



Ergonomics in the Welding Environment

INTRODUCTION

Ergonomics is an applied science concerned with designing and arranging things people use so that the people and things interact most efficiently and safely. Ergonomics is also called Human Factors Engineering. It involves making the workplace fit the needs of workers. It does not try to make workers adjust to the workplace. When a workplace is designed properly, the worker feels comfortable. Quality and production increase. Everyone benefits.

NATURE OF THE HAZARD

Welding introduces many ergonomic challenges. Welding often requires awkward body positions. Body position and time are key factors in causing injuries.

OBJECTIVES OF ERGONOMICS

- Reduce injuries and disorders
- Ensure worker safety
- Ensure worker health
- Ensure worker productivity
- Reduce compensation costs
- Reduce absenteeism
- Comply with regulations

Ergonomics focuses on changing things (tools, equipment, facilities, etc.), not changing people.

PROBLEMS FROM POOR ERGONOMICS

- Musculoskeletal Disorders (MSDs)
- Repetitive Motion Injury
- Lower productivity
- Lower quality
- Worker dissatisfaction
- Increased absenteeism
- Increased compensation costs
- Increased turnover rate
- Decreased compliance with regulations
- Increased insurance costs

SOME CAUSES OF THE PROBLEMS

- Reaching
- Bending
- Heavy lifting
- Using continuous force
- Working with vibrating equipment
- Repetitive motions
- Awkward postures
- Temperature
- Noise

SOME SYMPTOMS OF MUSCULOSKELETAL DISORDERS

- Less gripping strength
- Less range of motion
- Loss of muscle function
- Painful joints
- Pain, tingling, or numbness

- Shooting or stabbing pains
- Swelling or inflammation
- Stiffness or burning sensation

POSSIBLE SOLUTIONS TO PROBLEMS

- Recognize that often Repetitive Motion Injury is mistakenly felt to be a type of short-term weakness or fatigue. Actually, it is the start of potentially more serious injuries.
- Address complaints in a timely manner.
- Get employee input.
- Interact with the worker. Discuss possible solutions. Give the employee ownership of any new plans. Promote employee acceptance of solutions.
- Redesign the workstation with the employees' help. Employees should feel part of the process.
- Utilize gravity when it can help move material to the work area or station. This helps to prevent unnecessary material handling.

PRACTICAL SOLUTIONS—HOW TO AVOID THE HAZARDS

- Avoid fixed work positions. They reduce the blood supply to muscles.
- Keep elbows close to the body.
- Avoid positions where arms are raised above shoulder level.
- Use lighter hand tools.
- Suspend tools.
- Support your elbows.
- Provide sufficient rest.
- Utilize jigs and fixtures.
- Use proper personal protective equipment

WORKSTATION DESIGN FACTORS

- Position of the work
- Physical ability of the worker
- Design and weight of the tools
- Body mechanics of the operation
- Type of protective equipment used
- Workspace / environment (size, lighting, temperature, noise, vibration, etc.)
- Physical requirements of the job (lifting, turning, reaching, etc.)
- Mental requirements (motivation, alertness, concentration)
- Strength and size of the workers

SUMMARY

Consider ergonomic solutions for all welding situations. Many can be improved. Evaluate and apply ergonomic principles. Use suggested PRACTICAL SOLUTIONS and avoid the hazards.

INFORMATION SOURCES

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