

Ceramics

Industry

Advisory

Committee

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## Picking up the pieces

Prevention of musculoskeletal  
disorders in the ceramics industry



*Members of the Ceramics Industry Advisory Committee*

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# **Picking up the pieces**

Prevention of musculoskeletal  
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## PREFACE

***“We have too many malingerers in British industry who complain about the slightest pain or twinge and are not prepared to put their backs into the job.”***

Attitudes like that are one reason why it appeared, from the Labour Force Survey of 1990, that:

- 5.4 million working days were lost as a result of a musculoskeletal disorder caused or made worse by work (of these, about half - 2.8 million - were due to back problems);
- 964 000 people suffered from a musculoskeletal disorder which they believed was caused or made worse by work (including 493 000 back injuries and 155 000 upper limb disorders); and
- in over 60% of cases, people saw their condition as caused and not merely aggravated by work.

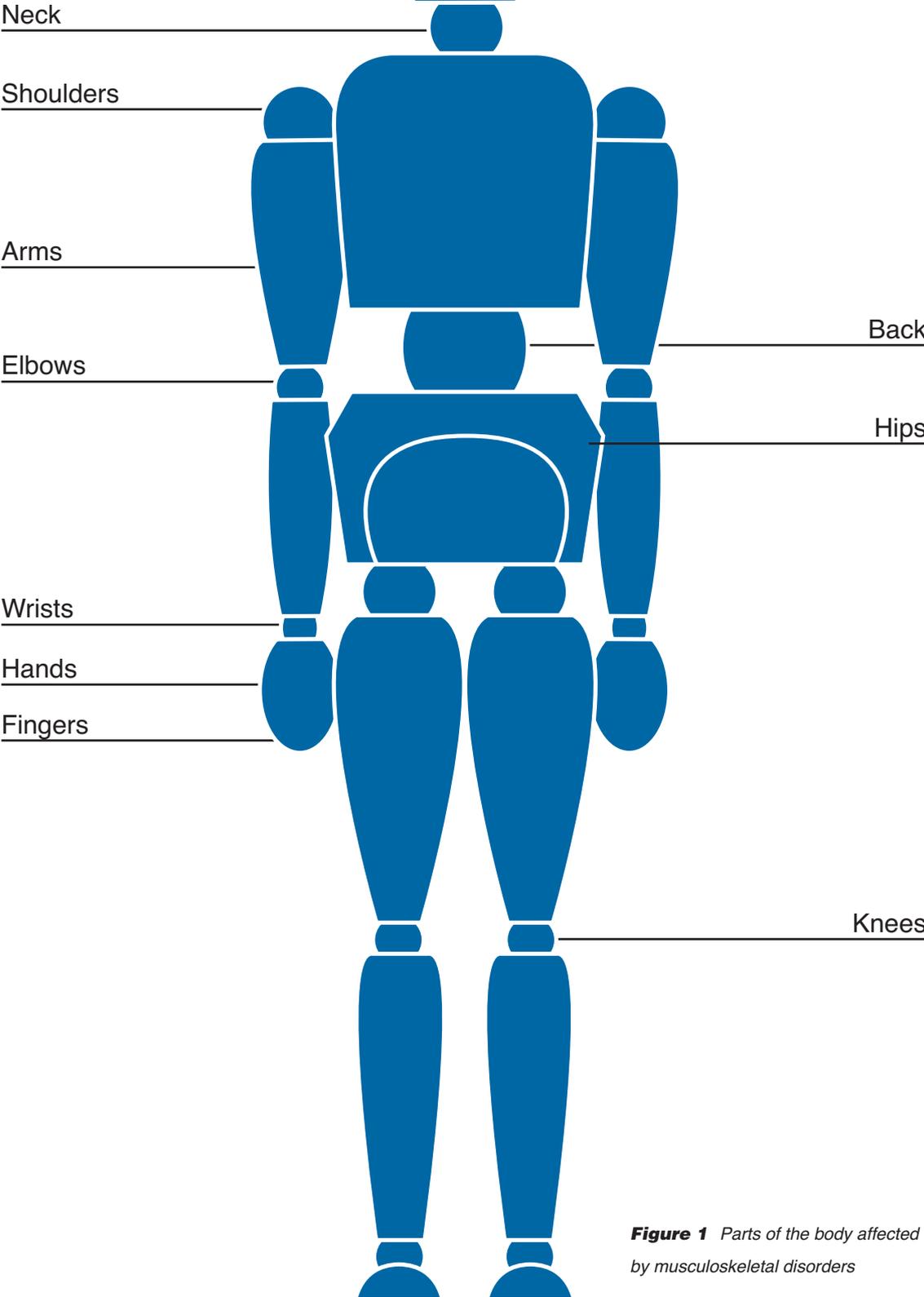
Adopting a policy to prevent these injuries brings two major benefits:

- less pain, less inconvenience and less reduction of earnings for individual employees; and
- more output of better quality than can be achieved when skilled employees are off sick or unable to perform at their best.

This book aims to give practical guidance to established ceramic companies who may already have experienced difficulties from musculoskeletal disorders and want to know what to do about prevention. It is also for new employers who can avoid problems from the start by looking carefully at training and work design.

UPPER LIMB  
DISORDERS (ULDs)  
are conditions that  
can affect:

MANUAL HANDLING  
INJURIES  
can also affect:



**Figure 1** Parts of the body affected by musculoskeletal disorders

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## WHAT ARE MUSCULOSKELETAL DISORDERS?

1 You have heard of writers' cramp and tennis elbow - these are only two of a whole family of aches, pains and difficulties in movement which seem to arise from particular activities and are called 'musculoskeletal disorders'. Some happen in sport or DIY, some affect the shoulders or back rather than hands, arms and wrists, some are very hard for doctors to pinpoint. But whatever the problems of scientific definition or diagnosis, there is a clear enough pattern of some of these disorders being linked to work, so employers need to be concerned.

2 Symptoms may occur straight away, for example sprains and strains causing pain and immediate loss or restriction of movement. Alternatively, initial tingling, slight swelling or soreness may persist and worsen gradually. They can affect anyone and almost any part of the body (see Figure 1). Initially employees may adapt the way they perform tasks, avoiding the use of the affected limb - and putting strain on other joints. What starts with discomfort can lead to long-term disability, requiring the sufferer to change jobs or stop working completely. Therefore it is important to ensure that employees are encouraged to report the earliest sign of any symptoms.

### Who's picking up the pieces?

3 Around 40% of all accidents reported by the ceramics industry to the Health and Safety Executive (HSE) are strains, sprains and other musculoskeletal injuries from manual handling and lifting. These are just the more serious accidents in which over three days' work are lost. A survey showed that a typical handling accident reported to HSE resulted, on average, in 3-4 weeks' absence when back injuries were involved. And there are many other people who, at some time, suffer discomfort arising from the way they do their work - perhaps their seating or posture is bad, or the bench is too high, or the work requires them to reach awkwardly so that muscles, tendons and joints become painful. This not only creates suffering for individuals, but it will lead to inefficiency and significant losses in production. If they take time off work they will need to be paid and replacements found. New workers will need to be trained and will, perhaps, be more likely to suffer from a musculoskeletal injury because they are not used to doing the work. In potteries, damage to the ware is obvious; unwitting damage to the workforce may be less apparent, but is costly to all concerned.

### Why do you need to take action?

4 Some reasons are given earlier and recent regulations also require you to assess health and safety risks to your workers. They are the:

- Management of Health and Safety at Work Regulations 1992;
- Manual Handling Operations Regulations 1992;
- Display Screen Equipment Regulations 1992.

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5 Compensation awards are increasing in number and size and this may affect your insurance premium. Adapting jobs to suit the individuals doing them often reduces fatigue and increases motivation and satisfaction. This leads to increased productivity and better health and well-being for both the employees and the company.

**Why is there a problem in the ceramics industry?**

6 There is a particular problem in the ceramics industry because it involves a relatively high proportion of handling, carrying and manipulation. Much of this work is highly skilled and simply cannot be avoided or automated. However, you can still take action to reduce the risks.

**How can this book help?**

7 The information in this book will help you identify key problem areas in the ceramics industry and give examples of how to put the main principles which should be used to reduce musculoskeletal disorders into effect. These principles are:

**AVOID** the need for hazardous, very physical and repetitive operations as far as reasonably practicable;

**ASSESS** the risk of injury from any of the above-mentioned operations that cannot be avoided; and

**REDUCE** the risk of injury from these operations as far as reasonably practicable.

8 Three key problem areas are identified in the following sections of this book. Not all solutions are simple and inexpensive, but you will be surprised to see how much can be done at minimal cost to reduce the problem. This may be as simple as providing a proper seat, altering the height of a bench or changing the lighting. Such changes are 'reasonably practicable', ie the benefits of taking action outweigh the cost needed to bring about the improvements. However, it makes sense to pilot some changes in work design at one or two places before extending them or unforeseen problems and unnecessary expense may result. A planned approach by stages should also help to make changes acceptable to the employees concerned.

**When you've read the book, what should you do?**

9 This book will not give the answer to all your problems. However, it gives practical examples of the basic principles of job design to help you and often, once understood, they appear no more than common sense. You can use or adapt the ideas to provide solutions for other problems. Records of injuries and sickness absence would also be a way of identifying particular areas which may require priority action. Useful clues can be picked up from habits employees have adopted because they seem to make jobs easier - standing on boxes, wearing bandages or splints on the wrists, bringing cushions for seats, or calling on a colleague to help perform a particular task because of their height, reach, particular agility or strength.

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10 As well as recognising problems identified in this book or reported in the workplace, employers can take the initiative to make improvements for themselves. They can use existing methods for getting the ideas of the workforce on production matters or other health and safety issues to highlight ergonomic problems, or glean tips from trade journals, exhibitions and other contacts in the industry. Proposed new plant and changes to production methods can be scrutinised for risks of musculoskeletal disorder, but these gains will be made only if they are planned.

**Does this book explain how to complete the assessments?**

11 Not in full. Further guidance is provided in *Upper limb disorders: assessing the risks* and secondly *Getting to grips with manual handling*. There are summaries of tables from these booklets in Appendix 1 which you may find helpful. Full details of these free publications and other useful publications are listed in the Bibliography in Appendix 2.

**What action should employees take?**

12 Just altering the physical arrangements for a job will not be successful without gaining the employees' understanding and co-operation from the outset. They are the people best placed to say whether any proposed changes will create other difficulties or where 'fine tuning' is needed to make them acceptable. Even if you believe you have found the optimum solution at the first attempt, remember that sometimes people need time or help to get used to new ways of working. Of course, the reporting of even minor signs of musculo-skeletal disorders suffered by employees should be encouraged so that early action can be taken. Employees should be made to feel that they can play a part in identifying problem tasks and possible solutions.

**Where can you find further information?**

13 HSE has produced a lot of practical guidance which addresses general and common problems facing wide cross-sections of industry. *Manual handling: solutions you can handle* provides 80 or so typical ideas which may solve your manual handling problems. *A pain in your workplace: ergonomic problems and solutions* gives examples of around 80 actual case study solutions for a broad range of activities paying particular attention to upper limb disorders. See the Bibliography in Appendix 2 for details.

**Two notes of caution**

14 The rest of this book is split up into three sections but they should be considered as different angles of the same problem. Sometimes it is appropriate to consider these particular aspects in isolation and sometimes they are best considered in combination. Only you can decide the best way forward.

15 Other health and safety requirements need to be kept in mind when workstations are being redesigned, otherwise it is possible to make a task less strenuous, but at the same time hazardous in another way. For example, you could make it more difficult to work close enough to dust control equipment in fettling operations or reducing machinery guarding standards. Health and safety regulations require you to assess all these risks.

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## POSTURE AND SEATING

16 Standing in one spot for long periods and sitting on unsuitable chairs can lead to tiredness, discomfort and inefficiency. Poor posture and seating can also cause chronic musculoskeletal problems (especially back pain), and contribute to work-related upper limb disorders, and injuries from manual handling/lifting.

**Questions you should ask**

17 Are employees required to carry out jobs standing up which could be done sitting down? Well-designed workstations with seating can be provided for many jobs like sponging, fettling, glaze dipping, decoration and selection. In general, if tasks requiring fine manipulation, high visual attention or highly repetitive movements, or involving employees of very different heights are being performed for more than half the day, they should be done seated. Both the employees and the work will benefit. If seating is provided it is particularly important to get the dimensions right. Chairs should have adjustable seats and you should also provide backrests and footrests.

18 If the work cannot be done on a conventional chair, can other means of support for the upper body be provided? This could take the form of a support for the employee to lean against to take the strain off the lower limbs. This could be desirable where a lot of reaching is needed to select ware from conveyors in the processes described in paragraph 17.

19 For some jobs, standing is better, especially if the work is intermittent or involves extended reach and the use of force, for example when large pieces of ware have to be manoeuvred.



**Figure 2** Standing and sitting positions are adopted for fettling ware of different sizes

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20 If the job has to be done standing, does the employee have enough scope to change position? Standing itself is not bad if an element of whole body movement is allowed. Dippers, for example, often adopt a 'dancing' rhythm unconsciously so that they are not completely static. It is often possible to adjust the height or angle of the workbench to reduce the amount of bending, stooping and crouching. Can the workpiece be placed on a turntable to avoid unnecessary reaching? These solutions should be considered for moulding and all operations on large items of ware, particularly sanitaryware.



**Figure 3** *The ware is on a turntable but can it be presented at a less awkward height without encouraging the employee to bring his/her breathing zone nearer the dust source?*

21 Does the job have enough natural breaks to make it sensible to provide seating nearby? This is often possible for filtering and milling processes and work at kilns. Can job rotation be implemented particularly when one job requiring a lot of standing or awkward postures could be shared with another job which may be seated or uses different postures?

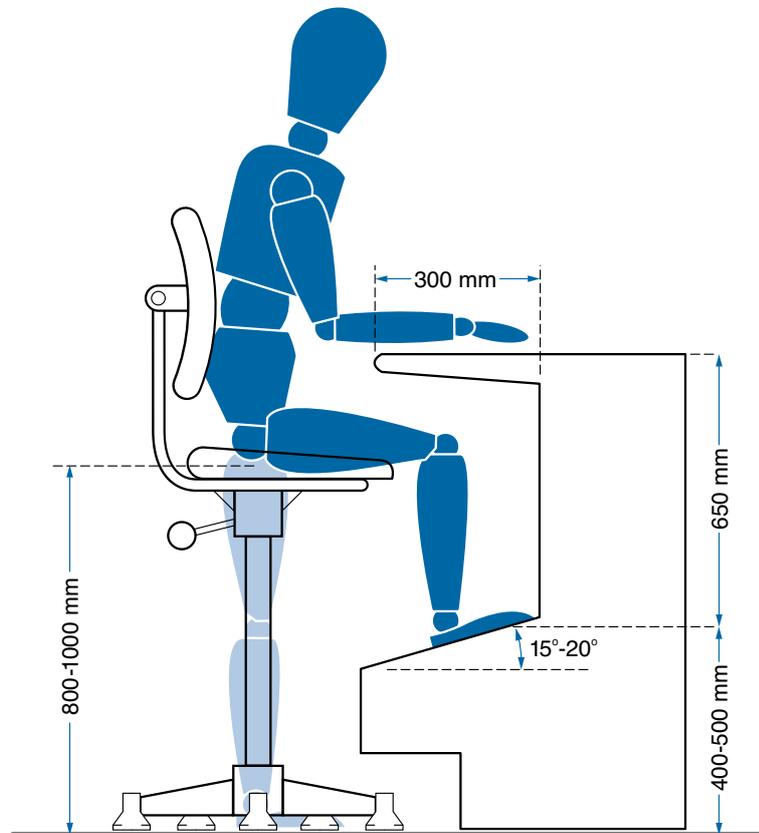
22 It is normally possible to complete modifications at minimal cost at existing workstations to avoid long-term posture problems. When you are laying out a new process area, the cost of ensuring it is designed and built to comply with best ergonomic practice is usually negligible. The costs of failing to do so in terms of injury, suffering and loss of production efficiency etc may be significant.

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23 When it comes to seating, look at the seating provided in the areas where employees take their breaks and meals, as well as the process areas. Now is the time to conduct a survey of seating in your pottery. Is it in good repair? Have employees completed their own adaptations, eg blocks under the feet of the chair, home-made footrests, pads of foam on the seats? Is the employee's torso near vertical or is it leaning forwards over the workbench?



**Figure 4** Adjustable seating provided in a warehouse. Some employees prefer a style of seat (left), that allows the legs room to go as far beneath the top as required, and the feet to rest under the bench



**Figure 5** Suggested dimensions for workstations where workers can sit or stand. Adjustment should be available to accommodate any particular individual's requirements

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The checklists at the end of this section should help you when completing inspections.



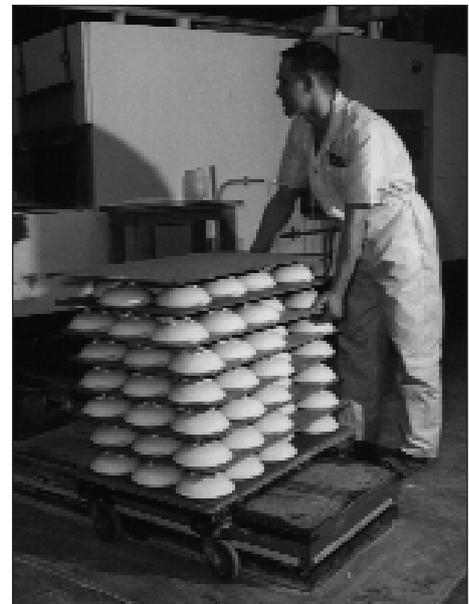
**Figure 6** This hydraulic raising turntable enables constant work height to be maintained while loading kiln cars by rotating and raising/lowering

#### **CHECKLIST FOR WORKSTATION**

- Are the work and all equipment/machine controls in frequent use within easy reach (about 620 mm) and at a suitable height?
- Is the lighting adequate for the task and correctly positioned (or adjustable if necessary)?
- Is the seated employee able to work with hands at about elbow level or lower?
- Does the height of the work surface which is suitable for hands and arms leave enough space for the legs? (Clearance between underside of worktop and seat should be about 200 mm.)
- Can employees stretch their legs and change position?
- Is there clearance for armrests if required?



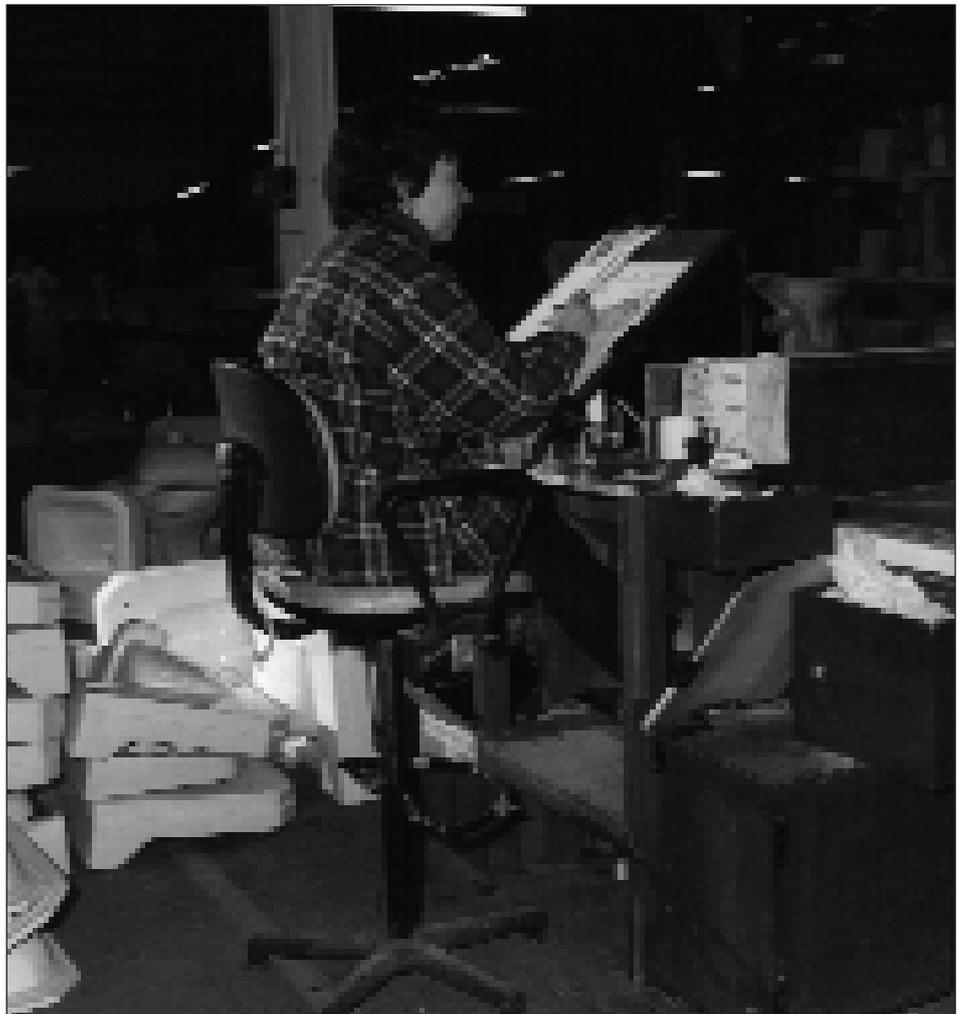
**Figure 7** Workstation for sponging/green fettling with easy access to multi-level conveyor and working surfaces



**Figure 8** An adjustable height workstation for a glaze dipper. The work table can be adjusted by a pedal as ware is transferred to the dipping bowl to allow the glaze dipper to work continuously at the same level without the need for crouching or stooping. (This modification has, in the firm's view, paid for itself in better production.)



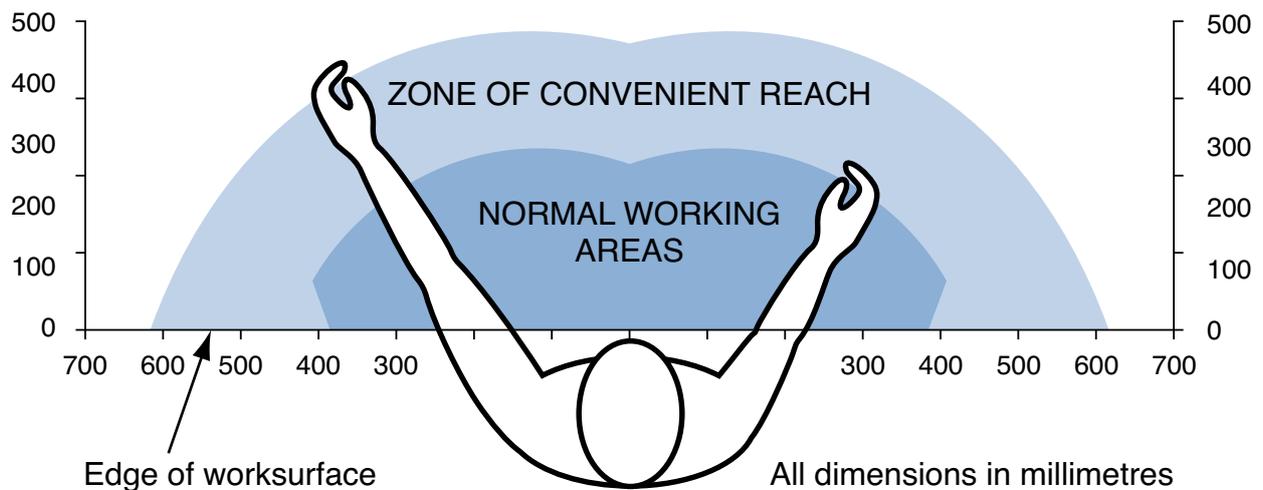
**Figure 9** Shovelling into saggars (left) compared with metered dispensing of powders (right). As in the case of returning scrap to blungers, improved handling methods also reduce exposure to hazardous substances



**Figure 10** This checking job requires a raised viewpoint with seat and footrest to match.

### CHECKLIST FOR SEATING

- Is the height of the seat adjustable?
- Is the centre of the backrest at a suitable height and is it adjustable for different angles with the seat?
- Are the backrest, armrest (if fitted) and seat (especially the front edge), firmly padded?
- Will the seat tilt back and forward to a small degree?
- Does the work involve movements that would make a mobile chair, ie with castors, more convenient?
- If it is not possible to put the feet flat on the floor, is an adequate footrest provided?
- Are adjustments to seat height and backrest angle easily made? Regular maintenance is essential, as well as good initial design.
- Employees with mobility problems may also need special consideration, eg higher seats tilted forward and armrests but no castors for those with problems in getting up from a chair, special access arrangements and bench adjustments for wheelchairs, high backrests for people with back/neck/shoulder pain.



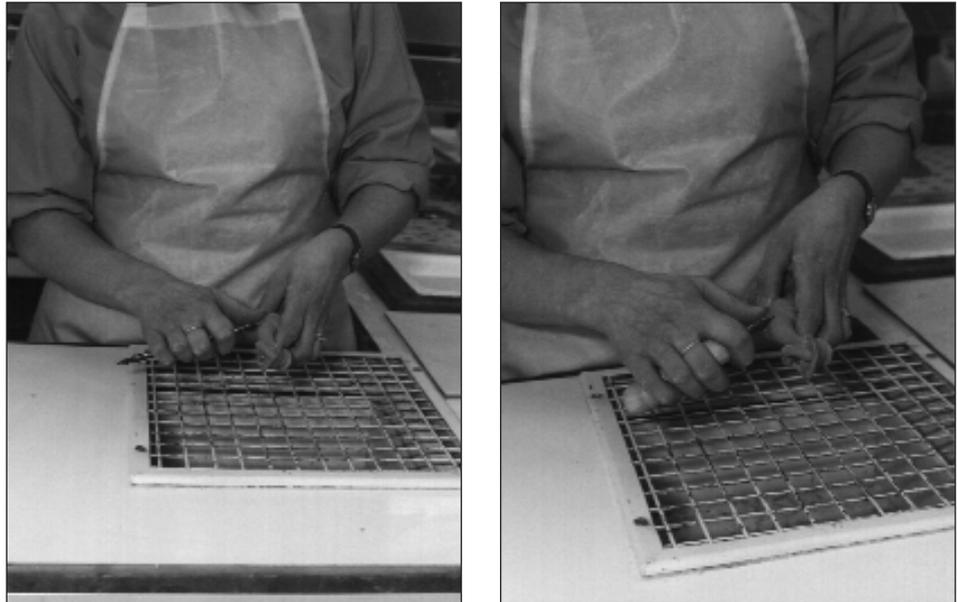
**Figure 11** Appropriate reach distances in the horizontal plane (for 95% of women)

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## WORK-RELATED UPPER LIMB DISORDERS

24 In the last 10 years the ceramics industry has become increasingly aware of problems like tenosynovitis, repetitive strain injury (RSI) etc affecting the hand, wrist and forearm, or upper arm. As a group, these are now called work-related upper limb disorders (WRULDs). The term covers a range of soft tissue disorders of the upper limbs, shoulders and neck, resulting in anything from mild discomfort in hands and wrists to swelling, cramping pain and disability if undetected and allowed to progress. Such symptoms can be found among casters, makers, fettlers, spongers, selectors, lithographers and decorators.

25 We know that many people have suffered and lost time from work as a result of these injuries. Prior to 1 April 1996, unless the injuries could be linked to a specific incident, there was no requirement to keep official records of time lost and the number of injuries. Since 1 April 1996 (when the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 came into force), this situation has changed. The list of Reportable Diseases now covers many of the conditions which were previously outside the requirement to report and keep records. About 100 claims a year have been lodged with the Ceramics and Allied Trades Union (CATU), 75% from women, and this figure is increasing. Women are not necessarily more susceptible but may be concentrated in jobs with high risk factors.

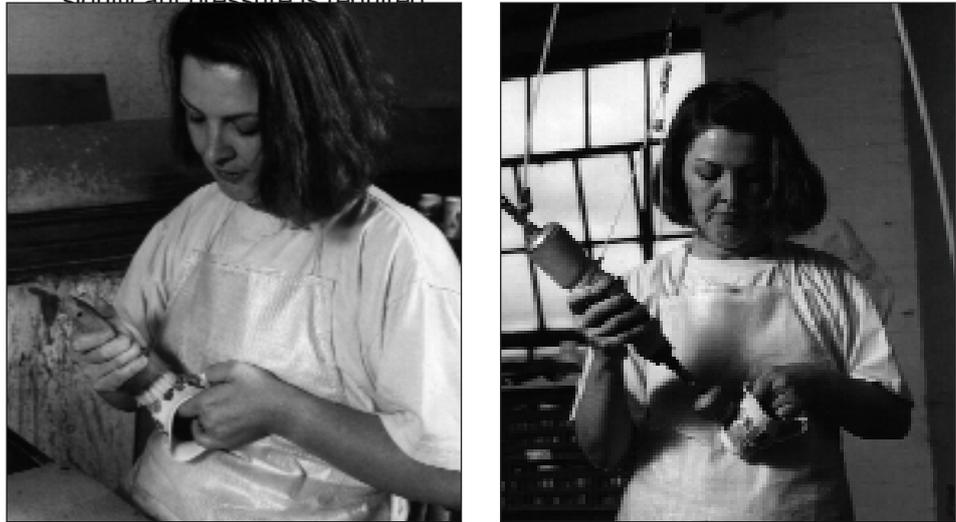


**Figure 12** Modified fettling tool (right) reduces the pinching grip needed

26 The precise causes of an individual's symptoms may not always be easy to establish, but the following factors, alone or in combination, are linked with an increased risk of developing WRULD. Look out for them when making your assessments.

- Awkward orientation of hand or arm.
- Excessive manual force required to carry out or control the job.

- Over-reaching outwards or upwards.
- Frequent repetitive movements over a long period with inadequate rest time to recover - perhaps because the job is machine paced.
- Inappropriately designed hand tools.
- Twisting/gripping/squeezing movements for which the exertion of significant pressure is required



**Figure 13** Buffing causes flexion of left hand and awkward grasping action of the right wrist. A tool with the weight supported by a wire hawser helps to reduce force required (right)



**Figure 14** Selection - the fingers of the left hand are spread to hold the plate. It may not be possible to change the work method, though job rotation could be considered

27 Look around your workplaces for risk factors and consider how to reorganise the work and redesign the workplace to reduce these factors. Pay particular attention to how the employee grips the tool or ware. It may be

possible to redesign the handle/grip point on the tool.

28 Training and refresher training on the risks and on the correct working techniques for each job are important. Employees should be advised on the symptoms to look out for and encouraged to report them early.

29 Employers should take a constructive approach. Problems *can* be designed out of the system.

30 Automation will remove some of these problems but until then employers with risky processes need to be aware - some experiments and rotations have failed. You will need to be vigilant.



**Figure 15** Vacuum tool gives a 'third hand' to help in decorating



**Figure 16** Where mould turning is a frequent/continuous activity, job rotation should



**Figure 17** Sponging. The left hand maintains an open continuous grip, while the manipulative sponging operation is completed by the right



**Figure 18** Where frequent reaching over head height is needed, a simple platform can help to reduce injury potential (and to

**'RSI claims' submitted to the Ceramic and Allied Trades Union (November 1989 to November 1991)**

*hand. This task could cause problems*

*accommodate people of different heights)*

**Sectors**

China	95	(78F, 17M)*
Earthenware	75	(60F, 15M)
Tiles	8	(4F, 4M)
Sanitaryware	7	(1F, 6M)
Electric porcelain	4	(2F, 2M)
Refractories	2	(2F, 0M)
Misc	6	(5F, 1M)

\* F = Females, M = Males

**Sectors**

Lithographer	24
Selector	24
Maker	24
Caster	21
Decorator	16
Fettler	12
Sponger	9
Dipper	6
Inspector	5
Packer	7
Labourer	10
Others	39

31 Apart from firms' quantifiable costs of any established claims (in sick pay, effects on insurance premiums etc), there are considerable hidden costs in resulting inefficiency and paperwork, as well as the costs in pain and loss of earnings to individuals.

**ULDs IN THE WORKPLACE - CHECKLIST**

This checklist is closely based on one from *Upper limb disorders: assessing the risks* - see Appendix 2: Bibliography for details.

<i>Risk factor</i>	<i>Action required</i>
<b>INITIAL ASSESSMENT. DOES THE JOB INVOLVE A LOT OF:</b>	
Frequent or forceful or awkward	Gripping (a tool or workpiece)? Squeezing (for example tool handles)? Twisting? Reaching? Moving things (pushing, pulling, lifting)? Finger/hand movement (for example keyboard work)?
<b>ARE THERE ANY WARNING SIGNS OF ULDs?</b> For example, are there:	
<input type="checkbox"/> actual cases of ULDs in this or similar work? <input type="checkbox"/> complaints by employees, for example aches and pains in hands, wrists, arms, shoulder etc? Ask your employees if they have any of these symptoms. <input type="checkbox"/> home-made, improvised changes to workstations or tools? (For example handles cushioned or made longer.)	If your answer is 'yes' to any of the questions in the left hand column in this section, there may be a risk of ULDs in your workplace. You should go on to do the full risk assessment on the following pages.

<i>Risk factor</i>	<i>Action required</i>
<b>FULL RISK ASSESSMENT</b>	
Are there any factors in the job that make ULDs <i>likely</i> , such as:	
<b>NEED FOR A LOT OF FORCE</b>	
Does the job involve:	
<input type="checkbox"/> strong force at the same time as awkward movements or posture, for example bent wrists, work with arms raised or fully extended?	Redesign workstation, for example - reposition supply of components to reduce reaching required; - move controls to a more convenient position.
<input type="checkbox"/> forceful use of hand/forearm muscles?	Redesign job, workstation, and/or tools to avoid over-use of the hand or forearm. Maintain tools, for example keep them sharp and lubricated for ease of use.
<input type="checkbox"/> trying to make do with ill-fitting components by forcing them into place?	Improve quality of components, or provide suitable tools for fitting them.

*Risk factor*

*Action required*

tools not ideal for repetitive or frequent use - particularly if squeezing, twisting, or hammering actions required?

Replace domestic or DIY hand tools with tools designed for repetitive industrial use. Redesign tool handles to achieve even distribution of force across hand (power grip preferable to pinch grip) and straight rather than bent wrists. Consider replacing hand tools with power tools. Reduce squeezing forces by using weaker springs in triggers etc.

using equipment designed for a larger or stronger person (for example women using tools designed for men)?

Redesign equipment or tool (for example counter-balancing to reduce force required). Provide powered version.

**RAPID, AWKWARD OR FREQUENT MOVEMENT**

Does the job involve:

machine pacing, for example to keep up with conveyor?

Self-pacing is preferable.

frequent repetition of the same small number of movements?

Replan work, for example to break up pause/repetition cycles or spread movement across both hands. Consider adding extra activities to job, to give variety. Consider scope for automation or use of power tools.

awkward movements such as twisting or rotation of the wrist, movement of the wrist from side to side, very bent fingers and wrist, or hand or arm movements beyond a comfortable range?

Redesign workstation, controls or shape of tool handles.

pressures on employees to work fast, for example from piecework or bonus systems?

Consider the need for such systems (but employees may resist change). Better training in ULD risks may help.

**AWKWARD OR STATIC POSTURE**

Does the job involve:

cramped body position, and/or not enough space to change posture?

Improve space available to the employee. Provide adjustable workstation (especially chair) for employees who are above or below average height or shape.

arms stretched or overhead for long periods?

Move materials or controls to a more convenient position.

work at awkwardly high or low height (crouching, stooping, or reaching up)?

Move materials or controls to a more convenient position.

*Risk factor*

*Action required*

poor posture for any other reason?

Has the employee been trained in good working techniques and posture? Is there a need for better seating (adjustable to the correct height for the individual), footrests etc?

**WORK FOR LONG PERIODS WITHOUT BREAKS OR CHANGES OF ACTIVITY**

Does the job involve:

no changes to work routine or variation of tasks?

If possible, vary tasks to provide changes in activity. If not, check there are adequate rest breaks.

no breaks or infrequent breaks?

Check that breaks are taken, especially if work involves continuous effort such as holding tools, or rapidly repeated movements (for example fettling).

the employee not able to have short pauses when desired?

Redesign work to make short pauses possible.

**NO SPECIAL ARRANGEMENTS FOR NEW EMPLOYEES (or those returning to work after a long break)**

Does the job involve:

people having to work at full pace immediately they start (or resume) the job?

Allow recruits to build up their work rate sensibly as they gain experience.

no training in the risk of ULDs and ways employees can reduce risks?

Provide training in skills, posture, and warning symptoms for all those at risk.

**POOR ENVIRONMENTAL CONDITIONS**

Is the work carried out:

in dim light, shadow or flickering light?

Provide better lighting so that employees do not have to adopt awkward postures to see properly.

in cold or otherwise adverse conditions?

Cold may increase the risk of ULDs. If it is not possible to warm the working environment, check that protective clothing is well-designed and does not affect posture or grip.

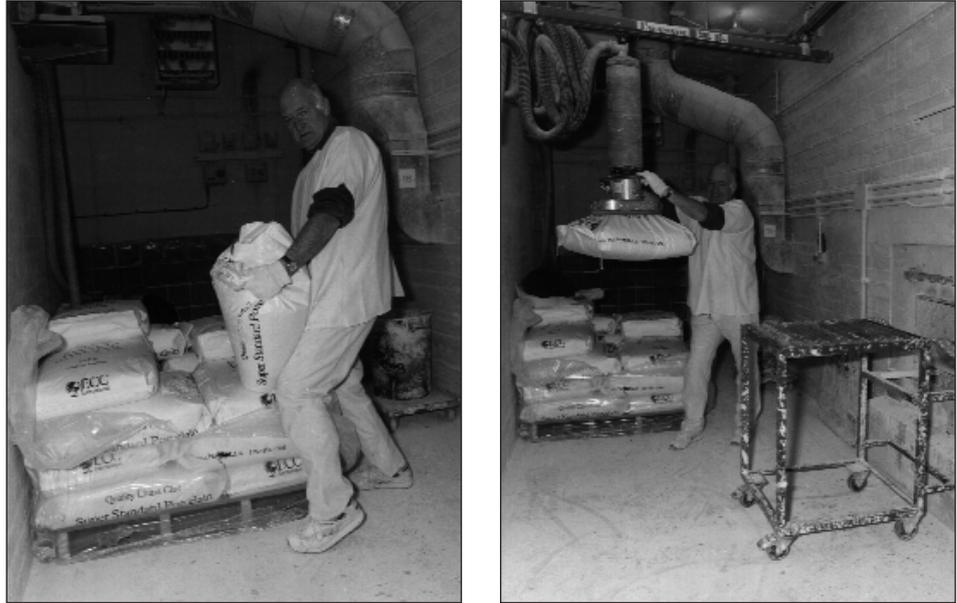
with tools that vibrate?

Consider whether the job can be done another way to avoid the need for high-vibration tools. Or provide vibration-absorbing grip and minimise vibration by proper maintenance.

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## MANUAL HANDLING

32 Manual handling injuries are often seen to be minor and accepted as unavoidable or, at least, preventable where the work is done by trained 'strong people'. In fact, nothing could be further from the truth. Manual handling injuries may rarely be fatal but the pain and cumulative damage caused to limbs, joints and the back can be disabling and result in long periods off work. Strength is no defence against the risks. It is the so-called 'strong' people who may be most at risk of chronic problems. They are more likely to suffer in silence and continue to do unsafe jobs for fear of being considered not up to the job if they complain.



**Figure 19** Manual handling of sacks is made unnecessary by a pneumatic lifting device on a swinging gantry. Where raw materials are still handled, suppliers can be asked about smaller (25 kg) bags. Alternatively, some firms make mechanical handling the only option by changing to much larger (1 tonne) bags

33 Manual handling is not just lifting but includes all manual movement of loads including supporting, pushing and pulling. Many arduous manual handling operations are widespread in the ceramics industry including the feeding of ball mills, blungers and pug mills, unloading filter presses, casting, opening and closing large moulds, loading/unloading kilns and the general movement of raw materials and ware. It is possible to avoid or significantly reduce the manual handling element in almost all these operations. Improvements can be made to existing processes but also new problems can be avoided by looking at plans for new or modified processes to see how strenuous tasks can be designed out.

### What action needs to be taken?

34 The Manual Handling Operations Regulations 1992 set out a framework for dealing with risks to the health and safety of employees from manual handling.

35 The steps that need to be taken are as follows:

- **AVOID** the need for hazardous manual handling, where reasonably practicable.



**Figure 20** Mechanised handling (above) reduces risk from moving filter cakes (top)



**Figure 21** Conveyor removes need for direct manual loading of pugmill



**Figure 22** Piped slip to casting benches

- **ASSESS** the risk of injury from any hazardous manual handling.
- **REDUCE** the risk of injury from hazardous manual handling.

36 If manual handling activities cannot be avoided, the checklist in Appendix 1 can help you to assess the risks effectively. In most cases, selected personnel within your own company will be able to complete assessments. They may include production managers and maintenance managers, as well as individuals with skills in safety and training. The employees should always be involved in the assessments of their workstations and encouraged to come up with practical solutions.



**Figure 23** The small kiln car (left) can be moved easily provided it is well-maintained and the tracks are kept clear but the dog-clutch (centre) and winch (right) were local solutions to reducing risk on larger cars

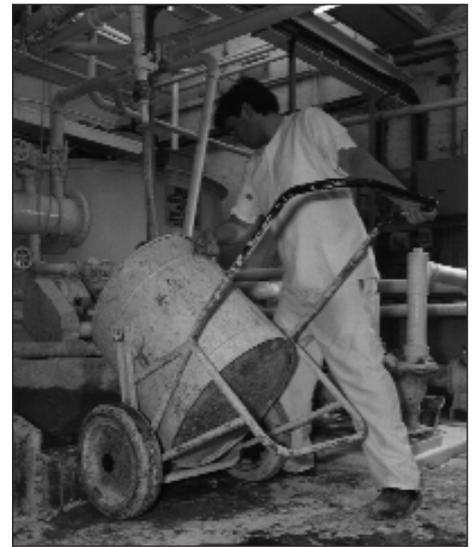
37 The basic aim should be to **reduce** the number of times a particular task needs to be carried out, eg bring workstations **closer** to reduce the distance loads must be handled and reduce handling by use of aids including barrows, trolleys, lift trucks and conveyors.

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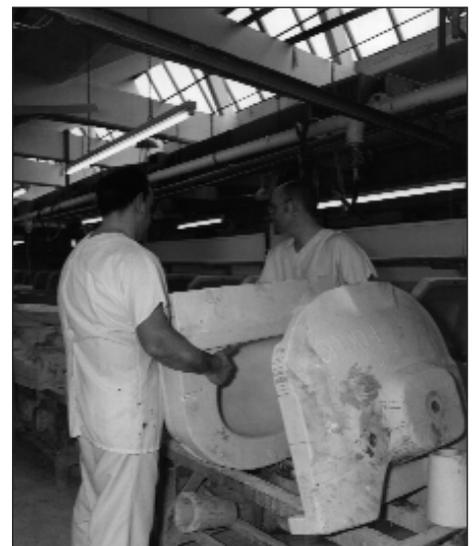
38 Improve the **competency** of the employee, eg encourage the use of good handling techniques and consider training on how to recognise and avoid bad practice in manual handling.



**Figure 24** Aids to manual handling of ware, wareboards and scraps



**Figure 25** Aids to manual handling of slip, plaster and scrap (jug supported from a gantry (right) avoids the holding of the heavy jug (left))



**Figure 26** Co-ordinated pairs lifting together in sanitary ware casting. The cistern (left) is being raised from the mould with special gripping tools

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## APPENDIX 1 TABLES AND CHECKLIST

The following tables are the result of a survey by the British Ceramics Confederation in an attempt to estimate the full extent of manual handling injuries in the industry. For a number of years, manual handling accidents have accounted for about 40% of all accidents reported to HSE (and it is known that the number of reports tends to be significantly less than the number of accidents which ought to be reported by law). About half of these handling accidents appear from sample investigation or enquiry, to be due to the weight of the load. Apart from losses to individuals, each reported accident imposes costs on the employer - estimated on average by one firm as £1700 per accident.

### *BRITISH CERAMICS CONFEDERATION MANUAL HANDLING SURVEY OF THE CERAMICS INDUSTRY 1989-91 (SELECTED JOBS)*

#### *Number of injuries*

	Lift	Put down	Carry	Support	Push	Pull	Other	Total
Caster	102	28	26	18	20	27	3	224
Dipper	20	5	6	2	9	6	1	49
Fitter	31	6	7	4	5	10	2	65
Kiln operator	27	1	11	3	34	30	0	106
Labourer	170	28	53	8	75	86	5	425
Lithographer	42	6	12	3	6	5	5	79
Machine operator	21	2	5	2	21	10	0	61
Maker	53	4	7	9	17	18	3	111
Selector	134	20	27	6	19	30	12	248
Slipmaker	21	3	3	0	9	11	0	47
Sponger	29	6	13	0	8	17	2	75
Warehouse workers	19	3	9	1	2	6	1	41
Packers	67	7	4	14	4	12	14	122
Placers	49	16	29	5	55	51	3	208
<b>TOTAL</b>	<b>785</b>	<b>135</b>	<b>212</b>	<b>75</b>	<b>284</b>	<b>319</b>	<b>51</b>	<b>1861</b>

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*BRITISH CERAMICS CONFEDERATION MANUAL HANDLING SURVEY OF  
THE CERAMICS INDUSTRY 1989-91 (SELECTED JOBS)*

*Injuries by percentage*

	Lift	Put down	Carry	Support	Push	Pull	Other	Total
Caster	45	13	12	8	9	12	1	100
Dipper	42	10	12	4	18	12	2	100
Fitter	48	9	11	6	8	15	3	100
Kiln operator	25	1	10	3	33	28	0	100
Labourer	40	7	12	2	18	20	1	100
Lithographer	53	8	15	4	8	6	6	100
Machine operator	35	3	8	3	35	16	0	100
Maker	48	4	6	8	15	16	3	100
Selector	54	8	11	2	8	12	5	100
Slipmaker	46	6	6	0	19	23	0	100
Sponger	38	8	17	0	11	23	3	100
Warehouse workers	47	7	22	2	5	15	2	100
Packers	56	6	3	11	3	10	11	100
Placers	24	8	14	2	26	25	1	100
TOTAL	42.3	7.2	11.5	4.1	14.3	17.2	3.4	100

NOTE: Many of these injuries will now be reportable under the new Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 (see Appendix 2: Bibliography)

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## MANUAL HANDLING IN THE WORKPLACE - CHECKLIST

This checklist is reproduced from *Manual handling: Manual Handling Operations Regulations 1992. Guidance on regulations L23* - see Appendix 2: Bibliography.

### Problems to look for when making an assessment

### Ways of reducing the risk of injury

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#### **The tasks: do they involve -**

- holding loads away from trunk?
- twisting, stooping or reaching upwards?
- large vertical movement?
- long carrying distances?
- strenuous pushing or pulling?
- repetitive handling?
- insufficient rest or recovery time?
- a work rate imposed by a process?

#### **Can you -**

- improve workplace layout to improve efficiency?
- reduce the amount of twisting and stooping?
- avoid lifting from floor level or above shoulder height?
- cut carrying distances?
- avoid repetitive handling?
- vary the work, allowing one set of muscles to rest while another is used?

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#### **The loads: are they -**

- heavy, bulky or unwieldy?
- difficult to grasp?
- unstable or unpredictable?
- intrinsically harmful, eg sharp or hot?

#### **Can you make the load -**

- lighter or less bulky?
- easier to grasp?
- more stable?
- less damaging to hold?
- Have you asked your suppliers to help?

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#### **The working environment: are there -**

- constraints on posture?
- poor floors?
- variations in levels?
- hot/cold/humid conditions?
- strong air movements?
- poor lighting conditions?
- restrictions on movement or posture from clothes or personal protective equipment?

#### **Can you -**

- remove obstructions to free movement?
- provide better flooring?
- avoid steps and steep ramps?
- prevent extremes of hot and cold?
- improve lighting?
- consider less restrictive clothing or personal protective equipment?

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#### **Individual capacity: does the job -**

- require unusual capability?
- endanger those with a health problem?
- endanger pregnant women?
- call for special information or training?

#### **Can you -**

- take better care of those who have a physical weakness or are pregnant?
  - give your employees more information, eg about the range of tasks they are likely to face?
  - provide training?
-

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## **APPENDIX 2: BIBLIOGRAPHY**

### ***Priced publications***

*Seating at work* HS(G)57 HSE Books 1991 ISBN 0 11 885431 3

*Work related upper limb disorders: a guide to prevention* HS(G)60  
HSE Books 1990 ISBN 07176 0475 6

*Manual handling: solutions you can handle* HS(G)115 HSE Books 1994  
ISBN 0 7176 0693 7

*A pain in your workplace: ergonomic problems and solutions* HS(G)121  
HSE Books 1994 ISBN 0 7176 0668 6

*Management of Health and Safety at Work Regulations 1992: Approved Code  
of Practice* L21 HSE Books 1992 ISBN 0 7176 0412 8

*Manual handling: Manual Handling Operations Regulations 1992: Guidance on  
regulations* L23 HSE Books 1994 ISBN 0 7176 0411 X

*Display screen equipment at work. The Health and Safety (Display Screen  
Equipment) Regulations 1992. Guidance on regulations* L26 HSE Books 1992  
ISBN 0 7176 0410 1

*Workplace health, safety and welfare. Health and Safety (Health, Safety and  
Welfare) Regulations 1992. Approved Code of Practice* L24 HSE Books 1992  
ISBN 0 7176 0413 6

*A guide to the Reporting of Injuries, Diseases and Dangerous Occurrences  
Regulations 1995* L73 HSE Books 1996 ISBN 0 7176 1012 8

*Handle the load - guidance for the brick and heavy clay industry.*  
This publication is available from the British Ceramics Confederation,  
Federation House, Station Road, Stoke-on-Trent, Staffordshire, ST4 2SA  
(Tel: 01782 744631)

### ***Free publications***

*If the task fits - ergonomics at work* IND(G)90(L) (Rev) HSE Books

*Upper limb disorders: assessing the risks* IND(G)171(L) HSE Books  
Available in priced packs ISBN 0 7176 0751 8

*Getting to grips with manual handling* IND(G)143(L) HSE Books  
Available in priced packs ISBN 0 7176 0966 9

*Working with VDUs* IND(G)36(L) HSE Books  
Available in priced packs ISBN 0 7176 0814 X

*Everyone's guide to RIDDOR '95* - HSE 31 HSE Books  
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