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# Implementation of Occupational Safety and Health (K3) in Supporting Production at Fias Furniture Malang

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**Abstract**

*The implementation of Occupational Safety and Health (OSH) is essential in minimizing occupational accidents and supporting production activities in small-scale furniture industries. This study aims to describe the implementation of OSH, identify potential hazards, assess risk levels, and determine appropriate risk control measures at Mebel Fias Malang. A qualitative descriptive approach with the Hazard Identification, Risk Assessment, and Risk Control (HIRARC) method was employed. Data were collected through observation, interviews, and documentation, while risk assessment referred to the AS/NZS 4360:2004 standard. The results indicated several potential hazards with low, medium, and high risk levels. Risk control measures were based on the hierarchy of controls according to ISO 45001:2018, including the provision of Personal Protective Equipment (PPE), installation of partitions, sanitation facilities, and fire extinguishers. These measures are expected to reduce occupational accidents and support the production process at Mebel Fias Malang.*

**Keywords:Occupational safety and health, HIRARC, hazard identification, risk assessment, risk control.**

## INTRODUCTION

The furniture industry faces various potential occupational hazards, such as exposure to wood dust, flammable chemicals, and the risk of mechanical injury from manual material handling. Without legally mandated Occupational Health and Safety (K3) protections and systems,(Republic of Indonesia, 2012), this condition is prone to triggering accidents and occupational diseases(Wirna Putri et al., 2023)In small-scale industries, K3 protection is often hampered by workers' low understanding and reluctance to use Personal Protective Equipment.(Pradityatama et al., 2024). In addition, minimal



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supervision often leads to unsafe work behavior or unsafe actions.(Uyun & Widowati, 2022).

Previous research has extensively examined the implementation of K3 in the furniture industry, one of which uses the Hazard Identification, Risk Assessment, and Risk Control (HIRARC) method, which is effectively able to identify high risks of physical and installation hazards in the work area.(Mahrus Khoirul Umami et al., 2021). Although this risk analysis method is commonly used, every small-scale furniture industry has limitations in facilities, availability of resources(Firdaus & Hasin, 2022), layout, and unique worker behavior, thus requiring hazard identification tailored to specific conditions in the field.

These specific conditions and spatial planning issues were found at Mebel Fias, a small-scale furniture business in Malang City. The production process at Mebel Fias operates conventionally in a narrow 3x2 meter room without partitions, which causes cutting dust to spread freely into the finishing area. In addition, initial observations revealed a number of potentially fatal hazards, including the absence of portable fire extinguishers (APAR) in the fire-prone glue application area, minimal sanitation facilities, and complaints of muscle pain among workers due to manual material lifting methods.

Based on these current issues, this study aims to describe the current implementation of K3, identify potential hazards, and formulate risk control measures using the HIRARC method. These control measures are expected to minimize losses and effectively support productivity and the smooth running of the production process at Mebel Fias.(Novitasari et al., 2023).

## RESEARCH METHODS

This study uses a qualitative approach with a descriptive type to describe the implementation of Occupational Safety and Health (OHS) in the production process at Mebel Fias Malang. Data collection was carried out through observation, interviews, and documentation. Data analysis was carried out using the Hazard Identification, Risk Assessment, and Risk Control (HIRARC) method which includes hazard identification, risk assessment, and risk control. The risk assessment was carried out with reference to the AS/NZS 4360:2004 standard based on the likelihood value of the risk (likelihood) and the severity of the impact (consequence).(Standards Australia & Standards New Zealand, 2004).The risk assessment criteria used in this study are presented in Tables 1, 2 and 3.

**Table 1 Likelihood Scale**

| Score | Level | Description |
|---|---|---|
| 5 | *Almost Certain* | It almost certainly happens in most circumstances. |
| 4 | *Likely* | It is likely to happen in many circumstances. |


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| | | |
|---|---|---|
| 3 | *Possible* | It might happen at some point. |
| 2 | *Unlikely* | It is unlikely to happen, only under certain conditions. |
| 1 | *Rare* | It is very unlikely to happen |

**Table 2 Consequence Scale (Impact)**

| Score | Level | Description |
|---|---|---|
| 5 | *Catastrophic* | Resulting in death or permanent disability; very large losses. |
| 4 | *Major* | Resulting in serious injury or serious illness; major loss. |
| 3 | *Moderate* | Requires medical attention; moderate loss. |
| 2 | *Minor* | Requires first aid; small loss |
| 1 | *Insignificant* | No injury; very minor or insignificant loss. |

**Table 3. Risk Level Matrix**

| ***Likelihood*** | | | **Consequence** | | |
|---|---|---|---|---|---|
| **(Possibility)** | **1** | **2** | **3** | **4** | **5** |
| | **Very small** | **Small** | **Currently** | **Big** | **Very large** |
| *5 Almost Certain* | Currently | Tall | Tall | Very high | Very high |
| *4 Likely* | Currently | Currently | Tall | Tall | Very high |
| *3 Possible* | Low | Currently | Currently | Tall | Tall |
| *2 Unlikely* | Low | Low | Currently | Currently | Tall |
| 1 Rare | Low | Low | Low | Currently | Currently |

The risk assessment in this study was conducted based on two parameters: the likelihood of the risk occurring and the resulting impact (consequence or impact). The results of these two parameters were used to determine the risk level, which was classified as low, medium, high, and very high.

## RESULTS AND DISCUSSION

The research results were obtained through observation, interviews, and documentation at Mebel Fias Malang. The data obtained were then analyzed using the method*Hazard Identification, Risk Assessment, and Risk Control*(HIRARC) to identify potential hazards, assess risk levels, and determine risk control measures in the production process. The results of this analysis are outlined through the stages of hazard identification, risk assessment, and risk control for each work activity in the Mebel Fias Malang production area.


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### 1. *Hazard Identification*

Hazard identification*(Hazard Identification)*Hazard identification is a step to identify potential hazards in each work activity. In this study, hazard identification was conducted in the material cutting, assembly, finishing, and shipping areas from the production warehouse to identify potential hazards as a basis for risk assessment and control using the HIRARC method.

**Table 4 Hazard identification**

| Area / Section | Danger | Risk |
|---|---|---|
| Shipping Process | Lifting and moving furniture to vehicles is done manually without tools. | Muscle injuries and wounds. |
| Material cutting area | Not using PPE (mask, protective glasses, and gloves). | Respiratory disorders, eye irritation, and wounds on the hands. |
| Finishing area | Smoking during the HPL coating process and the use of flammable glue. | Fire. |
| | Consuming drinks during the glue coating process on HPL and sheets. | Surface damage of the material. |
| | There is no partition between the cutting area and the finishing area so that dust spreads to the finishing area. | Decreased quality of finishing results and exposure to dust. |
| production area | There are no sanitation facilities and clean water sources available. | Disturbances in workers' hygiene and health. |
| | There are no light fire extinguishers (APAR) available. | Delay in handling fires. |

Based on the results of hazard identification conducted in several work areas at Mebel Fias Malang, several potential hazards were found originating from the work environment and worker behavior. These potential hazards include manual lifting of loads, failure to use Personal Protective Equipment (PPE), smoking in the finishing area, the absence of partitions between work areas, the lack of sanitation facilities, and the lack of portable fire extinguishers (APAR). These various conditions have the potential to cause risks such as worker injury, health problems, decreased production quality, and fires. Therefore, risk control efforts are needed to minimize the possibility of workplace accidents and health problems during the production process.


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### 2. *Risk Assessment*

A risk assessment is conducted to determine the level of risk associated with each identified hazard. The risk assessment is based on the likelihood and severity of the resulting impact, based on AS/NZS 4360:2004. The results of the risk assessment for each hazard are shown in the table above.

**Table 5 Risk Assessment**

| No. | Area / Job | Risk | | Risk Assessment | | Ranking |
|---|---|---|---|---|---|---|
| | | | ***Likelihood (L)*** | ***Consequence (C)*** | ***Score (LxC)*** | **Risk** |
| 1 | Shipping Process | Muscle injuries and injuries from manual lifting. | 3 | 3 | 9 | **Tall** |
| 2 | Material cutting area | Disorders, breathing, eye irritation, and wounds on the hands due to not using PPE. | 4 | 3 | 12 | **Tall** |
| 3 | Finishing area | Fires caused by smoking when using glue and flammable materials. | 2 | 5 | 10 | **Tall** |
| 4 | | Damage to the surface of materials due to consumption of beverages in the work area. | 3 | 1 | 3 | **Low** |



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| | | | | | | |
|---|---|---|---|---|---|---|
| 5 | | Decreased quality of finishing results and dust appearance due to the absence of partitions. | 3 | 2 | 6 | **Currently** |
| 6 | Production Area | Disturbances in workers' hygiene and health due to the lack of sanitation and clean water sources. | 2 | 2 | 4 | **Currently** |
| 7 | | Delays in handling fires due to the unavailability of APAR. | 2 | 4 | 8 | **Tall** |

Based on the table above, several risks in the production process at Mebel Fias Malang are classified as low, medium, and high. High risks occur in the shipping process, the cutting area, the finishing area, and the lack of portable fire extinguishers (APAR). Therefore, risk management efforts are necessary to reduce the likelihood of workplace accidents and other losses.

### 3. *Risk Control*(Risk Control)

Risk control is carried out based on the results of a risk assessment, taking into account the conditions at Mebel Fias Malang. In this study, risk control refers to the hierarchy.control according to ISO 45001:2018(International Organization for Standardization, 2018)which includes the following:

A. Elimination, eliminating the source of danger so that the risk does not occur.


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B. Substitution, replacing materials, equipment, or work processes with safer alternatives.
C. Engineering Controls, modifying equipment or the work environment to reduce exposure to hazards
D. Administrative Controls, implementing work procedures, training, and supervision to reduce risks.
E. Personal Protective Equipment (PPE), uses protective equipment as the last layer of protection for workers.

Based on the results of observations, interviews, documentation, hazard identification and risk assessment using the HIRARC method, several potential hazards were obtained that required control measures. Proposed risk controls adapted to the conditions of Malang Fias Furniture can be described as follows:

1. Muscle injuries and injuries from manual lifting;
   Using a wheeled trolley can help reduce the load when moving furniture to the delivery vehicle. Furthermore, lifting large items should be done by two people to reduce the risk of injury.
2. Respiratory disorders, eye irritation, and hand injuries due to not using PPE;
   Providing KN95 masks, protective glasses, and gloves placed on special racks near the cutting area can make it easier for workers to use PPE while working.
3. Fire due to smoking in finishing area;
   Considering that the habit of smoking is still difficult to break, providing a smoking area outside the finishing area with a cigarette butt container in the form of a sand-filled can can be a more realistic step to reduce the risk of fire.
4. Damage to the surface of materials due to consuming drinks in the work area;
   Separating the rest area from the HPL and sheet coating area can prevent drink spills on the materials being worked on so that product quality is maintained.
5. Decreased quality of finishing results and exposure to dust due to the absence of partitions;
   Installing simple partitions using plywood, partitions, or clear plastic curtains (PVC curtains) can reduce the spread of dust from the cutting area to the finishing area.
6. Disturbances in workers' hygiene and health due to the lack of sanitation facilities;
   The availability of water taps connected to water tanks and simple toilets can help workers maintain personal hygiene after carrying out production activities that produce a lot of dust.
7. Delays in handling fires due to the unavailability of light fire extinguishers (APAR);


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As a precautionary measure, the production area can be equipped with one dry chemical powder fire extinguisher unit with a capacity of 3 kg which is placed in a location that is easily accessible to workers.

## CONCLUSION

Based on the results of research using the Hazard Identification, Risk Assessment, and Risk Control (HIRARC) method, several potential hazards were found in the production process at Mebel Fias Malang originating from the work environment conditions and worker behavior. These potential hazards include manual material lifting, not using Personal Protective Equipment (PPE), smoking habits in the finishing area, the absence of partitions between work areas, the lack of sanitation facilities, and the lack of Light Fire Extinguishers (APAR). The results of the risk assessment indicate that there are low, medium, and high risk levels, where high risks are found in the delivery process, material cutting area, finishing area, and the lack of APAR.

Based on the results of the risk identification and assessment, risk control efforts are carried out by referring to the control hierarchy according to ISO 45001:2018. The proposed controls include the use of lifting aids, provision of PPE, separation of smoking areas, separation of rest areas from work areas, installation of partitions, provision of sanitation facilities, and provision of fire extinguishers. The implementation of these controls is expected to reduce the risk of work accidents and occupational health disorders so as to support the smooth production process at Mebel Fias Malang.

## BIBLIOGRAPHY

Firdaus, M. A., & Hasin, A. (2022). Faktor-Faktor yang Memengaruhi Penerapan Keselamatan dan Kesehatan Kerja (K3) pada CV Agis Truss. *Selekta Manajemen: Jurnal Mahasiswa Bisnis & Manajemen*, *1*(4), 192–208. https://journal.uii.ac.id/selma/index

International Organization for Standardization. (2018). ISO 45001:2018 Occupational Health and Safety Management Systems—Requirements with Guidance for Use. *Www.Spindo.Com*, 85. https://drive.google.com/file/d/1ym3gi7ur-HhifF6gouMKeJJufhAqCx2H/view

Mahrus Khoirul Umami, Muhammad Arif, Zaenal Ari, & Imnatus Mu'arrifah. (2021). Evaluasi Dan Rekomendasi Penerapan Keselamatan DanKesehatan Kerja Pada Industri Kecil Mebel. *JAPTI: Jurnal Aplikasi Ilmu Teknik Industri*, *2*(1), 22–30. https://www.researchgate.net/publication/365857511_EVALUASI_DAN_REKOMENDASI_PENERAPAN_KESELAMATAN_DAN_KESEHATAN_KERJA_PADA_INDUSTRI_KECIL_MEBEL_STUDI_KASUS_PADA_INDUSTRI_KECIL_MEBEL_PURNAMA_DI_JOMBANG



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Novitasari, D., Suwandy, S. D., Asbari, M., & Rahman, Y. (2023). Pengaruh Keselamatan dan Kesehatan Kerja (K3) Terhadap Kinerja Karyawan: Narrative Literature Review. *Jubisma*, *5*(1), 72–76. https://doi.org/10.58217/jubisma.v5i1.75

Pradityatama, M., Fahrussiam, F., Hidayanti, A. A., Febrian, A., & Mardiah, R. (2024). Sosialisasi Kesehatan dan Keselamatan Kerja ( K3 ) pada Usaha Tukang Kayu di dea Perina, Lombok Tengah, NTB. *Pengabdian Kepada Masyarakat Nusantara (JPkMN)*, *5*(4), 4453–4457. https://doi.org/http://doi.org/10.55338/jpkmn.v5i4.4216

Republik Indonesia. (2012). *Peraturan Pemerintah Nomor 50 Tahun 2012 tentang Penerapan Sistem Manajemen Keselamatan dan Kesehatan Kerja*. https://jdih.kemenkeu.go.id/kamus-hukum/keselamatan-dan-kesehatan-kerja?id=059ee750479c77958216e24d4c6ab392

Standards Australia, & Standards New Zealand. (2004). *AS/NZS 4360:2004 Risk Management* (3rd ed.). Standards Australia International Ltd and Standards New Zealand. https://www.preventionweb.net/publication/nzs-43602004-risk-management

Uyun, R. C., & Widowati, E. (2022). Hubungan Antara Pengetahuan Pekerja Tentang K3 Dan Pengawasan K3 Dengan Perilaku Tidak Aman (Unsafe Action). *Jurnal Kesehatan Masyarakat (Undip)*, *10*(3), 391–397. https://doi.org/10.14710/jkm.v10i3.33318

Wirna Putri, N., Try Fathul, T., Ainul Fiqran, W., Angela, M., & Berliana Marianda, I. (2023). Identifikasi Bahaya dan Penilaian Risiko Pekerja Industri Mebel di Kota Payakumbuh Hazard Identification and Risk Assessment of Furniture Industry Workers Payakumbuh City. *Jurnal Kesehatan Kerja Dan Lingkungan*, *04*(2), 2023. http://jk3l.fkm.unand.ac.id/index.php/jk3l/index

Standards Australia, & Standards New Zealand. (2004). AS/NZS 4360:2004 Risk Management (3rd ed.). Sydney: Standards Australia International Ltd and Standards New Zealand.

International Organization for Standardization. (2018). ISO 45001:2018 Occupational Health and Safety Management Systems—Requirements with Guidance for Use. Geneva: International Organization for Standardization.



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