IOHA International Occupational Hygiene Association

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Recent Workplace Health Without Borders online training project

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Workplace Health Without Borders (WHWB) recently partnered with the Occupational Safety and Health Africa Foundation (OSHAfrica), the University of Brasilia, the International Occupational Hygiene Association (IOHA), the Belgian Center for Occupational Hygiene (BeCOH), and the Occupational Hygiene Training Association (OHTA) to provide training in a new way! Both synchronous (online) and asynchronous (on your own time) training was used to deliver course material in a way that circumvented pandemic travel constraints.

Although the course material was available only in English, multilingual WHWB members assisted in teaching or finding tutors for the OHTA's Health and Safety Awareness course. Zoom was used for online course delivery.

Students studied the English online training material at their own pace. Each week, we held a tutorial class in the major language of the participants, covering a specific section of the online course. Having sufficient tutors to help with weekly question-and-answer sessions kept the training fresh and interactive. The course cost (USD 50) was defrayed by scholarships from the BeCOH. The training course was offered in French, Portuguese and English. Each language group had a coordinator who arranged the tutorial session at an appropriate time and day of the week for the participants.

Training started on 15 February with an introduction to the different partners and the tutors of each language group. Students were shown how to use the online, interactive training material. In addition, immediately following this session, they were e-mailed their individual passwords and sign-in information for the online portion of the class. The OHS course lasted about one month, concluding with an exam, an evaluation, and a certificate of completion.

A systematic approach to reduce product safety and health risks through design in Malaysia

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Consumers are commonly exposed to numerous chemical ingredients found in various formulated products, especially household and personal care products. Some of the ingredients in products have been found to be safety and health hazards. For example, phthalates have been shown to have an endocrine-disrupting potential for pregnant women who used personal care products. Furthermore, children exposed to the ingredients in paint (e.g. lead) have exhibited neurobehavioural symptoms. Other health problems, such as dermal irritation, respiratory difficulties, and carcinogenicity are the consequences of using other formulated consumer products. Therefore, prevention and reduction of product safety and health risks must be performed as early as in the design stage. A systematic approach to integrate risk assessment methods at this stage is highly recommended.

Traditionally, in Malaysia, risk assessment is conducted at the final stage of product design, which is on the finished product. The assessment of the finished product is conducted to determine if the exposure of ingredients in a product exceeds a predetermined safety threshold. However, a more efficient way to assess the safety of product materials is at the early stages of the design phase. For a formulated product, there are seven main design stages:

Step 1: Identification of product attributes
Step 2: Conversion of product attributes into property constraints
Step 3: Determination of product form
Step 4: Generation of candidates
Step 5: Determination of composition and microstructure
Step 6: Product quality model
Step 7: Verification and experimental iterations

Based on these seven steps, the risk assessment could be applied during the generation of ingredient candidates (step 4). The ingredient candidates could undergo risk assessment with the inclusion of hazard identification and risk characterisation to ensure that the selected ingredients are safe and not harmful to consumers. The exposure assessment and risk characterisation can be performed once the composition and microstructure are confirmed, in step 5. The systematic approach for embedding the risk assessment in product design is aligned with the concept of 'Prevention through Design (PtD)'. The proposed approach is intended to encourage the manufacturers to prevent and reduce the safety and health risks through design rather than relying on the hazards and risks control or management system. The application of the PtD concept among industries has been included as one of the programmes in Malaysia's OSH Master Plan (OSHMP) 2021–2025. Figure 1 illustrates the steps in the Malaysian PtD programme.

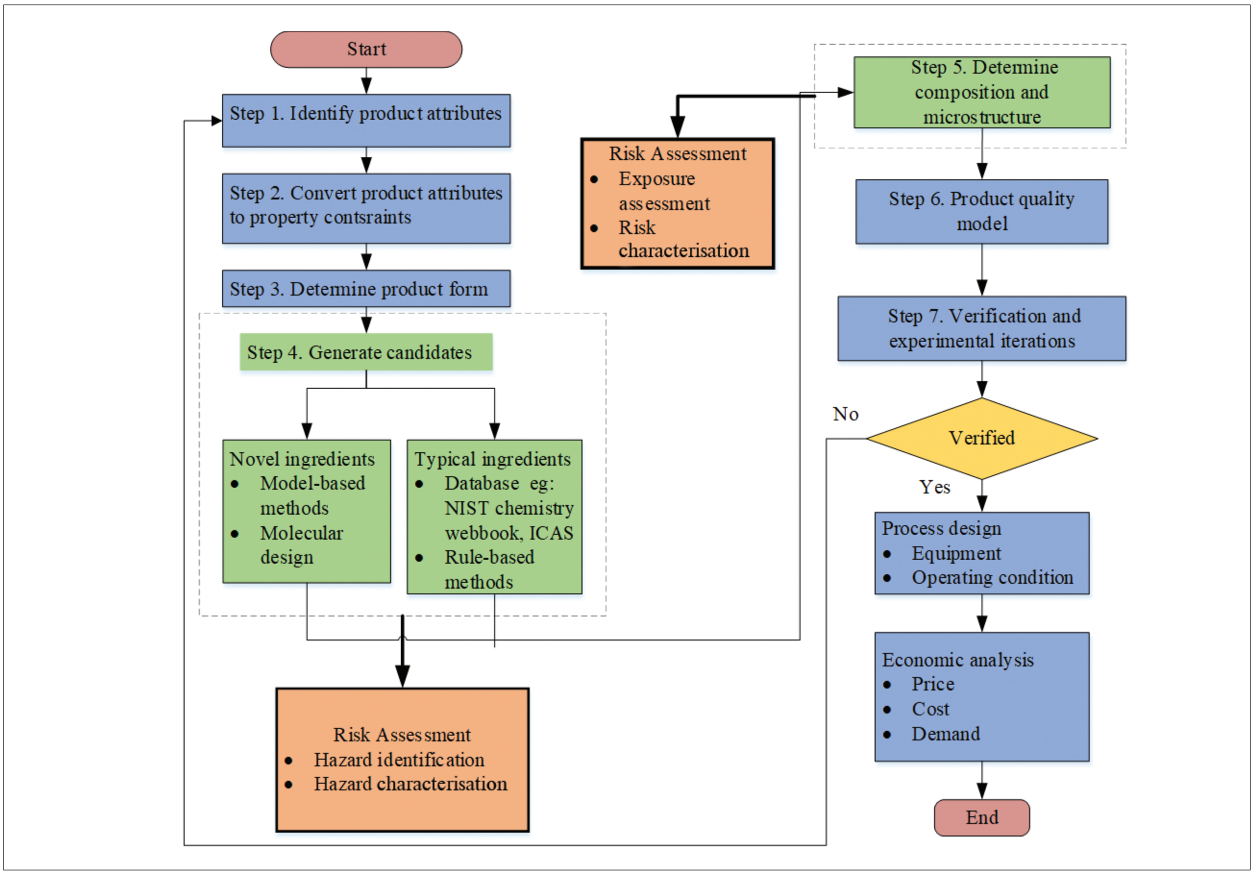

Figure 1. Embedding risk assessment in product design

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Industrial hygiene in e-waste processing: expectations in terms of occupational hazards and Malaysian standards

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The growing amount of e-waste or electrical and electronic equipment waste that becomes dysfunctional through redundancy or breakage has become a vital global concern due to its impact on human health and the environment. E-waste generates a broad range of toxic chemicals. Studies have found that e-waste releases toxic metals as well as polyhalogenated organics (e.g. polychlorinated biphenyls (PCBs)) and polybrominated diphenyl ethers (PBDEs). There are more than 1 000 toxic substances that can be found in e-waste.[1,2] These can be divided into toxic metals such as barium, cadmium and lead, and persistent organic pollutants, including brominated flame retardants (PBRs) and polycyclic aromatic hydrocarbons (PAHs).[2] These substances can cause serious harm to humans, especially recycling workers who are directly involved in processing e-waste.[3,4] Substances such as PBDEs are contained in the dust and broken pieces of plastic, and are readily released and dispersed during the recycling process.[5] In addition, heating of printed wiring boards can easily volatilise the lower-brominated PBDEs. These are only a few identified sources of occupational exposure to workers in e-waste recycling processes.

Inhalation and dust ingestion have been identified as the primary exposure routes for workers in e-waste recycling.[5] Therefore, in order to reduce exposure to PBDEs, object-to-mouth and hand-to-mouth contact times should be reduced. This can be done by utilising good personal protective equipment (PPE) such as eye protection, respiratory protection, and gloves. Different e-waste recycling processes present different occupational exposure hazards and risks due to differences in e-waste hazardous materials content, recycling methods, and PPE provided to workers. Therefore, it is crucial to monitor the occupational exposures of these hazardous materials in e-waste recycling plant workers. It is also necessary to construct e-waste recycling health and safety programmes and procedures for worker protection in order to minimise impacts on worker health and local environments.

In Malaysia, the Government awards various certifications to e-waste recycling facilities, which allow them to handle e-waste. The international standards include the certification for occupational health and safety management systems under an international standard (OHSAS 18001:2007) and a Malaysian standard (MS 1722). These certifications indicate that the facilities meet the health and safety requirements set by the Malaysian Department of Occupational Safety and Health, and that they are capable of ensuring the welfare of their employees with regard to occupational injuries and sickness. However, the certification only provides general guidelines to the facilities. More specific guidelines for each type of e-waste recycling are needed as different substances emitted during the recycling process require different strategies to reduce the associated occupational health hazards.

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