

# **Industrial Hygiene Case Study: Chemical Assessment at Cosmetic Manufacturer**

## **Objective:**

To evaluate, assess, sample, analyze, and report on the health and safety risks associated with the chemicals used in the manufacturing of cosmetics across three buildings, focusing on those chemicals with a health rating of 3 or greater. This comprehensive evaluation involved research, interviews, and both qualitative and quantitative assessments to identify potential exposures in various job classifications and processes.

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## **Scope of Service:**

KES was contracted by a leading cosmetic manufacturer to evaluate the potential chemical exposure risks in their production facilities. The goal of the project was to assess and manage the use of chemicals with a health rating of 3 or higher, as classified by the company's proprietary chemical health assessment system. KES was tasked with conducting an in-depth evaluation of 250 chemicals used across three manufacturing buildings, determining the risk of exposure to employees, and ensuring compliance with occupational health and safety regulations.

## **Key Services Provided:**

### **1. Chemical Health Risk Assessment:**

- KES implemented a corporate proprietary assessment system to evaluate 250 chemicals with a health rating of 3 or greater. This system provided a framework for identifying hazardous chemicals based on toxicity, exposure levels, and the potential for adverse health effects on workers.
- KES conducted a thorough review of safety data sheets (SDS) for all chemicals in use, ensuring that the most hazardous chemicals were identified and prioritized for further evaluation.

### **2. Research and Interviews:**

- KES conducted research on each chemical to gather information on its toxicity, routes of exposure, and potential health effects. This research included reviewing literature, regulatory databases, and consultation with industry experts.
- Interviews with plant employees, supervisors, and safety officers were conducted to understand the processes involved, potential chemical exposure scenarios, and existing control measures. These interviews helped identify job classifications and tasks that may require additional focus during the exposure assessment.

### **3. Exposure Assessment – Qualitative and Quantitative:**

- KES implemented a combination of qualitative and quantitative methods to assess the potential chemical exposure levels in various manufacturing processes.
- Qualitative assessments included walk-through surveys and employee interviews to identify potential sources of exposure, as well as the types of PPE and engineering controls currently in use.
- Quantitative assessments involved the collection of air and surface samples from work areas where high-risk chemicals were used. Personal air sampling was conducted for employees working in areas with the highest risk, including mixing, packaging, and formulation areas.

### **4. Job Classification and Process Sampling:**

- KES worked with plant managers and safety teams to identify specific job classifications and processes where chemical exposure risks were most likely. These included tasks such as mixing, handling, and packaging of cosmetic products containing hazardous chemicals.
- Sampling efforts focused on the highest-risk processes, where employees were directly exposed to chemicals with a health rating of 3 or greater.

### **5. Analysis of Results:**

- Samples collected during the exposure assessments were analyzed for chemical concentrations, comparing results to regulatory standards such as OSHA's permissible exposure limits (PELs) and other relevant guidelines.
- KES provided a detailed analysis of the results, identifying areas of concern where chemical exposure exceeded safe limits and recommending appropriate corrective actions.

### **6. Reporting and Communication:**

- KES compiled the results into detailed reports, which included an assessment of the exposure risks, recommendations for mitigation measures, and compliance with applicable occupational health standards.
- Individual reports were provided to safety management, department heads, and employees, highlighting areas of concern and specific recommendations for improving workplace safety.
- KES also provided a database of sampling records to maintain ongoing monitoring and support future health and safety programs.

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## **Project Activities and Response Efforts:**

## **1. Initial Planning and Chemical Inventory Review:**

- KES began the project by reviewing the company's chemical inventory and categorizing chemicals based on their health hazard ratings. This step helped prioritize the chemicals that required immediate attention.
- A comprehensive list of 250 chemicals with a health rating of 3 or greater was identified, including substances such as solvents, preservatives, fragrances, and active ingredients used in cosmetic formulations.

## **2. Walkthrough Surveys and Identification of High-Risk Processes:**

- KES conducted in-depth walkthrough surveys of the three manufacturing buildings to assess the processes where chemical exposures were most likely. Areas such as mixing, heating, and aerosolizing substances were identified as high-risk areas.
- Job classifications with potential exposure to these chemicals, such as formulation operators, lab technicians, and packaging staff, were also identified for further sampling and assessment.

## **3. Sampling and Exposure Monitoring:**

- KES set up sampling stations in high-exposure areas to collect air samples, which were analyzed to determine the concentration of chemicals in the air. Personal air samples were taken for employees working in the most hazardous areas.
- Surface wipe samples were also collected to assess contamination levels in work areas, especially where chemicals were likely to settle.
- In addition to air and surface sampling, KES used direct-reading instruments to assess real-time levels of chemicals during production runs.

## **4. Data Analysis and Risk Evaluation:**

- After collecting all samples, KES performed an analysis of the data, comparing the measured concentrations to OSHA's PELs and ACGIH's TLVs (Threshold Limit Values). Areas where exposure levels exceeded safe limits were flagged for immediate corrective action.
- The results also included an assessment of control measures in place, such as ventilation systems, PPE, and administrative controls, to determine if additional measures were necessary to reduce exposure.

## **5. Recommendations and Mitigation Strategies:**

- Based on the analysis, KES provided recommendations for reducing chemical exposure in high-risk areas. These included enhancing ventilation systems, introducing additional PPE, revising standard operating procedures, and considering safer chemicals or process modifications.

- KES also recommended periodic re-assessment and ongoing monitoring to ensure that exposure levels remained within safe limits and to track the effectiveness of implemented controls.

#### **6. Final Reporting and Stakeholder Communication:**

- KES produced a comprehensive report detailing the findings of the assessment, including identified hazards, exposure levels, and recommendations for improvement.
  - The report was shared with the company's safety management team, departmental supervisors, and union representatives, ensuring that all stakeholders were informed of the findings and proposed actions.
  - KES also provided individual reports to employees who were part of the sampling process, explaining their exposure levels and any recommended actions to reduce risks.
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### **Program Results and Impact:**

#### **1. Identification of High-Risk Areas:**

- The assessment identified several high-risk areas where exposure to hazardous chemicals was above recommended limits, including certain mixing and formulation processes.
- Several job classifications, particularly those working with solvents and preservatives, were found to have potential exposure risks that warranted immediate action.

#### **2. Improved Workplace Safety:**

- Through the implementation of engineering controls (e.g., improved ventilation), administrative controls (e.g., rotating shifts to reduce exposure), and PPE enhancements (e.g., chemical-resistant gloves and respirators), the company was able to reduce employee exposure to hazardous chemicals.
- Specific mitigation measures, such as improved personal air filtration systems and better handling practices for volatile chemicals, were recommended and successfully implemented.

#### **3. Regulatory Compliance:**

- The program ensured that the company met OSHA's PELs and other regulatory standards for chemical exposure in the workplace, reducing the risk of regulatory violations.
- By conducting regular assessments and sampling, KES helped the company maintain compliance with industry standards for workplace safety and chemical exposure.

#### 4. Long-Term Health Monitoring:

- The data collected during the sampling phase was stored in a comprehensive database, allowing the company to track exposure trends over time and implement proactive health and safety measures.
  - KES recommended annual follow-up assessments to ensure that exposure levels remained under control and to evaluate the effectiveness of mitigation strategies.
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#### **Conclusion:**

KES's evaluation and assessment of the 250 chemicals used in the cosmetic manufacturing process helped identify and mitigate potential exposure risks to workers across the facility. By combining research, interviews, and both qualitative and quantitative exposure assessments, KES was able to deliver a comprehensive report that improved workplace safety, ensured regulatory compliance, and provided long-term solutions for chemical exposure management. The project not only enhanced the health and safety of employees but also provided the company with the tools and data to maintain a safe working environment for years to come.