

# Vibra2005

Assessment and control  
of exposure to vibration

## User's Guide

**ANEOP - Asso. Nac. Empreiteiros de Obras Públicas**

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## Introduction

Vibra2005 is an application mainly aimed to make easy and disseminate the knowledge and methods involved in the assessment and control of exposure to mechanical vibration.

First of all, we must bear in mind that vibration measurement on people handling powered tools and driving or operating vehicles or equipments transmitting vibration to their bodies has its own specialization, and requires the use of very particular methods and processes. Vibration measurement is a very specialized field, where rather sophisticated and sensitive equipments (accelerometers) are used, which demands very precise procedures for mounting and set-up adjustments to run in a reliable way. These equipments are highly sensitive and measurement is a delicate operation, depending to a large extent on the accuracy provided by local conditions. When performed by unskilled or unaware people, vibration measurements may produce results far away from reality, thus leading to possible distorted conclusions.

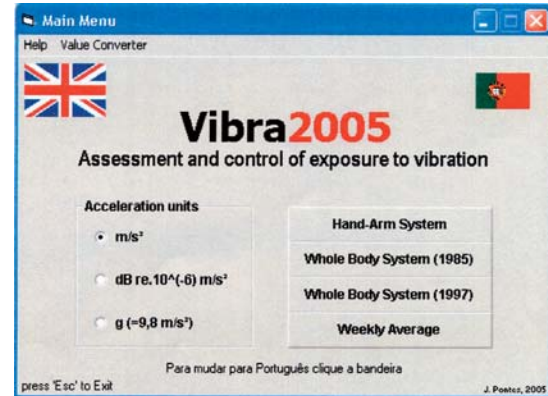
The application Vibra2005 covers the downstream phase of vibration assessment and control, after the measurement operations. It is supposed that data registration (basically composed by levels of vibration and exposure duration) is available, in order to be entered in the various features provided by the application.

The application can be installed from the disk distributed with this Guide. After closing all the applications, run the program SETUPEXE, follow the instructions on screen and create a shortcut on desktop for convenience (a screen definition of 800x600 pixels and small size fonts are recommended).

## Description of the prevention product

The prevention product here presented to competition is an IT application aimed to the assessment and control of exposure to vibration. This application has been developed on a bilingual basis (in Portuguese and English) and will be delivered with a "User's Guide" written in both languages, as well.

This work is a practical development of the principles defined in the Directive 2002/44/EC, of 22 June, setting minimum health and safety requirements for workers exposed to risks arising from mechanical vibrations, which shall be transposed to the EU Member States' internal laws no later than 6 July 2005.



The application consists of four main areas, where the various aspects regarding exposure to vibration are thoroughly dealt with, according to the statements of Directive 2002/44/EC and in the normative references there defined as technical and scientific support.

One of the areas of development refers to the Hand-Arm System, where vibration transmitted by powered hand-held tools is analysed. Since vibration energy is transmitted to the upper limbs of the operators, it may cause a group of diseases (vascular, neurological, muscular and skeletal) in the workers subject to this kind of exposure. This area uses ISO 5349-1:2001 as a basic normative reference.

Another field of intervention covered by the application is the one corresponding to the Whole Body System, where the effects of vibration transmitted to the drivers or operators of heavy equipments are studied. The vibration of such equipments is transmitted to the operators' bodies and the most common effects are discomfort, fatigue and some health disorders, mostly back pain. This scale of effects depends mainly on the vibration level and on the exposure duration. This field of intervention has been split in two areas, referring to two ISO standards - the ISO 2631-1:1985 and the standard resulting from its revision, ISO 2631-1:1997. The reason for this splitting is because there was a significant evolution in the Whole Body System approach, but even the preamble of the latter standard states that the guidance recommended in the former version was safe and preventive.

Another area included in the application is aimed to calculate the average exposure level for a period of five working days whenever the exposure level varies markedly from day to day during the working week, using the principle of equivalent energy.

The application also gives the user the possibility of converting acceleration values expressed in different acceleration units, as well as help screens covering all the features available, where a brief description of the operations and possibilities in each specific field is provided.

Regarding the target groups likely to benefit from this prevention product, we believe that it can reach a large number of people. On one hand, the bilingual option on which the application relies (Portuguese + English) will enable an effective penetration in a vast geographical area, and on the other hand, it refers to a matter to which little attention has been given in the health and safety working environment, and where significant steps forward may be taken regarding the prevention of dangerous exposures.

The objectives awaited with the development of this product were to create a working tool with a high potential, intended to knowledge dissemination in a field where little has been done. At the same time, it could play the role of a calculation toolbox to help people dealing with exposure to vibration, in the framework defined by the Directive 2002/44/EC and their supporting international standards. As a general objective, the product might contribute to a better compliance with the regulations to be published according to the Directive.

The methods used have been the development of an IT application intended to be “user friendly” and a “User’s Guide” where a set of examples can be found to elucidate the different features, providing both training and basic background to the users on the matters under analysis.

The technical device selected is composed by a common PC able to run applications designed for Windows environment.

The expected results are not easy to estimate, as we are currently at a starting point, without any previous references. Anyway, having in mind the huge amount of work to be done in this field, we believe that this product may be much sought after, just to become an auxiliary tool for those dealing daily with design, planning and supervision of works where significant levels of vibration can occur. Just imagine how many thousands of chipping hammers are now vibrating in the workers’ hands, or how many truck drivers or excavator operators are working on construction sites, everyday and everywhere.

**"EMPLOYERS SHOULD MAKE ADJUSTEMENTS IN THE LIGHT OF TECHNICAL PROGRESS AND SCIENTIFIC KNOWLEDGE REGARDING RISKS RELATED TO EXPOSURE TO VIBRATION, WITH A VIEW TO IMPROVING THE SAFETY AND HEALTH PROTECTION OF WORKERS".**

*Directive 2002/44/EC*