

SCIENTIFIC RESEARCH LABORATORY

An ISO 9001:2015 (QMS) & OHSAS 45001:2018 Certified Organization
Recognized by Jharkhand State Pollution Control Board
Analytical & Environmental Engineering Laboratory
C- 144, Aman Green City, Pundag, Ranchi- 834 004, Jharkhand
Tele No.: 0651- 2950060, Mobile: 94701 30700, E-mail: nirajksingh2003@yahoo.co.in

Report No. : SRL/RCMPL/SEPT/22

Date: 24.09.2022

TEST REPORT

- Name and Address of the Unit : M/s Radha Casting & Metalik (Pvt) Limited.
(M. S. Ingot Unit), At.: Paiki, P.O.: Marar,
District: Ramgarh, Jharkhand.
- Location of Monitoring : Near Main Gate (Beside Office Building)
- Date of Monitoring : 15.09.2022 to 16.09.2022
- Ambient Temperature : 33°C
- Average Relative Humidity : 72 %
- Meteorological Condition : Partly Cloudy
- Results of Ambient Air Quality :

Sl. No.	PARAMETERS	UNIT	METHODS	RESULTS
1.	PM ₁₀	µg/m ³	IS: 5182 (Part- 23) 2006	77.50
2.	PM _{2.5}	µg/m ³	IS: 5182 (Part- 24) 2006	45.00
3.	Sulphur dioxide (SO ₂)	µg/m ³	IS: 5182 (Part- 2) 2001	16.20
4.	Nitrogen Oxides (NO _x)	µg/m ³	IS: 5182 (Part- 6) 2006	31.00
5.	Ozone (O ₃)	µg/m ³	ISC 411, 3 rd Edition 1999	22.00
6.	Lead (Pb)	µg/m ³	IS 5182 (Part-22): 2004	<0.02
7.	Carbon monoxide (CO)	mg/m ³	IS 5182 (Part-10): 1999	0.76
8.	Ammonia (NH ₃)	µg/m ³	IS: 5182 (Part- 25) 2018	16.00
9.	Benzene (C ₆ H ₆)	µg/m ³	IS: 5182 (Part- 11) 2006	<1.00
10.	Benzo (a) Pyrene (BaP)	ng/m ³	IS: 5182 (Part- 12) 2009	<1.00
11.	Arsenic (As)	ng/m ³	ISC 411, 3 rd Edition 1999	<1.00
12.	Nickel (Ni)	ng/m ³	IS 5182 (Part-22): 2004	<4.00

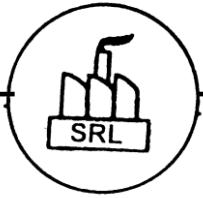
Note: 01. Ambient Fine Dust Sampler [Make Ecotech Instruments, Greater Noida, Model-AAS 190] was used for PM_{2.5} collection.

02. Analysis of Lead (Pb), Arsenic (As), Nickel (Ni), and Benzo (a) Pyrene (BaP) was carried out on PM₁₀ fraction.

for Scientific Research Laboratory,

Niraj

(Dr. Niraj Kumar Singh)
In-charge, Jharkhand office.



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(M. S. Ingot Unit), At.: Paiki, P.O.: Marar,
District: Ramgarh, Jharkhand.
- Location of Monitoring : Near South – East Boundary
- Date of Monitoring : 15.09.2022 to 16.09.2022
- Ambient Temperature : 33°C
- Average Relative Humidity : 72 %
- Meteorological Condition : Partly Cloudy
- Results of Ambient Air Quality :

Sl. No.	PARAMETERS	UNIT	METHODS	RESULTS
1.	PM ₁₀	µg/m ³	IS: 5182 (Part- 23) 2006	85.00
2.	PM _{2.5}	µg/m ³	IS: 5182 (Part- 24) 2006	48.00
3.	Sulphur dioxide (SO ₂)	µg/m ³	IS: 5182 (Part- 2) 2001	17.00
4.	Nitrogen Oxides (NO _x)	µg/m ³	IS: 5182 (Part- 6) 2006	34.50
5.	Ozone (O ₃)	µg/m ³	ISC 411, 3 rd Edition 1999	23.00
6.	Lead (Pb)	µg/m ³	IS 5182 (Part-22): 2004	<0.02
7.	Carbon monoxide (CO)	mg/m ³	IS 5182 (Part-10): 1999	0.80
8.	Ammonia (NH ₃)	µg/m ³	IS: 5182 (Part- 25) 2018	18.00
9.	Benzene (C ₆ H ₆)	µg/m ³	IS: 5182 (Part- 11) 2006	<1.00
10.	Benzo (a) Pyrene (BaP)	ng/m ³	IS: 5182 (Part- 12) 2009	<1.00
11.	Arsenic (As)	ng/m ³	ISC 411, 3 rd Edition 1999	<1.00
12.	Nickel (Ni)	ng/m ³	IS 5182 (Part-22): 2004	<4.00

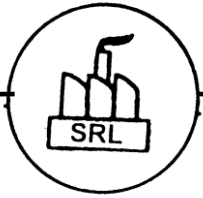
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District: Ramgarh, Jharkhand.
- Location of Monitoring : Near South – West Boundary (Beside Laboratory)
- Date of Monitoring : 15.09.2022 to 16.09.2022
- Ambient Temperature : 33°C
- Average Relative Humidity : 72 %
- Meteorological Condition : Partly Cloudy
- Results of Ambient Air Quality :

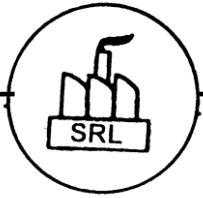
Sl. No.	PARAMETERS	UNIT	METHODS	RESULTS
1.	PM ₁₀	µg/m ³	IS: 5182 (Part- 23) 2006	86.50
2.	PM _{2.5}	µg/m ³	IS: 5182 (Part- 24) 2006	49.00
3.	Sulphur dioxide (SO ₂)	µg/m ³	IS: 5182 (Part- 2) 2001	18.50
4.	Nitrogen Oxides (NO _x)	µg/m ³	IS: 5182 (Part- 6) 2006	36.20
5.	Ozone (O ₃)	µg/m ³	ISC 411, 3 rd Edition 1999	26.00
6.	Lead (Pb)	µg/m ³	IS 5182 (Part-22): 2004	<0.02
7.	Carbon monoxide (CO)	mg/m ³	IS 5182 (Part-10): 1999	0.83
8.	Ammonia (NH ₃)	µg/m ³	IS: 5182 (Part- 25) 2018	24.00
9.	Benzene (C ₆ H ₆)	µg/m ³	IS: 5182 (Part- 11) 2006	<1.00
10.	Benzo (a) Pyrene (BaP)	ng/m ³	IS: 5182 (Part- 12) 2009	<1.00
11.	Arsenic (As)	ng/m ³	ISC 411, 3 rd Edition 1999	<1.00
12.	Nickel (Ni)	ng/m ³	IS 5182 (Part-22): 2004	<4.00

Note: 01. Ambient Fine Dust Sampler [Make Ecotech Instruments, Greater Noida, Model-AAS 190] was used for PM_{2.5} collection.

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- Meteorological Condition : Partly Cloudy
- Results of Ambient Air Quality :

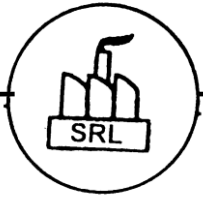
Sl. No.	PARAMETERS	UNIT	METHODS	RESULTS
1.	PM ₁₀	µg/m ³	IS: 5182 (Part- 23) 2006	81.00
2.	PM _{2.5}	µg/m ³	IS: 5182 (Part- 24) 2006	46.00
3.	Sulphur dioxide (SO ₂)	µg/m ³	IS: 5182 (Part- 2) 2001	15.80
4.	Nitrogen Oxides (NO _x)	µg/m ³	IS: 5182 (Part- 6) 2006	33.50
5.	Ozone (O ₃)	µg/m ³	ISC 411, 3 rd Edition 1999	24.00
6.	Lead (Pb)	µg/m ³	IS 5182 (Part-22): 2004	<0.02
7.	Carbon monoxide (CO)	mg/m ³	IS 5182 (Part-10): 1999	0.79
8.	Ammonia (NH ₃)	µg/m ³	IS: 5182 (Part- 25) 2018	22.00
9.	Benzene (C ₆ H ₆)	µg/m ³	IS: 5182 (Part- 11) 2006	<1.00
10.	Benzo (a) Pyrene (BaP)	ng/m ³	IS: 5182 (Part- 12) 2009	<1.00
11.	Arsenic (As)	ng/m ³	ISC 411, 3 rd Edition 1999	<1.00
12.	Nickel (Ni)	ng/m ³	IS 5182 (Part-22): 2004	<4.00

Note: 01. Ambient Fine Dust Sampler [Make Ecotech Instruments, Greater Noida, Model-AAS 190] was used for PM_{2.5} collection.

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**M/s RADHA CASTING & METALIK (P) LTD.
(M. S. INGOT UNIT)
At.: PAINKI, P.O.: MARAR, DISTRICT: RAMGARH
JHARKHAND**

AMBIENT NOISE MONITORING DATA

Report No.: SRL/RCMPL/N-01/22

Date of Reporting: 24.09.2022

Monitoring Location	Date of Monitoring	Hours		Sound Pressure Level, dB(A)
		Day Time (06.00-22.00 hr.)	Night Time (22.00-06.00 hr.)	
Near Main Gate (Beside Office Building)	15.09.2022 & 16.09.2022	Day Time (06.00-22.00 hr.)	09.00	56.2
			10.00	58.0
			11.00	59.7
			12.00	60.4
			13.00	60.2
			14.00	59.8
			15.00	60.3
			16.00	61.6
		Night Time (22.00-06.00 hr.)	22.00	55.3
			23.00	53.7
			00.00	51.0
			01.00	52.9
			02.00	49.7
			03.00	49.4
			04.00	51.6
			05.00	52.2

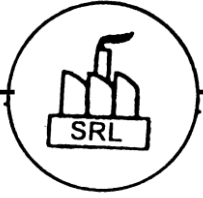
Norms: National Ambient Air Quality Standards (NAAQS) in respect of Noise as per CPCB, New Delhi,
Industrial Area : Day Time 75 dB(A) Leq and Night Time 70 dB(A) Leq
Commercial Area : Day Time 65 dB(A) Leq and Night Time 55 dB(A) Leq
Residential Area : Day Time 55 dB(A) Leq and Night Time 45 dB(A) Leq
Silence Zone : Day Time 50 dB(A) Leq and Night Time 40 dB(A) Leq

Norms: OSHA Norms in work place for 8 hr. exposure: 90 dB (A)

for Scientific Research Laboratory,

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AMBIENT NOISE MONITORING DATA

Report No.: SRL/RCMPL/N-01/22

Date of Reporting: 24.09.2022

Monitoring Location	Date of Monitoring	Hours		Sound Pressure Level, dB(A)
		Day Time (06.00-22.00 hr.)	Night Time (22.00-06.00 hr.)	
Near South – East Boundary	15.09.2022 & 16.09.2022	Day Time (06.00-22.00 hr.)	09.10	61.3
			10.10	62.8
			11.10	63.5
			12.10	64.0
			13.10	63.7
			14.10	64.5
			15.10	63.1
		Night Time (22.00-06.00 hr.)	16.10	65.2
			22.10	60.6
			23.10	59.3
			00.10	57.5
			01.10	55.9
			02.10	56.0
			03.10	55.1
			04.10	57.4
			05.10	58.7

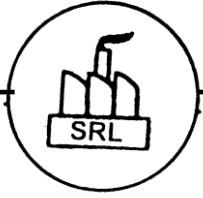
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Report No.: SRL/RCMPL/N-01/22

Date of Reporting: 24.09.2022

Monitoring Location	Date of Monitoring	Hours		Sound Pressure Level, dB(A)
		Day Time (06.00-22.00 hr.)	Night Time (22.00-06.00 hr.)	
Near South – West Boundary (Beside Laboratory)	15.09.2022 & 16.09.2022	Day Time (06.00-22.00 hr.)	09.20	61.7
			10.20	62.0
			11.20	61.9
			12.20	62.4
			13.20	63.1
			14.20	64.7
			15.20	65.2
		Night Time (22.00-06.00 hr.)	16.20	64.5
			22.20	61.0
			23.20	60.3
			00.20	59.7
			01.20	58.9
			02.20	59.5
			03.20	58.7
			04.20	57.5
			05.20	58.2

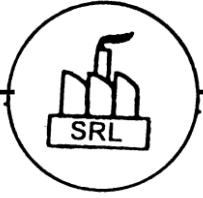
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At.: PAINKI, P.O.: MARAR, DISTRICT: RAMGARH
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AMBIENT NOISE MONITORING DATA

Report No.: SRL/RCMPL/N-01/22

Date of Reporting: 24.09.2022

Monitoring Location	Date of Monitoring	Hours		Sound Pressure Level, dB(A)
		Day Time (06.00-22.00 hr.)	Night Time (22.00-06.00 hr.)	
Near Staff Quarter	15.09.2022 & 16.09.2022	Day Time (06.00-22.00 hr.)	09.30	57.2
			10.30	58.4
			11.30	60.7
			12.30	59.5
			13.30	58.3
			14.30	59.8
			15.30	60.1
		Night Time (22.00-06.00 hr.)	16.30	61.3
			22.30	57.5
			23.30	56.2
			00.30	54.8
			01.30	52.9
			02.30	51.4
			03.30	52.7
			04.30	53.4
			05.30	55.2

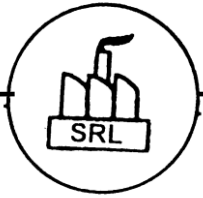
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Residential Area : Day Time 55 dB(A) Leq and Night Time 45 dB(A) Leq
Silence Zone : Day Time 50 dB(A) Leq and Night Time 40 dB(A) Leq

Norms: OSHA Norms in work place for 8 hr. exposure: 90 dB (A)

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Report No. : SRL/RCMPL/WZ-FD/22

Date: 24.09.2022

WORK ZONE FUGITIVE DUST EMISSION

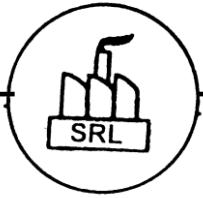
1. Name and Address of the Unit : M/s Radha Casting & Metalik (Pvt.) Limited.
(M. S. Ingot Unit)
At.- Paiki, P.O.: Marar, District: Ramgarh
Jharkhand.
2. Date of Monitoring : 16.09.2022
3. Ambient Temperature : 32^oC
4. Average Relative Humidity : 68 %
5. Meteorological Condition : Partly Cloudy
6. Results of Fugitive Dust Emission :

Sl. No.	Sample No.	Monitoring Location	Results in $\mu\text{g}/\text{Nm}^3$
			Respirable Suspended Particulate Matter (PM ₁₀)
1.	WZ - 1	Near Raw Material Handling Yard	1796
2.	WZ - 2	Near Induction Furnace	1884
3.	WZ - 3	Near Finished Product Exit Point	1736
4.	WZ - 4	Near Crusher Plant (About 10m from Crushing Unit)	1878
Norms for Fugitive Emission: MoEF & CC Notification, 18 th March, 2016			2000 at 10 metre

The results when compared with norms show that the work zone air quality were well within the stipulated limits.

for Scientific Research Laboratory,

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STACK MONITORING REPORT

Name of the Industry : M/s Radha Casting & Metalik (Pvt) Limited.
(M. S. Ingot Unit)
At.: Paiki, P.O.: Marar, District: Ramgarh,
Jharkhand.

Date of sampling : 15.09.2022

Weather condition : Partly Cloudy

Stack number if any : Induction Furnace Stack (Electric)

Height of stack from ground level (in metre) : 21.26

Inner dimension of stack (in metre) : 0.40

Height of port hole (in metre) : 7.62

Atmospheric temperature (in °C) : 34

Stack gas temperature (in °C) : 106

Stack gas velocity (in m/s) : 6.58

Volumetric flow rate (in Nm³/hr) : 2341

Dust concentration (in mg/Nm³) : 68

Emission rate (in kg/hr) : 0.159

Name of fuel & quantity used per shift : Electricity

Production capacity : 15,000 T/Annum

Stack attached to : Fume Extraction System with Wet Scrubber

GASES

Sulphurdioxide (in mg/Nm³) as SO₂ : 12

Nitrogenoxides (in mg/Nm³) as NO₂ : 32

Carbon Monoxide (in %) as CO : <0.2%

Carbon dioxide (% v/v by Orsat method) : 5.6

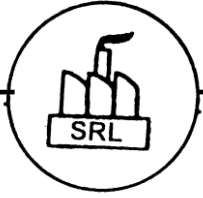
Note: Sampling was carried out at CO₂ 12%

Remarks: Dust concentration was found 68 mg/Nm³ against prescribed limit of 150 mg/Nm³.

for Scientific Research Laboratory,

Niraj

(DR. NIRAJ KUMAR SINGH)
In-charge, Jharkhand Office.



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TEST REPORT

Sample No.: EW- 1
Report No.: SRL/RCMPL/EW-1/22

Reporting Date: 24.09.2022

SAMPLE DRAWN BY SCIENTIFIC RESEARCH LABORATORY

Customer Name & Address : Radha Casting & Metalik (P) Limited.
At.: Paiki, P.O.: Marar, District: Ramgarh
Jharkhand.
Type of the Sample : Cooling Tower Blow- Down Water
Location : Final Outlet
Sampling Method : APHA 23rd Edition, 1060B
Date of Sampling : 16.09.2022
Sample Received On : 16.09.2022
Environmental Condition : Partly Cloudy, Temp. 32 °C

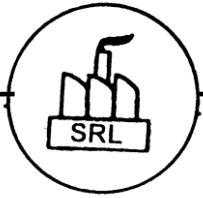
RESULTS

Sl. No.	Parameters	Unit	Permissible Limit	Results
1.	Temperature	°C	-	29
2.	pH	-	5.5 – 9.0	7.8
3.	Total Dissolved Solids	mg/l	-	346
4.	Total Suspended Solids	mg/l	100	48
5.	Chemical Oxygen Demand	mg/l	250	42
6.	Biological Oxygen Demand 3 Days at 27°C	mg/l	30	4.0
7.	Oil and Grease	mg/l	10	<5

for Scientific Research Laboratory,

Niraj

(DR. NIRAJ KUMAR SINGH)
In-charge, Jharkhand Office



SCIENTIFIC RESEARCH LABORATORY

An ISO 9001:2015 (QMS) & OHSAS 45001:2018 Certified Organization

Recognized by Jharkhand State Pollution Control Board

Analytical & Environmental Engineering Laboratory

C- 144, Aman Green City, Pundag, Ranchi- 834 004, Jharkhand

Tele No.: 0651- 2950060, Mobile: 94701 30700, E-mail: nirajksingh2003@yahoo.co.in

RESULTS OF GROUND WATER ANALYSIS

CLIENT : M/S Radha Casting & Metalik (Pvt) Limited (M. S. Ingot Unit)
AT.: Painki, P.O.: Marar, District: Ramgarh, Jharkhand

DATE OF SAMPLING : 16.09.2022

DATE OF REPORTING: 24.09.2022

Sl. No.	Characteristics	Requirement (desirable limits)	Permissible Limits* in the absence of Alternate Source	Results
				Bore Well Water (Plant Campus)
1.	Colour, Hazen units, Max.	5	-	< 5
2.	Odour	Unobjectionable	-	Unobjectionable
3.	Taste	Agreeable	-	Agreeable
4.	Turbidity, NTU, Max.	5	10	<0.5
5.	pH Value	6.5 to 8.5	No relaxation	7.2
6.	Total Hardness (as CaCO ₃), mg/l, Max.	300	600	220
7.	Iron (as Fe), mg/l, Max.	0.3	0.30	0.20
8.	Chloride (as Cl), mg/l, Max.	250	1000	32
9.	Residual Free Chlorine, mg/l, Min.	0.2	-	< 0.1
10.	Fluoride (as F) mg/L, Max.	1.0	1.5	0.60
11.	Dissolved Solids mg/l, Max.	500	2000	324
12.	Calcium (as Ca), mg/l, Max.	75	200	54
13.	Magnesium (as Mg), mg/L, Max.	30	100	20
14.	Copper (Cu), mg/l, Max.	0.05	1.5	< 0.01
15.	Manganese (as Mn), mg/l, Max.	0.1	0.3	0.02
16.	Sulphate (as SO ₄), mg/l, Max.	200	400	16
17.	Nitrate (as NO ₃), mg/l, Max.	45	100	1.8
18.	Phenolic Compounds (as C ₆ H ₅ OH),	0.001	0.002	< 0.001
19.	Mercury (as Hg), mg/l, Max.	0.001	No relaxation	< 0.0005
20.	Cadmium (as Cd), mg/l, Max.	0.01	No relaxation	< 0.005
21.	Selenium (as Se), mg/l, Max.	0.01	No relaxation	< 0.005
22.	Arsenic (as As), mg/l, Max.	0.05	No relaxation	< 0.03
23.	Cyanide (as CN), mg/l, Max.	0.05	No relaxation	< 0.01
24.	Lead (as Pb), mg/l, Max.	0.05	No relaxation	< 0.05
25.	Chromium (as Cr ⁶⁺), mg/l, Max.	0.05	No relaxation	< 0.01
26.	Alkalinity (as CaCO ₃) mg/l, Max.	200	600	185
27.	Aluminium (as Al) mg/l, Max.	0.03	0.2	< 0.01
28.	Boron, mg/l, Max.	1.0	5	< 0.1
29.	Total Coliforms Count, MPN/100ml	**	-	Nil

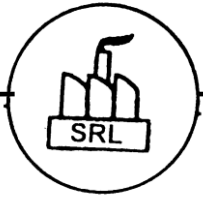
IS: 10500 (2012): Norms for drinking water

* IS: 10500 : 1991 Drinking water – Specification and amendment no. 01, January 1993.

- **
- Throughout any year, 95% of samples should not contain Coliform organisms in 100 ml.
 - No samples should contain E. Coli in 100 ml.
 - No samples should contain more than 10 Coliform organisms per 100 ml.
 - Coliform organisms should not be detected in 100 ml of any two consecutive samples.

for Scientific Research Laboratory,

(Dr. Niraj Kumar Singh)
In-charge, Jharkhand Office



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LECHATE ANALYSIS REPORT

Report No.: SRL/RCMPL/LA/SEPT/2022

Date of Reporting: 24.09.2022

SAMPLE NOT DRAWN BY SCIENTIFIC RESEARCH LABORATORY

Client Name & Address : Radha Casting & Metalik (P) Limited.
At.: Paiki, P.O.: Marar, District: Ramgarh
Jharkhand.
Sample Submitted by : Radha Casting & Metalik (P) Limited.
Type of Sample : Slag
Date of Sampling : 16.09.2022

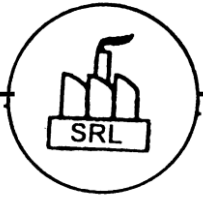
Analysis Report

Sl. No.	Parameters	EPA Regulatory Level, mg/l	Results (mg/l in extract)
1.	Arsenic (as As)	5.0	<0.020
2.	Cadmium (as Cd)	1.0	<0.010
3.	Chromium (as Cr)	5.0	<0.050
4.	Lead (as Pb)	5.0	<0.050
5.	Mercury (as Hg)	0.2	<0.005
6.	Selenium (as Se)	1.0	<0.010
7.	Silver (as Ag)	5.0	<0.050

Note: The sample was extracted with extraction fluid- 1 (pH 4.93 ± 0.05) in 1:20 ratio for 18 hours. The extraction fluid was selected after pH study of the sample (Ref: EPA Method 1311: Toxicity Characteristic Leaching Procedure).

for Scientific research Laboratory,

(Dr. Niraj Kumar Singh)
In-charge, Jharkhand Laboratory.



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STACK MONITORING REPORT

Name of the Industry : M/s Radha Casting & Metalik (Pvt) Limited.
(B. F. Division)
At.: Paiki, P.O.: Marar, District: Ramgarh,
Jharkhand.

Date of sampling : 16.09.2022

Weather condition : Partly Cloudy

Stack number if any : Blast Furnace Stack

Height of stack from ground level (in metre) : 26

Inner dimension of stack (in metre) : 0.82

Height of port hole (in metre) : 12.6

Atmospheric temperature (in °C) : 34

Stack gas temperature (in °C) : 128

Stack gas velocity (in m/s) : 6.76

Volumetric flow rate (in Nm³/hr) : 9548

Dust concentration (in mg/Nm³) : 36

Emission rate (in kg/hr) : 0.34

Name of fuel & quantity used per shift : Electricity

Production capacity : 15,000 MT/Annum

Stack attached to : Furnace through Pollution Control System
(Dust Catcher, Cyclone and Bag-filters)

GASES

Sulphurdioxide (in mg/Nm³) as SO₂ : 09

Nitrogenoxides (in mg/Nm³) as NO₂ : 20

Carbon Monoxide (in %) as CO : <0.2%

Carbon dioxide (% v/v by Orsat method) : 5.2

Note: Sampling was carried out at CO₂ 12%

Remarks: Dust concentration was found 36 mg/Nm³ against prescribed limit of 50 mg/Nm³.

for Scientific Research Laboratory,

Niraj

(DR. NIRAJ KUMAR SINGH)
In-charge, Jharkhand Office.