



An overview by Johanna DeMaine

Through knowledge and commonsense we can empower ourselves to work safely within a potentially hazardous environment by taking responsibility for ourselves and our actions.

Zamek observes that while many ceramicists have questions about dramatic health concerns such as respiratory disease or heavy metal poisoning from clays and glazes, the mundane, seemingly insignificant events in the studio pose the most common risks and the average ceramic artist will face four common hazards frequently: back pain, burns, cuts and Carpal Tunnel Syndrome. In a nutshell the main Health and Safety issues in ceramics involve:

- the hazardous nature of some of the materials that are used
- the ergonomics of the tasks undertaken
- the work practices involved.



Now then is the time to examine how we work and how we should look after our bodies. This article identifies ergonomics and how an understanding of this concept will enable us to:

- listen to our bodies
- recognise the problems and the potential for problems
- look at prevention strategies
- develop good safe work habits.

What is Ergonomics?

The term ergonomics is a combination of two Greek words: “ergos” meaning “work” and “nomos” meaning “the study of”. Ergonomics then is the study or science of work. The Board of Certification for Professional Ergonomics (BCPE) defines ergonomics as:

a body of knowledge about human abilities, human limitations and human characteristics that are relevant to design. Ergonomic design is the application of this body of knowledge for the design of tools, machine systems, tasks, jobs and environments for safe, comfortable and effective human use. (BCPE, 1993)



In other words, it is the study of how the task is best fitted to the person.

There are two branches of study, which have considerable overlap:

- One deals with the physical aspects of work and human capabilities, such as force, posture and repetition.
- The other concentrates on the psychological aspects of work, such as mental loading and decision-making.

Ergonomics is about ensuring a good “fit” between people and the things they use.

The Workplace

The work setting can be influenced by the following variables:

- People vary enormously in height and weight, in physical strength, the ability to handle information, intellect and expectations. To put it succinctly, we are all INDIVIDUALS.
- Physical objects used vary greatly – materials, tools, furniture.
- Work environments created by lighting, climate, noise, vibration etc. vary significantly.

The interaction of these variables determines how a task is performed. The skeleton, central to which is the spine, supports the human body. Muscles, tendons and ligaments hold the skeleton together and these are controlled by the nervous system. Muscles provide the power to make joints move or hold a fixed position. If any repeated activity is performed incorrectly, muscle pain, upper limb disorders and lower back injury can result. How we sit, stand, move and work can affect our bodies, both in the short and long term.

Work Risk Factors

There are certain features in the workplace that can be associated with risks that can predispose us to injury. The risk factors can be categorised according to the types of interactions.

1. Physical Characteristics: the interaction between the worker and the work setting; it is affected by the following:

- posture
- force
- duration
- velocity, acceleration
- repetition
- recovery time
- heavy dynamics

2. Environmental Characteristics: the interaction of the worker with the environment; this can cause:

- heat stress
- cold stress
- whole body vibration
- lighting
- noise

Posture is the way the body is used for activities. Continuing to twist while using force to perform a task can lead to severe muscle tension and stress. Force or exertion necessary, length of time as well as the velocity or speed at which an activity is performed, together with the subsequent relaxation of the muscles in question, all contribute to performance. For instance, gripping things with the fingers in a pinching motion rather than grasping with the whole hand causes a greater degree of stress, and if this is continuous without a time for the muscles and nerve endings to recover, injury could result. Lifting incorrectly can also lead to injury. By designing tasks, equipment and work stations to suit the operator, errors, accidents and ill health can be monitored and reduced. Effective use of ergonomics will make work/activity safer, healthier and more productive. How then does this actually translate to our field of ceramics and what are the solutions we can best tap into for prevention of injuries and stress to our bodies?

Proactive Approaches for Ceramics

Lifting, sitting and manual handling are at the core of ceramics activity. We lift clay and kiln shelves, without thinking. We sit at the wheel or at the workbench to shape the clay as well as making repetitious movements when we decorate or hand-build. The following are observations that are universal.

1. Lifting

- Weight is not the only factor to consider. Bending, twisting and reaching over for long periods also need to be taken into consideration.
- Lift with the object close to the body, legs apart and slightly bent. Use the strength in your legs to lift, not the strength in your back or arms. Do not bend from the waist for things on the ground; rather bring your body down by bending your knees.
- Store equipment between knee and shoulder height.
- Use a ladder when reaching above shoulder height.
- Use a trolley when moving heavy items. If you don't have a trolley, break up the items into smaller sizes and make more trips.
- Where possible put wheels or a dolly under storage bins and use a movable stillage (ware rack).

2. Sitting at the wheel

- Make sure the seat is at the same level as the wheel head. If the seat is higher or lower it can cause back distress.
- Bend from the hips not from the waist.
- Pivot your elbows on your thighs to make a triangle when throwing. Use leverage.
- Use your body weight to throw, not just the muscles in your arms and shoulders.

3. Sitting at the work bench

Make sure that the table or workbench is the right height for you. Adjust your chair height so your elbows are at right angles to or slightly higher than the workbench.

- Use a footrest so your knees are at right angles to or slightly higher than your seat.
- Where possible, use an arm rest to support the forearm when decorating.
- Consider that a chair on wheels needs extra muscle contraction to create stability. Do you really need it?
- Use a lumbar support where possible.
- Have a seat that is adjustable in both angle and height.
- Have a swivel seat so you are not twisting and reaching across your body.

4. Standing

- Use an anti-fatigue mat when standing to work for any length of time.
- Tables for working whilst standing should be approximately at navel height so your elbows are just slightly higher than the tabletop. If sitting at a high table, use a stool.

5. General

- Try to have things within easy reach so you are not twisting your body to pick up tools or work. Above all, break up any repetitious activity so your body has recovery time. Do this by varying your work pattern.
- Change from one task to another. Don't spend more than 30-45 minutes at one specific intense task, e.g. decorating.
- Make your workstations to incorporate as many of these features as possible. Make your workstation specifically to suit your body type and activity. Plan your workspace to incorporate as many of the above
- observations as possible.
- Take time out to do some gentle stretching or isometrics while working to deactivate stressed muscles.

I make the analogy of the body being like any other machine. If you don't look after it, it will break down. Be kind to it. Empower yourself through knowledge and commonsense.

Suggested Reading

Safe and best work practices employed in industry, for the hand-painted decoration of porcelain and ceramics, Johanna DeMaine, Churchill Fellowship Report

<http://johanna.demaine.org/index.php?type=library&showdocument=5&id=4>

Hazards in Ceramics: www.goshen.edu/art/DeptPgs/Hazards.html

Health, Safety and Environment Induction Booklet, Royal Doulton Health, Safety and Environment Department, September 1998, Minton House, Stoke-on-Trent, ST4 7QD, UK

Ergonomic Concepts: www.ergoweb.com

<http://johanna.demaine.org>

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