



A Strategy for Assessing and Managing Occupational Exposures

Third Edition

IHF professionals will find this newly updated resource beneficial in allocating resources for assessing and managing occupational exposures to chemical, physical, and biological agents.

Edited by Joeselito S. Ignacio and William H. Sudlock



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A Strategy For Assessing And Managing Occupational Exposures Third Edition

Tuffi Messias Saliba

A Strategy For Assessing And Managing Occupational Exposures Third Edition:

A Strategy for Assessing and Managing Occupational Exposures William H. Bullock,Joselito Ignacio (S.)Joselito S. Ignacio,2006 **Statistical Tools for the Comprehensive Practice of Industrial Hygiene and Environmental Health Sciences** David L. Johnson,2017-01-17

Reviews and reinforces concepts and techniques typical of a first statistics course with additional techniques useful to the IH EHS practitioner Includes both parametric and non parametric techniques described and illustrated in a worker health and environmental protection practice context Illustrated through numerous examples presented in the context of IH EHS field practice and research using the statistical analysis tools available in Excel wherever possible Emphasizes the application of statistical tools to IH EHS type data in order to answer IH EHS relevant questions Includes an instructor s manual that follows in parallel with the textbook including PowerPoints to help prepare lectures and answers in the text as for the Exercises section of each chapter

Assessing Nanoparticle Risks to Human Health Gurumurthy Ramachandran,2011-08-05 The book will take a systematic look at nanoparticle risks within the paradigm of risk assessment consider the limitations of this paradigm in dealing with the extreme uncertainties regarding many aspects of nanoparticle exposure and toxicity and suggest new methods for assessing and managing risks in this context It will consider the occupational environment where the potential for human exposure is the greatest as well as the issues relevant to occupational exposure assessment e g the exposure metric and the evidence from toxicological and epidemiological studies A chapter will be devoted to how conventional risk assessment can be carried out for a candidate nanoparticle e g carbon nanotubes and the limitations that arise from this approach We will propose several alternate methods in another chapter including screening assessments and adapting the rich methodological literature on the use of experts for risk assessment Another chapter will deal with non occupational populations their susceptibilities and life cycle risk assessments There will be a chapter on current risk management and regulatory oversight frameworks and their adequacy This chapter will also include a discussion of U S and E U approaches to risk assessment as well as corporate approaches

Coast Guard ,2007 **Potential Health Risks to DOD Firing-Range Personnel from Recurrent Lead Exposure** National Research Council,Division on Earth and Life Studies,Board on Environmental Studies and Toxicology,Committee on Toxicology,Committee on Potential Health Risks from Recurrent Lead Exposure of DOD Firing Range Personnel,2013-04-20 Lead is a ubiquitous metal in the environment and its adverse effects on human health are well documented Lead interacts at multiple cellular sites and can alter protein function in part through binding to amino acid sulphhydryl and carboxyl groups on a wide variety of structural and functional proteins In addition lead mimics calcium and other divalent cations and it induces the increased production of cytotoxic reactive oxygen species Adverse effects associated with lead exposure can be observed in multiple body systems including the nervous cardiovascular renal hematologic immunologic and reproductive systems Lead exposure is also known to induce adverse developmental effects in utero and in

the developing neonate Lead poses an occupational health hazard and the Occupational Safety and Health Administration OSHA developed a lead standard for general industry that regulates many workplace exposures to this metal The standard was promulgated in 1978 and encompasses several approaches for reducing exposure to lead including the establishment of a permissible exposure limit PEL of 50 g m³ in air an 8 hour time weighted average TWA exposure guidelines for instituting medical surveillance guidelines for removal from and return to work and other risk management strategies An action level of 30 g m³ an 8 hour TWA for lead was established to trigger medical surveillance in employees exposed above that level for more than 30 days per year Another provision is that any employee who has a blood lead level BLL of 60 g dL or higher or three consecutive BLLs averaging 50 g dL or higher must be removed from work involving lead exposure An employee may resume work associated with lead exposure only after two BLLs are lower than 40 g dL Thus maintaining BLLs lower than 40 g dL was judged by OSHA to protect workers from adverse health effects The OSHA standard also includes a recommendation that BLLs of workers who are planning a pregnancy be under 30 g dL In light of knowledge about the hazards posed by occupational lead exposure the Department of Defense DOD asked the National Research Council to evaluate potential health risks from recurrent lead exposure of firing range personnel Specifically DOD asked the National Research Council to determine whether current exposure standards for lead on DOD firing ranges protect its workers adequately The committee also considered measures of cumulative lead dose Potential Health Risks to DOD Firing Range Personnel from Recurrent Lead Exposure will help to inform decisions about setting new air exposure limits for lead on firing ranges about whether to implement limits for surface contamination and about how to design lead surveillance programs for range personnel appropriately

Asthma in the Workplace, Fourth Edition Jean-Luc Malo, Moira Chan-Yeung, David I. Bernstein, 2013-05-10 Occupational factors are responsible for a large percentage of cases of asthma in adults of working age Any irritant generated at high concentrations can cause occupational asthma and early diagnosis is critical because cure is still possible at this stage This latest edition of Asthma in the Workplace reflects the rapid pace of discovery and research in workplace asthma that has taken place in recent years This Fourth Edition retains the international flavor of prior editions with contributions from editors and contributors from around the world Several chapters commence with clinical histories and workplace scenarios relevant to the focus of the chapter making it particularly germane for primary care providers to develop skills in early recognition of the disease Topics discussed include Definitions historical background epidemiology genetics pathophysiology and animal models Guidelines for assessing the worker and the workplace and proposed guidelines for management including compensation aspects Medicolegal aspects prevention and surveillance Detailed information about specific agents including a variety of high and low molecular weight agents Other types of work related asthma conditions such as irritant induced asthma eosinophilic bronchitis and occupational rhinitis This new edition has been significantly restructured and places a greater emphasis on the clinical aspects of management and treatment This heightened focus on

practical considerations makes it a truly comprehensive hands on resource for practitioners and researchers in this fast moving field **Health Risk Assessment for Asbestos and Other Fibrous Minerals** Andrey Korchevskiy,James Rasmussen,Eric Rasmussen,2024-07-10 Evaluates the risks and human health impacts of asbestos and other fibrous minerals Despite continuous efforts to eliminate asbestos from commercial use it remains a serious occupational and environmental hazard Health Risk Assessment for Asbestos and Other Fibrous Minerals provides a rigorous discussion of risk assessment methodology for elongate mineral particles covering basics theory models and practical applications enabling readers to participate in carrying out efficient and informed health risk assessments to estimate potential adverse effects for exposed populations and to determine the acceptability of risks at a given level of exposure Coverage includes Mineralogy health effects pathology exposure assessment modeling and characterization of risks for asbestos and similar toxic materials Necessary integration of epidemiology toxicology industrial hygiene and environmental health expertise when performing a health risk assessment Emerging and not well known hazards e g erionite and other naturally occurring fibrous minerals Contributions by Garry Burdett Bruce Case Lucy Darnton Daniel Hall Arseniy Korchevskiy Brooke Mossman Cassidy Strode Robert Strode and Ann Wylie Case studies and examples of risk calculations Health Risk Assessment for Asbestos and Other Fibrous Minerals is a highly practical reference on the subject for occupational and public health professionals industry and government regulators industrial hygienists and risk assessors along with epidemiologists biostatisticians toxicologists and other scientific professionals **Nanotoxicology** Nancy A. Monteiro-Riviere,C. Lang Tran,2007-07-25 Nanomaterials structures with characteristic dimensions between 1 and 100 nm exhibit a variety of unique and tunable chemical and physical properties that have made engineered nanoparticles central components in an array of emerging technologies The use of nanotechnology is increasing however its potential adverse effects on human health are n **Basic Principles and Practical Applications in Epidemiological Research** Jung-Der Wang,2002 Based on the concept of conjecture and refutation from the Popperian philosophy of science i e looking for alternative causes this book simplifies the design and inferences of human observational studies into two types descriptive and causal It clarifies how and why causal inference should be considered from the search for alternative explanations or causes and descriptive inference from the sample at hand to the source population Furthermore it links the health policy and epidemiological concept with decisional questions for which the basic measurement can be quality adjusted survival time or quality adjusted life year **Principles of Occupational Health and Hygiene** Sue Reed,2024-11-29 Now in its fourth edition this book allows for early career occupational hygienists and occupational health and safety professionals or students to develop their basic skills and knowledge to anticipate recognize evaluate and control workplace hazards that can result in injury illness impairment or affect the well being of workers and members of the community Principles of Occupational Health and Hygiene An Introduction Fourth Edition offers a comprehensive overview of occupational health risks and hazardous environments

encountered in a range of industries and organizational settings This new edition offers information on the current techniques and equipment used in assessing workplace hazards Methods of assessment are developing at a rapid rate due to the new technologies now available Featuring new chapters on occupational hygiene statistics and psychosocial hazards and fully updated throughout leading industry professionals and educators explain how to identify key workplace hazards including chemical agents such as dusts metals and gases physical agents such as noise radiation and extremes of heat and cold and microbiological agents The book highlights assessment procedures and processes for identifying exposure levels and explains how to evaluate risk and follow safety guidelines to control and manage these hazards effectively Highly illustrated up to date with current Workplace Health and Safety legislation and written in a jargon free manner this book will be a bible to any student or professional Principles of Occupational Health and Hygiene An Introduction Fourth Edition is an essential reference for students early career Occupational Hygienists professionals and anyone in an Occupational Health and Safety role

Forensic Engineering Stephen E. Petty,2021-09-23 Serving as a comprehensive resource that builds a bridge between engineering disciplines and the building sciences and trades Forensic Engineering Damage Assessments for Residential and Commercial Structures Second Edition provides an extensive look into the world of forensic engineering Focusing on investigations associated with insurance industry claims the book describes methodologies for performing insurance related investigations including the causation and origin of damage to residential and commercial structures and or unhealthy interior environments and adverse effects on the occupants of these structures Edited by an industry expert with more than 40 years of experience and contributors with more than 100 years of experience in the field the book takes the technical aspects of engineering and scientific principles and applies them to real world issues in a nontechnical manner The book provides readers with the experiences investigation methodologies and investigation protocols used in and derived from thousands of forensic engineering investigations FEATURES Covers 24 topics in forensic engineering based on thousands of actual field investigations Provides a proven methodology based on engineering and scientific principles experience and common sense to determine the causes of forensic failures pertaining to residential and commercial properties Includes references to many codes standards technical literature and industry best practices Illustrates detailed and informative examples utilizing color photographs and figures for industry best practices as well as to identify improper installations Combines information from a multitude of resources into one succinct easy to use guide This book details proven methodologies based on over 10 000 field investigations in which the related strategies can be practically applied and appreciated by both professionals and laymen alike

Handbook of Measurements Adedeji B. Badiru, LeeAnn Racz, 2018-10-08 Planning measuring and paying attention to details form the basis for all successful engineering operations Measurements pervade everything we do and must be viewed from a systems perspective A comprehensive all encompassing guide to measurements Handbook of Measurements Benchmarks for Systems Accuracy and Precision focuses on high level

engineering computations essential for benchmarks and technical innovation The book uses a systems framework and a technically rigorous approach to systems linking of measurements an approach that sets it apart from other handbooks The popular saying measure twice and cut once bears out the importance of measurements in human endeavors This handbook covers both qualitative and quantitative topics of measurement It opens with a chapter on the fundamentals of measurement and includes coverage of human centric measurements such as measurement of personnel productivity and contractor performance It concludes with three appendices on measurement references conversion factors equations formulas and statistics for measurement It is well understood that humans cannot manage anything that cannot be measured All elements involved in our day to day decision making involve some form of measurement whether in the kitchen retail sports service operations geographical exploration health care delivery worker productivity clothing design engineering product design or space craft launching Measuring an attribute of a system and then analyzing it against some standard some specification some best practice or some benchmark empower a decision maker to take appropriate and timely actions This book gives you a guide for sustainable practices to ensure accurate measurements helping you make decisions backed by metrics

Beryllium Michael J. Brisson,Amy A. Ekechukwu,2009 This title describes all aspects of the current sampling and analysis techniques for trace level beryllium in the workplace It covers the challenges inherent in sampling procedures as reproducibility limited sample volume surface sampling materials and collection efficiency **Patty's Industrial Hygiene, Volume 1** Barbara Cohrssen,2021-03-25 Since the first edition in 1948 Patty's Industrial Hygiene and Toxicology has become a flagship publication for Wiley During its nearly seven decades in print it has become a standard reference for the fields of occupational health and toxicology The volumes on industrial hygiene are cornerstone reference works for not only industrial hygienists but also chemists engineers toxicologists lawyers and occupational safety personnel Volume 1 covers Introduction of Industrial Hygiene and Recognition of Chemical Agents In addition to revised and updated chapters a number of new chapters reflect current technology and concerns The chapters include Ethics in Industrial Hygiene Prevention through Design Risk Communication Managing Workplace Demographics and Mastering Digital Media for Workers Employers and Community Practice

Manual Prático de Avaliação e Controle de Poeira e outros Particulados Tuffi Messias Saliba,2023-04-17 A obra aborda de maneira prática o reconhecimento a avaliação e o controle da exposição ocupacional de Poeira e outros Particulados e em especial os procedimentos de avaliação O Manual de Avaliação e Controle de Poeira foi revisado e atualizado conforme as recentes alterações das Normas Regulamentadoras incluindo o PGR Foi dedicado um capítulo contemplando a metodologia e classificação do risco de exposição a poeira no PGR A nova edição do Manual Prático de Avaliação e Controle de Poeira foi toda revisada e atualizada com as recentes alterações das Normas Regulamentadoras especialmente as NRs 1 e 9 As alterações das Normas Regulamentadoras 1 e 9 refletem na avaliação e controle da exposição a poeira A NR 1 passou a exigir a implantação do PGR Programa de Gestão de Riscos Ocupacionais Esse programa mais amplo e

contempla todos os riscos ocupacionais incluindo os ambientais A NR 9 passou a regulamentar a Avaliação das Exposições Ocupacionais aos Agentes Físicos Químicos e Biológicos Assim este manual foi atualizado conforme as novas regulamentações Além disso foi incluído o capítulo contemplando a metodologia e classificação do risco de exposição à poeira no PGR Sumário Parte 1 Definição e Classificação 1 Considerações Gerais 2 Definições 2.1 Classificação quanto forma 2.2 Classificação quanto ao tamanho da partícula 2.3 Classificação quanto ao efeito no organismo 3 Tipos de Particulados Efeitos e Ocorrência no Ambiente de Trabalho 3.1 Sílica 3.2 Asbestos 3.3 Algodão 3.4 Caulim 3.5 Madeira 3.6 Grãos de trigo, cevada 3.7 Partículas insolúveis ou de baixa solubilidade não especificadas de outra maneira PNOS 3.8 Partículas metálicas 3.9 Negro de fumo Parte 2 Parâmetros utilizados na avaliação de Particulados 1 Tamanho das Partículas 2 Contagem de Partículas 3 Análise Gravimétrica 4 Estratégia de Amostragem 5 Grupo Homogêneo de Exposição 6 Tipos de Amostragem 7 Unidades de Medida Parte 3 Instrumentos de medição 1 Bomba Gravimétrica de Poeira 2 Meio de Coleta Filtros Porta-filtros e Suportes 3 Sistema Separador de Tamanho de Partículas Ciclone 4 Calibradores Tipo Bolha de Sopro 5 Calibrador Eletrônico 6 Elutriador Vertical para Poeira de Algodão Parte 4 Avaliação Ocupacional dos Particulados 1 Limites de Tolerância da NR 15 Portaria nº 3214/78 do MTE 2 Limites de Exposição recomendados pela ACGIH 3 Procedimento de Avaliação 3.1 Poeira contendo sílica livre cristalizada 3.2 Asbestos 3.3 Fumos e poeiras metálicas 3.4 Fumo total 3.5 Poeira de algodão 3.6 Negro de fumo 3.7 Partículas insolúveis ou de baixa solubilidade não especificadas de outra maneira PNOS 3.8 Caulim 3.9 Cereais 3.10 Poeira de madeira 4 Avaliação de Poeira para Fins Preventivos 5 Avaliação de Poeira e Tratamento Estatístico dos Dados 6 Avaliação de Poeira para Fins de Insalubridade e Aposentadoria Especial 6.1 Insalubridade 6.2 Aposentadoria especial Parte 5 Atmosferas explosivas por poeira 1 Risco de Explosão 2 reias Classificadas 3 Medidas de Proteção Contra Explosão Parte 4 Medidas de controle 1 Medidas Relativas ao Ambiente 2 Medidas Relativas ao Homem 2.1 Limitação do tempo de exposição 2.2 Educação e treinamento 2.3 Equipamentos de proteção individual Parte 5 PGR Programa de Gestão de Riscos Ocupacionais 1 Identificação dos Riscos e Caracterização da Exposição 2 Avaliação das Exposições Ocupacionais aos Agentes Físicos Químicos e Biológicos 2.1 Severidade 2.2 Probabilidade 2.3 Matriz de risco 3 Controle dos Riscos Ocupacionais 3.1 Plano de Ação 3.2 Acompanhamento das Medidas de Controle Implementadas 3.3 Acompanhamento da Saúde Ocupacional dos Trabalhadores Referências Apêndices Apêndice I Exemplo de Avaliação Estatística de Particulados Apêndice II Laudo Técnico de Avaliação de Exposição à Poeira Apêndice III Quadro Resumo dos Módulos Apêndice IV Normas Regulamentadoras NR 9 e NR 15 Apêndice V PGR Programa de Gerenciamento de Riscos Ocupacionais

Estratégia de Avaliação dos Riscos Ambientais Tuffi Messias Saliba, Maria Beatriz de Freitas Lanza, 2021-10-07 Esta obra visa atender as frequentes consultas que recebemos bem como as demandas suscitadas pelos participantes de nossos treinamentos. Dentro dos questionamentos a quantidade e a frequência das medições são as mais recorrentes. A NR 9 estabelece que pelo menos uma vez por ano deve-se realizar análise global do PPRA. Sendo assim, a maioria dos profissionais entendem que essa análise inclui a realização da avaliação dos riscos ambientais. Ora, essa estratégia não

correta pois todas as medi es ser o sempre realizadas no mesmo perodo J a NR 22 determina a quantidade de medi o de poeira mineral em fun o do tamanho do grupo no entanto n o estabelece o crit rio de tratamento estat stico dos dados Na legisla o brasileira apenas a Instru o Normativa n 01 95 do MTE define a estrat gia de avalia o incluindo o tratamento estat stico dos dados quanto ao agente qu mico benzeno Acreditamos que esta obra preencher a lacuna existente a respeito do tema pois aborda a mat ria de maneira objetiva e did tica A determina o do risco da exposi o aos agentes ambientais com apenas uma medi o quantitativa n o recomendada vez que existem muitas vari veis que podem afetar os resultados tais como demanda diaria de produ o m quinas e equipamentos em manuten o varia es das concentra es ou intensidade ao longo do tempo erros de calibra o coletas e an lises qu micas condicione s clim ticas entre outros Desse modo fundamental definir a estrat gia de avalia o incluindo o tratamento estat stico dos dados No primeiro capitulo apresentamos algumas no es b sicas sobre estat stica de forma a facilitar a compreens o e sua aplicac o na higiene ocupacional Nos demais capitulos foram abordadas as estrat gias de avalia o e os tratamentos estat sticos dos agentes qu micos e f sicos Sumario Introdu o CAP TULO I NO ES B SICAS DE ESTAT STICA 1 M dia 1 1 M dia aritm tica 1 2 M dia ponderada 1 3 M dia geom trica 1 4 Moda 1 5 Mediana 1 6 Amplitude total 1 7 Popula o ou universo 1 8 Amostra 1 9 Vari ncia 1 10 Desvio padr o 1 11 Coeficiente de varia o 1 12 Erro padr o da amostra 2 Probabilidades 2 1 Distribui o normal 2 2 Distribui o student 2 3 Distribui o logaritmo normal 3 Limite de confian a ou intervalo de confian a CAP TULO II DEFINI ES DOS PAR METROS UTILIZADOS NAS AVALIA ES AMBIENTAIS 1 Reconhecimento caracteriza o 2 Grupo Homog neo de Exposi o GHE 3 Exposi o de maior risco 4 Ciclo de exposi o 5 Limite de toler ncia 6 Nivel de a o 7 Avalia o dos riscos ambientais 8 Monitoramento 9 Avalia o pessoal ou individual 10 Avalia o ambiental ou em ponto fixo 11 An lise laboratorial 12 Instrumentos calibra o 13 Ru do 13 1 O Leq Equivalent Level ou Lavg Average Level 13 2 TWA Time Weighted Average 13 3 NEN Nivel de Exposi o Normalizado 14 Vibra o 14 1 are ou AEQ 14 2 aren 14 3 VDVR 15 Calor 15 1 IBUTG ndice de Bulbo mido Term metro de Globo 15 2 M dia ponderada 16 Par metros agentes qu micos 16 1 Volume amostrado m3 16 2 Concentra o 16 3 Concentra o em Parte Por Milh o PPM 16 4 Convers o das f rmulas 16 5 Concentra o m dia ponderada 16 6 Concentra o relativa ou ndice de concentra o 16 7 Brief scala 16 8 Coleta 16 9 Amostragem 16 9 1 Amostra instant nea e amostra curta dura o 16 9 2 Amostra cont nua 16 9 3 Amostragens conforme NIOSH 1997 CAP TULO III ESTRAT GIA DE AVALIA O DE AGENTES QU MICOS 1 Reconhecimento dos riscos 2 Grupo homog neo de exposi o 3 Tamanho da amostra 4 Tipos de amostragem 4 1 Amostragem nica durante toda a jornada de trabalho 4 2 Amostragem consecutiva durante toda a jornada 4 3 Amostragem nica em tempo parcial da jornada 4 4 Amostragem consecutiva em tempo parcial 4 5 Amostragem aleatoria durante a jornada 4 6 Amostragem de curta dura o 5 Limites de confian a 5 1 Crit rio NIOSH 5 1 1 Limites de confian a inferior e superior 5 1 2 Testes de conformidade 5 2 Crit rio da AHIA e outros crit rios 5 2 1 Limites de confian a distribui o normal 5 2 2 Limites de confian a distribui o log normal 6 Probabilidade da exposi o ao risco 6 1 Crit rio NIOSH 6 2 Crit rios da UNE 689 e NTP 554 7 Frequ ncia de monitoramento 7

1 Instru o normativa 01 95 do MTE 7 2 Portaria SEPRT n 6 734 de 10 03 2020 NR 7 7 3 A norma UNE EN 689 7 4 NIOSH 1977 e OSHA 7 5 AIHA 2006 7 6 FUNDACENTRO CAP TULO IV ESTRAT GIA DE AVALIA O DE AGENTES F SICOS 1 Defini o do GHE 2 Ru do 2 1 Crit rio NTP 270 2 2 Crit rio AIHA 3 Vibra 4 Calor 5 Considera es finais REFER NCIAS BIBLIOGR FICAS Palavras Chave LTr LTR Editora Jur dica Trabalhista Direito do Trabalho Direito Trabalhista Reforma Trabalhista Direito Processo do Trabalho Direito Processual do Trabalho Legisla o Doutrina Jurisprud ncia Leis Lei Trabalho CLT Consolida o das Leis do Trabalho Livro Jur dico ABDT Academia Brasileira de Direito do Trabalho Revista LTRED AP ndICE *Manual Prático de Higiene Ocupacional e PPRA* Tuffi Messias Saliba, 2021-01-12 Nessa edi o os textos foram revisados e atualizados especialmente na avalia o de calor conforme as altera es do anexo 3 da NR 15 e NR 9 Al m disso foram corrigidos alguns erros identificados pelos leitores Todos os temas abordados na obra s o analisados e aperfei oados a cada edi o Por esse motivo importante a contribui o dos leitores com sugest es de melhoria da obra Desde a primeira edi o a aceita o desse manual tma Isso me motiva a buscar melhoria permanente de seu conte do Vale destacar que esse manual til para os profissionais e estudantes da rea de seguran a e sa de do trabalhador inclusive utilzo sempre nos treinamentos promovidos por nossa empresa Nesta edi o Cap tulo I Introdu o ao estudo de higiene ocupacional 1 Defini o 2 Classifica o dos agentes ambientais 2 1 Agentes f sicos 2 2 Agentes qu micos 2 3 Agentes biol gicos 3 Objetivo da Higiene Ocupacional 3 1 Antecipa o dos Riscos 3 2 Reconhecimento 3 3 Avalia o 3 4 Controle 4 A Higiene Ocupacional e outros ramos de atividades afins 4 1 Medicina do Trabalho 4 2 Meio ambiente 4 3 Direito 4 4 Ergonomia 4 5 Seguran a do Trabalho 5 O Profissional de Higiene Ocupacional 6 Entidades de Higiene Ocupacional Cap tulo II Agentes F sicos 1 Ru do 1 1 Conceitos e par metros b sicos 1 2 Efeitos do ru do sobre o organismo 1 3 Instrumentos de medi o 1 4 Limite de toler ncia 1 5 Adi o de n veis de ru do 1 6 Subtra o de n veis de ru do ru do de fundo 1 7 Avalia o do ru do 1 8 Medidas de controle 2 Ultrassom e infrassom 2 1 Infrassom e sons de baixa frequ ncia 2 2 Ultrassom 3 Vibra o 3 1 Par metros utilizados na avalia o de vibra o 3 2 Crit rio legal 3 3 Vibra o de corpo inteiro 3 4 Vibra o localizada ou m o e bra o 3 5 Instrumentos de medi o 3 6 Procedimentos de avalia o 3 7 Medidas de controle 4 Calor 4 1 Trocas t rmicas 4 2 Fatores que influenciam nas trocas t rmicas 4 3 Equil brio homeot rmico 4 4 Efeitos do calor no organismo 4 5 Avalia o ocupacional de calor 4 6 Outros ndices de avalia o ocupacional 4 7 Avalia o para fins de conforto t rmico 4 8 Medidas de controle 5 Frio 5 1 Crit rio legal 5 2 Limite de exposi o ocupacional ao frio 5 3 Avalia o da exposi o ao frio 5 4 Medidas de controle 6 Radia o ionizante 6 1 Limites de toler ncia 6 2 Avalia o quantitativa 6 3 Medidas de controle 7 Radia es n o ionizantes 7 1 Radia es ultravioletas 7 2 Radia o infravermelha 7 3 Radia o micro ondas e radiofrequ ncia 7 4 Laser 7 5 Campos e radia es eletromagn ticos Cap tulo III Agentes Qu micos 1 Conceitos defini es e classifica o 2 Par metros utilizados nas avalia es de particulados e gases e vapores 2 1 Tamanho das Part culas 2 2 Limite de Toler ncia 2 3 Contagem de Part culas 2 4 An lise Gravim trica 2 5 Grupo Homog nio de Exposi o 2 6 Avalia o 2 7 Coleta de Amostras 2 8 An lise Laboratorial 2 9 Amostragem 2 10 Zona de respira o 2 11 Estrat gia de Avalia o 2 12 Unidades de medida 2 13 Brief

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