

Chemical Health Risk Assessment at Paper-based Box Manufacturing

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Structured Abstract

Background: Paper-Based Box Manufacturing (PBBM) involves activities, such as Die-Cutting, Maintenance, and Starch Mixing, which subject workers to the stressful effects of chemicals, such as Dunlop Glue, WD-40, Boric Acid, and Caustic Soda Flakes. These chemicals may enter the body by inhalation, skin contact or ingestion and cause irritation or permanent organ damage. Even though emergency stations and PPE exist, their status is unknown. Chemical Health Risk Assessment (CHRA) was carried out to assess exposure levels, and the suitability of current control measures.

Methods: This study used a qualitative method based on CHRA Manual (3rd Edition) by the Department of Occupational Safety and health (DOSH), Malaysia. Three work units were assessed: Die-Cut, Maintenance, and Starch Mixing Personnel. Data were collected through site observations, interviews, SDS, and workplace walkthroughs. Each chemical was given a hazard rating (HR) and exposure rating (ER) based on how toxic it is and how often workers are exposed. The risk rating (RR) was calculated using HR and ER. The adequacy of existing controls like ventilation, PPE, and safety practices was also evaluated.

Results: Eight chemicals were evaluated. Dunlop Glue was identified as one of the high-risk tasks and while the remaining seven chemicals posed medium risks. For inhalation exposure, one chemical presented a high risk and four posed moderate risks. For dermal exposure, four chemicals were categorized as high risk and four as moderate risk. The starch mixing unit showed the most critical dermal risk due to direct handling of chemicals. Monitoring chemical exposure is important for respirable caustic soda dust, as it can irritate the respiratory tract. Air monitoring is recommended, and medical surveillance should be initiated if exposure reaches 50% of the allowed limit.

Conclusion: This CHRA highlighted the significant risks of chemical exposure in PBBM industry. Although some control measures are in place, they do not adequately address the full range of chemical hazardous to health (CHTH) at the workplace. The study recommends stricter engineering measures and structured training on PPE. These measures are essential to ensure the well-being and safety of the employees.

Keywords: CHRA, CHTH, Occupational Exposure, Risk Rating, PPE

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