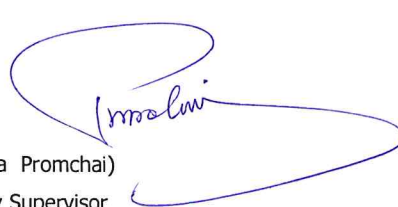
**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AB436-007  
**Report No.** : 2023-RAAH839  
**Report Date** : May 8, 2023

Interval Time	Result CO (ppm)						Standard <sup>1'</sup>
	Apr 18-19, 23		Apr 19-20, 23		Apr 20-21, 23		
	1 hr Avg	8 hr Avg	1 hr Avg	8 hr Avg	1 hr Avg	8 hr Avg	
13:00-14:00	0.5	-	0.5	0.5	0.5	0.5	
14:00-15:00	0.4	-	0.4	0.5	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	0.5	0.5	
18:00-19:00	0.5	-	0.5	0.4	0.5	0.5	
19:00-20:00	0.5	-	0.5	0.4	0.5	0.5	
20:00-21:00	0.5	0.4	0.5	0.4	0.5	0.5	
21:00-22:00	0.4	0.4	0.5	0.4	0.4	0.5	
22:00-23:00	0.4	0.4	0.4	0.4	0.4	0.5	
23:00-00:00	0.4	0.4	0.4	0.4	0.4	0.5	
00:00-01:00	0.4	0.4	0.4	0.4	0.4	0.4	
01:00-02:00	0.4	0.4	0.4	0.4	0.4	0.4	
02:00-03:00	0.4	0.4	0.4	0.4	0.4	0.4	
03:00-04:00	0.4	0.4	0.3	0.4	0.4	0.4	
04:00-05:00	0.4	0.4	0.4	0.4	0.4	0.4	
05:00-06:00	0.4	0.4	0.4	0.4	0.4	0.4	
06:00-07:00	0.4	0.4	0.5	0.4	0.5	0.4	
07:00-08:00	0.6	0.4	0.5	0.4	0.8	0.5	
08:00-09:00	0.5	0.4	0.5	0.4	0.7	0.5	
09:00-10:00	0.5	0.4	0.5	0.4	0.6	0.5	
10:00-11:00	0.4	0.4	0.5	0.4	0.5	0.5	
11:00-12:00	0.4	0.4	0.4	0.5	0.5	0.6	
12:00-13:00	0.4	0.4	0.5	0.5	0.5	0.6	
24 Hours Average	0.4	-	0.4	-	0.5	-	-
1 Hour Maximum	0.6	-	0.5	-	0.8	-	30
8 Hours Maximum	-	0.4	-	0.5	-	0.6	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.Piyatida Pradangkho)  
 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** : ริมรั้วโรงงานทางด้านทิศเหนือ  
**GPS. Coordinate** : UTM (WGS84) 47P 0733501 E, 1402605 N  
**Measured Date** : April 18-21, 2023  
**Measured By** : Mr.Akarawat Kochobog  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Measured Instrument** : NOx Chemiluminescence Analyzer Horiba Model APNA-370 Serial Number VLR55LT4

**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AB436-001  
**Report No.** : 2023-RAAH834  
**Report Date** : May 8, 2023

Interval Time	Result NO <sub>2</sub> (ppm)			Standard <sup>1'</sup>
	Apr 18-19, 23	Apr 19-20, 23	Apr 20-21, 23	
14:00-15:00	0.0159	0.0147	0.0174	
15:00-16:00	0.0141	0.0134	0.0095	
16:00-17:00	0.0135	0.0118	0.0092	
17:00-18:00	0.0182	0.0141	0.0145	
18:00-19:00	0.0210	0.0226	0.0178	
19:00-20:00	0.0238	0.0344	0.0200	
20:00-21:00	0.0247	0.0386	0.0266	
21:00-22:00	0.0202	0.0367	0.0283	
22:00-23:00	0.0294	0.0312	0.0224	
23:00-00:00	0.0227	0.0258	0.0141	
00:00-01:00	0.0246	0.0220	0.0105	
01:00-02:00	0.0211	0.0301	0.0135	
02:00-03:00	0.0179	0.0304	0.0116	
03:00-04:00	0.0118	0.0173	0.0121	
04:00-05:00	0.0107	0.0109	0.0084	
05:00-06:00	0.0104	0.0082	0.0098	
06:00-07:00	0.0098	0.0060	0.0082	
07:00-08:00	0.0090	0.0057	0.0206	
08:00-09:00	0.0091	0.0065	0.0084	
09:00-10:00	0.0130	0.0092	0.0126	
10:00-11:00	0.0135	0.0210	0.0147	
11:00-12:00	0.0133	0.0118	0.0177	
12:00-13:00	0.0134	0.0110	0.0133	
13:00-14:00	0.0154	0.0192	0.0117	
<b>24 Hours Average</b>	<b>0.0165</b>	<b>0.0189</b>	<b>0.0147</b>	-
<b>1 Hour Maximum</b>	<b>0.0294</b>	<b>0.0386</b>	<b>0.0283</b>	<b>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.Piyatida Pradangkho)  
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** : ริมรั้วโรงงานทางด้านทิศเหนือ  
**GPS. Coordinate** : UTM (WGS84) 47P 0733501 E, 1402605 N  
**Measured Date** : April 18-21, 2023  
**Measured By** : Mr.Akarawat Kochobog  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Measured Instrument** : CO NDIR Analyzer Horiba Model APMA-360CE Serial Number 41346760054


**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AB436-001  
**Report No.** : 2023-RAAH835  
**Report Date** : May 8, 2023

Interval Time	Result CO (ppm)						Standard <sup>1'</sup>
	Apr 18-19, 23		Apr 19-20, 23		Apr 20-21, 23		
	1 hr Avg	8 hr Avg	1 hr Avg	8 hr Avg	1 hr Avg	8 hr Avg	
14:00-15:00	0.4	-	0.4	0.5	0.4	0.5	
15:00-16:00	0.4	-	0.3	0.5	0.4	0.5	
16:00-17:00	0.4	-	0.3	0.4	0.4	0.4	
17:00-18:00	0.4	-	0.4	0.4	0.5	0.4	
18:00-19:00	0.4	-	0.5	0.4	0.5	0.4	
19:00-20:00	0.4	-	0.4	0.4	0.5	0.4	
20:00-21:00	0.4	-	0.4	0.4	0.5	0.4	
21:00-22:00	0.4	0.4	0.4	0.4	0.4	0.4	
22:00-23:00	0.4	0.4	0.5	0.4	0.4	0.4	
23:00-00:00	0.4	0.4	0.4	0.4	0.4	0.4	
00:00-01:00	0.4	0.4	0.4	0.4	0.4	0.4	
01:00-02:00	0.4	0.4	0.4	0.4	0.4	0.4	
02:00-03:00	0.4	0.4	0.4	0.4	0.4	0.4	
03:00-04:00	0.4	0.4	0.4	0.4	0.4	0.4	
04:00-05:00	0.4	0.4	0.4	0.4	0.4	0.4	
05:00-06:00	0.4	0.4	0.4	0.4	0.4	0.4	
06:00-07:00	0.4	0.4	0.5	0.4	0.4	0.4	
07:00-08:00	0.4	0.4	0.5	0.4	0.5	0.4	
08:00-09:00	0.5	0.4	0.5	0.4	0.5	0.4	
09:00-10:00	0.5	0.4	0.5	0.4	0.5	0.4	
10:00-11:00	0.5	0.4	0.5	0.5	0.5	0.4	
11:00-12:00	0.5	0.4	0.5	0.5	0.5	0.5	
12:00-13:00	0.5	0.5	0.5	0.5	0.5	0.5	
13:00-14:00	0.5	0.5	0.4	0.5	0.5	0.5	
24 Hours Average	0.4	-	0.4	-	0.4	-	-
1 Hour Maximum	0.5	-	0.5	-	0.5	-	30
8 Hours Maximum	-	0.5	-	0.5	-	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.Piyatida Pradangkho)  
 Laboratory Reviewer



  
 (Ms.Panicha Promchai)  
 Laboratory Supervisor



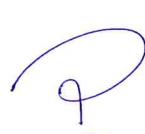
## ANALYSIS REPORT

**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** : ริมรั้วโรงงานทางด้านทิศใต้  
**GPS. Coordinate** : UTM (WGS84) 47P 0733148 E, 1402389 N  
**Measured Date** : April 18-21, 2023  
**Measured By** : Mr.Akarawat Kochobog  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Measured Instrument** : NOx Chemiluminescence Analyzer Horiba Model APNA-370 Serial Number M4286P23

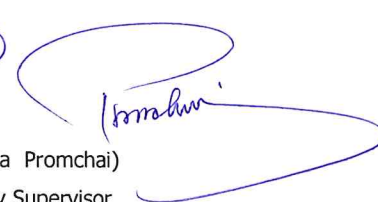
**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AB436-004  
**Report No.** : 2023-RAAH836  
**Report Date** : May 8, 2023

Interval Time	Result NO <sub>2</sub> (ppm)			Standard <sup>1'</sup>
	Apr 18-19, 23	Apr 19-20, 23	Apr 20-21, 23	
15:00-16:00	0.0104	0.0238	0.0173	
16:00-17:00	0.0166	0.0212	0.0127	
17:00-18:00	0.0184	0.0189	0.0097	
18:00-19:00	0.0196	0.0191	0.0079	
19:00-20:00	0.0209	0.0256	0.0092	
20:00-21:00	0.0179	0.0213	0.0091	
21:00-22:00	0.0197	0.0230	0.0121	
22:00-23:00	0.0208	0.0111	0.0113	
23:00-00:00	0.0155	0.0130	0.0083	
00:00-01:00	0.0162	0.0154	0.0087	
01:00-02:00	0.0226	0.0218	0.0110	
02:00-03:00	0.0200	0.0160	0.0079	
03:00-04:00	0.0210	0.0105	0.0075	
04:00-05:00	0.0256	0.0122	0.0078	
05:00-06:00	0.0219	0.0142	0.0124	
06:00-07:00	0.0226	0.0190	0.0097	
07:00-08:00	0.0206	0.0164	0.0062	
08:00-09:00	0.0207	0.0128	0.0291	
09:00-10:00	0.0207	0.0118	0.0196	
10:00-11:00	0.0272	0.0351	0.0209	
11:00-12:00	0.0292	0.0348	0.0130	
12:00-13:00	0.0269	0.0198	0.0258	
13:00-14:00	0.0256	0.0248	0.0209	
14:00-15:00	0.0272	0.0242	0.0248	
<b>24 Hours Average</b>	<b>0.0212</b>	<b>0.0194</b>	<b>0.0135</b>	-
<b>1 Hour Maximum</b>	<b>0.0292</b>	<b>0.0351</b>	<b>0.0291</b>	<b>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.Piyatida Pradangkho)  
 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** : ริมรั้วโรงงานทางด้านทิศใต้  
**GPS. Coordinate** : UTM (WGS84) 47P 0733148 E, 1402389 N  
**Measured Date** : April 18-21, 2023  
**Measured By** : Mr.Akarawat Kochobog  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Measured Instrument** : CO NDIR Analyzer Horiba Model APMA-360CE Serial Number 577274012

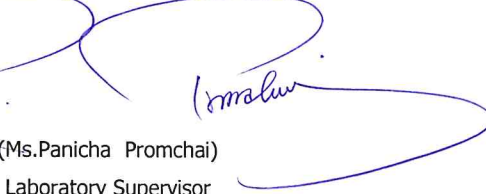
**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AB436-004  
**Report No.** : 2023-RAAH837  
**Report Date** : May 8, 2023

Interval Time	Result CO (ppm)						Standard <sup>1'</sup>
	Apr 18-19, 23		Apr 19-20, 23		Apr 20-21, 23		
	1 hr Avg	8 hr Avg	1 hr Avg	8 hr Avg	1 hr Avg	8 hr Avg	
15:00-16:00	0.5	-	0.5	0.5	0.5	0.6	
16:00-17:00	0.5	-	0.5	0.5	0.4	0.6	
17:00-18:00	0.5	-	0.5	0.5	0.5	0.5	
18:00-19:00	0.5	-	0.5	0.5	0.5	0.5	
19:00-20:00	0.5	-	0.5	0.5	0.4	0.5	
20:00-21:00	0.5	-	0.5	0.5	0.4	0.5	
21:00-22:00	0.5	-	0.5	0.5	0.4	0.4	
22:00-23:00	0.4	0.5	0.4	0.5	0.4	0.4	
23:00-00:00	0.4	0.5	0.4	0.5	0.4	0.4	
00:00-01:00	0.4	0.5	0.3	0.4	0.4	0.4	
01:00-02:00	0.5	0.5	0.4	0.4	0.4	0.4	
02:00-03:00	0.4	0.4	0.3	0.4	0.4	0.4	
03:00-04:00	0.5	0.4	0.3	0.4	0.4	0.4	
04:00-05:00	0.5	0.4	0.3	0.4	0.4	0.4	
05:00-06:00	0.5	0.4	0.4	0.4	0.4	0.4	
06:00-07:00	0.5	0.5	0.4	0.4	0.5	0.4	
07:00-08:00	0.5	0.5	0.6	0.4	0.5	0.4	
08:00-09:00	0.5	0.5	0.5	0.4	0.7	0.5	
09:00-10:00	0.6	0.5	0.7	0.4	0.5	0.5	
10:00-11:00	0.5	0.5	0.7	0.5	0.5	0.5	
11:00-12:00	0.5	0.5	0.6	0.5	0.5	0.5	
12:00-13:00	0.5	0.5	0.5	0.6	0.5	0.5	
13:00-14:00	0.5	0.5	0.5	0.6	0.5	0.5	
14:00-15:00	0.5	0.5	0.5	0.6	0.5	0.5	
24 Hours Average	0.5	-	0.5	-	0.5	-	-
1 Hour Maximum	0.6	-	0.7	-	0.7	-	30
8 Hours Maximum	-	0.5	-	0.6	-	0.6	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. Piyatida Pradangkho)  
 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, 1402605 N  
**Sampling Date** : January 30, 2023  
**Sampling Time** : 15:44  
**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** : Turbid, Light Yellow, Sediment, Odor

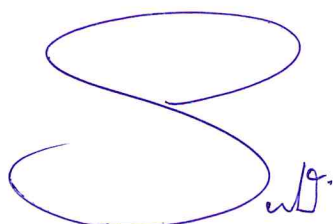
**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AA284-001  
**Received Date** : February 1, 2023  
**Analytical Date** : February 1-March 14, 2023  
**Report No.** : 2023-RAAB975  
**Report Date** : February 8, 2023

Parameter	Unit	Method of Analysis <sup>1'</sup>	Result	Standard <sup>2'</sup>
pH	-	Electrometric	8.6	5.5-9.0
Temperature	°C	Certified Thermometer	26.9	40
Color (ADMI)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	21	300
Color (at pH 7)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	20	300
Total Suspended Solids	mg/L	Dried at 103-105°C	33	50
Biochemical Oxygen Demand	mg/L	5-Day BOD Test, Membrane Electrode	5.0	20
Oil and Grease	mg/L	Liquid-Liquid Partition, Gravimetric	2.6	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-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  
**Project Location** : เลขที่ 1 นิคมอุตสาหกรรมมาบตาพุด ถนนไอ-7 ตำบลมาบตาพุด อำเภอเมืองระยอง จังหวัดระยอง  
**Sampling Source** : Wastewater Sampling  
**Sampling Point** : รางระบายน้ำหน้าโรงงาน  
**GPS. Coordinate** : UTM (WGS84) 47P 0733150 E, 1402319 N  
**Sampling Date** : January 30, 2023  
**Sampling Time** : 15:27  
**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** : Turbid, Light Yellow, Sediment, Odor

**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AA284-002  
**Received Date** : February 1, 2023  
**Analytical Date** : February 1-8, 2023  
**Report No.** : 2023-RAAB976  
**Report Date** : February 8, 2023

Parameter	Unit	Method of Analysis <sup>1'</sup>	Result	Standard <sup>2'</sup>
pH	-	Electrometric	7.0	5.5-9.0
Temperature	°C	Certified Thermometer	26.0	40
Color (ADMI)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	23	300
Color (at pH 7)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	21	300
Total Suspended Solids	mg/L	Dried at 103-105°C	20	50
Biochemical Oxygen Demand	mg/L	5-Day BOD Test, Membrane Electrode	7.6	20
Oil and Grease	mg/L	Liquid-Liquid Partition, Gravimetric	<1.0	5

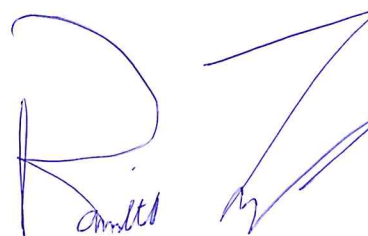
**Remark :** <sup>1'</sup> Standard Method for Examination of Water and Wastewater, 23<sup>rd</sup> Edition, 2017.

<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** : รางระบายน้ำหลังโรงงาน  
**GPS. Coordinate** : UTM (WGS84) 47P 0733739 E, 1402364 N  
**Sampling Date** : January 30, 2023  
**Sampling Time** : 15:36  
**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** : Turbid, Light Yellow, Sediment, Odor

**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AA284-003  
**Received Date** : February 1, 2023  
**Analytical Date** : February 1-March 14, 2023  
**Report No.** : 2023-RAAB977  
**Report Date** : February 8, 2023

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	25.0	40
Color (ADMI)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	21	300
Color (at pH 7)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	25	300
Total Suspended Solids	mg/L	Dried at 103-105°C	5.7	50
Biochemical Oxygen Demand	mg/L	5-Day BOD Test, Membrane Electrode	4.9	20
Oil and Grease	mg/L	Liquid-Liquid Partition, Gravimetric	<1.0	5

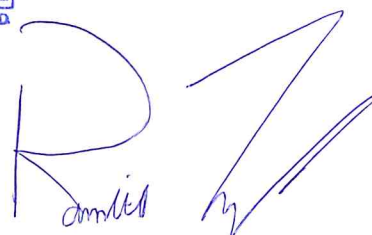
**Remark :** <sup>1'</sup> Standard Method for Examination of Water and Wastewater, 23<sup>rd</sup> Edition, 2017.

<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-ท-7664

## ANALYSIS REPORT

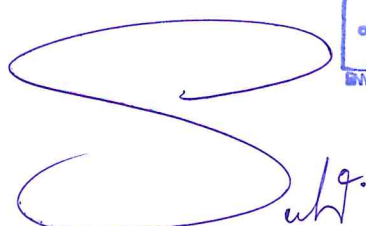
**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Sampling Source** : Wastewater Sampling  
**Sampling Point** : Irrigation Pond  
**GPS. Coordinate** : UTM (WGS84) 47P 0733538 E, 1402605 N  
**Sampling Date** : February 27, 2023  
**Sampling Time** : 11:20  
**Sampling Method** : Grab  
**Sampling By** : Mr.Nitad Sirichad, Registration No.ว-099-ก-8803  
**Analyzed By** : Environment Research & Technology Co., Ltd. Laboratory  
Registration No.ว-099  
**Physical Properties** : Turbid, Light Yellow, Sediment, Odor


**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AA627-001  
**Received Date** : March 1, 2023  
**Analytical Date** : March 1-7, 2023  
**Report No.** : 2023-RAAD840  
**Report Date** : March 10, 2023

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	26.5	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	26	50
Biochemical Oxygen Demand	mg/L	5-Day BOD Test, Membrane Electrode	4.7	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-ก-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** : February 27, 2023  
**Sampling Time** : 10:58  
**Sampling Method** : Grab  
**Sampling By** : Mr.Nitad Sirichad, Registration No.ว-099-ค-8803  
**Analyzed By** : Environment Research & Technology Co., Ltd. Laboratory  
Registration No.ว-099  
**Physical Properties** : Turbid, Light Yellow, Sediment, Odor

**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AA627-002  
**Received Date** : March 1, 2023  
**Analytical Date** : March 1-7, 2023  
**Report No.** : 2023-RAAD841  
**Report Date** : March 10, 2023

Parameter	Unit	Method of Analysis <sup>1'</sup>	Result	Standard <sup>2'</sup>
pH	-	Electrometric	7.4	5.5-9.0
Temperature	°C	Certified Thermometer	26.5	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	22	50
Biochemical Oxygen Demand	mg/L	5-Day BOD Test, Membrane Electrode	7.2	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.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, 1402364 N  
**Sampling Date** : February 27, 2023  
**Sampling Time** : 11:10  
**Sampling Method** : Grab  
**Sampling By** : Mr.Nitad Sirichad, Registration No.ว-099-ค-8803  
**Analyzed By** : Environment Research & Technology Co., Ltd. Laboratory  
Registration No.ว-099  
**Physical Properties** : Turbid, Light Yellow, Sediment, Odor

**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AA627-003  
**Received Date** : March 1, 2023  
**Analytical Date** : March 1-24, 2023  
**Report No.** : 2023-RAAD842  
**Report Date** : March 10, 2023

Parameter	Unit	Method of Analysis <sup>1'</sup>	Result	Standard <sup>2'</sup>
pH	-	Electrometric	8.7	5.5-9.0
Temperature	°C	Certified Thermometer	27.5	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	5.6	50
Biochemical Oxygen Demand	mg/L	5-Day BOD Test, Membrane Electrode	13	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.Sudarat Khejonrak)  
Laboratory Reviewer No. ว-099-จ-7037

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

## ANALYSIS REPORT

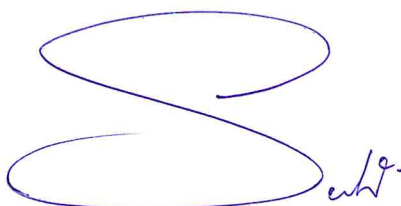
**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Sampling Source** : Wastewater Sampling  
**Sampling Point** : Irrigation Pond  
**GPS. Coordinate** : UTM (WGS84) 47P 0733538 E, 1402605 N  
**Sampling Date** : March 20, 2023  
**Sampling Time** : 10:03  
**Sampling Method** : Grab  
**Sampling By** : Mr.Akarawat Kochobog, Registration No.ว-099-จ-0015  
**Analyzed By** : Environment Research & Technology Co., Ltd. Laboratory  
Registration No.ว-099  
**Physical Properties** : Turbid, Light Yellow, Sediment, Odor

**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AA956-001  
**Received Date** : March 22, 2023  
**Analytical Date** : March 22-31, 2023  
**Report No.** : 2023-RAAF265  
**Report Date** : April 1, 2023

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	30.0	40
Color (ADMI)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	17	300
Color (at pH 7)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	18	300
Total Suspended Solids	mg/L	Dried at 103-105°C	28	50
Biochemical Oxygen Demand	mg/L	5-Day BOD Test, Membrane Electrode	4.8	20
Oil and Grease	mg/L	Liquid-Liquid Partition, Gravimetric	1.1	5

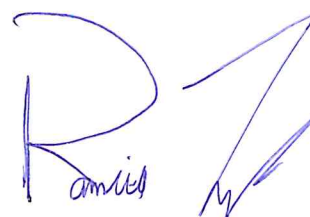
**Remark :** <sup>1'</sup> Standard Method for Examination of Water and Wastewater, 23<sup>rd</sup> Edition, 2017.

<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-จ-7664

## ANALYSIS REPORT

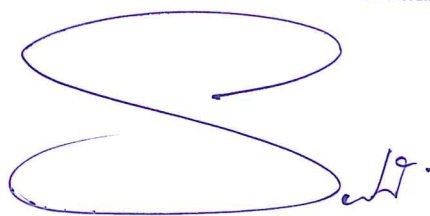
**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Sampling Source** : Wastewater Sampling  
**Sampling Point** : รางระบายน้ำหน้าโรงงาน  
**GPS. Coordinate** : UTM (WGS84) 47P 0733150 E, 1402312 N  
**Sampling Date** : March 20, 2023  
**Sampling Time** : 10:30  
**Sampling Method** : Grab  
**Sampling By** : Mr.Akarawat Kochobog, Registration No.ว-099-จ-0015  
**Analyzed By** : Environment Research & Technology Co., Ltd. Laboratory  
Registration No.ว-099  
**Physical Properties** : Turbid, Light Yellow, Sediment, Odor

**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AA956-002  
**Received Date** : March 22, 2023  
**Analytical Date** : March 22-31, 2023  
**Report No.** : 2023-RAAF266  
**Report Date** : April 1, 2023

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	19	300
Color (at pH 7)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	19	300
Total Suspended Solids	mg/L	Dried at 103-105°C	8.0	50
Biochemical Oxygen Demand	mg/L	5-Day BOD Test, Membrane Electrode	3.9	20
Oil and Grease	mg/L	Liquid-Liquid Partition, Gravimetric	1.1	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-จ-7664



## ANALYSIS REPORT

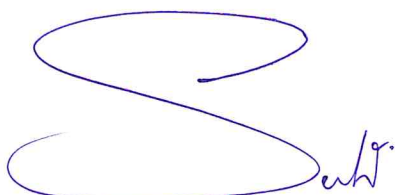
**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Sampling Source** : Wastewater Sampling  
**Sampling Point** : รางระบายน้ำหลังโรงงาน  
**GPS. Coordinate** : UTM (WGS84) 47P 0733739 E, 1402364 N  
**Sampling Date** : March 20, 2023  
**Sampling Time** : 10:14  
**Sampling Method** : Grab  
**Sampling By** : Mr.Akarawat Kochobog, Registration No.ว-099-จ-0015  
**Analyzed By** : Environment Research & Technology Co., Ltd. Laboratory  
Registration No.ว-099  
**Physical Properties** : Turbid, Light Yellow, Sediment, Odor

**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AA956-003  
**Received Date** : March 22, 2023  
**Analytical Date** : March 22-31, 2023  
**Report No.** : 2023-RAAF267  
**Report Date** : April 1, 2023

Parameter	Unit	Method of Analysis <sup>1'</sup>	Result	Standard <sup>2'</sup>
pH	-	Electrometric	8.9	5.5-9.0
Temperature	°C	Certified Thermometer	28.0	40
Color (ADMI)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	14	300
Color (at pH 7)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	14	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	1.1	5

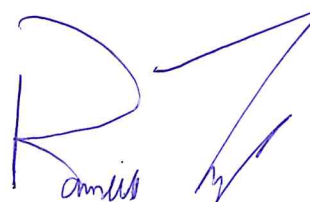
**Remark :** <sup>1'</sup> Standard Method for Examination of Water and Wastewater, 23<sup>rd</sup> Edition, 2017.

<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-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** : April 20, 2023  
**Sampling Time** : 14:31  
**Sampling Method** : Grab  
**Sampling By** : Mr.Akarawat Kochobog, Registration No.จ-099-จ-0015  
**Analyzed By** : Environment Research & Technology Co., Ltd. Laboratory Registration No.จ-099  
**Physical Properties** : Turbid, Light Yellow, Sediment, Odor

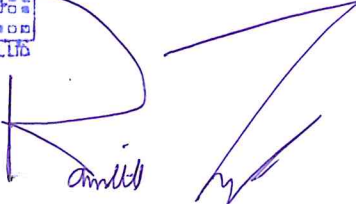
**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AB415-001  
**Received Date** : April 24, 2023  
**Analytical Date** : April 24-May 4, 2023  
**Report No.** : 2023-RAAH456  
**Report Date** : May 4, 2023

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	32.0	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	14	50
Biochemical Oxygen Demand	mg/L	5-Day BOD Test, Membrane Electrode	5.8	20
Fat Oil and Grease	mg/L	Liquid-Liquid Partition, Gravimetric	3.4	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)	<0.003	0.03
Lead	mg/L	Digestion, Electrothermal Atomic Absorption Spectrometry	0.012	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. Yuwadee Na Ranong)  
 Laboratory Reviewer No. จ-099-ค-8805

  
 (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, 1402605 N  
**Sampling Date** : April 20, 2023  
**Sampling Time** : 14:31  
**Sampling Method** : Grab  
**Sampling By** : Mr.Akarawat Kochobog  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Physical Properties** : Turbid, Light Yellow, Sediment, Odor

**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AB415-001  
**Received Date** : April 24, 2023  
**Analytical Date** : April 24-26, 2023  
**Report No.** : 2023-RAAH457  
**Report Date** : May 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.Yuwadee Na Ranong)  
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** : April 20, 2023  
**Sampling Time** : 15:00  
**Sampling Method** : Grab  
**Sampling By** : Mr.Akarawat Kochobog, Registration No.ว-099-ก-0015  
**Analyzed By** : Environment Research & Technology Co., Ltd. Laboratory Registration No.ว-099  
**Physical Properties** : Turbid, Light Yellow, Sediment, Odor

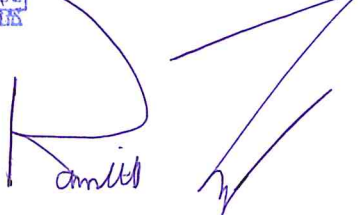
**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AB415-002  
**Received Date** : April 24, 2023  
**Analytical Date** : April 24-May 4, 2023  
**Report No.** : 2023-RAAH458  
**Report Date** : May 4, 2023

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	32.0	40
Color (ADMI)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	24	300
Color (at pH 7)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	26	300
Total Suspended Solids	mg/L	Dried at 103-105°C	7.4	50
Biochemical Oxygen Demand	mg/L	5-Day BOD Test, Membrane Electrode	4.6	20
Fat Oil and Grease	mg/L	Liquid-Liquid Partition, Gravimetric	<1.0	5
Arsenic	mg/L	Digestion, Hydride Generation Atomic Absorption Spectrometry	0.0032	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	0.002	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.Yuwadee Na Ranong)  
 Laboratory Reviewer No. ว-099-ก-8805

  
 (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** : April 20, 2023  
**Sampling Time** : 15:00  
**Sampling Method** : Grab  
**Sampling By** : Mr.Akarawat Kochobog  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Physical Properties** : Turbid, Light Yellow, Sediment, Odor

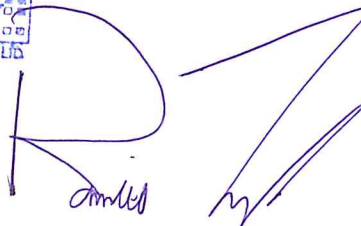
**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AB415-002  
**Received Date** : April 24, 2023  
**Analytical Date** : April 24-26, 2023  
**Report No.** : 2023-RAAH459  
**Report Date** : May 4, 2023

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.Yuwadee Na Ranong)  
 Laboratory Reviewer

  
 (Ms.Ramita Taengthai)  
 Laboratory Supervisor

## ANALYSIS REPORT

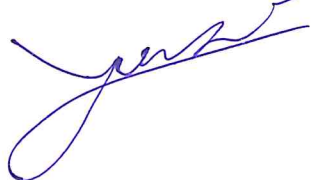
**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Sampling Source** : Wastewater Sampling  
**Sampling Point** : รางระบายน้ำหลังโรงงาน  
**GPS. Coordinate** : UTM (WGS84) 47P 0733739 E, 1402364 N  
**Sampling Date** : April 20, 2023  
**Sampling Time** : 14:21  
**Sampling Method** : Grab  
**Sampling By** : Mr.Akarawat Kochobog, Registration No.ว-099-จ-0015  
**Analyzed By** : Environment Research & Technology Co., Ltd. Laboratory Registration No.ว-099  
**Physical Properties** : Turbid, Light Yellow, Sediment, Odor

**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AB415-003  
**Received Date** : April 24, 2023  
**Analytical Date** : April 24-May 4, 2023  
**Report No.** : 2023-RAAH460  
**Report Date** : May 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	31.0	40
Color (ADMI)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	18	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	3.0	20
Fat Oil and Grease	mg/L	Liquid-Liquid Partition, Gravimetric	<1.0	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	0.004	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.Yuwadee Na Ranong)



(Ms.Ramita Taengthai)

Laboratory Reviewer No. ว-099-ค-8805

Laboratory Supervisor No. ว-099-ค-7664



## ANALYSIS REPORT

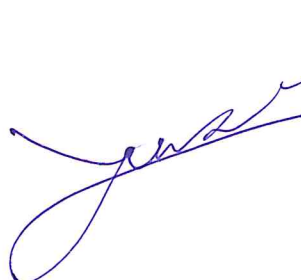
**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Sampling Source** : Wastewater Sampling  
**Sampling Point** : รางระบายน้ำหลังโรงงาน  
**GPS. Coordinate** : UTM (WGS84) 47P 0733739 E, 1402364 N  
**Sampling Date** : April 20, 2023  
**Sampling Time** : 14:21  
**Sampling Method** : Grab  
**Sampling By** : Mr.Akarawat Kochobog  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Physical Properties** : Turbid, Light Yellow, Sediment, Odor

**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AB415-003  
**Received Date** : April 24, 2023  
**Analytical Date** : April 24-26, 2023  
**Report No.** : 2023-RAAH461  
**Report Date** : May 4, 2023

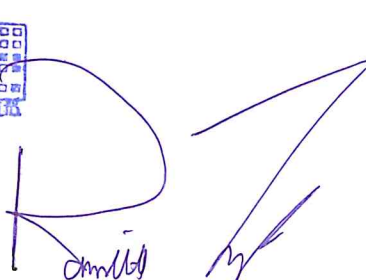
Parameter	Unit	Method of Analysis <sup>1'</sup>	Result	Standard <sup>2'</sup>
Chromium	mg/L	Digestion, Inductively Coupled Plasma (ICP-OES)	<0.01	-

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. Yuwadee Na Ranong)  
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** : Irrigation Pond  
**GPS. Coordinate** : UTM (WGS84) 47P 0733538 E, 1402605 N  
**Sampling Date** : May 15, 2023  
**Sampling Time** : 14:04  
**Sampling Method** : Grab  
**Sampling By** : Mr.Akarawat Kochobog, Registration No.ว-099-จ-0015  
**Analyzed By** : Environment Research & Technology Co., Ltd. Laboratory  
Registration No.ว-099  
**Physical Properties** : Turbid, Light Yellow, Sediment, Odor

**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AB891-001  
**Received Date** : May 17, 2023  
**Analytical Date** : May 17-June 6, 2023  
**Report No.** : 2023-RAAJ523  
**Report Date** : May 29, 2023

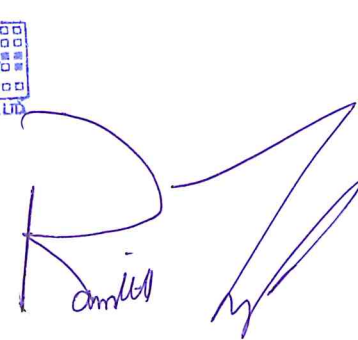
Parameter	Unit	Method of Analysis <sup>1'</sup>	Result	Standard <sup>2'</sup>
pH	-	Electrometric	8.3	5.5-9.0
Temperature	°C	Certified Thermometer	32.0	40
Color (ADMI)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	15	300
Color (at pH 7)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	14	300
Total Suspended Solids	mg/L	Dried at 103-105°C	16	50
Biochemical Oxygen Demand	mg/L	5-Day BOD Test, Membrane Electrode	4.8	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.Yuwadee Na Ranong)  
Laboratory Reviewer No. ว-099-ก-8805



(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** : May 15, 2023  
**Sampling Time** : 14:25  
**Sampling Method** : Grab  
**Sampling By** : Mr.Akarawat Kochobog, Registration No.ว-099-จ-0015  
**Analyzed By** : Environment Research & Technology Co., Ltd. Laboratory  
Registration No.ว-099  
**Physical Properties** : Turbid, Light Yellow, Sediment, Odor

**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AB891-002  
**Received Date** : May 17, 2023  
**Analytical Date** : May 17-26, 2023  
**Report No.** : 2023-RAAJ524  
**Report Date** : May 29, 2023

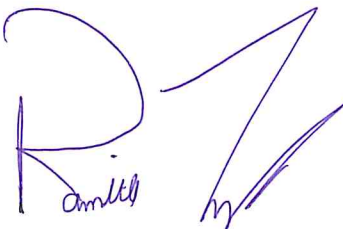
Parameter	Unit	Method of Analysis <sup>1'</sup>	Result	Standard <sup>2'</sup>
pH	-	Electrometric	7.3	5.5-9.0
Temperature	°C	Certified Thermometer	32.0	40
Color (ADMI)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	17	300
Color (at pH 7)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	17	300
Total Suspended Solids	mg/L	Dried at 103-105°C	8.8	50
Biochemical Oxygen Demand	mg/L	5-Day BOD Test, Membrane Electrode	4.3	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.Yuwadee Na Ranong)  
Laboratory Reviewer No. ว-099-ก-8805



(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** : รางระบายน้ำหลังโรงงาน  
**GPS. Coordinate** : UTM (WGS84) 47P 0733739 E, 1402364 N  
**Sampling Date** : May 15, 2023  
**Sampling Time** : 14:14  
**Sampling Method** : Grab  
**Sampling By** : Mr.Akarawat Kochobog, Registration No.ว-099-จ-0015  
**Analyzed By** : Environment Research & Technology Co., Ltd. Laboratory  
Registration No.ว-099  
**Physical Properties** : Turbid, Light Yellow, Sediment, Odor

**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AB891-003  
**Received Date** : May 17, 2023  
**Analytical Date** : May 17-26, 2023  
**Report No.** : 2023-RAAJ525  
**Report Date** : May 29, 2023

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	32.0	40
Color (ADMI)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	21	300
Color (at pH 7)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	19	300
Total Suspended Solids	mg/L	Dried at 103-105°C	10	50
Biochemical Oxygen Demand	mg/L	5-Day BOD Test, Membrane Electrode	2.4	20
Oil and Grease	mg/L	Liquid-Liquid Partition, Gravimetric	2.0	5

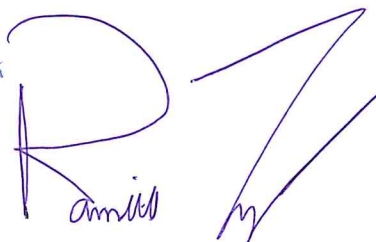
**Remark :** <sup>1'</sup> Standard Method for Examination of Water and Wastewater, 23<sup>rd</sup> Edition, 2017.

<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.Yuwadee Na Ranong)

Laboratory Reviewer No. ว-099-ก-8805



(Ms.Ramita Taengthai)

Laboratory Supervisor No. ว-099-ก-7664

## ANALYSIS REPORT

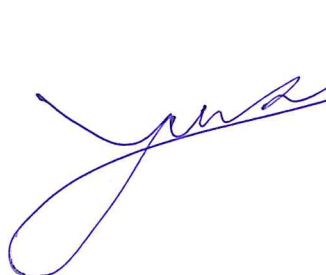
**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Sampling Source** : Wastewater Sampling  
**Sampling Point** : Irrigation Pond  
**GPS. Coordinate** : UTM (WGS84) 47P 0733538 E, 1402605 N  
**Sampling Date** : June 10, 2023  
**Sampling Time** : 10:42  
**Sampling Method** : Grab  
**Sampling By** : Mr.Jirayuth Samart, Registration No.ว-099-จ-0007  
**Analyzed By** : Environment Research & Technology Co., Ltd. Laboratory Registration No.ว-099  
**Physical Properties** : Turbid, Light Yellow, Sediment, Odor

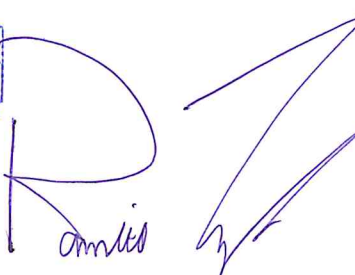
**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AC312-001  
**Received Date** : June 12, 2023  
**Analytical Date** : June 12-20, 2023  
**Report No.** : 2023-RAAL476  
**Report Date** : June 20, 2023

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	30.0	40
Color (ADMI)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	16	300
Color (at pH 7)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	17	300
Total Suspended Solids	mg/L	Dried at 103-105°C	9.2	50
Biochemical Oxygen Demand	mg/L	5-Day BOD Test, Membrane Electrode	5.2	20
Oil and Grease	mg/L	Liquid-Liquid Partition, Gravimetric	2.8	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.Yuwadee Na Ranong)  
 Laboratory Reviewer No. ว-099-ก-8805

  
 (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** : June 10, 2023  
**Sampling Time** : 11:06  
**Sampling Method** : Grab  
**Sampling By** : Mr.Jirayuth Samart, Registration No.จ-099-จ-0007  
**Analyzed By** : Environment Research & Technology Co., Ltd. Laboratory  
Registration No.จ-099  
**Physical Properties** : Turbid, Light Yellow, Sediment, Odor

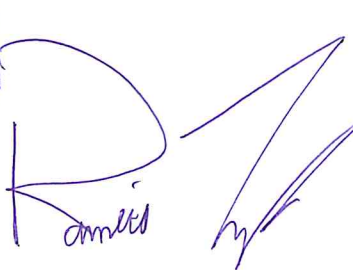
**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AC312-002  
**Received Date** : June 12, 2023  
**Analytical Date** : June 12-20, 2023  
**Report No.** : 2023-RAAL477  
**Report Date** : June 20, 2023

Parameter	Unit	Method of Analysis <sup>1'</sup>	Result	Standard <sup>2'</sup>
pH	-	Electrometric	6.5	5.5-9.0
Temperature	°C	Certified Thermometer	32.0	40
Color (ADMI)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	20	300
Color (at pH 7)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	23	300
Total Suspended Solids	mg/L	Dried at 103-105°C	15	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. Yuwadee Na Ranong)  
Laboratory Reviewer No. จ-099-ค-8805

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



## ANALYSIS REPORT

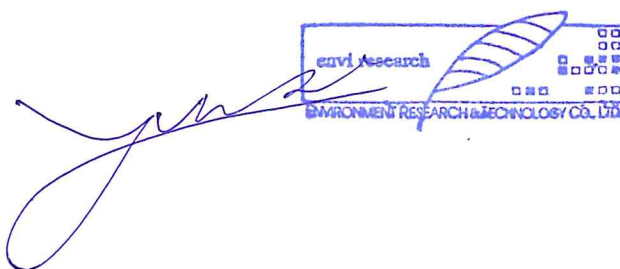
**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Sampling Source** : Wastewater Sampling  
**Sampling Point** : รางระบายน้ำหลังโรงงาน  
**GPS. Coordinate** : UTM (WGS84) 47P 0733739 E, 1402364 N  
**Sampling Date** : June 10, 2023  
**Sampling Time** : 10:53  
**Sampling Method** : Grab  
**Sampling By** : Mr.Jirayuth Samart, Registration No.จ-099-จ-0007  
**Analyzed By** : Environment Research & Technology Co., Ltd. Laboratory  
Registration No.จ-099  
**Physical Properties** : Turbid, Light Yellow, Sediment, Odor

**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AC312-003  
**Received Date** : June 12, 2023  
**Analytical Date** : June 12-20, 2023  
**Report No.** : 2023-RAAL478  
**Report Date** : June 20, 2023

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	30.0	40
Color (ADMI)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	20	300
Color (at pH 7)	ADMI	ADMI Weighted-Ordinate Spectrophotometric	18	300
Total Suspended Solids	mg/L	Dried at 103-105°C	15	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

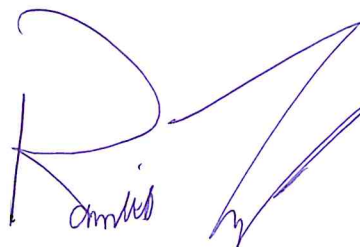
**Remark :** <sup>1'</sup> Standard Method for Examination of Water and Wastewater, 23<sup>rd</sup> Edition, 2017.

<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.Yuwadee Na Ranong)

Laboratory Reviewer No. จ-099-ก-8805



(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** : Solid Waste Sampling  
**Sampling Point** : ฝุ่นอัดเม็ด (Fume Plant) (ฝุ่นจากเตาหลอมเหล็ก)  
**GPS. Coordinate** : UTM (WGS84) 47P 0733533 E, 1402529 N  
**Sampling Date** : April 20, 2023  
**Sampling Time** : 14:01  
**Sampling Method** : Grab  
**Sampling By** : Mr.Akarawat Kochobog, Registration No.ว-099-จ-0015  
**Analyzed By** : Environment Research & Technology Co., Ltd. Laboratory  
Registration No.ว-099  
**Physical Properties** : -

**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AB415-004  
**Received Date** : April 24, 2023  
**Analytical Date** : April 24-May 12, 2023  
**Report No.** : 2023-RAAH473  
**Report Date** : May 16, 2023

Parameter	Unit	Method of Analysis	Result	Standard <sup>1'</sup>	
				TTLIC	STLC*
Arsenic	mg/kg	Digestion, Inductively Coupled Plasma (ICP-OES)	18	500	5.0
Cadmium	mg/kg	Digestion, Inductively Coupled Plasma (ICP-OES)	175	100	1.0
Chromium	mg/kg	Digestion, Inductively Coupled Plasma (ICP-OES)	1,878	2,500	5
Lead	mg/kg	Digestion, Inductively Coupled Plasma (ICP-OES)	14,849	1,000	5.0
Mercury	mg/kg	Digestion, Cold-Vapor Atomic Absorption Spectrometry	4.0	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** : April 20, 2023  
**Sampling Time** : 13:52  
**Sampling Method** : Grab  
**Sampling By** : Mr.Akarawat Kochobog, Registration No.ว-099-จ-0015  
**Analyzed By** : Environment Research & Technology Co., Ltd. Laboratory  
 Registration No.ว-099  
**Physical Properties** : -


**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AB415-007  
**Received Date** : April 24, 2023  
**Analytical Date** : April 24-May 12, 2023  
**Report No.** : 2023-RAAH476  
**Report Date** : May 16, 2023

Parameter	Unit	Method of Analysis	Result	Standard <sup>1'</sup>	
				TTLC	STLC*
Arsenic	mg/kg	Digestion, Inductively Coupled Plasma (ICP-OES)	51	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)	1,065	2,500	5
Lead	mg/kg	Digestion, Inductively Coupled Plasma (ICP-OES)	43	1,000	5.0
Mercury	mg/kg	Digestion, Cold-Vapor Atomic Absorption Spectrometry	<0.1	20	0.2

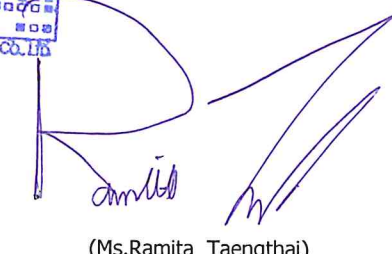
**Remark :** <sup>1'</sup> Notification of the Ministry of Industry, B.E.2548 (2005), dated December 27, B.E.2548 (2005) issued under Factory Act B.E.2535 (1992), published in the Royal Government Gazette No.123 Part 11D dated January 25, B.E.2549 (2006).

\* 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** : ภาวตะกอนจากระบบบำบัดน้ำเสีย (Sludge Drying Bed)  
**GPS. Coordinate** : UTM (WGS84) 47P 0733517 E, 1402580 N  
**Sampling Date** : April 20, 2023  
**Sampling Time** : 13:52  
**Sampling Method** : Grab  
**Sampling By** : Mr.Akarawat Kochobog  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Physical Properties** : -

**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AB415-007  
**Received Date** : April 24, 2023  
**Analytical Date** : April 24-May 5, 2023  
**Report No.** : 2023-RAAH477  
**Report Date** : May 16, 2023

Parameter	Unit	Method of Analysis	Result	Standard <sup>1'</sup>	
				TTLIC	STLC*
Oil & Grease <sup>2'</sup>	%	Soxhlet Extraction	1.87	-	-

**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).

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

\* The unit of STLC is mg/l



(Ms. Raiwin Posit)  
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  
**Measured Source** : Work Place Air Temperature  
**Measured Date** : April 21, 2023  
**Measured By** : Mr.Noppasit Taweepornpadit  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Measured Instrument** : Heat Stress Monitor/Electronic Quest Technologies Model QT-34 Serial Number TEC050027

**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AB449-001  
**Report No.** : 2023-RAAH747  
**Report Date** : May 8, 2023

Measured Location	Employee Name	Duration	Measurement Temperature; °C					Job Description/ Activities	Work Load, WL			Standard <sup>2'</sup>
			T <sub>wb</sub>	T <sub>db</sub>	T <sub>gr</sub>	WBGT	WBGT <sup>1'</sup> (Avg.)		Metabolic Rate (Kcal/hr)	Metabolic Rate Average (Kcal/hr)	Workload Rate	
- หน้าตาหลอม EAF (Indoor)	คุณวรุฒ แก้วสา	10:25-10:45	28.4	36.7	37.7	31.2	23.2	เดินเชื้อเพลิง				
- ห้องควบคุม (Indoor)		10:45-12:25	19.0	26.4	27.7	21.6		- ยืน ทำงานด้วยแขนทั้ง 2 ข้าง (หนัก) ควบคุมเครื่องจักร	31.0			
								- นั่ง ทำงานด้วยมือ (เบา)	35.0			
								การเผาผลาญพื้นฐานของร่างกาย	60.0	126.0	Light	34.0

**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.

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

<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. Thidarat Pukkha)  
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** : April 21, 2023  
**Measured By** : Mr.Noppasit Taweepornpadit  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Measured Instrument** : Heat Stress Monitor/Electronic Metrosonics Model hs-32 Serial Number MCF010006

**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AB449-002  
**Report No.** : 2023-RAAH748  
**Report Date** : May 8, 2023

Measured Location	Employee Name	Duration	Measurement Temperature; °C				Job Description/ Activities	Work Load, WL		Standard <sup>2/</sup>
			T <sub>WB</sub>	T <sub>DB</sub>	T <sub>Gr</sub>	WBGT <sup>1/</sup> (Avg.)		Metabolic Rate (Kcal/hr)	Metabolic Rate Average (Kcal/hr)	
- จุดปฏิบัติงาน CCM (Indoor) - ห้องพักพนักงาน CCM (Indoor)	คุณ.โบสิน วงศ์จันทร์	10:34-11:34	30.0	39.9	40.7	33.2	สังเกตการทำงานบนเครื่องจักร			
		11:34-12:34	19.3	26.5	28.0	21.9	- นั่ง เข็นชิ้นเหล็ก	6.0		
							- ยืน ใช้ร่างกายทุกส่วน (เบา)	41.0		
							สังเกตการทำงานบนเครื่องจักร	9.0		
							- นั่ง การเผาลานพื้นฐานของร่างกาย	60.0	116.0	34.0

**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.

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

<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.Thidarat Pukkha)  
Laboratory Reviewer

(Ms.Thanida Bunnrungrueang)  
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** : April 21, 2023  
**Measured By** : Mr.Noppasit Taweepornpadit  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Measured Instrument** : Heat Stress Monitor/Electronic Metrosonics Model hs-32 Serial Number MCB030005

**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AB449-003  
**Report No.** : 2023-RAAH749  
**Report Date** : May 8, 2023

Measured Location	Employee Name	Duration	Measurement Temperature; °C				Job Description/ Activities	Work Load, WL		Standard <sup>2'</sup>
			T <sub>NWB</sub>	T <sub>DB</sub>	T <sub>GT</sub>	WBGT <sup>1'</sup> (Avg.)		Metabolic Rate (Kcal/hr)	Metabolic Rate Average (Kcal/hr)	
ลานแท่นรีด (Indoor)	คุณจิฑูรย์ ศรีสง่า	10:42-12:42	28.3	37.4	39.1	31.5	ซ่อมเครื่องจักร			
							- ยืน ใ้ร่างกายทุกส่วน (เบา)	205.0		
							ตรวจสอบการทำงานของเครื่องจักร			
							- เดินบนพื้นราบ	20.0		
							การเผาผลาญพื้นฐานของร่างกาย	60.0	Moderate	32.0

**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  $((WBGT_1 \times Time_1) + (WBGT_2 \times Time_2) + \dots + (WBGT_n \times Time_n)) / (Time_1 + Time_2 + \dots + Time_n)$

<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.Thidar Pukkha)  
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** : April 21, 2023  
**Measured By** : Mr.Noppasit Taweepornpadit  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Measured Instrument** : Heat Stress Monitor/Electronic Metrosonics Model hs-32 Serial Number MCD090008

**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AB449-004  
**Report No.** : 2023-RAAH750  
**Report Date** : May 8, 2023

Measured Location	Employee Name	Duration	Measurement Temperature; °C				Job Description/ Activities	Work Load, WL		Standard <sup>2'</sup>
			T <sub>NWB</sub>	T <sub>db</sub>	T <sub>g</sub>	WBGT		Metabolic Rate (Kcal/hr)	Metabolic Rate Average (Kcal/hr)	
Pendulum Shear (Indoor)	Voln Sy Sem	10:47-12:47	29.2	37.6	39.5	32.3	ควบคุมเครื่องตัดเหล็ก - ยืน ทำงานด้วยแขนทั้ง 2 ข้าง (บน) การเผาผลาญพื้นฐานของร่างกาย	126.0	186.0	34.0
								60.0		

**Remark :** T<sub>NWB</sub> = Nature Wet Bulb Temperature, T<sub>db</sub> = Dry Bulb Temperature, T<sub>g</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.Thidarat Pukkha)  
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** : April 21, 2023  
**Measured By** : Mr.Noppasit Taweepornpadit  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Measured Instrument** : Heat Stress Monitor/Electronic Metrosonics Model hs-32 Serial Number MCB030006

**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AB449-005  
**Report No.** : 2023-RAAH751  
**Report Date** : May 8, 2023

Measured Location	Employee Name	Duration	Measurement Temperature; °C				Job Description/ Activities	Work Load, WL		Standard <sup>2'</sup>
			T <sub>NWB</sub>	T <sub>DB</sub>	T <sub>GT</sub>	WBGT <sup>1'</sup> (Avg.)		Metabolic Rate (Kcal/hr)	Metabolic Rate Average (Kcal/hr)	
ลานปั้นเหล็กของหริบเหมา (Indoor)	คุณวีรุดม แก้วหัง	10:53-12:53	28.2	35.7	36.7	30.8	นับเหล็ก - นั่ง ทำงานด้วยแขนทั้ง 2 ข้าง (เบา) การเผาผลาญพื้นฐานของร่างกาย	108.0	168.0	34.0
								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.Thidarat Pukkha)  
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** : April 21, 2023  
**Measured By** : Mr.Noppasit Taweepornpadit  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Measured Instrument** : Heat Stress Monitor/Electronic Quest Technologies Model QT-34 Serial Number TEH070023

**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AB449-006  
**Report No.** : 2023-RAAH752  
**Report Date** : May 8, 2023

Measured Location	Employee Name	Duration	Measurement Temperature; °C				Job Description/ Activities	Work Load, WL		Standard <sup>2'</sup>
			T <sub>nwb</sub>	T <sub>db</sub>	T <sub>gr</sub>	WBGT <sup>1'</sup> (Avg.)		Metabolic Rate (Kcal/hr)	Metabolic Rate Average (Kcal/hr)	
จุดผลิตเหล็กเส้นรูป (Indoor)	Myd Thu	11:02-13:02	28.3	35.5	36.9	30.9	ควบคุมการทำงานของเครื่องจักร - ยืน ทำงานด้วยแขนทั้ง 2 ข้าง (เบา) การเคลื่อนย้ายพื้นฐานของร่างกาย	126.0	186.0	34.0
								60.0		

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

1' Calculate by ((WBGT<sub>1</sub> x Time<sub>1</sub>) + (WBGT<sub>2</sub> x Time<sub>2</sub>) + ... + (WBGT<sub>n</sub> x Time<sub>n</sub>)) / (Time<sub>1</sub> + Time<sub>2</sub> + ... + Time<sub>n</sub>)

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.Thidarat Pukkha)  
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** : February 4, 2023  
**Measured By** : Mr.Chayanut Boongantong  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Measured Instrument** : Integrating Sound Level Meter Type II, ACO Model 6236 Serial Number 222121

**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AA343-011  
**Report No.** : 2023-RAAC279  
**Report Date** : February 10, 2023

Measured Location	Interval Time	Equivalent Level; dB(A)	Maximum Level; dB(A)	Standard <sup>1)</sup>
เดาหลอมเหล็ก EAF ห้องควบคุม	08:52 - 09:52	71.0	84.6	-
	09:52 - 10:52	68.8	80.3	-
	10:52 - 11:52	72.4	88.3	-
	11:52 - 12:52	70.7	82.6	-
	12:52 - 13:52	70.6	86.0	-
	13:52 - 14:52	70.0	81.3	-
	14:52 - 15:52	72.4	83.5	-
	15:52 - 16:52	75.1	82.2	-
	Equivalent Level 8 hrs (Leq 8 hrs)	71.8		90
	Maximum Level (Lmax)	88.3		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.Thidarat Pukkha)  
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** : February 4, 2023  
**Measured By** : Mr.Chayanut Boongantong  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Measured Instrument** : Integrating Sound Level Meter Type II, ACO Model 6236 Serial Number 222111


**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AA343-010  
**Report No.** : 2023-RAAC278  
**Report Date** : February 10, 2023

Measured Location	Interval Time	Equivalent Level; dB(A)	Maximum Level; dB(A)	Standard <sup>1'</sup>
เครื่องหล่อเหล็กแท่ง ห้องควบคุม	08:36 - 09:36	64.0	80.8	-
	09:36 - 10:36	66.9	87.7	-
	10:36 - 11:36	68.0	87.3	-
	11:36 - 12:36	66.0	85.6	-
	12:36 - 13:36	63.2	78.7	-
	13:36 - 14:36	63.7	79.9	-
	14:36 - 15:36	69.0	89.7	-
	15:36 - 16:36	67.7	82.2	-
	Equivalent Level 8 hrs (Leq 8 hrs)	66.5		90
	Maximum Level (Lmax)	89.7		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.Thidarat Pukkha)  
 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** : February 4, 2023  
**Measured By** : Mr.Chayanut Boongantong  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Measured Instrument** : Integrating Sound Level Meter Type II, ACO Model 6236 Serial Number 222122

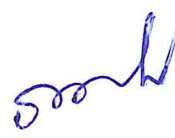
**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AA343-009  
**Report No.** : 2023-RAAC277  
**Report Date** : February 10, 2023

Measured Location	Interval Time	Equivalent Level; dB(A)	Maximum Level; dB(A)	Standard <sup>1)</sup>
แท่นรีดเหล็ก ห้องควบคุม	08:24 - 09:24	70.9	82.2	-
	09:24 - 10:24	70.8	78.5	-
	10:24 - 11:24	71.1	77.1	-
	11:24 - 12:24	69.6	77.7	-
	12:24 - 13:24	67.0	77.6	-
	13:24 - 14:24	69.7	77.9	-
	14:24 - 15:24	70.3	77.4	-
	15:24 - 16:24	69.5	81.2	-
	<b>Equivalent Level 8 hrs (Leq 8 hrs)</b>	<b>70.0</b>		<b>90</b>
	<b>Maximum Level (Lmax)</b>	<b>82.2</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.Thidarat Pukkha)  
 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** : February 4, 2023  
**Measured By** : Mr.Chayanut Boongantong  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Measured Instrument** : Integrating Sound Level Meter Type II, ACO Model 6236 Serial Number 222110

**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AA343-008  
**Report No.** : 2023-RAAC276  
**Report Date** : February 10, 2023

Measured Location	Interval Time	Equivalent Level; dB(A)	Maximum Level; dB(A)	Standard <sup>1'</sup>
Pendulum Shear ห้องควบคุม	08:20 - 09:20	67.1	85.4	-
	09:20 - 10:20	67.7	88.9	-
	10:20 - 11:20	65.6	79.7	-
	11:20 - 12:20	65.3	79.7	-
	12:20 - 13:20	67.3	85.3	-
	13:20 - 14:20	66.9	86.3	-
	14:20 - 15:20	77.2	89.2	-
	15:20 - 16:20	66.2	78.4	-
	Equivalent Level 8 hrs (Leq 8 hrs)	70.3		90
	Maximum Level (Lmax)	89.2		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.Thidarat Pukkha)  
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** : April 21, 2023  
**Measured By** : Mr.Noppasit Taweepornpadit  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Measured Instrument** : Integrating Sound Level Meter ACO Model 6226 Serial Number 180064

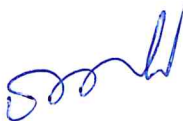
**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AB449-017  
**Report No.** : 2023-RAAH760  
**Report Date** : May 8, 2023

Measured Location	Interval Time	Equivalent Level; dB(A)	Maximum Level; dB(A)	Standard <sup>1'</sup>
เตาหลอมเหล็ก EAF ห้องควบคุม	09:58 - 10:58	69.2	82.5	-
	10:58 - 11:58	68.1	78.9	-
	11:58 - 12:58	68.5	82.0	-
	12:58 - 13:58	66.9	79.9	-
	13:58 - 14:58	67.7	78.1	-
	14:58 - 15:58	67.7	78.7	-
	15:58 - 16:58	68.4	80.2	-
	16:58 - 17:58	59.0	67.0	-
	<b>Equivalent Level 8 hrs (Leq 8 hrs)</b>	<b>67.6</b>		<b>90</b>
	<b>Maximum Level (Lmax)</b>	<b>82.5</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).



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(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** : April 21, 2023  
**Measured By** : Mr.Noppasit Taweeponpadit  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Measured Instrument** : Integrating Sound Level Meter ACO Model 6226 Serial Number 160120

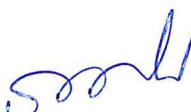
**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AB449-016  
**Report No.** : 2023-RAAH759  
**Report Date** : May 8, 2023

Measured Location	Interval Time	Equivalent Level; dB(A)	Maximum Level; dB(A)	Standard <sup>1'</sup>
เครื่องหล่อเหล็กแท่ง ห้องควบคุม	09:42 - 10:42	65.4	90.7	-
	10:42 - 11:42	65.9	82.1	-
	11:42 - 12:42	67.5	88.7	-
	12:42 - 13:42	61.8	81.1	-
	13:42 - 14:42	68.5	93.3	-
	14:42 - 15:42	67.5	92.0	-
	15:42 - 16:42	66.6	87.2	-
	16:42 - 17:42	66.2	84.1	-
	<b>Equivalent Level 8 hrs (Leq 8 hrs)</b>	<b>66.5</b>		<b>90</b>
	<b>Maximum Level (Lmax)</b>	<b>93.3</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.Thidararat Pukkha)  
Laboratory Reviewer



(Ms.Thanida Bunrungrueang)  
Laboratory Supervisor


## ANALYSIS REPORT

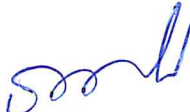
**Customer Name** : Tata Steel Manufacturing (Thailand) PCL. (Branch : 00005)  
**Address** : 1 Map Ta Phut Industrial Estate, I-7 Road, Map Ta Phut, Mueang Rayong, Rayong 21150  
**Project Name** : โครงการขยายกำลังการผลิตเหล็กเส้นก่อสร้าง  
**Measured Source** : Work Place Noise  
**Measured Date** : April 21, 2023  
**Measured By** : Mr.Noppasit Taweeornpadit  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Measured Instrument** : Integrating Sound Level Meter ACO Model 6226 Serial Number 180068

**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AB449-015  
**Report No.** : 2023-RAAH758  
**Report Date** : May 8, 2023

Measured Location	Interval Time	Equivalent Level; dB(A)	Maximum Level; dB(A)	Standard <sup>1'</sup>
แท่นรีดเหล็ก ห้องควบคุม	09:35 - 10:35	70.0	79.7	-
	10:35 - 11:35	70.6	79.4	-
	11:35 - 12:35	69.7	78.8	-
	12:35 - 13:35	68.5	78.8	-
	13:35 - 14:35	69.2	77.2	-
	14:35 - 15:35	69.2	76.4	-
	15:35 - 16:35	67.0	84.7	-
	16:35 - 17:35	65.6	73.8	-
	<b>Equivalent Level 8 hrs (Leq 8 hrs)</b>	<b>69.0</b>		<b>90</b>
	<b>Maximum Level (Lmax)</b>	<b>84.7</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.Thidarat Pukkha)  
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** : April 21, 2023  
**Measured By** : Mr.Noppasit Taweepornpadit  
**Analyzed By** : Environment Research & Technology Co., Ltd.  
**Measured Instrument** : Integrating Sound Level Meter ACO Model 6226 Serial Number 160111

**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AB449-014  
**Report No.** : 2023-RAAH757  
**Report Date** : May 8, 2023

Measured Location	Interval Time	Equivalent Level; dB(A)	Maximum Level; dB(A)	Standard <sup>1'</sup>
Pendulum Shear ห้องควบคุม	09:12 - 10:12	69.3	83.8	-
	10:12 - 11:12	70.1	86.8	-
	11:12 - 12:12	67.7	84.4	-
	12:12 - 13:12	66.1	84.9	-
	13:12 - 14:12	67.2	84.7	-
	14:12 - 15:12	66.7	81.3	-
	15:12 - 16:12	70.6	86.3	-
	16:12 - 17:12	71.2	91.6	-
	<b>Equivalent Level 8 hrs (Leq 8 hrs)</b>	<b>69.0</b>		<b>90</b>
	<b>Maximum Level (Lmax)</b>	<b>91.6</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.Thidarat Pukkha)  
Laboratory Reviewer

(Ms.Thanida Bunrungrueang)  
Laboratory Supervisor



# ANALYSIS REPORT

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	ลานปั้นเหล็กของผู้รับเหมา	คุณสุรัตน์ ชังบอน	08:00 – 16:00	8.00	04/02/66	08:12 – 15:33	7.21	190600235	65.30	83.2
2	Pendulum Shear	คุณธีรเดช ใจมั่นคง	08:00 – 16:00	8.00	04/02/66	08:20 – 15:44	7.24	190600236	0.45	61.5
3	ลานแท่นรีด	คุณสาธิต กอเข้ม	08:00 – 16:00	8.00	04/02/66	08:26 – 15:38	7.12	17862	2.07	68.2
4	เตาหลอมเหล็ก LF	คุณนิติรัตน์ สารวมทรัพย์	08:00 – 16:00	8.00	04/02/66	08:48 – 15:57	7.09	190800268	517.90*	92.1*
5	หน้าเตาหลอมเหล็ก EAF	คุณพรชัย ดิษยพงศ์	08:00 – 16:00	8.00	04/02/66	08:52 – 16:04	7.12	190800276	45.00	81.5
6	จุดปฏิบัติงาน CCM	คุณเทพพงษ์ นาคอุดม	08:00 – 16:00	8.00	04/02/66	08:59 – 16:19	7.20	180200304	160.50*	87.0*
7	จุดผลิตเหล็กเส้นขึ้นรูป	คุณเอกวิรุ สุขดา	08:00 – 16:00	8.00	04/02/66	09:07 – 16:25	7.18	190800173	50.50	82.0
Standard <sup>2'</sup>									100	85

Remark : 1' Using 3 dB Energy Exchange Rate, Slow Response, 85 dB Criteria Level, 80 dB Threshold Level.  
2' 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.Thidarat Pukkha)  
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** : Personal Noise Dose  
**Measured By** : Mr.Noppasit Taweepornpadit  
**Analyzed By** : Environment Research & Technology Co., Ltd.

**Quotation No.** : 2023-00099  
**Analysis No.** : 2023-AB449  
**Report No.** : 2023-RAAH762  
**Report Date** : May 8, 2023

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	Pendulum Shear	คุณนันทน์ ช่างหนู	08:00 – 16:00	8.00	Apr 21, 23	09:21 – 16:42	7.21	170400055	7.60	73.8
2	ลานนับเหล็กของผู้รับเหมา	คุณนันทน์ ช่างหนู	08:00 – 16:00	8.00	Apr 21, 23	09:31 – 17:01	7.30	190600235	93.70	84.7
3	ลานแผ่นรีด	คุณวันชัย ศรีนรินทร์	08:00 – 16:00	8.00	Apr 21, 23	09:34 – 16:55	7.21	180200302	123.20*	85.9*
4	จุดปฏิบัติงาน CCM	คุณไวยสิน วงศ์รินทร์	08:00 – 16:00	8.00	Apr 21, 23	09:47 – 17:17	7.30	180200301	252.30*	89.0*
5	เตาหลอม LF	คุณศุภรัตน์ สิทธิการ	08:00 – 16:00	8.00	Apr 21, 23	09:50 – 17:05	7.15	170400043	81.30	84.1
6	หน้าเตาหลอม EAF	คุณอโศก คำเผื่อง	08:00 – 16:00	8.00	Apr 21, 23	09:57 – 17:01	7.04	190600222	107.40*	85.3*
7	จุดผลิตเหล็กเส้นขึ้นรูป	คุณวีรชน บุญไธย	08:00 – 16:00	8.00	Apr 21, 23	10:06 – 17:10	7.04	190800266	60.60	82.8
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 190 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.Thidarat Pukkha)  
Laboratory Reviewer

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