



25th Sept, 2024

✓ To,


The Environmental Officer,
Karnataka State Pollution Control Board,
"C" Block, Plot No. 501, Near Income Tax Office,
Devraj Urs Layout,
Davangere - 577 006.

Dear Sir,

Sub : Submission of Environmental Statement Report (Form-V) (April, 2023 to March, 2024)
for Gracilene Division, at Kumarapatnam - 581 123, Dist: Haveri Karnataka by M/s.
Gracim Industries Ltd.

With reference to the aforesaid subject, we are herewith submitting the Environmental Statement Report (Form-V) for Gracilene Division, at Kumarapatnam - 581 123, Dist: Haveri Karnataka for financial year April, 2023 to March, 2024.

Thanking you with Regards,


(Soumya Kanta Mohanty)
President and Unit Head
Harihar Polyfibers & Gracilene Division
(Unit of Gracim Industries Ltd.,)

Encl. as above.

Cc:

1. The Member Secretary
Karnataka State Pollution Control Board,
"Parisara Bhavan", #49, 4th & 5th Floor,
Church Street, Bangalore-560001
2. The Regional Office, MoEF & CC,
Kendriya Sadan, 4th Floor, E&F
Wings, 17th Main Road,
Koramangala II Block,
Bangalore - 560034 (copy through e-mail only).



Birla Cellulose
Fibres from Nature

Gracim Industries Limited

Units : Harihar Polyfibers & Gracilene Division
Kumarapatnam 581 123, Dist. Haveri, Karnataka.

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Regd. Office : P.O. Birlagram, Nagda 456 331 (M.P.)

ENVIRONMENTAL STATEMENT REPORT

FORM-V

(See Rule 14)

Environmental Statement for the financial year ending with 31st March 2024

PART-A

(i)	Name and address of the owner/occupier of the industry operation or process.	Mr. Soumya Kanta Mohanty President and Unit Head M/s. Grasile Division, (Unit of Grasim Industries) Kumarapatnam - 581 123, Tq- Ranebennur, Dist: Haveri Karnataka	
(ii)	Industry category Primary	Large Red	
(iii)	Production capacity	Consented Quantity	Actual Quantity of Production
	Viscose staple Fiber	1,09,500 TPA	84617.32 TPA
	Sulphuric Acid	76,650 TPA	68923.78 TPA
	CS₂ (Carbon Di-Sulphide)	15,562 TPA	13589.72 TPA
	by-product Sodium Sulphate	86,520 TPA	56454.76 TPA
	Power Plant	20 MW	
(iv)	Year of establishment	1977	
(v)	Date of the last environmental statement submitted	30.09.2023	

Note:

1. The industry has obtained EC for Expansion of Fibre Plant from 87,600 to 1,75,200 TPA, Pulp Plant from 74,400 to 1,48,800 TPA, Captive Power Plant from 20 to 50 MW and setting up Excel Fibre Plant of capacity 36,500 TPA vide EC LETTER NO. IA-J-11011/371/2006-IA II(I) DATED 13.08.2019 and we are submitting the half yearly compliance report once in six months.
2. As per the EC LETTER NO. IA-J-11011/371/2006-IA II(I) DATED 13.08.2019, we have obtained the CFO for Viscose staple Fibre - 109500 TPA, Sulphuric Acid - 76,650 TPA, CS₂ (Carbon Di-Sulphide)- 15,562 TPA, by-product Sodium Sulphate- 86520 TPA Power Plant - 20 MW vide CFO order No. AW 327298 Dtd: 07.10.2021.

PART-B

Water and Raw Material Consumption

(i) **Water consumption: 15398.46 m³/day**

Domestic	121.82 m ³ / day
Manufacturing Process & cooling	13065.11 m ³ / day
Boiler Feed	2117.315 m ³ / day
Others (Gardening)	94.20 m ³ / day

Name of Products	Process Water Consumption per Unit of product Output (m ³ /TF)	
	During the previous financial year (2022-2023)	During the current financial year (2023-2024)
Viscose Staple Fibre	68.25	66.42

(ii) Raw Material Consumption

Name of raw materials	Name of products	Unit	Consumption of raw material per unit of output (Tons/TF)	
			During the current financial year (2022-2023)	During the current financial year (2023-2024)
Rayon Grade Pulp	Viscose Staple Fiber	T/TF	1.004	1.006
Caustic Soda		T/TF	0.478	0.457
Sulphuric Acid		T/TF	0.645	0.624
Carbon-di-sulphide		T/TF	0.160	0.158
Zinc		T/TF	0.00170	0.00157

PART-C



Pollution discharged to environment/unit of output

(Parameters specified in the consent issued)

a. Air

Sl. No.	Pollutants (Particulates Emission)	Unit	Limits Specified by KSPCB	Concentratio n of the pollutant in flue gas (stack emission)	Quantity of pollutants discharged (ton/day)	Percentage of variation from prescribed standards with reasons
1.	Chimney attached to Spinning Plant					Discharge level Maintained within prescribed standards
a	SPM	mg/Nm ³	150	25.14	0.175	
b	CS2	Kg/TF	95	92	21.32	
2	H2SO4 Plant					
a	SO2	Kg/TF	1.0	0.52	0.12	
b	Acid Mist	mg/Nm ³	50.0	26	0.0087	
3	Power Plant					
	CFBC Boiler					
a	SPM	mg/Nm ³	150	44	0.28	

b. Water

Sl. no.	Pollutants	Unit	Tolerance limit specified by KSPCB (Mass/Vol)	Concentrations of pollutants in mixed discharges (Mass/Vol)	Quantity of pollutants discharged (T/day) [Mass/day]	Percentage of variation from prescribed standards with reasons
1.	Colour & Odour	--	*			 All the parameters are maintained within the prescribed standards 
2.	Suspended Solids	mg/l	Max.100	51.14	1.49	
3.	Dissolved Solids (Inorganic)	"	Max.2100	1783.49	27.44	
4.	Temperature	Deg. C	***	30	-	
5.	pH	-	6.0 - 8.5	7.32	-	
6.	Oils & Grease	mg/l	Max. 10.0	1.69	0.049	
7.	Biochemical Oxygen Demand (3 days at 27 Deg.C)	"	Max.30.0	15.84	0.46	
8.	Chemical Oxygen Demand	"	Max.250.0	146.49	4.29	
9.	Mercury (as Hg)	"	Max. 0.01	ND	-	
10.	Total Chromium (as Cr)	"	Max.2.0	ND	-	
11.	Zinc (as Zn)	"	Less than 1.0	0.22	0.006	
12.	Sulphate (as SO ₄)	"	Max.1000	847.33	24.82	
13.	Sulphide (as S)	"	Max.2.0	1.60	0.046	
14.	Phenolic Compounds (as C ₆ H ₅ OH)	"	Max.1.0	ND	-	
15.	Bioassay - as per IS-6582: 1971	% survival	Not less than 90% of test animals shall survive in 96 hours	-	100%	
16.	Hexavalent Chromium (as Cr ⁺⁶)	"	Max.0.10	ND	-	
17.	Total Volume of mixed effluent	m ³ /d Max	49840	29303.12		

* All efforts should be made to remove colour & unpleasant odour as far as possible.

** All efforts are made to remove colour & odour at source as far as possible.

*** Shall not exceed 5°C above the receiving water temperature

ND- Not Detectable

Note: 1) Treated effluent recycled for industry activities is 2877.18 m³/day

PART-D
HAZARDOUS WASTES

(As specified under Hazardous & Other wastes/Management & Trans boundary movement Rules, 2016)

Hazardous Waste	Total Quantity (Kg)	
	During the current financial year (2022 - 2023)	During the current financial year (2023 - 2024)
(a) *From process		
Used Oil	2350	1660
Waste Residues containing oil	420	300
Process Acidic Residues Dusts Or Filter Cakes	68400	68300 60300 Kg was Burnt in Boiler as per the KSPCB Authorization condition. Quantity of 8 T is stored as stock at the premises
Spent Catalyst	Nil	931
Empty barrels/containers/liners contaminated with hazardous chemicals /wastes barrels/ containers/liners contaminated with hazardous chemicals/wastes	23450	23980
Spent ion exchange resin containing toxic metals	1900	2635
(b) *From Pollution Control facilities	--	--

The Hazardous waste generated during the fire incident at GRD is 19.94 MT of Burnt FRP waste and is disposed to TSDF for Landfill and 86.56 MT of Viscose Lumps to TSDF and after pre treatment in TSDF it has been transported to cement industry for Incineration as per the One time Authorization issued by KSPCB vide letter No. PCB/WMC/2804/HWM/2018/4413 Dtd: 18.11.2023.

PART-E
SOLID WASTE

Source		Total Quantity (Tons)	
		During the Previous financial Year 2022-23	During the Current financial Year 2023 - 2024
a) From Process	Fly Ash	34522	49187
	Bottom Ash	5568.0	11009.1
	Charcoal churi waste	1997.7	1471.8
	Tow Waste (Cellulosic Fibre)	354.6	245.5
b) From pollution control facility	ETP Sludge (Organic)	1505.46	1723.641
	Gypsum Sludge in ETP	782.3	1356.8

PART-F

Please specify the characterization (in terms of composition and quantum) of hazardous material as well as solid wastes and indicate disposal practice adopted for both the categories of waste.

1. Hazardous Wastes

Hazardous Waste	Composition	Method of disposal
From Process		
Used Oil	Lubricating oil	Provided designated area for collection and storage of waste oil and timely disposal to KSPCB authorized recycling unit i.e. M/s. Balaji Industries.
Waste Residues containing oil	Cotton waste contaminated with lubricating oil	Used in Boiler along with Coal as per the KSPCB Authorization.
Process Acidic Residues Dusts or Filter Cakes	Sulphur Hardmass is a Mixture of 90% carbon and 10% Sulphur	Used in Boiler along with Coal as per the KSPCB Authorization.
Spent Catalyst	Vanadium Pentoxide	Used in Boiler along with Coal as per the KSPCB Authorization.
Empty barrels/containers/liners contaminated with hazardous chemicals /wastes barrels/containers/liners contaminated with hazardous chemicals/wastes	Contaminated with oil, paint, chemicals	Disposed to KSPCB authorized unit i.e. Y.J. Rao Industries.
Spent ion exchange resin containing toxic metals	Methacrylic acid, sulfonated styrene, and divinylbenzene (DVB).	Used in Boiler along with Coal as per the KSPCB Authorization.
*From Pollution Control facilities	NIL	Nil

2.

SOLID WASTE

Source		Composition	Method of disposal
c) From Process	Fly Ash	Ash collected from ESP	Made available to Bricks & Cement Manufacturers
	Bottom Ash	Noncombustible residue	Made available to Bricks manufacturers
	Charcoal churi waste	Waste generated from Charcoal	Used as fuel in Boiler
	Piece Up/ Tow Waste	Alpha cellulose	Sold to low quality fiber Manufacturers
d) From pollution control facility	ETP Sludge (Organic)	Aerobic biomass and regenerated hemi cellulose with calorific value >2500 kcal/kg	Used as fuel in boilers after natural drying.
	Gypsum Sludge in ETP	Calcium Sulphate	Sold to Cement Block Manufacturers

PART-G

Impact of the pollution abatement measures taken up on conservation of natural resources and on the cost of production.

The Following Activity Completed in FY 2024.

- ✓ PA & ID Fans Airflow controlled by varying speed of fan by installing VFD resulting in Power reduction.
- ✓ Replacement of conventional light fittings with LED Light Fittings for Power saving.
- ✓ Higher Capacity Vacuum pump for Simplexes for Power saving.
- ✓ Installation of Resistance controller in furnace operation for Power saving .
- ✓ Replacement of Aluminium bus bars in Furnace 1 to 9 in 3 phase for Power saving.
- ✓ 20MW TG CEP pump shaft assembly modification by blinding one stage for CEP pump for Power saving.
- ✓ CEP pump one stage blinding for removed pump for Power saving.
- ✓ One stage of Spare CEP pump blinded to optimise the flow and head for Power saving.
- ✓ Around 2.5 Hectares of greenbelt area has been developed with more oxygen releasing plants only. (Common for both Harihar Polyfibers & Grasilene Division).
- ✓ Around 1200 No's of multispecies planted nearby KHB as instructed by EO, KSPCB, Davangere.

The Following Activity Completed and Sustained.

- ✓ Replacement of conventional fittings with LED fittings of quantity 203 No's
- ✓ High mast Lighting replacement with LED of quantity 60 No's
- ✓ Stopping old auxiliary pump by interconnecting existing system with new plant ACW line to reduce power consumption resulted in reduced coal consumption.
- ✓ Constructed coal storage shed to comply with the Coal handling guidelines.
- ✓ Installed H₂S and SO₂ detectors in Spinning, Recovery and CS₂ Departments and also installed CS₂ detectors in Viscose churn and Simplex
- ✓ Replaced Gland Packing of all Caustic pumps with Mechanical seal in Viscose Department to avoid the caustic leakages.
- ✓ 3 No's 30 HP Jet Aerator Installed in Biological Reactor to improve BR efficiency and also to reduce the COD & BOD load to the river discharge.
- ✓ Conduit pipe drain laid for discharging the treated Combined effluent from ETP to River to meet environment regulations.
- ✓ Replaced around 200 damaged diffuser membranes in BR# 3 to improve the performance of Biological reactor.
- ✓ Industry has taken fugitive smell reduction initiative by providing the shutters to both the production lines in Spinning dept.
- ✓ Industry has installed lime injection system for CFBC Boiler to reduce the SO_x emission into the atmosphere.

- ✓ Industry has installed advanced Wagon Tippler System in the coal yard for unloading coal from Railway Wagons to minimize fugitive emission during coal unloading from Wagon and it also eliminates human intervention for coal unloading.
- ✓ Around 2376 m³/day Grasilene effluent reusing for filter press cloth washing and for sprinkler at Coal yard to reduce fugitive emission. Hence, discharge of treated effluent load has been reduced.
- ✓ At Viscose Section, unit has adopted Centrifuge technology in place of Plate and Frame type filtration system thereby reducing around 400 m³/day effluent generation as well as water consumption.
- ✓ At ETP Section, all membranes of the # 3 Diffused aeration system were replaced with new membranes resulting in improved efficiency of Biological reactor.
- ✓ All high noise generating equipment's covered with Shed. As a result, noise level has been reduced in the unit.
- ✓ The industry has constructed new Water reservoir with built-up area 1,80,000 Sq.m to harvest and store the rain water and excess runoff water from Tungabhadra River during monsoon season, thereby facilitating groundwater recharge. (common for both Harihar Polyfibers and Grasilene division).

Online Monitoring Details:

- ✓ As per the directions of CPCB, the unit has installed online continuous monitoring system for Treated effluent, stack emission and Ambient Air. The details are as follows;

➤ For Treated Effluent:

Sl. No.	Location	Parameters	Analyzer Model	Make	Service Provider	Online connectivity
1	Mixed Treated Effluent sampling point	pH, BOD, COD, TSS and Temperature	CarboVis 70xIQ TS	WTW (A Xylem brand)	M/s. Nevco Engineering Ltd.	CPCB Server
		Flow (Grasilene Division)	VEGA64	VEGA		

➤ For Stack Emission:

Sl. No.	Online monitoring facility Attached to	Parameters	Analyzer Model	Make	Service Provider	Online connectivity
1	Spinning Stack	Flow	HFM-200	Teledyne	Environment -SA	CPCB Server
		H ₂ S & CS ₂	AF22M	Environment -SA	Environment -SA	
2	Sulphuric Acid Plant Stack	Flow	HFM-200	Teledyne	Environment -SA	
		SO ₂	AF22M	Environment -SA	Environment -SA	

3	Power Plant Stack	Flow	HFM-200	Teledyne	Environment -SA	
		SO _x , NO _x	MIR 9000	Environment -SA	Environment -SA	
		PM	SPM-380	PCME (envea)	Environment -SA	

➤ For AAQM:

Sl. No.	Location	Parameters	Analyzer Model	Make	Service Provider
1	Intake well	PM2.5 and PM10	MP101M	Environment-SA	Environment-SA
		CS ₂ , H ₂ S, SO ₂	AF22M		
		NO _x	AC32M		
2	ETP	PM2.5 and PM10	MP101M	Environment-SA	Environment-SA
		CS ₂ , H ₂ S, SO ₂	AF22M		
		NO _x	AC32M		
3	Guest House	PM2.5 and PM10	MP101M	Environment-SA	Environment-SA
		CS ₂ , H ₂ S, SO ₂	AF22M		
		NO _x	AC32M		

- The details of Environmental improvement Projects completed in the FY 2023-24 with Expenditure cost are as follows;

Sl No	Name of the Project and Its Impacts	Expenditure Cost Rs. (Lakhs)
1	PA & ID Fans Airflow controlled by varying speed of fan by installing VFD.	685.6
2	Replacement of conventional light fittings with LED Light Fittings	11.76
3	Higher Capacity Vacuum pump for Simplexes	27.81
4	Installation of Resistance controller in furnace operation	51.94
5	Replacement of Aluminium bus bars in Furnace 1 to 9 in 3 phase	13.7
6	20MW TG CEP pump shaft assembly modification by blinding one stage for CEP pump	7.5
7	CEP pump one stage blinding for removed pump	7.5
8	One stage of Spare CEP pump blinded to optimize the flow and head.	8
	Total Expenses	813.81

PART-H

Additional measures/investment proposal for environmental protection including abatement of pollution

Proposed projects for the financial year 2024-25

Proposed Project Name	Approx. Cost Rs. (Lakhs)
Shed for Sulphur Hard mass Sludge Storage	23.25 (Woks under progress)
Proper Storm Water Drain work with Concrete lining at Coal Yard area	59.49 (Woks under progress)
Upgradation of diffused aeration system in Biological Reactor No 1 and Polishing Pond aeration	73.3
Coal plant dust suppression system	16.78
Two boiler feed water pumps ARC replacement	12.1
Installation of energy Efficient of New Soft Water pump 1	8.69
Installation Mix charge lye cooling Chillers in Viscose 1 No Phase I	129.03
installations of VFD s for Wal seal Blower Motors of CFBC 2 boiler	34.04
Replacement of old transformers of CS2 Furnace	70.84
Installation of VFDs for Wall seal blower motors of CFBC-1 Boiler Phase 2	26.28
Replacement of Aluminium busbars in Furnace 1 to 9 (in 3 phase) Phase 2	14.88
Temp. Control thro' VFD for CD plant cooling tower Fan	5.49
Total	474.17

Strategies & techniques applied for continuous monitoring of environment and feedback mechanism for correcting/ preventing any run-away operations for achieving stable operations.

1. Alternative power supply is provided to Effluent Treatment Plant (ETP) so that in case of failure of one supplies the stand by resumes automatically for the ETP. A similar arrangement is provided for air pollution control equipment's.
2. Sensitive effluent streams are monitored round the clock at influent stage itself by providing simple visual monitoring aids for easy and quick qualitative monitoring for taking timely corrective action.
3. Stand by arrangements have been provided for all critical air and water pollution control equipment's.
4. All equipment's critical to environment are identified & subjected to preventive maintenance and condition-based monitoring as per a pre-drawn schedule to prevent unforeseen stoppages.

5. All process operating personnel have been trained to notice and inform any untoward incident that could lead to 'out of control' situation, to the operatives at the ETP so that the relevant stream can be diverted to a 'guard pond' which has a capacity to hold a day's effluents.
6. All input chemicals and raw materials are carefully and closely monitored daily against preset norms per unit weight of product so that all inefficient practices that would result in emission to air or discharge to environment is eliminated.
7. Operation cost of the ETP and Air Pollution control measures per day is as follows;

Grasilene Division ETP Operation Cost

Sl. No.	Particulars	Unit cost (INR/Kg)	Daily consumption	Total Cost in Rs.
1	Chemicals			
a	Hydrated Lime	8	9000	72000
b	Urea	55	200	11000
c	DAP	113	200	22600
d	Deformer	126	15	1260
e	PAC (Powder)	25	300	7500
f	Cation poly 419	365	25	9125
				123485
2	Power Requirement			
a	Electricity	7	7900	55300
3	Service & Repair			
a	Accessories plate and frame clothes (yearly 4 sets considered 2+2)		600	600
b	Belt presses top and bottom wire (one set replacement for every 2 years)		450	450
c	Capex		18000	18000
d	Spares and Repairs		8700	8700
4	Salary & Wages			
a	Organic & Inorganic sludge handling cost (for trips)		8	3040
b	Lime preparation		4	2825
c	Other cleanings like sump zone clarifier flash mixer (Yearly 80,000/)		220	220
d	Maintenance workmen		2	2000
e	Staff and workmen salary		18	23000
f	Contract workmen for ETP		1520	1520
5	AMC charges for online stack & AAQMS maintenance			3561.6
6	Electricity consumption for ESP installed at Power Plant	7	996	6972
TOTAL				249673

PART-I

Any other particular for improving the quality of the environment

- ✓ The unit has aligned itself with Environmental Management Systems ISO 14001:2015 and Occupational Health and Safety Management System in accordance with ISO 45001:2018.
- ✓ The unit is continuously adopting cleaner technologies as an ongoing exercise with several projects under formulation and implementation to further enhance its environmental performance by avoiding human errors, improving work environment & controlling pollution at source.
- ✓ Staff and workmen are exposed environmental awareness training by in-house faculty and external agencies.
- ✓ All activities in the unit, which have an interaction with the environment, have been identified. Aspects and impacts related to these activities are listed out. Based on this data environmental objectives and targets have been set against the significant environmental impacts. Aspects and impacts are being reviewed & updated periodically.
- ✓ As a step towards afforestation, green coverage is extended to degraded lands with free distribution of seedlings and post plantation services to ensure maximum survival rate. Following plantation activities have been taken up under 'Operation Green' campaign. This activity will be a continuous exercise to improve the greenery in and around the industry:
 - Industry has already developed 245 acres of own land (by considering total plant area includes HPF and Grasilene) under "Operation Green Project" planting around 340000 Nos. of different tree species. (Around 4000 plantation done in FY 24).
- ✓ Various varieties of birds and flower species in & around factory premises are found due to availability of greenery in the premises and they were protected by industry. Lots of peacocks are found in the premises and special care is taken to protect them.

Awards

- Unit has own “Platinum Award” under Apex India Green Leaf Awards 2023 for Sustainability category in Textile Sector
- Grasilene Division won “Gold medal in National Awards for Manufacturing Competitiveness (NAMC)” from International Research Institute for Manufacturing, India on 21st April 2023
- Unit has own Silver 3 star trophy in WSO OHSE award for CY2023
- Unit has own the Gold award in CSR from Grow Care India, Delhi in 2022
- Grasim Industries Limited, Harihar won the “Golden Peacock Gold Award “ in the category of Occupational Health & Safety, Aug,2022.
- Unit has own the Platinum Award for Occupational Health and Safety by Grow Care India, Delhi in 2021.
- Unit has emerged as one of the Top Performers at the National Level getting an award of three leaves in the Green Rating Award by Centre, New Delhi for Science and Environment. Also the unit is recognized with a special award for the best performance in fiber sourcing for striving towards raw material self-sufficiency by promoting farm and social forestry Certificate.
- Unit’s achievements of attaining the global distinction of high chemical recovery efficiency was appreciated and the technical paper presented in this regard during IPPTA Seminal was adjusted as the best and awarded the first prize.
- Unit was awarded 2nd prize amongst large industries in the State of Karnataka for Safety from Dept. of Factories & Boilers.
- Technical paper titled “Two stage oxygen for Bleaching Dissolving Grade Pulp” presented during IPPTA Seminar was adjusted as one of the best Technical paper.
- Unit has awarded 4 star ratings for the Commitment to EHS practices in the CII-SR ESH Excellence awards in 2018.
- Unit has own “Golden Peacock Award” for Environmental management by Institute of Directors and world Environmental Foundation, New Delhi in 2018.

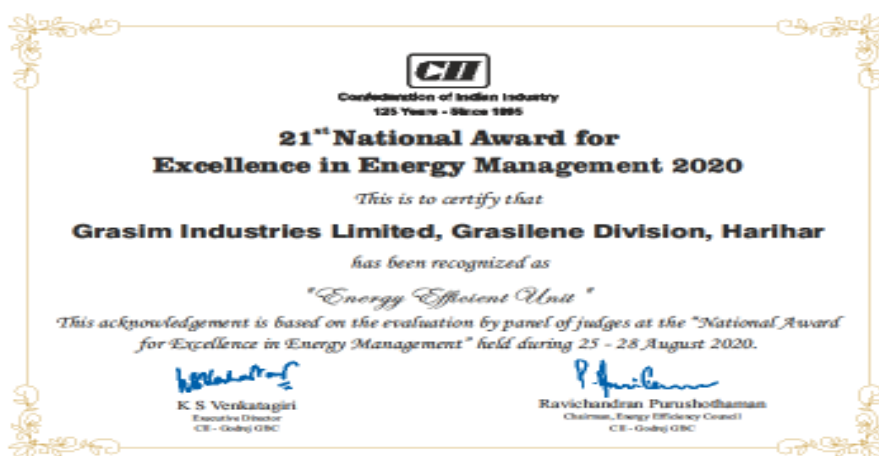


- Unit was awarded 1st prize for installation of “Color Removal Plant” in Project Recognition Program conducted by “Frost and Sullivan” at Mumbai in 2019.

- Unit has own the CII-ITC Sustainability award -2019 for “Excellence in Environment Management”.



- Unit has own “Best Skill Development Award-2020” from Bangalore chamber of Industry & Commerce.
- Unit has own National Award for Energy Efficient unit from CII in 2020.



Unit has own Golden Peacock Gold Award “ in the category of Occupational Health & Safety, on Aug,2022.



