

## BRUIT ET VIBRATIONS

### Identification of quality attributes of automotive idle sounds and whole-body vibrations

The aims of this study are the generation and comparison of the semantic spaces of vehicle idling sounds and vibrations and the determination of their quality dimensions. In this study, two different sets of quality attributes were developed for idling sounds (34 attributes) and whole-body vibrations (22 attributes). In contrast to prior investigations, the results demonstrated that the sound level alone is an insufficient attribute for describing the complexity of idle sounds and vibration perceptions. The qualities of both idle sounds and idle vibrations have multidimensional, complex characters. The results show that intensity-dependent attributes, signal-based attributes in terms of spectrum and temporal properties, and comfort- and emotion-based attributes are all required to characterise the idling noise, vibration, and harshness (NVH) performance of vehicles. Therefore, an index was proposed based on psychoacoustic metrics such as loudness, sharpness, roughness, fluctuation strength, and relative approach. The results also show that emotional aspects play an important role for the assessment of sound and vibrations.

Source :

M. Ercan Altinsoy ,International Journal of Vehicle Noise and Vibration, Vol. 9, No. 1/2, 2013.<http://dx.doi.org/10.1504/IJVNV.2013.053814>

Envoyé: 2013-05-31 8:00 par Ginette Vadnais | avec aucun commentaire

Classé sous : Conduite de véhicules, Exposition des travailleurs au bruit, Exposition - dose, Vibrations globales - corps entier,Exposition aux vibrations

### Comprehensive measurement in whole-body vibration

Accurate measurements of human response to whole-body vibration are essential to any conclusions about the health risks, discomfort, and assessment of suspension systems in vibration environments. While accelerometers are traditionally considered the main measurement tools in whole-body vibration studies, their measurements become questionable when they are attached to inclined surfaces or when the motion has coupled components in multiple directions. Current measurement correction methodologies are subjective and limited to simple cases. A comprehensive correction methodology using inertial sensors was used in this work to quantify human response under single fore-aft, single-vertical, and multiple-axis whole-body vibration of twelve seated subjects with supported-backrest and unsupported-backrest upright posture. Vibration files of white noise random signals with frequency content of 0.5-12 Hz and vibration magnitude of 1.8 m/s<sup>2</sup> RMS were used in the testing. The results have shown considerable differences in the transmissibility measurements without proper correction. The work presented has the potential to standardize experimentation in whole-body vibration and make measurements more accurate and defined across labs.

Source :

Jonathan DeShaw, Salam Rahmatalla. Noise Notes, vol. 12, no 1, 2013, p. 27-38.

<http://dx.doi.org/10.1260/1475-4738.12.1.27>

<http://multi-science.metapress.com/content/A2H80WG8U1264763>

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Classé sous : Sièges, Méthodes de mesures, Vibrations globales - corps entier, Propagation

## Survey of noise emission and risk information supplied with a range of work machinery - RR962

Previous work has shown that the noise emission data provided by the manufacturers can be of variable quality and be based on standards that no longer exist. In some cases no noise emission data are provided at all. The Health and Safety Executive (HSE) needs to be in a position to challenge or support the validity of noise emission data or other information provided by manufacturers, to offer robust advice to dutyholders on the management of noise exposure based on this information, and facilitate the promotion of low noise machinery on a general or machine specific basis. The aim of the project was to assess the suitability of information on noise emission required under the Supply of Machinery (Safety) Regulations and the Noise Emission in the Environment by Equipment for Use Outdoors Regulations for workplace risk assessment. The noise information provided by manufacturers and suppliers of a wide range of machine types for which noise declaration is required was assessed.

Source : <http://www.hse.gov.uk/research/rrpdf/rr962.pdf>

Envoyé: 2013-05-24 8:15 par Ginette Vadnais | avec aucun commentaire

Classé sous : Exposition des travailleurs au bruit, Conception des machines, Risques dus au bruit, Normalisation et réglementation du bruit

## Promoting Hearing Health among Fire Fighters

Exposure to high noise levels among fire fighters is well documented and increases the risk for noise-induced hearing loss. NIOSH recommends measures to promote better hearing health through the use of quieter equipment, better work practices, hearing protection devices, and implementation of effective hearing loss prevention programs.

Source : <http://www.cdc.gov/niosh/docs/wp-solutions/2013-142/pdfs/2013-142.pdf>

Envoyé: 2013-05-14 13:00 par Ginette Vadnais | avec aucun commentaire

Classé sous : Exposition des travailleurs au bruit, Prévention du bruit, Normalisation et réglementation du bruit, Secteur de l'administration publique, Atteinte auditive

## Emotional stress may affect sound perception

A fresh article by researchers including Dan Hasson at Karolinska Institute and the Stress Research Institute in Stockholm, Sweden concludes that emotional exhaustion in women affects their sound perception in a negative way. The sample of subjects were taken from SLOSH (Swedish Longitudinal Occupational Survey of Health) and followed up with additional data collection. After being provoked with an acute stress task women who had scored high on emotional exhaustion also showed a greater sensitivity to sounds. This study supports the theory that hearing problems such as hyperacusis (auditory sensitivity) may be stress induced and that emotional exhaustion should be taken into account in the diagnosis and treatment of hearing problems.

Source : Hasson D, Theorell T, Bergquist J, Canlon B . Acute Stress Induces Hyperacusis in Women with High Levels of Emotional Exhaustion. PLoS ONE 8(1) 2013. <http://dx.doi.org/10.1371/journal.pone.0052945>

Envoyé: 2013-05-02 8:00 par Ginette Vadnais | avec aucun commentaire  
Classé sous : Exposition des travailleurs au bruit, Effets sur la santé, Stress, Atteinte auditive

## How far do you speak in the office?

Should we just accept that it takes 20 metres for the sound level of someone's voice to drop to a comfortable non-distracting level, or should we reduce this to 10 metres so that workgroup-to-workgroup distractions are minimized?

Source : [http://www.acousticbulletin.com/EN/2013/04/how\\_far\\_do\\_you\\_speak\\_in\\_the\\_of.html](http://www.acousticbulletin.com/EN/2013/04/how_far_do_you_speak_in_the_of.html)

Envoyé: 2013-04-26 8:30 par Ginette Vadnais | avec aucun commentaire  
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## Sound Pressure Levels in Rooms: A Study of Steady State Intensity, Total Sound Level, Reverberation Distance, a New Discussion of Steady State Intensity and Other Experimental Formulae

In this publication we include all, or almost all, the valid formulas of sound levels in different types of rooms. We will explain all the theoretical basis of each of them, starting with reflected intensity, both classical and revised theories, the total sound level and its uses in concert venues. We will also deal with empirical formulas mainly for classrooms, churches and religious buildings and industrial use. However, the main significance of this work is not only the wide range of formulas exposed but also that we have found the explanation of why the reverberation radius, or distance radius, cannot exist in the revised theory. This finding can help that the revised theory of M. Barron be slightly modified to apply it to any room for several uses, other than concerts

Source : Higini Arau-Puchades. Sound Pressure Levels in Rooms: A Study of Steady State Intensity, Total Sound Level, Reverberation Distance, a New Discussion of Steady State Intensity and Other Experimental Formulae. Noise notes, Vol.11, No 4 / December 2012, <http://dx.doi.org/10.1260/1475-4738.11.4.13>

Envoyé: 2013-04-25 10:00 par Ginette Vadnais | avec aucun commentaire  
Classé sous : Estimation du niveau sonore, Exposition au bruit industriel, Réverbération, spectacles et loisirs, Secteur des arts

## Quantitative neurosensory findings, symptoms and signs in young vibration exposed workers

**Background:** Long-term exposure to hand-held vibrating tools may cause the hand arm vibration syndrome (HAVS) including vibration induced white fingers and sensorineural symptoms. The aim was to study early neurosensory effects by quantitative vibrotactile and monofilament tests in young workers with hand-held vibration exposure. **Methods:** This cross-sectional study consisted of 142 young, male machine shop and construction workers with hand-held exposure to vibrating tools. They were compared with 41 non-vibration exposed subjects of the same age-group. All participants passed a structured interview, answered several questionnaires and had a physical examination including the determination of vibrotactile perception thresholds (VPTs) at two frequencies (31.5 and 125 Hz) and Semmes Weinstein's Monofilament test. **Results:** In the vibration exposed grlogistic multiple regression

analysis (result of monofilament test) 8% of the workers reported episodes of tingling sensations and 10% numbness in their fingers. Approximately 5–10% of the exposed population displayed abnormal results on monofilament tests. The vibrotactile testing showed significantly increased VPTs for 125 Hz in dig II bilaterally (right hand,  $p = 0.01$ ; left hand,  $p = 0.024$ ) in the vibration exposed group. A multiple regression analysis (VPT - dependent variable; age, height, examiner and five different vibration dose calculations -- predictor variables) in dig II bilaterally showed rather low  $R^2$ -values. None of the explanatory variables including five separately calculated vibration doses were included in the models, neither for the total vibration exposed group, nor for the highest exposed quartile. A logistic multiple regression analysis (result of monofilament testing - dependent variable; age, height, examiner and five vibration dose calculations -- predictor variables) of the results of monofilament testing in dig II bilaterally gave a similar outcome. None of the independent variables including five calculated vibration doses were included in the models neither for the total exposed group nor for the highest exposed quartile. **Conclusion:** In spite of the fairly short vibration exposure, a tendency to raised VPTs as well as pathologic monofilament test results was observed. Thus, early neurophysiologic symptoms and signs of vibration exposure may appear after short-term exposure also in young workers.

Source : Lars Gerhardsson, Lage Burstrom, Mats Hagberg, Ronnie Lundstrom, Tohr Nilsson. Quantitative neurosensory findings, symptoms and signs in young vibration exposed workers. Journal of Occupational Medicine and Toxicology 2013, 8:8 doi:10.1186/1745-6673-8-8

Keywords: Vibrotactile thresholds; Monofilament test

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Classé sous : Atteinte neurologique, Méthodes de mesures, Secteur de l'industrie manufacturière, Secteur du bâtiment et des travaux publics, Exposition aux vibrations, Normalisation et réglementation des vibrations

## Predicting discomfort from whole-body vertical vibration when sitting with an inclined backrest

Current methods for evaluating seat vibration to predict vibration discomfort assume the same frequency weightings and axis multiplying factors can be used at the seat surface and the backrest irrespective of the backrest inclination. This experimental study investigated the discomfort arising from whole-body vertical vibration when sitting on a rigid seat with no backrest and with a backrest inclined at 0° (upright), 30°, 60°, and 90° (recumbent). Within each of these five postures, 12 subjects judged the discomfort caused by vertical sinusoidal whole-body vibration (at frequencies from 1 to 20 Hz at magnitudes from 0.2 to 2.0  $m s^{-2}$  r.m.s.) relative to the discomfort produced by a reference vibration (8 Hz at 0.4  $m s^{-2}$  r.m.s.). With 8-Hz vertical vibration, the subjects also judged vibration discomfort with each backrest condition relative to the vibration discomfort with no backrest. The locations in the body where discomfort was experienced were determined for each frequency at two vibration magnitudes. Equivalent comfort contours were determined for the five conditions of the backrest and show how discomfort depends on the frequency of vibration, the presence of the backrest, and the backrest inclination. At frequencies greater than about 8 Hz, the backrest increased vibration discomfort, especially when inclined to 30°, 60°, or 90°, and there was greater discomfort at the head or neck. At frequencies around 5 and 6.3 Hz there was less vibration discomfort when sitting with an inclined backrest.

Source :Bazil Basri, Michael J. Griffin. Predicting discomfort from whole-body vertical vibration when sitting with an inclined backrest. Applied Ergonomics, Vol. 44, no 3, May 2013, p.423–434. <http://dx.doi.org/10.1016/j.apergo.2012.10.006> Backrest angle; Whole-body vibration; Ride comfort; Prediction model

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Classé sous : Confort, Sièges, Vibrations globales - corps entier, Relation dose - effet, Exposition aux vibrations

## Sound Advice - noise at work in music and entertainment

Sound Advice contains practical guidelines on the control of noise at work in music and entertainment. Representatives of music and entertainment industries together with Environmental Health Officers and the Health and Safety Executive (HSE) prepared the guidance. For more details see About Sound Advice. On this site you will find out what you can do to avoid the harmful effects of prolonged exposure to noise - for yourself and for the people you employ or work with. It is closely related to a printed guide.

Source :

<http://www.soundadvice.info/>  
<http://www.hse.gov.uk/noise/musicound.htm>

Envoyé: 2013-04-19 8:15 par Ginette Vadnais | avec aucun commentaire  
Classé sous : Exposition des travailleurs au bruit, Risques dus au bruit, Protecteur auditif, Réduction du bruit, spectacles et loisirs, Secteur des arts, Lois et réglementations

## Noise-Induced Hearing Loss : Scientific Advances

Exposure to loud noise continues to be the largest cause of hearing loss in the adult population. The problem of NIHL impacts a number of disciplines. US standards for permissible noise exposure were originally published in 1968 and remain largely unchanged today. Indeed, permissible noise exposure for US personnel is significantly greater than that allowed in numerous other countries, including for example, Canada, China, Brazil, Mexico, and the European Union. However, there have been a number of discoveries and advances that have increased our understanding of the mechanisms of NIHL. These advances have the potential to impact how NIHL can be prevented and how our noise standards can be made more appropriate.

Source : Editors:Colleen G. Le Prell, Donald Henderson, Richard R. Fay, Arthur N. Popper.  
Noise-Induced Hearing Loss : Scientific Advances, Springer ,  
2012. <http://link.springer.com/book/10.1007/978-1-4419-9523-0/page/1>

(Quelques pages peuvent être consultées à l'intérieur de chaque chapitre)

Envoyé: 2013-04-18 0:00 par Ginette Vadnais | avec aucun commentaire  
Classé sous : Exposition des travailleurs au bruit, Équipement de protection individuel, Agents ototoxiques, Exposition - dose, Surdit , Pr vention du bruit, Atteinte auditive

## Panels Manufactured from Vegetable Fibers: An Alternative Approach for Controlling Noises in Indoor Environments

Noise control devices such as panels and barriers, when of high efficiency, generally are of difficult acquisition due to high costs turning in many cases their use impracticable, mainly for limited budget small-sized companies. There is a huge requirement for new acoustic materials that have satisfactory performance, not only under acoustic aspect but also other relevant ones and are of low cost. Vegetable fibers are an alternative solution when used as panels since they

promise satisfactory acoustic absorption, according to previous researches, exist in abundance, and derive from renewable sources. This paper, therefore, reports on the development of panels made from vegetable fibers (coconut, palm, sisal, and açai), assesses their applicability by various experimental (flammability, odor, fungal growth, and ageing) tests, and characterize them acoustically in terms of their sound absorption coefficients on a scale model reverberant chamber. Acoustic results point out that the aforementioned fiber panels play pretty well the role of a noise control device since they have compatible, and in some cases, higher performance when compared to commercially available conventional materials.

Source : Leopoldo Pacheco Bastos, Gustavo da Silva Vieira de Melo, and Newton Sure Soeiro. Panels Manufactured from Vegetable Fibers: An Alternative Approach for Controlling Noises in Indoor Environments. *Advances in Acoustics and Vibration* Volume 2012 (2012), Article ID 698737, 9 p. <http://dx.doi.org/10.1155/2012/698737>  
<http://www.hindawi.com/journals/aav/2012/698737/>

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Classé sous : Matériaux acoustiques, Exposition des travailleurs au bruit, Efficacité, Réduction du bruit, Performance

## Reducing of the sound pressure level in industrial areas by screening noise sources

This paper presents several ways in which the propagation of acoustic waves produced by an industrial noise source can be attenuated by identifying the optimal location of an acoustic screen near the noise source. Six types of acoustic screens were used, made of six types of materials (of the category used in the field of construction), with or without sound absorbing qualities. The noise source was placed in four different positions in front of the acoustic screen. The microphone was placed in 16 recording positions, at four distances and four heights. The experimentally obtained values indicate that the efficiency of the acoustic screen is optimal when the screen is placed at a reduced distance from the noise source, in a centered position. To obtain a high degree of sound pressure level attenuation, one can choose among variants with at least two screening walls positioned in a "V" form.

Source : Tomozei, C.; Nedeff, V.; Lazar, G.; Ciobanu, E. Reducing of the sound pressure level in industrial areas by screening noise sources. *Noise & Vibration Worldwide*, vol. 43, no 10, p. 28-38. <http://dx.doi.org/10.1260/0957-4565.43.10.28>

Envoyé: 2013-04-01 8:00 par Ginette Vadnais | avec aucun commentaire  
Classé sous : Matériaux acoustiques, Exposition des travailleurs au bruit, Réduction du bruit

## Effect of noise and redundant auditory alarm signal on semiconductor production operators' response to machine downtime

This paper investigates the effect of noise and the effect of a redundant impulsive auditory alarm signal on production operators' response to machine downtime in a semiconductor manufacturing system. Machine uptime is essential for productive and efficient production system and therefore downtime calls for an immediate response. Given a higher machine-to-man ratio, there is a difficulty in achieving quick response to machine downtime. For this end, ergonomic tower lamps with visual and auditory displays are used in most semiconductor manufacturing system to alert production operators and therefore minimize response time. The results of this study showed that a less noisy environment enhances operators' response to machine downtime. This proves literatures' claim on the limited capacity of human perception to achieve sharper focus on tasks when noise is present. Furthermore, the results also proved that a redundant auditory alarm signal aside from visual alarm at moderately high to high noise exposure; 85-90 dBA and >90 dBA, respectively, does not improve responses as discussed by

literatures. It could be, as literatures say, that on persistent exposure to alarm signals beyond permissible noise level of 85 dBA, production operators may experience alarm fatigue phenomenon - a state of failing to hear the signals. Thus, redundant auditory alarm signals are only added costs and can further increase ambient noise which may, in effect, possibly induce health-related problems.

Source : Lanndon A. Ocampo, Eppie E. Clark, Alaine Liggayu. Effect of noise and redundant auditory alarm signal on semiconductor production operators' response to machine downtime. *Noise & Vibration Worldwide*, vol. 43, no 11, p. 21-28. <http://dx.doi.org/10.1260/0957-4565.43.11.21>

noise, fatigue, visual-auditory signal, alarm, semiconductor

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Classé sous : Exposition des travailleurs au bruit, Bruit impulsif, Réduction du bruit, Secteur de l'industrie manufacturière

## Noise-induced hearing loss

Noise-induced hearing loss (NIHL) still remains a problem in developed countries, despite reduced occupational noise exposure, strict standards for hearing protection and extensive public health awareness campaigns. Therefore NIHL continues to be the focus of noise research activities. This paper summarizes progress achieved recently in our knowledge of NIHL. It includes papers published between the years 2008-2011 (in English), which were identified by a literature search of accessible medical and other relevant databases. A substantial part of this research has been concerned with the risk of NIHL in the entertainment sector, particularly in professional, orchestral musicians. There are also constant concerns regarding noise exposure and hearing risk in "hard to control" occupations, such as farming and construction work. Although occupational noise has decreased since the early 1980s, the number of young people subject to social noise exposure has tripled. If the exposure limits from the Noise at Work Regulations are applied, discotheque music, rock concerts, as well as music from personal music players are associated with the risk of hearing loss in teenagers and young adults. Several recent research studies have increased the understanding of the pathomechanisms of acoustic trauma, the genetics of NIHL, as well as possible dietary and pharmacologic otoprotection in acoustic trauma. The results of these studies are very promising and offer grounds to expect that targeted therapies might help prevent the loss of sensory hair cells and protect the hearing of noise-exposed individuals. These studies emphasize the need to launch an improved noise exposure policy for hearing protection along with developing more efficient norms of NIHL risk assessment.

Sliwinska-Kowalska M, Davis A. Noise-induced hearing loss. *Noise Health* [serial online] 2012 [cited 2013 Mar 18];14:274-80. Available from: <http://www.noiseandhealth.org/text.asp?2012/14/61/274/104893>

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Classé sous : Exposition des travailleurs au bruit, Secteur de l'agriculture et de la sylviculture, Secteur du bâtiment et des travaux publics, Atteinte auditive, spectacles et loisirs, Secteur des arts