A TATA Enterprise

ISWP

CII National Award for Environmental Best Practices Award 2021 From ISWP

PRESENTED BY:
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TATA STEEL

THE INDIAN STEEL & WIRE PRODUCTS LTD. IS A SUBSIDIARY OF TATA STEEL

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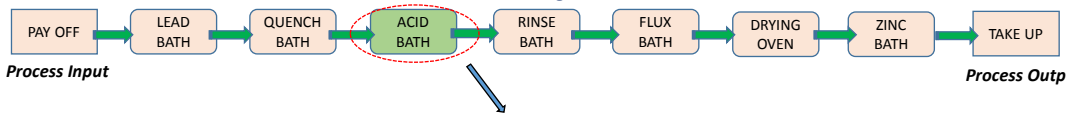
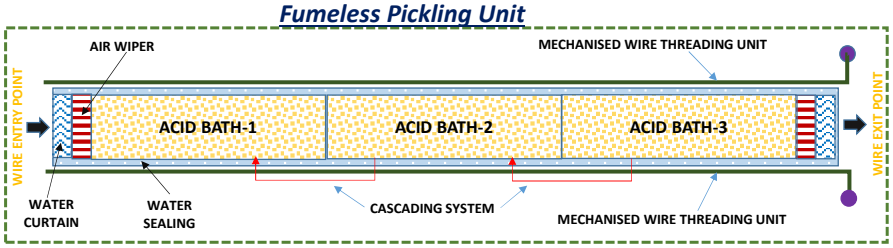
Title: FUMELESS PICKLING

Wire Galvanizing Process



Fumeless Pickling Unit



Project Brief

- In the process of **Galvanizing, wires** are being **pickled** with HCL.
- fumes extraction was done with **scrubber type FES system**.
- The **Fumeless Pickling System** introduced in the process is a **closed loop system.**
- Recirculated water curtain system where **acid fume is absorbed** and releasing to the working atmosphere.
- This **fumeless pickling system consisted** with 5 different units i.e. **Water Curtain, Acid Bath-1,2 & 3, Air Wiper and wire threading unit**.

 # WC: Water Curtain (Here curtain has been formed by circulation of water for absorbing of acid fumes generated from the pickling bath.)
 # Air Wiper: Dry the wire to removed water/acid from wire surface.
 # Acid Bath-1, 2, 3: Used for pickling of wires in order to remove the scale.

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TRIGGERS

- Generating acid fume creating unhealthy work environment.
- High consumption of fresh acid around 90-100 MT /Month .
- Severe damage to structural integrity.
- Damaging respiratory system.
- Probability of occurring occupational disease.

UNIQUENESS OF PROJECT

- No additional FES system is required.
- Above 98% efficient in Fume capturing.
- Self recirculating and cascading process leading to reduction of Fresh acid consumption.
- Creating a healthier work environment boosting the morale of employees.
- Eliminating the man machine interface(substituting manual operation to automatic threading).

DATE OF COMMENCEMENT & COMPLITION

The project was initiated in:- Oct'2019
Date of commencement :- 1/02/2020
Date if completion :- 15/02/2020

MILESTONES

- Reduction of fresh acid uo to 42-50 MT/Month Which is about 40-50 %
- Healthy and improved worked environment condition.
- Increased life of the structure.
- WPL generation is reduced upto 40%.
- Reduction in generation of ETP sludge.

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LIST OF CHALLENGES

TECHNICAL

- Unavailability of the space
- Relocation of individual process from quench bath to drying oven.
- Removal of FES systém.
- Increase in rinse water consumption.

ADMINISTRATIVE

- Skill developement of work force.
- Understanding the process from both operational and maintenance point of view.

MAINTENANCE

- Frequent failure of vertical acid circulation pump.
- Prevention of deformation of PP(polypropylene).
- Maintenance frequency increased due to increase in motor unit.

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TANGIBLE BENIFITS

1. Reduction of acid consumption up to 500-550 MT/Annum(Savings of 14 lakhs/annum)
2. Elimination of FES system (maintenance cost reduced up to 9 lakhs/annum)
3. 98% fume reduction during process
4. Low frequency of sheeting job leads to cost saving of 24 lakhs/annum.
5. Reduction of process delay (Saves up to 180hrs/month & 1.8 lakh/month)
6. Reduction of WPL generation up to 37% (Savings up to 12 lakhs/annum)

Total money savings of 80-85 lakhs/annum

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INTANGIBLE BENIFITS

- Reducing environmental contamination & pollution
- High morale among employees
- Ease of operation & Maintenance.
- Meet Legal requirement
- Increases job satisfaction

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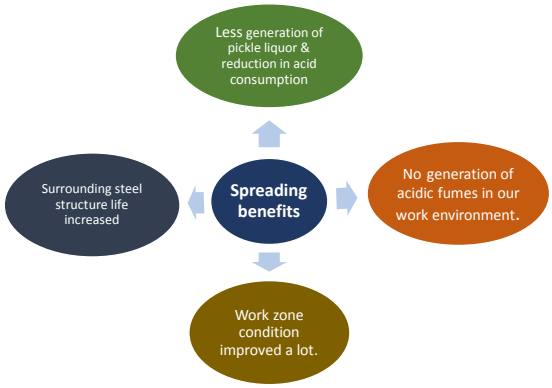
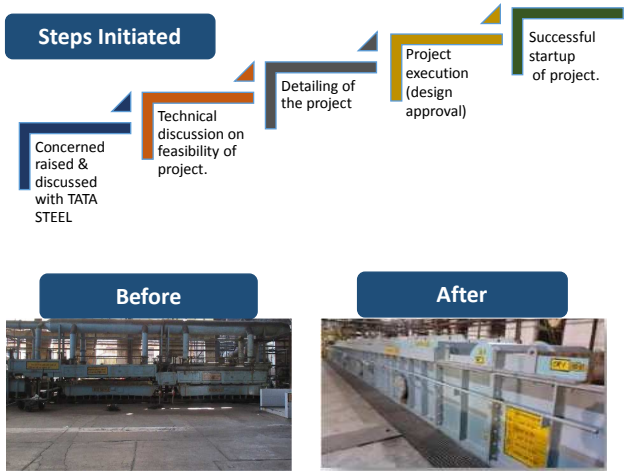
REPLICATION POTENTIAL OF PROJECT WITHIN SECTOR

Replication potential : Any wire making industries used galvanizing process can replicate this technology

Implementation in other companies :

- Shivas reinplast company
- TATA STEEL global wire(Tarapur)





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OTHER KNOWLEDGE SHARING PLATFORM

- Sharing the case study to our employees as well as vendor's employees.
- Shared in e - platform of TATA global wire.
- KM Portal.
- Our departmental whatsaap group.
- AIC performance meeting.
- TBEM & TPM
- Published in company quarterly magazine (Tar Samachar)

ACHIEVEMENT SHARING MODE

- Sharing achievements in form of presentation in international platform like CII Greenco rating .
- In house platforms and meeting of our company.
- Seminars
- Also mentioned in our company official website.

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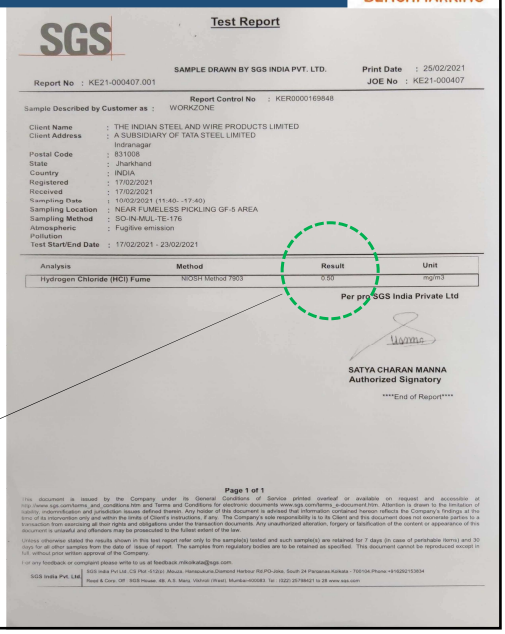
ACHIEVING NATIONAL BENCHMARK/STANDARDS

BENCHMARKING

- ❑ Our company is certified with Green Co (Sliver rated) in year 2020.
- ❑ Energy efficient company certified by CII at National level in metal sector in year 2020.
- ❑ ISO 9001, ISO 14001 and ISO 45001 certified.
- ❑ Achieved TPM second level award from JIPM in 2020.
- ❑ Industry leader in TBEM.

HCL FUMES EXPOSER LIMIT (mg/m3)

International	National	ISWPL(after installing fumeless pickling)
(1.49-7) mg/m3	7 mg/m3	0.50 mg/m3



SGS

Test Report

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Report No : KE21-000407.001

Print Date : 25/02/2021

JOE No : KE21-000407

Report Control No : KER0000169848

Sample Described by Customer as : WORKZONE

Client Name : THE INDIAN STEEL AND WIRE PRODUCTS LIMITED

Client Address : A SUBSIDIARY OF TATA STEEL LIMITED Indranagar

Postal Code : 831008

State : Jharkhand

Country : INDIA

Registered : 17/02/2021

Received : 17/02/2021

Sampling Date : 10/02/2021 (11:40 - 17:40)

Sampling Location : NEAR FUMELESS PICKLING GF-5 AREA

Sampling Method : SO-IN-MUL-TE-176

Atmospheric Pollution : Fugitive emission

Test Start/End Date : 17/02/2021 - 23/02/2021

Analysis	Method	Result	Unit
Hydrogen Chloride (HCl) Fume	NIOSH Method 7903	0.50	mg/m3

Per pro SGS India Private Ltd

SATYA CHARAN MANNA
Authorized Signatory

****End of Report****

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PRIORITY PLANS FOR FAST TRACK FOR +1 AND +2 YEARS

+1 year plan

- Substitution of 8% of electricity Consumption through Renewable Energy(solar energy)
- Mechanized drossing for cleaning The bottom dross for reduction of zinc & LPG consumption.
- 100% utilization of STP treated water in process & gardening.

+2 year plan

- Substitution of from MS tank to ceramic tank to reduce dross generation.
- Plantation of 1 lakh + trees in company premises, colony & other area.
- Induction based heating in place of LPG in lead bath to remove lead consumption.

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MAJOR LEARNING FROM THE PROJECT IMPLEMENTATION

- ***Cascading process.***
- How WR is working and preventing fumes from atmospheric release.
- Sludge can be used further for recycling process.
- Prevent releasing of acidic fumes to work environment.
- Efficiency of fumes absorption process has been increased due to closed loop water sealing system.
- Noise level is also reduced by substituting FES system with fumeless pickling from (90-95)db to (70-75)db.

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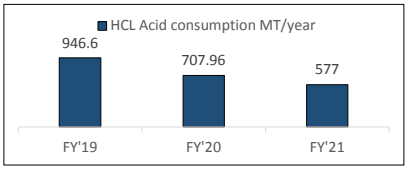
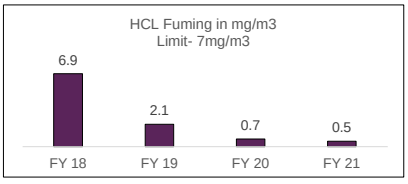
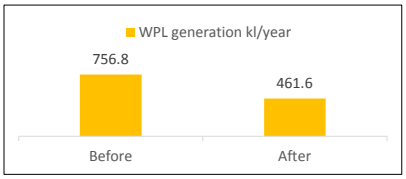
ENVIRONMENTAL PERFORMANCE EVALUATION (EPE)

OPERATIONAL PERFORMANCE INDICATOR

- Reduction on HCL fumes of 98% after installation of Fumeless pickling
- 40% reduction in HCL acid consumption.
- Reduction in generation of WPL.







MANAGEMENT PERFORMANCE INDICATOR

PARAMETERS	UOM	FY'19	FY'20	FY'21
Specific Hazardous waste generation	MT/MT prod (%)	1.16	1.14	1.11
Work zone PM	mg/m3	4101	1132.5	834
Specific energy consumption	Kwh/MT	203.9	199.6	197.8
Specific thermal energy consumption	GJ/T	1.83	1.98	1.62

Budget assigned to environment section

BUDGET	2019	2020	2021
Environment	606644/-	2586591/-	625599/-

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