



Nutan Maharashtra Vidya Prasarak Mandal's
**NUTAN MAHARASHTRA INSTITUTE
OF ENGINEERING AND TECHNOLOGY**



Under Administrative Support - Pimpri Chinchwad Education Trust

Approved by AICTE

Accredited by NAAC

Affiliated to SPPU

"Samarth Vidya Sankul", Vishnupuri, Telegaon Dabhade, Taluka Maval, District Pune - 410507

Tel. No. 02114 - 231666,777,888 E-mail : nmiettalegaon@gmail.com

Web : www.nmiet.edu.in

To,
The Manager,
Shri Sant Tukaram Sahakari Sakhar Karkhana Ltd.,
Survey No 149, Mulshi, Pune - 412108.

Date: 02/05/2023

Subject- Industrial Visit to Shri Sant Tukaram Sahakari Sakhar Karkhana Ltd., under subject "Energy Engg." of BE Mechanical Engineering.

Respected Sir,

Nutan Maharashtra Institute of Engg. & Technology (NMIET) was established in 2008 by Nutan Maharashtra Vidya Prasarak Mandal. NMVPM is a highly respected education society in Maharashtra and is credited with starting **First National Education Schools** in the Maval region of Pune district over 107 years back. The great freedom fighter **Lokmanya Bal Gangadhar Tilak** was the founder member of the Trust and was the first Chairman of Governing Body for almost 12 years. The late Hon. Vishnu G. Vijapurkar was the first Secretary of "Samarth Vidyalaya". The eco-friendly educational complex is spread on 42 acres of beautiful land situated close to Pune Mumbai Highway. During the last decade, over 10000 students have received quality technical education in the Maval region.

NMIET, Pune is an approved technical institute by AICTE, New Delhi, DTE, Mumbai and affiliated with University of Pune offering degree course in **Mechanical Engg., Computer Engg., Information Technology and Electronics & Telecommunication**. We have Research and Patents Club; 2 patents are registered. Our students have participated in various National and International paper presentation. We are member of Maharashtra Chambers of Commerce and Indo-German Chambers of Commerce and MOU with MelTek Info systems, Technocorp Solution Private limited, AMCAT, Dexler, Monster, SCOPE and many more companies. Ours is an authorized training center of SIEMENS for CAD/CAM/CAE software solution and Dexler for SAP, Renowned personalities visited to our campus and appreciated for top class infrastructure and academic culture.

As per the syllabus of SPPU, Fourth Year **Mechanical Engineering** students have Energy Engg. subject. To understand this subject better, we propose you to give an Industrial Visit on this subject to BE students, accompanied by 2 staff members. We kindly request you for this to give us a date preferably on 17-05-2023.

Thanking you.

HOD- Mechanical Engg.

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Telegaon Dabhade, Pune - 410 507





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Nutan Maharashtra Inst. of Engg. &
Tech.

RecordNo.:ACDM/R/071

Revision:00

Date:15/06/2016

Notice

Date: 15/05/2023.

All the students of BE Mechanical are hereby informed that **Industrial Visit** is scheduled on 17-05-2023 at Shri Sant Tukaram Sahakari Sakhar Karkhana Ltd., Survey No 149, Mulshi, Pune - 412108.

- Attendance is compulsory.
- Adhere to dress code.
- I-card and shoes are compulsory.

HOD

Mechanical Department

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Date: 17-05-2023

To,
The Manager,
Shri Sant Tukaram Sahakari Sakhar Karkhana Ltd.,
Survey No 149, Mulshi, Pune - 412108.

**Subject- "Expressing Gratitude for an Insightful Company Visit to Shri Sant Tukaram
Sahakari Sakhar Karkhana Ltd.,**

Respected Sir / Madam,

I hope this letter finds you well. I wanted to express my sincere gratitude for the opportunity to visit your company on 17-05-2023. The experience was incredibly insightful and educational, and it has left a lasting impression on a student interested in Mechanical Industry.

We are truly impressed by the warm welcome received from your team. From the moment we arrived, it was clear that your company values its visitors and is committed to providing an enriching experience.

Once again, thank you for your generosity and hospitality on behalf of Mechanical Department of NMIET, I am truly grateful for the opportunity to have visited your company, and I look forward to staying connected with Company in the future.

Sincerely,

**HOD
Mechanical Engg.**

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Talegaon Dabhade, Pune - 410 507



A REPORT ON INDUSTRIAL VISIT

Place of visit: Sant Tukaram Sugar Factory, Kasarsai, Pune

Date: 17th May, 2023.

A batch of 8th semester students of Department of Mechanical Engineering along with faculty Prof. D. R. Jadhav and Prof. P. B. Mali visited Sant Tukaram Sugar Factory in Kasarsai, Pune.

Overview of the sugarcane industry:

After Brazil, India is the largest sugar producer globally, and it leads in sugarcane production. The Food and Agriculture Organization of the United Nations states that 124 countries produce sugar. In all, approximately Rs. 1,250 crores are invested in this industry, and it also provides a livelihood for close to 2.86 lakh workers and supports 50 million farmers and their families, offering direct employment to 0.6 million skilled and semi-skilled persons.

The industry also benefits the nearly 2.5 crore people who grow sugarcane in India. In India, the primary sugar-producing states are Maharashtra, Gujarat, Uttar Pradesh, Haryana, Tamil Nadu, Punjab, Karnataka, Bihar and Andhra Pradesh. The Sant Tukaram Sugar Factory, Kasarsai, Pune is also one of them.



The capacity of the visited plant is illustrated in the following table:

Sr. No	Details	Quantity
1	Sugarcane	4,98,385 MT
2	The actual sugar	57,055 MT
3	Net production (%)	11.45 %

The guide present along with us in the visit from the sugar industry told us the detailed working of the industry.

He started with explaining the various constituents present in the sugarcane. The sugarcane contains the 70 % of the water, and rest 30% comprises of the actual sugar, the fibers etc.

The working of the plant:

Then the cycle of the process was explained. The making of sugar consists of the following processes.

- Extracting juice by pressing sugarcane.
- Boiling the juice to obtain crystals.
- Creating raw sugar by spinning crystals in extractors.
- Taking raw sugar to a refinery for the process of filtering and washing to discard remaining non-sugar elements and hues.
- Crystallizing and drying sugar.
- Packaging the ready sugar.

The sugarcane is loaded on the feeder machines which are having the long conveyors to transport the sugarcane. The feeder machines are in series with the rollers/ millers which are used to crush the sugarcane. A series of five mills compresses the sugar cane fibers and separates the juice from the bagasse, which can be used later as a fuel source.

The crushing and extraction in actual finishes at the third miller only. But to obtain the good and dry bagasse the other two rollers are also attached. The sugarcane juice is collected from the third miller with the separate arrangement.

Next the purification of the extracted sugarcane juice comes in. The purification is done with the help of the Sulphur dioxide vapors. The purification process typically takes several hours. At the end, the sludge is removed from the bottom of the tank and the juice is removed from the top. Secondary filtration is used to extract any remaining sugar from the sludge. This produces a material called mud, which can be used later to fertilize fields.

The clarified juice is then boiled in a series of vacuum evaporators until it reaches a concentration of maximum sugar. During the next step in the manufacturing process, a single-stage vacuum pan is used to evaporate the syrup until it is saturated with sugar crystals. As the mixture is boiled in a vacuum pan, water evaporates and sugar crystals continue to grow into a paste called massecuite, a dense mixture of syrup and sugar crystals. This mixture is then transferred into a large container called a crystallizer, where the massecuite is slowly stirred and cooled, continuing the crystallization process. The powder is then added to the sugarcane juice which crystallizes it rapidly.

To separate the massecuite into sugar crystals and molasses, the massecuite is added to a high-speed centrifuge. During centrifugation, the molasses passes out of the lined centrifuge basket and is drawn to the outside of the centrifuge where it is removed and sent to storage tanks. The sugar is retained in the lined centrifuge basket. The molasses is used to produce the ethanol. Thus it also helps to serve the purpose of making the country energy secured.

The damp sugar crystals are dried in large, hot air dryers. The sugar dried is segregated in accordance with its size and are stored in the silos. The silos are having the automated arrangement to fill the sugar bags of 50kg and also sealing of those bags. Thus the process gets completed here.

The eco-friendly model of the industry:

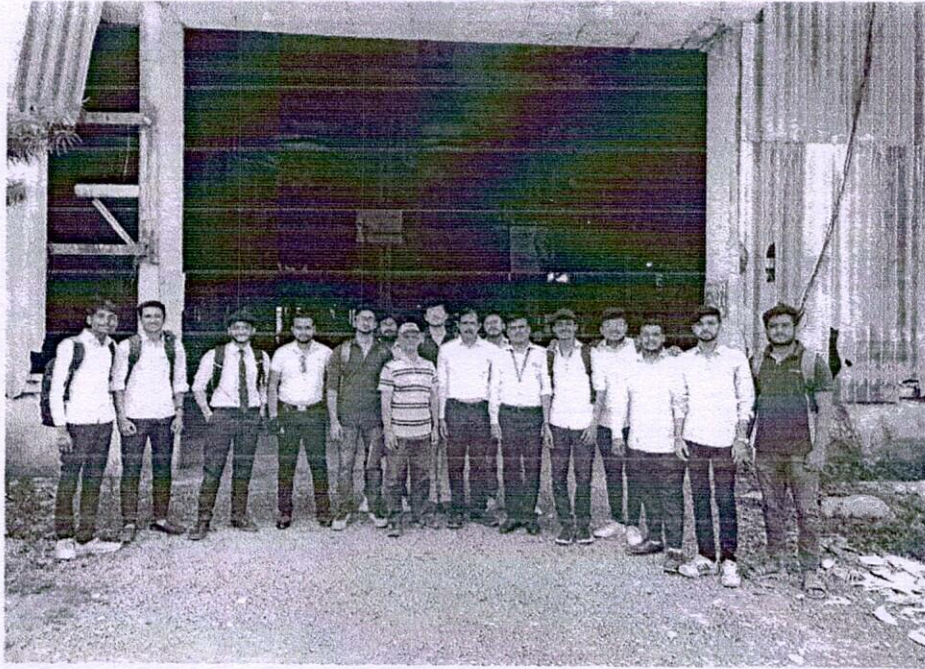
This plant is totally a self-powered one. It uses the steam to rotate the turbines which rotates the millers. This steam is produced using the bagasse obtained in the sugar making process. The alternator is also located in the plant which produces the electricity. The total of 15MW electricity is produced. The sugar factory only consumes the 4MW power. The rest 11MW power is sold to the electricity board. Then it also produces the highly fertile mud during the purification process which are again given to the farmers for fertilizing the land. Also, as stated earlier, the ethanol production is also done with the help of the molasse.



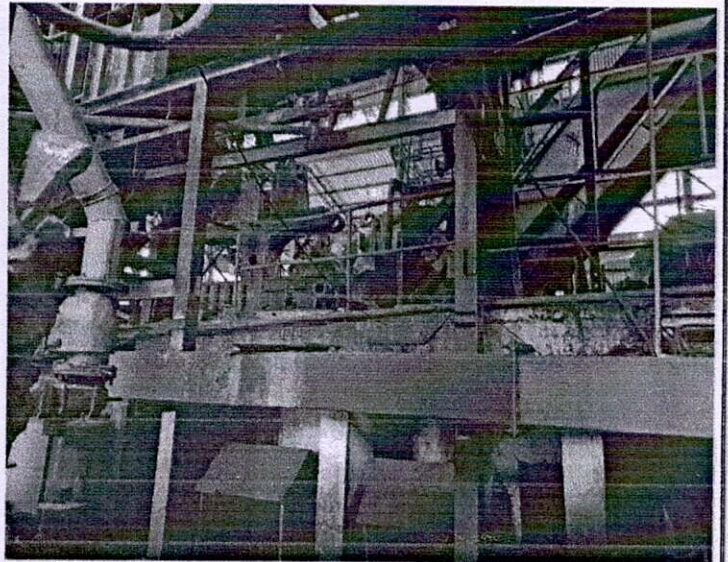
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The feeder device



The miller machine

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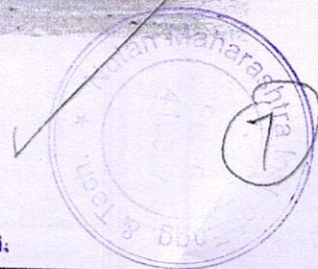




Crystallization tank



Boiler setup



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