

Automotive Side Industry Hood Rod Risk Analysis in Production

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Abstract The right to a healthy and safe working environment is recognised as a fundamental right for individuals in professional life. In recent years, as has been observed in the rest of the world, the importance attributed to occupational health and safety has been increasing in our country. In response to mounting demands, numerous industrial sectors have undergone development, notably the automotive industry. This expansion within the automotive sector has also contributed to the growth of the automotive subsidiary industry. The inherent risks associated with automotive subsidiary factories, which involve multiple processes, have been a subject of increasing concern. Employees in automotive subsidiary factories, particularly those in metal processing plants, are susceptible to numerous risks that can result in occupational accidents and various occupational diseases. This study aims to identify the risks in the automotive subsidiary industry and propose solutions to enhance worker safety in this sector. In 2023, a total of 15,873 occupational accidents occurred in the automotive subsidiary industry, and 41 employees were diagnosed with occupational diseases. This underscores the importance of the present research. The study was conducted in an automotive spare parts factory that produces stabiliser bars, hood rods, and springs. A comprehensive analysis of the risks encountered by workers during production was conducted using the Fine-Kinney risk analysis method, and the obtained results were evaluated. The scope of the study encompassed risks arising throughout the entire production process, from the intake of raw materials to the shipment of finished products. Recommendations were provided to address the identified risks. The risk analysis yielded a total of 66 risks, for which 66 corrective and preventive actions were proposed to mitigate these risks.

Keywords – Occupational Health and Safety, Risk Analysis, Fine Kinney, Risk Factors

I. Introduction

The advent of the automotive industry occurred initially in Germany and France, with subsequent development in the United States. The first steam-powered vehicle was produced by Cugnot in 1769; however, its limited functionality prevented it from achieving widespread adoption. In the 19th century, significant advancements were made in the field of steam-powered vehicles, with Trevithick, Evans, and Guyney developing steam-powered vehicles and Lenoir laying the foundation for the internal combustion engine in 1860. In 1876, Otto produced the four-cylinder engine, and in 1886, Benz and Daimler developed the modern automobile. By 1893, the United States had witnessed a surge in automobile production, and by 1890, the global landscape featured an impressive 500 automobile brands.

Initially, automobiles were produced in workshops; however, as industrialization progressed, production rapidly expanded into large manufacturing facilities. The automotive industry became a leader in the adoption of standardized and large-scale production methods. A significant milestone in this evolution was the advent of the Henry Ford Model T, which ushered in a new era of mass production. This development enabled the economical manufacture of a high volume of vehicles. By 1920, 65-70% of vehicles in the U.S. and 50% of vehicles worldwide were manufactured through mass production.

The Turkish automotive industry commenced in the 1950s and gained significant momentum in the late 1960s and 1970s with the development of assembly plants. The first production commenced in 1954 with the manufacturing of jeeps and pickup trucks by Türk Willys Overland Ltd. for the military, followed by the establishment of truck and bus factories.

In 1961, the first domestic automobile, designated as "Devrim," was produced in Eskişehir, though only four prototypes were constructed. The first mass-produced domestic car, the Anadol, was introduced in 1966, and a total of 87,000 units were produced until 1982. (Bedir, A., 2002) The evolution of the automotive industry has concomitantly given rise to occupational health and safety (OHS) concerns. The objective of OHS is to furnish employees with a healthy and safe working environment, to protect them from adverse effects in the workplace, and to enhance productivity.

In this regard, the government, employers, and employees all have responsibilities. Legislation falls under the purview of the government, while employers are obligated to adhere to these regulations and ensure a safe working environment. Employees, in turn, are charged with the responsibility of adhering to the established rules and safeguarding their legal entitlements and obligations.

Ensuring workplace safety is a collective responsibility that encompasses a multifaceted involvement from various entities, including the government, employers, employees, trade unions, occupational safety specialists, workplace doctors, and occupational nurses, among others.

The overarching objective of occupational health and safety (OHS) is to ensure that employees are provided with a healthy and safe working environment, are protected from the detrimental effects of the workplace, and that productivity is enhanced. In this regard, the government, employers, and employees are all accountable for their actions and contributions.

Legislation is the purview of the government, while employers are obligated to adhere to these regulations and guarantee a safe working environment. Conversely, employees bear the onus of adhering to safety protocols, exercising their legal entitlements, and fulfilling their obligations under the law.

Ensuring workplace safety is a collective responsibility that encompasses various stakeholders, including the government, employers, employees, trade unions, occupational safety specialists, workplace doctors, and occupational nurses, among others.

Each industry sector is characterized by its own unique set of specific risks. The contemporary world is marked by an expanding industrial sector, which has given rise to a variety of new hazards and risks. According to the Workplace Hazard Classification Notification on Occupational Health and Safety, the automotive sub-industry factory examined in this study is classified as a hazardous workplace. (CSGB, 2012)

In 2023, the automotive sector produced a total of 1,525,963 vehicles. During the production of these vehicles, various products from the automotive sub-industry were utilized and incorporated into the vehicles. (OSD, 2023) In 2023, a total of 15,873 workplace accidents occurred in the automotive sub-industry sector in our country, and 41 employees were diagnosed with occupational diseases. As reported by the SGK in 2023, the growing demand and diversification in today's global landscape have led to the expansion and evolution of various industrial sectors. This, in turn, has led to an increased exposure of laborers to a wide range of potential hazards. This study aims to examine the potential risks in a factory that produces hood rods and propose solutions accordingly.

II. Materials and Methods

Occupational safety refers to the implementation of measures designed to safeguard the well-being of personnel against potential hazards emanating from technical equipment in the workplace. In this regard, the identification of risks associated with workplace equipment and the implementation of preventive measures are among the primary objectives. (K Kılıç, 2006:19). The scope of occupational health and safety (OHS) extends beyond employees in production roles, encompassing all stakeholders affected by occupational activities within the workplace, in addition to the broader public. This comprehensive field can be defined as the set of processes designed to maintain health conditions and minimize risks. (Kabakçı, 2009:82) The present study focuses on a factory in the automotive sub-industry that manufactures stabilizer bars, springs, and hood rods. The study presents a comprehensive risk analysis, encompassing the entire production process of hood rods, from the raw material stage to the packaging phase. The study methodically evaluates the efficacy of the bending and plastic injection machines by employing the Fine-Kinney risk analysis method.

Research Type and Model

In this study, a risk analysis was conducted using the machine-based Fine-Kinney method in an automotive sub-industry factory. The risk assessment employed focused on the identification of potential risks associated with the plastic injection machine and the bending machine during the process of producing hood rods. The recommendations to mitigate these risks were provided.

A workflow diagram of the production process was created. Utilizing this diagram, the study proceeded to evaluate risks that may emerge during the reception of raw materials and subsequent shipment phase, extending to the product's completion stage. This analysis was conducted employing the machine-based Fine Kinney method in the context of an automotive sub-industry factory.

III. Risk Assessment Methodologies

One of the most critical steps in safety management is the risk assessment. This process entails the identification of hazardous conditions that have the potential to result in employee injuries. It also involves the assessment of the severity of the identified risks and the planning of the requisite preventive and corrective measures. (A. Grassi et al.) There are two main risk analysis methods used for risk assessment:

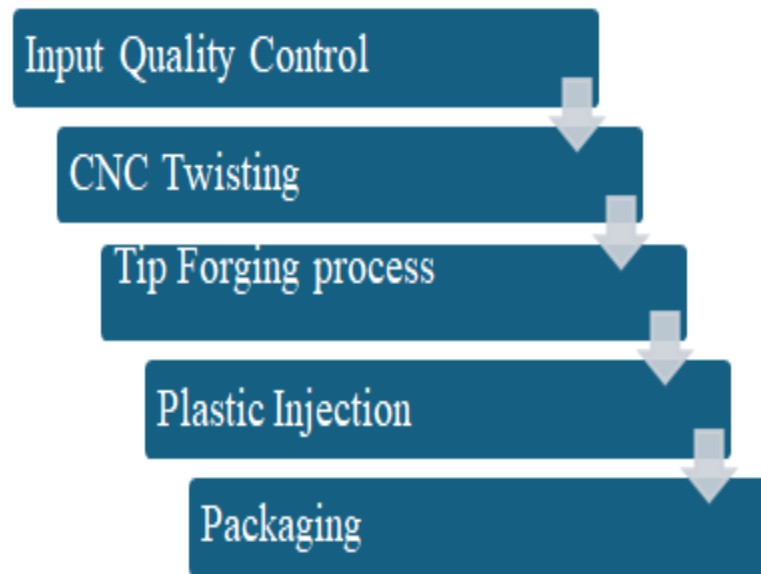
Qualitative Risk Analysis **Quantitative Risk Analysis** The primary distinction between these approaches lies in their unique methodologies for determining risk values. This distinction has been previously delineated by Ceylan and Başhelvacı (2011).

Fine Kinney Method

The Fine-Kinney method bears a resemblance to the matrix-based risk assessment method and is favored by businesses that utilize a regular registration system.

The application of simulation techniques has been shown to yield more objective and quantifiable results in comparison to traditional methodologies, by virtue of its reliance on mathematical models and probabilistic theories underpinning assessments of risk. (Ceylan & Başhelvacı, 2011)

Plastic Injection and Hood Rod Work Flow Chart



Introduction Quality Control

The raw materials delivered by the supplier company via truck are transferred to the raw material storage area and subsequently stored there. The responsibility for conducting visual and dimensional inspections of these materials falls upon incoming quality control teams. Materials that meet the stipulated criteria are labeled and earmarked for subsequent delivery to the production area.

Cold Twist

Products that have received approval from the raw material area are subsequently transported to the production area using forklifts. The raw material, which is wrapped in the shape of a coil, is placed on the twisting machine. The terminal segment of the raw material is severed by means of a spiral blade mechanism, and then the raw material is affixed to the twisting machine. Subsequently, the initial stage of the cold twisting process is executed, which is a machine-based operation that is central to the overall production procedure. During this stage, the ends of the raw material, which are initially in the form of a rod, are bent.

Tip Tattoo

The twisted material is easier to shape the metal in press machines and the internal structure of the material. Tattooing is done in order to improve.

Gauge Control

The rods with tip forging are passed through the control gauges and it is checked whether they are damaged in terms of shape and size. Not having a quality problem. The rods are transmitted to the next process.

Polish

In the context of the painting process, the components to be treated must be suspended from the hangers located along the conveyor belt. The rack or ace is then utilized for the removal of metal powders and oils from the surfaces of the parts. Subsequently, surface preparation enters the spray line for n. Parts that pass through the degreasing alkaline chemical pool spray enter the rinse bath and are washed. After washing in the activation bath, the zinc phosphate spray passes through the zinc phosphate and the surfaces of the parts are phosphate Pot Lar. Following this step, the parts undergo a final rinse with demineralized water. Following this, the pieces are subjected to a drying cycle in a specialized drying oven before advancing to the paint booths for the execution of the powder painting process. The material is subsequently transferred to the powder coating oven, where it undergoes a final thermal treatment.

Plastic Injection

The final form of the rods is determined by the completion of the plastic components at the terminal points of the plastic injection molding apparatus. The gauge control is then implemented, and the products are subsequently packaged.

Packaging

The products resulting from the plastic injection molding process are then transferred to the shipping area, where they are packaged for distribution. The packaged products are subsequently maintained in a state of preparedness for shipment.

N O	WORKPLACE DEPARTMENT NAME WITH RISK	SOURCE OF DANGER (Machine, equipmen, workplace building and attachmen t Etc)	DANGER OUS EVENT CAUSE / ACTIVIT Y	DANGER	THINGS THAT MAY BE AFFECTED	RISK	PRE-RISK SCORE				PRECAUTIONS TO BE TAKEN CONTROL MEASURES
							PROBABILITY	FREQUENT	VIOLENCE	RÖS	
1	Hood Stick	Hood wire raw material	The raw material (hood wire) is not wrapped properly	Opening the hood wire,	The operator that made the transaction	Injury	1	3	15	45	1) Untrained Personneller Should not take action. 2) Raw Material It should be checked before opening.
2	Hood Stick	Hood wire raw material	Bringing the raw material to the field by forklift	Forklift work area is not specified	Employees in the field	Jamming, crushing, loss of limb	3	6	40	720	1) Forklift work area floor markings should be made. 2) Pedestrian Walking floor markings should be made.
3	Hood Stick	Hood wire raw material	Raw materialCut ting the wire placed in the machine while placing i	Hand Tool Usage (Scissor cutting)	The operator that made the transaction	Jamming, crushing, loss of limb	3	1	15	45	1) Untrained personnel should not take action. 2) PPE gloves should be used. 3) Damaged Hand tools should not be used.
4	Hood Stick	Hood wire raw material	Raw material loading- Roof Crane Usage	Load by hand Orientation,bonding Do not hold by hand	Operator	Jamming, crushing, loss of limb	3	6	15	270	1) Order will be provided to control the load when transporting material with the overhead crane.2) Untrained and uncertified personnel will not work. 3) A warning sign will be hung in a visible place on the field "When the ceiling crane is carrying cargo by hand Intervention Don't"
5	Hood Stick	Hood wire raw material	Loading the raw material with a bridge crane that travels to the device	Ergonomic risks	Operator	Musculoskele tal system disorders	10	0,5	15	75	1) The area will be evaluated ergonomically and necessary engineering studies will be carried out, and it will be made ergonomically suitable. 2) In case of possible failure STOP- CALL - WAIT rule will be applied.
6	Hood Stick	Hood wire raw material	Cutting the bonnet wire end with a spiral before the raw material is placed in the machine	Spiral stone explosion, damage to the spiral cables, accidents that may occur during the use of the spiral.	Operator, those working in the field	Whole body	3	10	40	120 0	1) Untrained personnel should not take action. 2) Instruments that have not been maintained periodically should not be used. 3) Appropriate PEE should be used, such as glasses, visor.
7	Hood Stick	Hood rod machine	Rotating evenings in	Open turns and Moving parts Work accident due	Operator	Jamming, tangling, entangling,	3	10	15	450	1) Rotary parts will be closed so that they cannot be interfered

			the open	to		injury					with manually.
8	Hood Stick	Hood bar work area	Presence of a roof crane in the working area	Object fall	Those in the area	Injury, death	3	10	40	1200	1) Those in the area will use a helmet. 2) The load should not be entered while the roof crane is working, the transportation area will be emptied. 3) Warning OHS signs will be added to the area.
9	Hood Stick	Hood bar work area	Not using sensors actively	Entering the machine workspace	Operator	Jamming, crushing, injury	3	6	15	270	1) When the sensor does not work STOP- The CALL - WAIT command should be applied. 3) Pres-No sensor should be placed. 2) Operation of the sensors at the beginning of the work It should be checked that p is not working. Checks are carried out regularly Check-list Should be followed.
10	Hood Stick	Hood bar work area	The working area is open	Unauthorized persons can enter the work area	Interested people	Jamming, crushing injury, death	6	1	40	240	1) Lines to limit the working area should be drawn 2) 1) Stimulating OHS Signs Should be added. "Unauthorized persons cannot enter", Entry to the study area is prohibited".
11	Hood Stick	Hood bar work area	Removal of the cut piece by bending	Ergonomic risks(Neck,waist Pains)	Operator	Musculoskeletal disorders	3	6	15	270	1) Training should be given on appropriate lifting methods 2) The area will be evaluated ergonomically and necessary engineering studies will be carried out and it will be made ergonomically appropriate.
12	Hood Stick	Hood bar work area	Placing the cut part into the mask	When putting a product in the grass or Clamps Hand finger squeezing while closing	Operator	Soft tissue injury, open injury, crack	6	10	3	180	1) Practical trainings should be carried out to increase awareness. 2) Business Standard Forms should be hung in the fields. 3) To the working personnel\$ Standard Form (ISF) Training should be given.
13	Hood Stick	Hood bar work area	Pressing of the cut part	Placement of material in press	Operator	Injury	3	0,5	100	150	1) Business standards form should be placed in the field. 2) Press Usage OHS The instruction should be hung on the field. 3) ISF trainings should be given to working personnel.
14	Hood Stick	Hood bar press work area	Emergency stop button	No emergency stop button, not working, breaking	Operator	Injury as a result of jamming, crushing	1	3	40	120	1) In cases where the emergency stop button does not work STOP- CALL- The WAIT command

											should be applied. 2) It should be checked whether the emergency stop button is working at certain periods.
15	Hood Stick	Hood bar machine working area	Use of foot pedal	Press hand spinning	Operator	Injury	6	10	15	900	1) Work should be done with the double hand button. 2) Finger and hand protection should be provided with barrier sensor in the press working area. 3) Material straightening by fixing Should be done (Engineering measure will be investigated to make a special fixture.)
16	Hood Stick	Hood bar machine working area	Mold change, adjustment processes	Use of foot pedal	Operator	Injury, jamming, limb loss, death	3	3	40	360	1) The use of foot pedal can only be done in closed molds. Work will be done with the double hand button. 2) Possible accidents will be prevented by passing the foot pedal cables through the appropriate cable passage. 3) Foot pedals workWill be activated in time, when there is work Inactive Will be taken to the position. 4) Transitions to the foot pedal position, switched buttons on the control board Should be provided with.
17	Hood Stick	Hood bar work area	Floor of press foot pedal	Slippage caused by ground disturbance	Operator	Injury, jamming, loss of limbs	1	3	40	120	1)Pressed foot padThe floor where the romeys is placed is undamaged, Flat It should be, the ground Should not be broken.
18	Hood Stick	Hood bar work area	Putting the pressed product on the coffee table	Ergonomic risks	Operator	Musculoskeletal system disorders	3	2	15	90	1) The area will be evaluated ergonomically and necessary engineering studies will be carried out, and it will be made ergonomically suitable.
19	Hood Stick	Hood bar work area	Front and sides of the coffee table	Material drop	Operator	Injury	3	3	40	360	1) The physical condition of the coffee tables should be checked. 2) There should be a stopper brake on the legs of the coffee tables.
20	Hood Stick	Hood rod machine	Periodic control activities	Non-realization of periodic control activities	Interested people	Jamming, crushing injury, death	1	1	40	40	1) "Health and safety conditions in the use of work equipment RegulationAccording to ", periodic checks

											of the machines should be carried out.
21	Hood Stick	Hood rod machine	Staff use of watches, rings, necklaces, etc.	Stuck, open injury	Operator	Injury, loss of limb	3	3	15	135	1) OHS signs stating that the use of jewelry-accessories is prohibited should be hung in the area. 2) Group Leaders should follow up on the subject.
22	Hood Stick	Hood bar work area	Use of forklifts	Seeing the coffee table to the paint shop with a forklift	Interested people	Injury, death as a result of impact	1	6	40	240	1) The working area should be determined according to 5S rules. 2) The process of dropping and receiving the product stand of the forklift should be added to the Business Standard Forms.
23	Hood Stick	Hood bar work area	Electrical cables	Electrical cables are not included in the cable duct, the ducts are worn out, the cables are worn out	Those in the area	Electric current, injury, death	3	1	40	120	1) Applications should be continued. 2) "Electrical Hazard" OHS label should be added to the cable duct.
24	Hood Stick	Hood bar work area	Water Dispenser Usage	Look periodicallyLack of hygiene, lack of hygiene	Those in the area	Biological Risk Factors	3	6	7	126	1) ApplicationLara Should be continued. 2) Sample a as required by legislationMicrobiological measurements should be made. 3) Carafes should not be left empty in the area after opening. 4) Water carboys should be kept in a clean environment that does not receive sunlight and is sufficiently ventilated, and the areas should not be placed in excess carboys.
25	Hood Stick	Hood bar machine and press	Body grounding installation	No body grounding installation, not working	Interested people	Electric current, injury, death	6	1	40	240	1) Body grounding installation resistance measurements machine-based en It will be made once a year and shown on the map.
26	Hood Stick	Hood bar work area	Leakage current Rolesi	Leakage current Of the role Not to be, not to work	Interested people	Electric current, injury, death	6	3	40	720	1) All benches must have leakage current relays. 2) Maintenance and checks should be done regularly.
27	Plastic Injection	Plastic injection working area	Receiving products by bending from the safe	Ergonomic risks	Operator	Musculoskeletal system disorders	3	2	15	90	1) The area will be evaluated ergonomically and necessary engineering studies will be carried out, and it will be made ergonomically suitable. 2) Safes will be filled in a way that does not exceed legal limits.
28	Plastic	Plastic	Raw	Chemical exposure,	Interested		1	3	15	45	1) No chemicals will

	Injection	injection working area	material Of msds Absence	health problems	people						be kept without labels from the production area 2) It will be stored in chemical work areas as needed 3) MSDS' of the chemicals used LER Will be suspended in the area
29	Plastic Injection	Plastic injection working area	Raw made Going up the spilled funnel with a ladder	Working at height	Interested people	Fall, injury, death	6	3	40	720	1) The ladder should be revised in a protected way in accordance with the standards. 2) The work of the untrained personnel should be prevented by giving the necessary training to the personnel who will work at height. 3) The ladder must be non-slip grid type etc. stepped, the stair legs do not slip plastic With shoes And if possible, it should be fixed to the machine or on the ground with a pin etc.
30	Plastic Injection	Plastic injection working area	Stair steps and railings	Working at height	Interested people	Fall, injury, death	6	3	40	720	1) The ladder is a protected in accordance with the standards Revised in a way Should be 2) The person who will work at the height By giving the necessary training, the work of untrained personnel should be prevented 3) Stairs are in force Standard And regulations (BS EN 131).
31	Plastic Injection	Plastic injection working area	Working at height	Working at height	Interested people	Fall, injury, death	1	3	40	120	1) The work of untrained personnel should be prevented by giving the necessary training to the personnel who will work at height.
32	Plastic Injection	Plastic injection working area	The area is messy	Raw material bucket	Those in the area	Fall, injury	3	3	15	135	1) Unnecessary materials should be removed from the area. 2) By completing the location definitions Of everything Its location should be determined. Undefined material should not be kept in the field.
33	Plastic Injection	Plastic injection working area	Tool cabinet	Space clutter Don't get hung up, don't fall	Those in the area	Fall, injury	3	3	15	135	1) Order in the closet should be provided.
34	Plastic Injection	Plastic injection working area	Injection Machine Feeding	Ergonomic risks due to plastic injection raw material manual	Operator	Injure Nma, Occupational disease, Musculoskele	10	3	15	450	1) Employees are given the necessary training on lifting

		area	Place	feeding		tal system disorders					methods.
35	Plastic Injection	Plastic injection working area	The floor where the staff works is wooden pallet	Danger of falling	Operator	Don't fall, Injury, death	1	3	40	120	1) Working area A more solid material should be substituted instead of the wooden pallet.
36	Plastic Injection	Plastic injection working area	Injection device cover open	Part jumping injury	Operator	Injury	1	3	40	120	1) The plastic injection device should have a system that prevents it from working when the lid is open. 2) Switches Do not work when the covers are open It must be in working condition
37	Plastic Injection	Plastic injection working area	Untrained, inadequate staff work	Personnel do not have a vocational high school graduate or vocational education or vocational qualification certificate	Operator	Criminal sanction, insufficient personnel employment, accident	3	6	15	270	1) Professional competence by checking the vocational training of the working personnel It is necessary to obtain a certificate of vocational education. 2) Plastic Injection Production Element should be Level 3.
38	Plastic Injection	Plastic injection working area	Injection device Switch's Not active	Risk of injury	Operator	Injury	3	3	40	360	1) Safety Switch's In cases where it does not work, the STOP - CALL - WAIT command should be applied. 2) In case of failure, the maintenance unit should be notified and after the fault is fixed, the work in the area should be started.
39	Plastic Injection	Plastic injection working area	Instructions for use and safety	Incorrect use	Operator	Injury, death	3	1	40	120	1) Instructions should be hung on the machine.
40	Plastic Injection	Plastic injection working area	The product from the injection is hot	Combustion	Operator	Combustion	0,5	6	40	120	1) Hot material warning letter should be placed in the working area. 2) PPE gloves should be used heat resistant.
41	Plastic Injection	Plastic injection working area	Unsafe use of the utility knife	Interruption	Operator	Injury	1	6	15	90	1) A safe utility knife should be provided and used.
42	Plastic injection	Plastic injection working area	Use of the utility knife without cut-resistant gloves	Interruption	Operator	Injury	0,5	3	40	60	1) Employees should use cut-resistant work gloves.
43	Plastic injection	Plastic injection working area	No fire extinguishing device in the area	Lack of fire extinguishing tube, not working, empty	Those in the area	Injury, poisoning, death as a result of fire	3	0,5	100	150	1) Periodic inspections of fire tubes It should be continued to be done regularly. 2) The tubes used should be collected in a separate place and sent for filling.

44	Plastic Injection	Plastic injection working area	No smoke detector in the area	Smoke detector Not to be, not to work	Those in the area	Injury, poisoning, death as a result of fire	1	3	100	300	1) Checks of smoke sensor detectors regularly. It should be done annually. Checks should be done regularly.
45	Plastic Injection	Plastic injection working area	No emergency alarm button in the area	Emergency signal cannot be sent in case of emergency	Those in the area	Injury, death	0,5	3	40	60	1) An emergency button should be placed in the area.
46	Plastic Injection	Plastic injection working area	Lack of personal protective equipment	Not using Personal Protective Equipment (PPE) - Glasses, headphones, gloves, etc.	Those in the area	Vision problems, vision loss, limb loss, hearing loss, occupational diseases	3	6	15	270	1) Training on the use of PPE should be given in order to increase awareness in employees. 2) Visual signs should be increased to spread the use of PPE. 3) In Fields Found List-Sign and warnings should be requested to be renewed by Group Leaders by following the wear-and-tear status.
47	Plastic Injection	Plastic injection working area	Not wearing protective headphones	Employees are affected by noise	Those in the area	Hearing loss	1	6	15	90	1) Regular use of appropriate personal protective equipment will be ensured by making environmental measurements. 2) With periodic health checks, hearing loss in personnel will be monitored and checked.
48	Plastic Injection	Plastic injection working area	Not wearing safety glasses	Dust to the eye, material splash	Operator	Eye injury due to flying dust or burrs, loss of vision	6	6	7	252	1) PPE audits will be carried out. 2) Instead of cleaning with air, vacuum cleaning should be done. 3) Unnecessary use of air guns will be restricted.
49	Plastic Injection	Plastic injection working area	Not wearing protective work gloves	Hot Surface contact	Operator	Injury	3	3	7	63	1) Employees are informed about the risks. 2) All Warning OHS signs will be added, torn, etc. It will be renewed in cases. It will be prevented from being removed.
50	Plastic Injection	Plastic injection working area	Lack of protective work shoes	Injuries as a result of not wearing work shoes	Operator	Injury	0,5	3	40	60	1) Employees are informed about the risks. 2) All Warning OHS signs will be added, torn, etc. It will be renewed in cases. It will be prevented from being removed.
51	Plastic Injection	Plastic injection working area	Emergency referrals have not	Inability to evacuate in case of emergency	Those in the field	Injury and/or property damage as a result of not	1	1	100	100	1) Emergency exit guidance and door markings should be

		area	been made			being able to go out comfortably in panic					made in the area.
52	Plastic Injection	Plastic injection working area	Failure to make indoor hygiene measurements	Due to the lack of environment measurements, the exposure to catch work accidents and occupational diseases by not being able to determine	Those in the field	Work accidents and occupational diseases	0,5	3	40	60	1) Occupational environment hygiene should be measured. 2) Related In accordance with the legislation, the Employer is obliged to have occupational hygiene measurement, testing and analysis carried out by laboratories with competence or pre-qualification certificate.
53	Plastic Injection	Plastic injection working area	Inadequate ventilation	Dust, smell	Those in the field	Lung disorders, Occupational disease	6	6	15	540	1) A forced ventilation system that will expel smoke and odors out of the environment should be installed. 2) Ventilation Of the system Periodic maintenance and controls It should be done at least once a year. If the system is disabled, an alarm system should be installed. 3) Natural Ventilation is available.
54	Plastic Injection	Plastic injection working area	Unsuitable thermal comfort conditions	Lack of thermal comfort, health problems	Operator	Hot Collision, work accident as a result of lack of thermal comfort	0,5	3	40	60	1) Thermal comfort measurement should be made.
55	Plastic Injection	Plastic injection working area	Material drop from shelves	The working area is close to the shelves	Those in the field	Injury, limb Loss, death	0,5	3	40	60	1) Protection should be made between the working area and the shelf.
56	Plastic Injection	Plastic injection working area	Forklift work areas	Forklift work area is not specified	Those in the field	Injury, limb Loss, death	3	6	40	720	1) Forklift and pedestrian paths should be separated. 2) Safety health signs will be hung in appropriate places, "attention forklift can come out".
57	Plastic Injection	Plastic injection working area	Presence of a roof crane in the working area	Object fall	Those in the area	Injury, death	3	10	40	1200	1) Those in the area will use a helmet. 2) The load should not be entered while the roof crane is working, the transportation area will be emptied. 3) Warning OHS signs will be added to

											the area.
58	Plastic Injection	Plastic injection working area	The fact that the helmet is not installed while the overhead crane is working	Material Falling, multiplying	Interested people	Material fall, injury, death	0,5	3	40	60	1) Those in the area will use a helmet. 2) Under the load while the roof crane is working Will not be entered Warning OHS sign will be hung in the field. 3) The list of personnel with a crane license should be hung on the fields.
59	Plastic Injection	Plastic injection working area	Untrained personnel employment	Personnel do not have a vocational high school graduate or vocational education or vocational qualification certificate	Operator	Criminal sanction, insufficient personnel employment, accident	3	6	15	270	1) The vocational training of the working personnel will be checked, it will be ensured that those who do not have a vocational qualification / vocational training certificate are not employed and received a certificate.
60	Plastic Injection	Plastic injection working area	Your staff lsg Lack of education	OHS untrained personnel work	Related Lishis	Criminal sanction, insufficient personnel employment, accident	0,5	3	40	60	1) Employees OHS The job will not be started without training.
61	Plastic Injection	Plastic injection working area	Staff use of watches, rings, necklaces, etc.	Stuck, open injury	Operator	Injury, loss of limb	3	3	15	135	1) OHS signs stating that the use of jewelry-accessories is prohibited should be hung in the area. 2) Group Leaders should follow up on the subject.
62	Plastic Injection	Plastic injection working area	Hoppers Cleaning or intervening in case of any malfunction	Operator or maintenance personnel, on the machine There is a danger of slipping and falling out	Operator, Maintenance Staff	Injury, limb Loss, death	3	3	40	360	1) It should be possible to climb the machine with a suitable railing ladder. 2) High Personnel with work training should do this job.
63	Plastic Injection	Plastic injection working area	Hopper That their sleds are cramped	Cramped When the skids are pulled by applying a sudden - hard force, the upper covers will fall on the head of the working operator, shoulder, etc. if they are not well locked and will cause an accident.	Operator	Injury, limb Loss, death	1	3	40	120	1) Hoppers (Feed Funnel) to clean Hopper Skids must be suitable, skids should not create a congestion
64	Plastic Injection	Plastic injection working area	Mold change, adjustment processes	Staff adjusting the mold by going on the machine	Operator, Maintenance Staff	Don't fall, Injury, death	3	3	40	360	1) Work should be done with the help of a ladder. 2) A protected ladder in accordance with the standards Revised in a way Should be 3) Personnel who will work at height By giving the necessary training, the work of untrained personnel should be prevented. 4) The stairs are in

											force Standard And regulations (BS EN 131).
65	Plastic Injection	Plastic injection working area	Mold change, adjustment processes	Employee's manual intervention in the mold while placing the mold in the machine with the help of a crane	Mold maintenance personnel	Hand, finger Jamming	0,5	3	40	60	1) Employees should not interfere with the mold by hand.
66	Plastic Injection	Plastic injection machine	No body grounding of the machines	Electric shock	Operators, Maintenance Staff	Whole body	3	6	40	720	1) Periodic checks should be carried out.

IV. Conclusion

Ensuring compliance with occupational health and safety regulations is of paramount importance for all businesses. In light of this imperative, a series of measures have been instated within the purview of legal mandates. These measures are designed to ensure employee safety, enhance production process efficiency, and ensure the sustainability of the business. Ensuring production safety facilitates the achievement of higher quality and more efficient products, while measures taken to protect employees contribute to the overall security of the business. Such practices serve as a cornerstone for businesses in achieving their long-term goals.

The selection of the appropriate risk assessment method plays a crucial role in the risk evaluation process. Research has demonstrated the existence of diverse assessment methodologies. One such method is the Fine-Kinney method. This method, particularly well-suited to small enterprises and the construction sector, enables a systematic analysis of risk factors. Its popularity stems from its user-friendly interface and its clear methodological framework.

The present study is grounded in an automotive supply factory that produces components such as hood rods, stabilizer bars, and helical springs. In this study, the risks associated with the production process of hood rods, from the procurement of raw materials to shipment, were systematically evaluated. A total of 66 risks were identified, including 13 that were classified as insignificant, 16 as significant, 22 as probable, and 15 as intolerable. Among these risks, 13 were classified as insignificant, 16 as significant, 22 as probable, and 15 as intolerable. The determination of necessary precautions and the establishment of deadlines for corrective actions followed.

As part of the risk assessment process, the following recommended control mechanisms were proposed: the provision of training to increase employee awareness, the preparation of necessary instructions for safe workplace practices, the implementation of protective measures against hazardous equipment, and the enhancement of on-site inspections.

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