
STATUTORY INSTRUMENTS

2005 No. 1093

HEALTH AND SAFETY

The Control of Vibration at Work Regulations 2005

<i>Made</i>	<i>4th April 2005</i>
<i>Laid before Parliament</i>	<i>7th April 2005</i>
<i>Coming into force</i>	<i>6th July 2005</i>

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The Secretary of State, in the exercise of the powers conferred on him by sections 15(1), (2) and (5), and 82(3) of, and paragraphs 1(1)(a) and (c), 8(1), 9, 11, 13(2) and (3), 14, 15(1), 16 and 20 of Schedule 3 to, the Health and Safety at Work etc. Act 1974[1] ("the 1974 Act") and of all other powers enabling him in that behalf, for the purpose of giving effect without modifications to proposals submitted to him by the Health and Safety Commission under section 11(2)(d) of the 1974 Act after the carrying out by the said Commission of consultations in accordance with section 50(3) of that Act, hereby makes the following Regulations:

Citation and commencement

1. These Regulations may be cited as the Control of Vibration at Work Regulations 2005 and shall

come into force on 6th July 2005.

Interpretation

2. - (1) In these Regulations -

"daily exposure" means the quantity of mechanical vibration to which a worker is exposed during a working day, normalised to an 8-hour reference period, which takes account of the magnitude and duration of the vibration;

"emergency services" include -

(a) police, fire, rescue and ambulance services;

(b) Her Majesty's Coastguard;

"enforcing authority" means the Executive or local authority, determined in accordance with the provisions of the Health and Safety (Enforcing Authority) Regulations 1998[2];

"exposure action value" means the level of daily exposure set out in regulation 4 for any worker which, if reached or exceeded, requires specified action to be taken to reduce risk;

"exposure limit value" means the level of daily exposure set out in regulation 4 for any worker which must not be exceeded, save as set out in regulation 6(5);

"the Executive" means the Health and Safety Executive;

"hand-arm vibration" means mechanical vibration which is transmitted into the hands and arms during a work activity;

"health surveillance" means assessment of the state of health of an employee, as related to exposure to vibration;

"mechanical vibration" means vibration occurring in a piece of machinery or equipment or in a vehicle as a result of its operation;

"risk assessment" means the assessment of risk required by regulation 5;

"whole-body vibration" means mechanical vibration which is transmitted into the body, when seated or standing, through the supporting surface, during a work activity or as described in regulation 5(3)(f); and

"working day" means a daily working period, irrespective of the time of day when it begins or ends, and of whether it begins or ends on the same calendar day.

(2) In these Regulations, a reference to an employee being exposed to vibration is a reference to the

exposure of that employee to mechanical vibration arising out of or in connection with his work.

Application and transitional provisions

3. - (1) These Regulations shall have effect with a view to protecting persons against risk to their health and safety arising from exposure to vibration at work.

(2) Subject to paragraph (3), regulation 6(4) shall not apply until 6th July 2010 where work equipment is used which-

(a) was first provided to employees prior to 6th July 2007 by any employer; and

(b) does not permit compliance with the exposure limit values,

but in using such equipment the employer shall take into account the latest technical advances and the organisational measures taken in accordance with regulation 6(2).

(3) For the agriculture and forestry sectors, regulation 6(4) shall not apply to whole-body vibration until 6th July 2014 in respect of work equipment which-

(a) was first provided to employees prior to 6th July 2007 by any employer; and

(b) does not permit compliance with the exposure limit value for whole-body vibration,

but in using such equipment the employer shall take into account the latest technical advances and the organisational measures taken in accordance with regulation 6(2).

(4) Where a duty is placed by these Regulations on an employer in respect of his employees, he shall, so far as is reasonably practicable, be under a like duty in respect of any other person, whether at work or not, who may be affected by the work carried out by the employer except that the duties of the employer -

(a) under regulation 7 (health surveillance) shall not extend to persons who are not his employees; and

(b) under regulation 8 (information, instruction and training) shall not extend to persons who are not his employees, unless those persons are on the premises where the work is being carried out.

(5) These Regulations shall apply to a self-employed person as they apply to an employer and an employee and as if that self-employed person were both an employer and an employee, except that regulation 7 shall not apply to a self-employed person.

(6) These Regulations shall not apply to the master or crew of a ship or to the employer of such persons in respect of the normal shipboard activities of a ship's crew which are carried out solely by the

crew under the direction of the master, and for the purposes of this paragraph "ship" includes every description of vessel used in navigation, other than a ship forming part of Her Majesty's Navy.

Exposure limit values and action values

4. - (1) For hand-arm vibration -

(a) the daily exposure limit value is 5 m/s² A(8);

(b) the daily exposure action value is 2.5 m/s² A(8),

and daily exposure shall be ascertained on the basis set out in Schedule 1 Part I.

(2) For whole body vibration -

(a) the daily exposure limit value is 1.15 m/s² A(8);

(b) the daily exposure action value is 0.5 m/s² A(8),

and daily exposure shall be ascertained on the basis set out in Schedule 2 Part I.

Assessment of the risk to health created by vibration at the workplace

5. - (1) An employer who carries out work which is liable to expose any of his employees to risk from vibration shall make a suitable and sufficient assessment of the risk created by that work to the health and safety of those employees and the risk assessment shall identify the measures that need to be taken to meet the requirements of these Regulations.

(2) In conducting the risk assessment, the employer shall assess daily exposure to vibration by means of-

(a) observation of specific working practices;

(b) reference to relevant information on the probable magnitude of the vibration corresponding to the equipment used in the particular working conditions; and

(c) if necessary, measurement of the magnitude of vibration to which his employees are liable to be exposed,

and the employer shall assess whether any employees are likely to be exposed to vibration at or above an exposure action value or above an exposure limit value.

(3) The risk assessment shall include consideration of-

(a) the magnitude, type and duration of exposure, including any exposure to intermittent vibration or repeated shocks;

(b) the effects of exposure to vibration on employees whose health is at particular risk from such

exposure;

(c) any effects of vibration on the workplace and work equipment, including the proper handling of controls, the reading of indicators, the stability of structures and the security of joints;

(d) any information provided by the manufacturers of work equipment;

(e) the availability of replacement equipment designed to reduce exposure to vibration;

(f) any extension of exposure at the workplace to whole-body vibration beyond normal working hours, including exposure in rest facilities supervised by the employer;

(g) specific working conditions such as low temperatures; and

(h) appropriate information obtained from health surveillance including, where possible, published information.

(4) The risk assessment shall be reviewed regularly, and forthwith if-

(a) there is reason to suspect that the risk assessment is no longer valid; or

(b) there has been a significant change in the work to which the assessment relates,

and where, as a result of the review, changes to the risk assessment are required, those changes shall be made.

(5) The employer shall record-

(a) the significant findings of the risk assessment as soon as is practicable after the risk assessment is made or changed; and

(b) the measures which he has taken and which he intends to take to meet the requirements of regulations 6 and 8.

Elimination or control of exposure to vibration at the workplace

6. - (1) The employer shall ensure that risk from the exposure of his employees to vibration is either eliminated at source or, where this is not reasonably practicable, reduced to as low a level as is reasonably practicable.

(2) Where it is not reasonably practicable to eliminate risk at source pursuant to paragraph (1) and an exposure action value is likely to be reached or exceeded, the employer shall reduce exposure to as low a level as is reasonably practicable by establishing and implementing a programme of organisational and technical measures which is appropriate to the activity.

(3) The measures taken by the employer in compliance with paragraphs (1) and (2) shall be based

on the general principles of prevention set out in Schedule 1 to the Management of Health and Safety at Work Regulations 1999[3] and shall include consideration of -

- (a) other working methods which eliminate or reduce exposure to vibration;
- (b) choice of work equipment of appropriate ergonomic design which, taking account of the work to be done, produces the least possible vibration;
- (c) the provision of auxiliary equipment which reduces the risk of injuries caused by vibration;
- (d) appropriate maintenance programmes for work equipment, the workplace and workplace systems;
- (e) the design and layout of workplaces, work stations and rest facilities;
- (f) suitable and sufficient information and training for employees, such that work equipment may be used correctly and safely, in order to minimise their exposure to vibration;
- (g) limitation of the duration and magnitude of exposure to vibration;
- (h) appropriate work schedules with adequate rest periods; and
- (i) the provision of clothing to protect employees from cold and damp.

(4) Subject to regulation 3(2) and (3) and paragraph (5), the employer shall-

- (a) ensure that his employees are not exposed to vibration above an exposure limit value; or
- (b) if an exposure limit value is exceeded, he shall forthwith-
 - (i) reduce exposure to vibration to below the limit value;
 - (ii) identify the reason for that limit being exceeded; and
 - (iii) modify the measures taken in accordance with paragraphs (1) and (2) to prevent it being exceeded again.

(5) Paragraph (4) shall not apply where the exposure of an employee to vibration is usually below the exposure action value but varies markedly from time to time and may occasionally exceed the exposure limit value, provided that-

- (a) any exposure to vibration averaged over one week is less than the exposure limit value;
- (b) there is evidence to show that the risk from the actual pattern of exposure is less than the corresponding risk from constant exposure at the exposure limit value;
- (c) risk is reduced to as low a level as is reasonably practicable, taking into account the special circumstances; and
- (d) the employees concerned are subject to increased health surveillance, where such

surveillance is appropriate within the meaning of regulation 7(2), and exposure within the meaning of this paragraph shall be ascertained on the basis set out in Schedule 1 Part II for hand-arm vibration and Schedule 2 Part II for whole-body vibration.

(6) The employer shall adapt any measure taken in compliance with the requirements of this regulation to take account of any employee or group of employees whose health is likely to be particularly at risk from vibration.

Health surveillance

7. - (1) If -

(a) the risk assessment indicates that there is a risk to the health of his employees who are, or are liable to be, exposed to vibration; or

(b) employees are likely to be exposed to vibration at or above an exposure action value,

the employer shall ensure that such employees are placed under suitable health surveillance, where such surveillance is appropriate within the meaning of paragraph (2).

(2) Health surveillance, which shall be intended to prevent or diagnose any health effect linked with exposure to vibration, shall be appropriate where the exposure of the employee to vibration is such that-

(a) a link can be established between that exposure and an identifiable disease or adverse health effect;

(b) it is probable that the disease or effect may occur under the particular conditions of his work; and

(c) there are valid techniques for detecting the disease or effect.

(3) The employer shall ensure that a health record in respect of each of his employees who undergoes health surveillance in accordance with paragraph (1) is made and maintained and that the record or a copy thereof is kept available in a suitable form.

(4) The employer shall-

(a) on reasonable notice being given, allow an employee access to his personal health record; and

(b) provide the enforcing authority with copies of such health records as it may require.

(5) Where, as a result of health surveillance, an employee is found to have an identifiable disease or adverse health effect which is considered by a doctor or other occupational health professional to be the result of exposure to vibration the employer of that employee shall-

(a) ensure that a suitably qualified person informs the employee accordingly and provides the employee with information and advice regarding further health surveillance, including any health surveillance which he should undergo following the end of the exposure;

(b) ensure that he is himself informed of any significant findings from the employee's health surveillance, taking into account any medical confidentiality;

(c) review the risk assessment;

(d) review any measure taken to comply with regulation 6, taking into account any advice given by a doctor or occupational health professional or by the enforcing authority;

(e) consider assigning the employee to alternative work where there is no risk from further exposure to vibration, taking into account any advice given by a doctor or occupational health professional; and

(f) provide for a review of the health of any other employee who has been similarly exposed, including a medical examination where such an examination is recommended by a doctor or occupational health professional or by the enforcing authority.

(6) An employee to whom this regulation applies shall, when required by his employer and at the cost of his employer, present himself during his working hours for such health surveillance procedures as may be required for the purposes of paragraph (1).

Information, instruction and training

8. - (1) If -

(a) the risk assessment indicates that there is a risk to the health of his employees who are, or who are liable to be, exposed to vibration; or

(b) employees are likely to be exposed to vibration at or above an exposure action value, the employer shall provide those employees and their representatives with suitable and sufficient information, instruction and training.

(2) Without prejudice to the generality of paragraph (1), the information, instruction and training provided under that paragraph shall include-

(a) the organisational and technical measures taken in order to comply with the requirements of regulation 6;

(b) the exposure limit values and action values set out in regulation 4;

(c) the significant findings of the risk assessment, including any measurements taken, with an explanation of those findings;

- (d) why and how to detect and report signs of injury;
- (e) entitlement to appropriate health surveillance under regulation 7 and its purposes;
- (f) safe working practices to minimise exposure to vibration; and
- (g) the collective results of any health surveillance undertaken in accordance with regulation 7 in a form calculated to prevent those results from being identified as relating to a particular person.

(3) The information, instruction and training required by paragraph (1) shall be updated to take account of significant changes in the type of work carried out or the working methods used by the employer.

(4) The employer shall ensure that any person, whether or not his employee, who carries out work in connection with the employer's duties under these Regulations has suitable and sufficient information, instruction and training.

Exemption certificates for emergency services

9. - (1) Subject to paragraph (2), the Executive may, by a certificate in writing, exempt any person or class of persons from regulation 6(4) in respect of activities carried out by emergency services which conflict with the requirements of that paragraph, and any such exemption may be granted subject to conditions and to a limit of time and may be revoked by a certificate in writing at any time.

(2) The Executive shall not grant any such exemption unless it is satisfied that the health and safety of the employees concerned is ensured as far as possible in the light of the objectives of these Regulations.

Exemption certificates for air transport

10. - (1) Subject to paragraph (2), the Executive may, by a certificate in writing, exempt any person or class of persons from regulation 6(4) in respect of whole-body vibration in the case of air transport, where the latest technical advances and the characteristics of the workplace do not permit compliance with the exposure limit value despite the technical and organisational measures taken, and any such exemption may be granted subject to conditions and to a limit of time and may be revoked by a certificate in writing at any time.

(2) The Executive shall not grant any such exemption unless -

- (a) it consults the employers and the employees or their representatives concerned;
- (b) the resulting risks are reduced to as low a level as is reasonably practicable; and
- (c) the employees concerned are subject to increased health surveillance, where such

surveillance is appropriate within the meaning of regulation 7(2).

Exemptions relating to the Ministry of Defence

11. - (1) Subject to paragraph (2), the Secretary of State for Defence may, by a certificate in writing, exempt any person or class of persons from regulation 6(4) in respect of activities carried out in the interests of national security which conflict with the requirements of that paragraph, and any such exemption may be granted subject to conditions and to a limit of time and may be revoked by a certificate in writing at any time.

(2) The Secretary of State shall not grant any such exemption unless he is satisfied that the health and safety of the employees concerned is ensured as far as possible in the light of the objectives of these Regulations.

Extension outside Great Britain

12. These Regulations shall apply to and in relation to any activity outside Great Britain to which sections 1 to 59 and 80 to 82 of the 1974 Act apply by virtue of the Health and Safety at Work etc. Act 1974 (Application outside Great Britain) Order 2001[4] as those provisions apply within Great Britain.

Amendments

13. - (1) In the Offshore Installations and Wells (Design and Construction etc.) Regulations 1996[5], paragraph 67 of Schedule 1 shall be omitted.

(2) In the Provision and Use of Work Equipment Regulations 1998[6], to the end of the list in regulation 12(5) add -

" (g) the Control of Vibration at Work Regulations 2005"

Signed by authority of the Secretary of State

Chris Pond

Parliamentary Under-Secretary of State Department for Work and Pensions

4th April 2005

SCHEDULE 1

Regulations 4(1) and 6(5)

Hand-Arm Vibration

Part I-Daily exposure to vibration

The daily exposure to vibration ($A(8)$) of a person is ascertained using the formula:

$$A(8) = a_{hw} \sqrt{\frac{T}{T_0}}$$

where:

- a_{hv} is the vibration magnitude, in metres per second squared (m/s^2);
- T is the duration of exposure to the vibration magnitude a_{hv} ; and
- T_0 is the reference duration of 8 hours (28,800 seconds).

To avoid confusion between vibration magnitude and daily exposure to vibration, it is conventional to express daily exposure to vibration in $m/s^2 A(8)$.

The vibration magnitude, a_{hv} , is ascertained using the formula:

$$a_{hv} = \sqrt{a_{hwx}^2 + a_{hwy}^2 + a_{hwz}^2}$$

where:

a_{hwx} , a_{hwy} and a_{hwz} are the root-mean-square acceleration magnitudes, in m/s^2 , measured in three orthogonal directions, x, y and z, at the vibrating surface in contact with the hand, and frequency-weighted using the weighting W_h .

The definition for the frequency weighting W_h is given in British Standard BS EN ISO 5349-1:2001.

Where both hands are exposed to vibration, the greater of the two magnitudes a_{hv} is used to ascertain the daily exposure.

If the work is such that the total daily exposure consists of two or more operations with different vibration magnitudes, the daily exposure ($A(8)$) for the combination of operations is ascertained using the formula:

$$A(8) = \sqrt{\frac{1}{T_0} \sum_{i=1}^n a_{hvi}^2 T_i}$$

where:

n is the number of individual operations within the working day;

a_{hvi} is the vibration magnitude for operation i ; and

T_i is the duration of operation i .

Part II-Exposure to vibration averaged over one week

The exposure to vibration averaged over one week ($A(8)_{\text{week}}$) is the total exposure occurring within a period of seven consecutive days, normalised to a reference duration of five 8-hour days (40 hours). It is ascertained using the formula:

$$A(8)_{\text{week}} = \sqrt{\frac{1}{5} \sum_{j=1}^7 A(8)_j^2}$$

where:

$A(8)_j$ is the daily exposure for day j .

The exposure to vibration averaged over one week is for use only for the purposes of Regulation 6(5).

SCHEDULE 2

Regulations 4(2) and 6(5)

Whole-Body Vibration

Part I -Daily exposure to vibration

The daily exposure to vibration ($A(8)$) of a person is ascertained using the formula:

$$A(8) = ka_w \sqrt{\frac{T}{T_0}}$$

where:

a_w is the vibration magnitude (root-mean-square frequency-weighted acceleration magnitude) in one of the three orthogonal directions, x, y and z, at the supporting surface;

T is the duration of exposure to the vibration magnitude a_w ;

T_0 is the reference duration of 8 hours (28,800 seconds); and
 k is a multiplying factor.

To avoid confusion between vibration magnitude and daily exposure to vibration, it is conventional to express daily exposure to vibration in $\text{m/s}^2 A(8)$.

Daily exposure to vibration ($A(8)$) is evaluated separately for the x, y and z directions of vibration.

For horizontal vibration (x and y directions), $k = 1.4$ and a_w is obtained using the W_d frequency weighting. For vertical vibration (z direction), $k = 1.0$ and a_w is obtained using the W_k frequency weighting.

Definitions for the frequency weightings are given in International Standard ISO 2631-1:1997.

If the work is such that the total daily exposure consists of two or more operations with different vibration magnitudes, the daily exposure ($A(8)$) for the combination of operations is ascertained using the formula:

$$A(8) = \sqrt{\frac{1}{T_0} \sum_{i=1}^n a_{wi}^2 T_i}$$

where:

n is the number of individual operations within the working day;

a_{wi} is the vibration magnitude for operation i ; and

T_i is the duration of operation i .

Part II-Exposure to vibration averaged over one week

The exposure to vibration averaged over one week ($A(8)_{\text{week}}$) is the total exposure occurring within a period of seven consecutive days, normalised to a reference duration of five 8-hour days (40 hours). It is ascertained using the formula:

$$A(8)_{\text{week}} = \sqrt{\frac{1}{5} \sum_{j=1}^7 A(8)_j^2}$$

where:

$A(8)_j$ is the daily exposure for day j .

The exposure to vibration averaged over one week is for use only for the purposes of Regulation 6(5).

EXPLANATORY NOTE

(This note is not part of the Regulations)

1. These Regulations implement as respects Great Britain Council Directive 2002/44/EC (OJ No L 177, 6.7.2002, p.13) on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (vibration) (sixteenth individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC). The Regulations impose duties on employers to protect employees who may be exposed to risk from exposure to vibration at work, and other persons who might be affected by the work, whether they are at work or not.

2. The Regulations apply to both hand-arm and whole-body vibration. They make provision for -

(a) action values and limit values for daily exposure to vibration (regulation 4);

(b) risk assessment (regulation 5);

(c) elimination or, where elimination is not reasonably practicable, reduction of exposure to vibration to as low a level as is reasonably practicable (regulation 6(1));

(d) a programme of measures to be taken at the action values to reduce exposure to vibration to as low a level as is reasonably practicable (regulation 6(2));

(e) actions to be taken at the limit values and prohibition on exceeding the limit values (regulation 6(4));

(f) weekly averaging of exposure to vibration in specified circumstances (regulation 6(5));

(g) health surveillance (regulation 7); and

(h) information, instruction and training (regulation 8).

3. There are transitional periods for the commencement of the operation of regulation 6(4) concerning limit values. In the case of work equipment first provided before 6th July 2007 commencement is postponed for all vibration until 6th July 2010 (regulation 3(2)), and for whole-body vibration in agriculture and forestry only until 6th July 2014 (regulation 3(3)).

4. The Regulations give powers to the Health and Safety Executive to grant exemptions from regulation 6(4) on limit values in respect of the activities of emergency services (regulation 9) and in respect of whole-body vibration in the case of air transport (regulation 10), and to the Secretary of State for Defence in respect of activities carried out in the interests of national security (regulation 11).

5. The Regulations amend -

(a) the Offshore Installations and Wells (Design and Construction etc.) Regulations 1996 (S.I. 1996/913) by removing paragraph 67 of Schedule 1, which concerns measures to prevent or control exposure to risk from vibration of plant; and

(b) the Provision and Use of Work Equipment Regulations 1998 (S.I. 1998/2306) by adding these Regulations to the list in regulation 12(5) of those Regulations of instruments whose application excludes the application of regulation 12(1) to (4) of those Regulations.

6. Copies of British Standard BS EN ISO 5349-1:2001, relating to measurement and evaluation of human exposure to hand-transmitted mechanical vibration, referred to in Schedule 1, and International Standard ISO 2631-1:1997, relating to measurement and evaluation of human exposure to whole-body mechanical vibration and shock, referred to in Schedule 2, are obtainable from British Standards Institution, BSI House, 389 Chiswick High Road, London W4 4AL.

7. A copy of the regulatory impact assessment in respect of these Regulations can be obtained from the Health and Safety Executive, Economic Advisers Unit, Rose Court, 2 Southwark Bridge, London SE1 9HS. A copy of the Transposition Note in relation to the implementation of Council Directive 2002/44/EC can be obtained from the Health and Safety Executive, International Branch at the same address. Copies of both these documents have been placed in the Libraries of each House of Parliament.

Notes:

[1] 1974 c.37; sections 11(2), 15(1) and 50(3) were amended by the Employment Protection Act 1975 c.71, Schedule 15, paragraphs 4, 6 and 16(3) respectively. [back](#)

[2] S.I. 1998/494, as amended by S.I. 1999/2024, S.I. 1999/3232, S.I. 2002/2675, and S.I. 2004/3168. [back](#)

[3] S.I. 1999/3242, as amended by S.I. 2003/2457. [back](#)

[4] S.I. 2001/2127. [back](#)

[5] S.I. 1996/913, amended by S.I. 1997/1993. [back](#)

[6] S.I. 1998/2306. [back](#)

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厚生労働科学研究補助金（労働安全衛生総合研究事業）
分担報告書

手腕振動障害防止のための振動ばく露リスク評価および低減策に関する研究
ーアンケート調査方法の決定及びアンケート調査結果に基づいたハザードのランキング方法の具体
化に関する研究ー

分担研究者 安藤英雄（久留米大学医学部環境医学講座講師）

研究要旨：振動障害を防止する目的で、振動工具取扱い者に対して振動曝露の危険性を認知させるシステムを開発するために、英国で実施されているトラフィックライトシステムの内容を調査した。同システムは振動工具から発生する振動加速度を基にして、当該振動工具の作業員への健康障害に関する危険度を赤、橙、緑の3色のステッカーで表現したものである。これを各振動工具に明示することで、当該振動工具取扱い者がその工具がもつ振動に関する情報を確認しながら作業を行うことができる。このシステムに基づき作業員が振動工具を適切に取扱うことで、振動曝露による健康障害を防止することが可能となる。このようなシステムの開発が我が国にも必要と考えられる。

A. 研究目的

我が国における手腕振動障害患者数は近年減少してきてはいるものの、特に建設業を中心にいまだ700人以上に認められている。振動障害は長期間の振動曝露により、手指における末梢循環障害、しびれに代表される末梢神経障害、集中困難などの中枢神経障害、そして頸肩腕障害などの上肢における筋骨格障害などが発生する。これらはいずれも当該患者に日常生活における様々な障害や困難を生じさせている。したがって振動障害を予防し、振動障害患者数を減少させることが喫緊の課題である。

振動障害の発生は使用する振動工具から発生し手腕に伝達される振動加速度と使用する時間、すなわち振動曝露時間の関数である。したがって手指に伝達される振動加速度が小さく、曝露時間が短いほど振動障害発生の危険度は小さくなる。そのためには、発生する振動加速度が小さな振動工具を選択し可能な限り手腕への振動伝達を減少させ、短時間の作業が求められる。振動工具の性能は改善さ

れ、工具の発生する振動加速度はその重量とともに小さくなってきている。したがってこれらの振動工具に関する情報を実際に使用する作業員に対して与えることで、作業員自身が振動工具の危険性を認識しながら作業することができる。しかしながら実際の作業現場では、振動工具が発生する振動加速度や健康障害の観点からの使用限界時間に関する情報を把握しながら作業しているものは少ないと思われる。

そこで振動障害予防の観点から、振動工具の振動に関する情報を作業員に容易に知らせるシステムの開発が必要と考えられ、今回はそのようなシステムが導入されている英国の現場を視察した。

B. 研究方法

振動障害は、作業員が曝露する振動加速度が大きいくほど、また曝露時間が長くなるほど発生する危険度が大きくなる。したがって、振動障害を予防するためには、より小さな振動加速度を発生する振動工具をできるかぎり

短時間使用することが望ましい。そのためには振動工具を取扱う作業員自身が、操作する振動工具の振動に関する情報を把握しながら作業することが求められる。しかしながら我が国の実現場では、使用する振動工具の発生する振動加速度やそれに基づく使用限界を認識しながら作業を行っているものはないと考えられる。そこで、振動障害を予防する上で重要な情報、すなわち振動工具の発生する振動加速度およびそれに基づく使用限界時間をどのように作業員に認知させることができるのかを知ることが重要と考え、このようなシステムが開発されている英国の振動工具レンタル会社を訪問した。

訪問した会社はマンチェスター市および郊外にある振動工具のレンタル会社、計3ヶ所である。それぞれの会社で実施されているシステムがどのようなもので、どのような過程で振動工具取扱い者への振動情報伝達が行われているのかを調査した。

C. 研究結果

英国の振動工具レンタル会社では振動工具の取扱い者に、曝露する振動情報を認知させるためのシステムとして、トラフィックライトシステムが導入されていた。トラフィックライトシステムとは、振動工具本体に、当該振動工具の使用可能時間を色別で表示するものである(図)。EC指令では手腕振動の1日8時間の等価振動加速度として、振動曝露限界値を 5 m/s^2 と定めている。まずレンタル会社では、各メーカーから提出された振動加速度値(宣言値)を基に、振動工具を緑、橙、赤の3色のラベリングで分類している。すなわち、振動加速度が振動曝露限界値の 5 m/s^2 以下の工具には緑色のラベリングを表示し、1日最大8時間の使用が可能としている。また、振動加速度が $5\sim 10\text{ m/s}^2$ の工具には橙色のラベリングで、1日最大2時間の使用が可能であることを示している。さら

に、振動加速度が 10 m/s^2 以上の工具に対しては、使用による健康障害が危惧されるため、赤色のラベリングで表示することにより、使用に際しては労働衛生の専門家に相談するよう注意を促している。

レンタル会社によりラベリングの仕方は、工具本体につけるものや工具にひもで取り付けのものなどあるが、いずれにしても作業員はこのラベリングに注意することで、扱っている振動工具の危険性を把握することができ、一日の使用限界時間を理解することができる。レンタル会社では工具をレンタルする際にトラフィックライトシステムのラベリングの意味を周知させることで、作業員は操作する振動工具の危険性を認識しながら作業を行うことができる。

D. 考察

振動工具の使用による健康障害を予防するためには、作業員への振動曝露を小さくする必要があり、そのためには作業員に自分が曝露している振動の情報を認知させることが重要と考えられる。トラフィックライトシステムは、作業員に対して、使用している工具の危険性、すなわち振動加速度がどれほどで、一日何時間の使用が可能かを認知させることができる。すなわち、緑色のラベリングで表示された振動工具を用いて作業を行う場合には、1日8時間の作業時間が許容されていることを意味している。同様に橙色で表示された振動工具を用いる場合には1日に最大2時間の作業が可能であることを意味している。さらに、赤色で表示された振動工具は1日8時間の等価振動加速度として 10 m/s^2 を超えていることを示しているため工具の扱いに関して労働衛生の専門家に相談しなければならない。さらに同システムの重要な特徴の一つは、その情報が極めて容易に作業員に認識される点である。すなわち同システムは振動の情報を3色に分けることで、作業員が容易

に認知しやすいシステムであると考えられる。作業者に工具に表示しているラベリングの色の意味をあらかじめ教育しておくことで、いま使用している振動工具を安全に使うための使用限界が容易にわかることになる。この工具に表示された振動情報に基づき適切に振動工具を使用すれば、振動障害の発生を減少させることが可能となると考えられる。

英国でのトラフィックライトシステムにおいて振動工具の分類の根拠となっている振動曝露限界値 5 m/s^2 は、振動による健康障害を考える場合に、いかなる振動工具取扱業者も一日8時間の等価振動加速度として、この振動のレベルを超えて曝露してはならないというものである。したがって、この振動加速度を基に振動工具の分類を行うことは妥当であると考えられる。我が国においてもこのようなシステムを導入する際には、EU同様、1日8時間の等価振動加速度として、 5 m/s^2 の振動曝露限界値を基準に分類することが必要であろう。

このシステムを我が国に導入する上でさらに注意する点があると考えられる。英国のレンタル会社は、振動工具メーカーがISOに基づき測定し提出した振動の宣言値を基に工具の分類を行っている。我が国においても同様なシステムを導入する際には、各振動工具メーカーがISOなどの一定の規則に則り振動加速度を測定する必要がある。また、ラベリングを実施する機関が必要である。各メー

カーが独自にトラフィックライトシステムによりラベリングすることも考えられるが、ラベリングの正確さを担保するためには、各メーカーから独立した第三者機関が提出された振動の宣言値を集計し、ラベリングを行うことが望ましいと考えられる。

E. 結論

トラフィックライトシステムは、振動工具がもつ振動に関する情報を作業者に認知させることを容易に可能にさせると考えられる。また作業者がこの情報に基づき適切な使用方法をとることにより振動障害を減少させることができると考えられる。したがって日本においてもこのトラフィックライトシステムを導入し、工具の振動加速度と使用限界時間を作業者に対して、容易に認識させることにより、作業者への振動曝露の影響を小さくし、振動障害患者の発生を減少させることが期待できるものと考えられる。

F. 研究発表

論文発表 なし

学会発表 なし

G. 知的所有権の取得状況

なし

図 英国におけるトラフィックライトシステムで用いられているラベリング


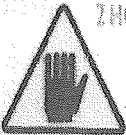
LOW
Bln 84b

VIBRATION RISK
8 HOURS MAXIMUM
DAILY USE



MEDIUM
Bln 83a

VIBRATION RISK
7 HOURS MAX DAILY USE
WITHOUT
FURTHER
ASSESSMENT



HIGH
Bln 82a

VIBRATION RISK
CONSULT YOUR
SUPERVISOR

