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REDEFINING RESOURCES

CASE STUDY
Industrial EHS

SWAT Lab Empowering the Craft Industry with Oizom's Pollusense in Nepal

INTRODUCTION: Craft Industrial Monitoring in Nepal with the SWAT Lab

Soil Water and Air Testing Laboratory Pvt. Ltd. (SWAT Lab) is an environmental testing and consultancy service provider in Nepal. It has been instrumental in helping both public and private sector organizations to achieve their environmental compliance and sustainability goals. As part of its commitment to sustainable development, SWAT partnered with Oizom to deliver a smart air quality monitoring solution for a traditional yet growing craft industry in Nepal.

This industry, deeply involved in processing wool imported from New Zealand, carries out a range of activities such as wool cleaning & scouring, drying & combing, spinning & weaving, dyeing, and packaging, all of which can contribute to varying levels of particulate and gaseous emissions. Recognizing the environmental and health challenges, they sought a compact, portable, and real-time monitoring system that could traverse all processing stages and deliver actionable insights.

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THE CHALLENGE: Ensuring Clean Air in a Multi-Step Wool Processing Setup

Operating across various departments within the wool processing lifecycle, the craft industry faced significant environmental and operational challenges:

1. **High Dust Emissions:** Wool cleaning and scouring activities generated fine dust particles (PM_1, $PM_{2.5}$, PM_{10}, PM_{100}), posing health risks and affecting product quality.
2. **Gaseous Pollutants:** Processes like dyeing and drying emit SO_2, NO_2, and CO, requiring close tracking to ensure worker safety.
3. **Fluctuating Weather Conditions:** Parameters such as temperature, humidity, and pressure directly impact wool fiber behavior during spinning and drying, necessitating tight control.
4. **Inadequate Fixed Monitoring:** A fixed monitoring solution wouldn't suffice due to the shifting nature of operations, from cleaning to packaging.
5. **High cost of multiple fixed monitors:** Installing multiple systems across various departments makes it financially unfeasible for the craft-based setup.
6. **Lack of Real-Time Insights:** Timely data was essential to take preventive actions and comply with local environmental norms.

The client needed a portable, scalable, and high-frequency monitoring system to effectively track pollution levels across multiple processing zones, something fixed monitoring systems couldn't achieve.

THE SOLUTION: Pollusense, A Smart Portable Monitor

The industry selected Pollusense as their go-to solution due to its portability, real-time multi-parameter monitoring, and built-in display for instant decision-making.

INSTALLATION DETAILS

1 UNIT
of
POLLUSENSE

Key Features of Pollusense:

1. **Multi-parameter monitoring:** Pollusense is equipped with high-precision sensors capable of detecting a wide spectrum of particulate matter (PM1, PM2.5, PM10, PM100), toxic gases (SO_2, NO_2, CO), as well as critical metrological parameters like temperature, humidity, and pressure.
2. **Real-Time Monitoring:** With a high-frequency data transmission rate, Pollusense sends air quality updates every 5 minutes. This allows instant detection of pollutant spikes during high-emission processes and proactive response from operators to improve ventilation.
3. **Portability:** The compact and easy-to-carry design of Pollusense enables easy relocation across different

processing departments without technical support and provides short-term and long-term deployment flexibility.

4. **Built-In Digital Display:** Pollusense features an intuitive, real-time digital display that shows current air quality metrics right on the device. This empowers field operators and plant supervisors to get quick updates without needing external systems.
5. **Data Integration:** Oizom's cloud-based data platform, Envizom, provides centralized access to real-time and historical data. Through intuitive dashboards and automated reporting, the industry can effortlessly visualize, analyze, and export data.
6. **Low-Concentration Monitoring:** Pollusense monitor with high-precision sensors capable of detecting pollutants even at low concentration levels, which is crucial for monitoring background air quality during low-activity periods or in departments with minimal emissions (e.g., spinning or weaving).

It was strategically moved across various units, wool cleaning, drying & combing, spinning & weaving, dyeing, and packaging, to capture complete air quality dynamics.

THE TRANSFORMATION: Actionable Data Leads to Cleaner, Safer Workspaces

Post-installation, the industry saw measurable improvements in both environmental and operational metrics:

1. **Real-Time Process Control:** Using Pollusense and Envizom, operators now receive real-time data every 5 minutes, enabling them to track dust levels and pollutant concentrations during each processing phase and respond immediately.
2. **Identification of Pollution Hotspots:** Pollusense helped identify specific activities and processes that triggered emission spikes. Leveraging these insights, the management implemented targeted interventions to reduce emissions and enhance overall air quality effectively.
3. **Safer Working Conditions:** With continuous monitoring of PM and gas levels, the industry proactively ensured pollutant levels stayed within safe limits, significantly reducing health risks for workers.
4. **Optimized Processing Efficiency:** Monitoring temperature and humidity helped maintain ideal conditions for wool drying and spinning, leading to better product consistency and reduced material waste.
5. **Data-Driven Pollution Actions:** Real-time insights enabled the industry to accurately identify high-emission processes and specific activities responsible for elevated pollutant levels.

With real-time insights from Pollusense, the industry could pinpoint pollution hotspots across different departments. This enabled data-backed decisions such as adjusting workflows, enhancing ventilation, and deploying pollution control measures, transforming reactive responses into proactive air quality management.

BROADER IMPACT: Data-Driven Compliance and Industry Influence

The integration of Pollusense and Envizom not only helped this craft industry meet compliance requirements but also catalyzed a broader environmental shift:

1. **Compliance & Reporting:** The industry can now generate data-driven compliance reports for local regulatory bodies, minimizing the risk of non-compliance penalties.
2. **Data-Driven Decision Making:** Leveraging Envizom's centralized dashboard, the management can compare air quality across different processes and timeframes, making long-term environmental planning a core part of their operations.

Most importantly, the selection of Pollusense for multiple site monitoring has allowed this industry to maintain air quality standards across departments, encouraging others in the sector to adopt continuous air quality monitoring as a key enabler for efficiency, compliance, and sustainability.

CONCLUSION: Enabling Clean Air and Sustainable Craftsmanship

By partnering with Oizom's Pollusense, SWAT Lab has turned environmental challenges into actionable insights. From minimizing worker exposure to pollutants to optimizing process efficiency, Pollusense has become more than just a device; it's a decision-making tool backed by real-time intelligence.

With portability, precision, and platform integration (Envizom), Oizom has once again empowered industries to operate responsibly while maximizing operational excellence.

Oizom is a company specializing in environmental monitoring solutions. They offer products to monitor air quality, weather conditions, and other environmental factors. Utilizing advanced sensor technology and data analytics, Oizom aims to provide actionable insights for construction, industrial compliance, and community awareness. Their solutions can be applied in various sectors including government, industries, and community initiatives.