VISHWAKARMA INSTITUTES VI

Bansilal Ramnath Agarwal Charitable Trust's
Vishwakarma Institute of Technology, Pune

Department of CSE(AI&ML)

Report on STTP/FDP/Workshop/Seminar/Guest Lectures/Industry Visit Organized

"Report on Industry Visit to Bekaert for Project Discussion"

Date: 24/03/2026

Industry Details: Atlas Copco Date: 24/03/2026, Tuesday

Time: 11 am to 3 pm

Location: Bekaert Eco Solutions Pvt Ltd.

Institution: Vishwakarma Institute of Technology (VIT), Pune

Department: Computer Science and Engineering – AI&ML

Purpose: SMA-Project Briefing Meeting

Industry Mentor: Ganesh Shinde, Ganesh.Shinde@bekaert.com

VIT Mentor: Dr. Jyoti Kanjalkar, CSE(AI&ML)

Students Involved:

Indrajeet Badhel, SY CSE(AI&ML) - C

Ishan Gupta, SY CSE(AI&ML) - C

Tanishq Jadhav, SY CSE(AI&ML) - C

Sidra Jahangir, SY CSE(AI&ML) - C

Jayshree Toshniwal, SY CSE(AI&ML) - C

Objectives of the Industry Visit

- To study the **wire manufacturing process used in the cement industry**, including raw material handling, drawing, coating, and finishing operations.
- To understand and identify **different types of surface defects in wires**, such as cracks, corrosion, irregular coating, and dimensional inconsistencies.

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- To explore the **feasibility of an automated, real-time defect detection system** using modern technologies like computer vision and AI.
- To gain exposure to **real-time industrial operations and working environments** at Bekaert.
- To understand the **tools, machinery, and technologies** used in wire manufacturing and automation processes.
- To bridge the gap between **theoretical knowledge and practical industrial applications.**
- To interact with industry professionals and **facilitate technical discussions related to the project**.

During the visit, which took place on Tuesday, March 24, 2026, at Bekaert, students had the chance to speak with professionals in the field and learn important details about wire manufacturing procedures and actual industrial operations. Understanding the production of wires used in the cement industry and helping students refine their project ideas to meet industry standards and practical viability were the main goals of the session.

Experts from Bekaert discussed a variety of technical aspects of wire production during the visit, such as surface treatment, drawing procedures, and quality control techniques. They also discussed the difficulties in effectively identifying common surface flaws in wires, such as corrosion, cracks, and irregularities in the coating.

PHOTOS OF THE VISIT

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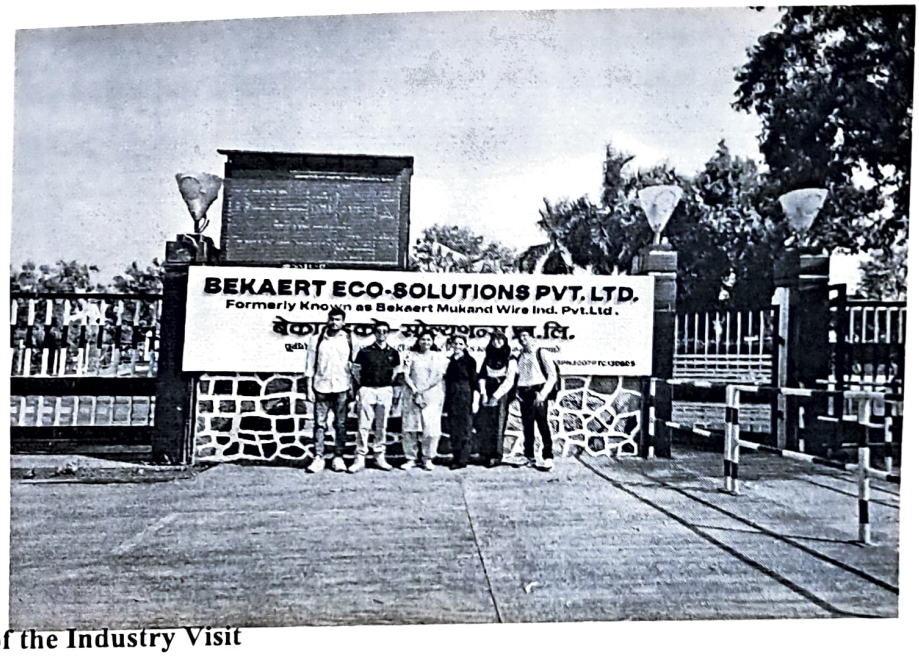

Outcomes of the Industry Visit

1. Students gained practical insights into **wire manufacturing processes** used in the cement industry, including production flow and quality control stages.
2. Enhanced understanding of **surface defects in wires**, such as cracks, corrosion, and coating irregularities, along with their impact on product quality.
3. Project ideas were refined based on **expert guidance**, focusing on the feasibility of an automated, real-time defect detection system.
4. Students understood **real-time industrial challenges** in defect detection and quality assurance within manufacturing environments.
5. Increased awareness of **advanced machinery, inspection techniques, and automation technologies** used in wire production.
6. Developed clarity on **project feasibility, scalability, and implementation challenges**, especially in integrating AI/vision-based systems in industry.
7. Improved ability to **connect theoretical concepts with practical applications** in manufacturing and automation.
8. Gained exposure to **industry-level problem-solving approaches** and best practices followed by Bekaert.
9. Strengthened **technical communication, professional interaction, and networking skills** with industry experts.

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POs Attained:

PO1 – Engineering Knowledge:
Students gained a fundamental understanding of wire manufacturing processes, material behavior, and quality control techniques used in the cement industry.

PO2 – Problem Analysis:
Exposure to real-world challenges in detecting surface defects enabled students to analyze complex manufacturing problems and explore efficient solutions.

PO4 – Conduct Investigations:
Understanding defect types and inspection methods provided insight into industrial investigation techniques, testing procedures, and defect analysis.

PO5 – Modern Tool Usage:
Students were introduced to modern inspection systems, automation technologies, and the potential use of AI/computer vision for real-time defect detection.

PO7 – Environment and Sustainability:
Learning about quality control and defect reduction highlighted the importance of minimizing material waste and improving sustainable manufacturing practices.

PO12 – Lifelong Learning:
The visit encouraged curiosity and motivated students to explore advanced technologies in automation, manufacturing, and intelligent inspection systems.

PSOs Attained:

PSO1 – Apply Computing Techniques:
Students were able to relate classroom concepts to real-world applications by exploring the use of computer vision, image processing, and automation systems for defect detection in wire manufacturing.

PSO2 – Design and Evaluate Solutions:
Exposure to industrial challenges enabled students to understand the design, feasibility, and evaluation of an automated real-time defect detection system, considering accuracy, speed, and reliability.

PSO3 – Explore AI Applications:
The interaction highlighted the potential use of AI and machine learning in identifying surface defects, thereby enhancing students' interest in intelligent manufacturing and smart inspection systems.

Faculty Mentor:

Dr. Jyoti P. Kanjalkar

Submitted

Prof. Dr. Premanand Ghadekar,

Head, Department of CSE(AIML)

Head, Department of Computer Science & Engineering
(Artificial Intelligence & Machine Learning)
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Dept of CSE AI & ML

Minutes of Meeting (MOM)
Date: 24-03-2026
Industry Project: Ganesh Shinde
Project Mentor: Dr. Jyoti Kanjalkar
Industry Visit: Bekaert, Lonand
Project Title: *Portable Device for Wire Surface Scanning and Defect Detection*

Discussion Points

1. The core methodology of the project was discussed in detail, focusing on the approa wire surface scanning and defect detection. Emphasis was placed on capturing resolution images and applying analysis techniques for identifying surface defects su cracks and irregularities.
2. The key hardware and software technologies required for the project implementation identified and finalized. The selected components include:
    - Raspberry Pi 5 (16 GB RAM) for processing
    - Camera module with interchangeable lens
    - Microscopic lens (up to 100× magnification) for precise crack detection
    - Gyroscope sensor for maintaining orientation and stability
    - Touchscreen interface for user interaction
3. A visit to the production line was conducted to understand the real-world wo environment. This helped in determining the appropriate placement and deploy strategy for the proposed system within the industrial setup.
4. The overall project workflow was finalized, covering all stages from data acquisiti defect detection and analysis. The workflow ensures systematic image capture, proce and result interpretation.
5. Camera and lens requirements were critically analyzed. It was observed that the ci system supports only 15–25× magnification, which is insufficient for detecting micro defects. Therefore:
    - A higher magnification lens (up to 100×) is required
    - An auto-focus lens is necessary for adaptability
    - The system must support varying wire diameters ranging from approximately to 1.5 mm
6. The design approach of the system was revised:
    - **Initial Concept:** Handheld device
    - **Final Decision:** Stand-based system

    Reason for Change:

    Improved stability during operation

    - Consistent and high-quality image capture
    - Reduced dependency on operator handling
    - Enhanced accuracy and repeatability
7. Tentative timelines and approximate submission dates were discussed to ensure p project planning and timely completion.