

Appendix 1

Table A1: List of Threshold Limit Values (TLV) for dust types (ACGIH, 1998)

<i>Dust</i>	<i>TLV-TWA (mg/m³)</i>
Aluminium – Metal dust	10.0
Aluminium – Pyro powders	5.0
Aluminium – Soluble salts – Al	2.0
Aluminium – Fumes – Al	5.0
Aluminium oxide	10.0
Antimony – Compounds – Sb	0.5
Arsenic – Elemental and inorganic - As	0.01
Asbestos – All forms	0.1 f/cc
Barium – Soluble compounds – Ba	0.5
Beryllium and compounds – Be	0.002
Borates – Salts – B	1.0
Cadmium – Elemental – Cd	0.01
Cadmium – Compounds – Cd	0.002
Calcium oxide – CaO	2.0
Carbon black – C	3.5
Chromite ore processing – Cr	0.05
Chrome – Metal and Cr III compounds	0.50
Chrome – Metal soluble VI compounds	0.05
Chrome – Insoluble Cr VI compounds	0.01
Coal – Bituminous	0.9
Coal – Anthracite	0.4
Coal tar pitch	0.2
Cobalt-Metal, dust and fumes – Co	0.02
Copper – Dust and mists – Cu	1.0
Copper – Fumes – Cu	0.20
Ferrovanadium dust	1.0
Fluorides – F	2.5
Gypsum – Calcium sulphate	10.0
Hydroquinone	2.0
Iron – Soluble salts – Fe	1.0
Iron – Oxide fumes - Fe ₂ O ₃	5.0

Table A2: List of Threshold Limit Values (TLV) for dust types (ACGIH, 1998)

<i>Pollutant</i>	<i>TLV-TWA (mg/m³)</i>
Kaolin	2.0
Lead – Elemental and organic, as Pb	0.05
Lead arsenate	0.15
Lead chromate, as Pb	0.05
Lead chromate, as Cr	0.012
Limestone - Calcium carbonate	10.0
Magnesite	10.0
Magnesium oxide fumes	10.0
Manganese – Mn	0.2
Mercury - Hg - Alkyl compounds	0.01
Mercury - Hg - Aryl compounds	0.1
Mercury - Hg – Inorganic forms	0.025
Mica	3.0
Molybdenum - Soluble compounds	5.0
Molybdenum - Insoluble compounds	10.0
Nickel - Elemental/metal	1.5
Nickel - Insoluble compounds - Ni	0.2
Nickel – Soluble compounds - Ni	0.1
Oil mist – Mineral	5.0
Perlite	10.0
Platinum – Metal compounds - Pt	1.0
Platinum – Soluble compounds-Pt	0.002
Portland cement	10.0
Rhodium – Metal	1.0
Rhodium – Insoluble, as Rh	1.0
Rhodium – Soluble, as Rh	0.01
Selenium and compounds, as Se	0.2
Silica – Inhalable particulate, amorphous	10.0
Silica – Respirable particulate	3.0
Precipitated silica	10.0
Silica fumes	2.0
Silica, fused	0.1

Table A3: List of Threshold Limit Values (TLV) for dust types (ACGIH, 1998)

<i>Pollutant</i>	<i>TLV-TWA (mg/m³)</i>
Silica gel	10.0
Silica, Crystalline – Cristobalite	0.05
Silica, Quartz	0.1
Silica, Tridymite	0.05
Silica, Tripoli – respirable	0.1
Silver - Metal, as Ag	0.1
Silver - Soluble, as Ag	0.01
Soapstone – Inhalable	6.0
Soapstone – Respirable dust	3.0
Sodium hydroxide, NaOH	2.0
Talc - No asbestos	2.0
Tantalum metal and oxide dusts, Ta	5.0
Tellurium compounds, Te	0.1
Tin – Metal	2.0
Tin - Oxide and inorganic compounds	2.0
Tin - Organic compounds	0.1
Titanium oxide	10.0
Tungsten – Insoluble	5.0
Tungsten – Soluble	1.0
Uranium	0.2
Vanadium pentoxide, V ₂ O ₅	0.05
Welding fumes	5.0
Zinc chromates, as Cr	0.01
Zinc oxide fumes, Zn	5.0
Zinc oxide dust, Zn	10.0
Zirconium and compounds, Zr	5.0
Diesel exhaust particulates	0.15

TableA4. Occupational exposure limits for respirable coal dust and free crystalline silica in various countries (Source: NIOSH, 1995)

Country	Recommended Value	Comment
Australia	3 mg/m ³	5 % respirable free silica
Belgium	10 mg/m ³ / (% quartz + 2)	
Brazil	8 mg/m ³ / (% quartz + 2)	
Finland	2.0 mg/m ³	Coal dust
	0.2 mg/m ³	Quartz (fine dust < 5 µm)
	0.1 mg/m ³	Silica: cristobalite, tridymite
Germany	0.15 mg/m ³	Quartz
	4 mg/m ³	Dust with quartz (> 1% by wt)
Italy	3.33 mg/m ³	Coal dust with < 1 % quartz
	10 mg/m ³ / (% quartz + 3)	Coal dust with > 1 % quartz
Netherlands	2.0 mg/m ³	< 5 % respirable quartz
	0.075 mg/m ³	Silica
South Africa	0.1 mg/m ³	Alpha quartz > 5 %
	2.0 mg/m ³	Alpha quartz < 5 %
	3.0 mg/m ³ (platinum mines)	Alpha quartz < 5 %
Sweden	0.05 mg/m ³	Silica: cristobalite, tridymite
UK	3.8 mg/m ³	At coal face
USA	2.0 mg/m ³	< 5 % silica
	10 mg/m ³ / (% quartz)	Coal dust with > 5 % silica
	10 mg/m ³ / (% quartz + 2)	Silica: quartz
	Half of the value for quartz	Silica: cristobalite, tridymite
Yugoslavia	4.0 mg/m ³	< 2 % free crystalline silica
	0.07 mg/m ³ (100) / (% FCS)	> 2 % free crystalline silica
	0.07 mg/m ³	Pure quartz (fine dust)

Table A5. Dust types, sources and health hazards (Source: ACGIH, 1998)

<i>Dust Type</i>	<i>Source</i>	<i>Health Hazard</i>
Aluminum	Mining, processing	Lung irritation
Antimony dust	Metal works	Pneumonitis
Arsenic	Mining, processing	Lung cancer
Barium sulphate	Metal works	Fibrosis
Beryllium dust	Beryllium ore mining	Berylliosis
Cadmium	Other works	Cancer, kidneys
Cement	Plants and other works	Dermatitis
Chrome dust	Metal works	Lung cancer
Coal dust	Mining, preparation plants	Pneumoconiosis
Cobalt dust or salt	Metal works	Interstitial fibrosis
Corundum	Mills	Fibrosis
Graphite	Non-metal works	Fibrosis
Iron dust	Mines, foundries, welding	Siderosis
Kaolin	Metal works	Fibrosis
Magnesium oxide	Metal works	Metal fume fever
Manganese dioxide	Metal works	Manganism, lungs
Mica	Metal works	Silicosis
Platinum	Metal works	Silicosis and others
Silica dust	Metal and non-metal works	Silicosis
Sericite - Micaceous	Metal works	Pneumoconiosis
Silver	Metal works	Argyria, bronchitis
Sulphur	Quarry works	Pneumoconiosis
Tin	Metal works	Stannosis
Talc	Other works	Pneumoconiosis
Tellurium	Other works	Cyanosis, liver
Tungsten	Metal works	Irritation
Uranium	Other works	Kidneys, cancer
Vanadium	Metal works	Lung irritation
Zinc chromate	Metal works	Lung cancer

Appendix 2

Elements of a Medical Screening and Medical Surveillance Programme (NIOSH, 1995)

1. Preplacement spirometric examination within three months and chest X-ray (within three to six months) as soon as possible after beginning employment.
2. A spirometric examination each year for the first three years after beginning employment and every two to three years thereafter if the worker is still engaged in work.
3. A chest X-ray every four to five years for the first 15 years of employment and every three years thereafter if the worker is still engaged in work.
4. A chest X-ray and spirometric examination when employment ends if more than six months have passed since the last examination.
5. A standardized respiratory symptom questionnaire, such as the American Thoracic Society (ATS) respiratory questionnaire (Ferris, 1978), to be administered at the preplacement examination and updated at each periodic examination.
6. A standardized occupational history questionnaire (listing of all jobs held up to and including present employment, a description of all duties and potential exposures, and a description of all protective equipment the worker has used) to be administered at the preplacement examination and updated at each periodic examination.

Appendix 3

Elements of a Respiratory Protection Programme (NIOSH, 1995)

1. A designated individual responsible for the administration of the programme.
2. A written programme for respiratory protection, containing standard operating procedures governing the selection and use of respirators.
3. Initial and annual training of workers in the proper use and limitations of respirators.
4. Annual training of people whose job requires them to be certified at workplaces in the use of self-contained self-rescuer devices.
5. Evaluation of working conditions in the workplace (including periodic air monitoring of worker exposures) to identify situations that require respiratory protection.
6. Routine inspection, cleaning, maintenance and proper storage of respirators.
7. Initial quantitative fit testing by a trained and qualified person to determine the level of protection provided by each respirator worn.
8. Additional daily fit checks conducted by the worker to ensure proper assembly, function and face-seal integrity of the respirator.
9. Medical evaluation of the worker's physical ability to perform work continuously while breathing through a respirator.
10. Continual evaluation of programme effectiveness through the monitoring of respirator-use patterns, quarterly inspection of the respirator maintenance programme and testing of supervisors and workers for awareness of respirator use requirements.