

## **M4-EN.9 PENDULOUS PARTICLES**

M4-EN.9.1 Main health problems- Respiratory problems

M4-EN.9.2 Respiratory problems (continuous)

M4-EN.9.3 Prevention metres

M4-EN.9.4 Levels of pendulous particles

### **Description of Chapter**

In this chapter, an extensive presentation of prevention metres that should be taken in their individual sectors of textile manufacturing unit is shown and the measurements are presented in a formal manufacturing unit of Textile.

Aim of the chapter is to familiarize all the involved parties with the Occupational Health and the Safety in the sector of Textile Industry with the prevention metres of high concentrations of pendulous particles in the specific sectors.

### **M4-EN.9.1 Main health problems- Respiratory problems**

Respiratory problems that concern workers in the sector of textile are due to two main factors:

- Cotton dust: it is consisted of particles of cotton or wool dirt that suspended during its treatment. Often it contains dangerous substances from pesticides. This dust contains a mix of many substances, as soil, fibres, bacteria, mushrooms, germicides, materials not related with the cotton, etc
- Cotton fibres: it is consisted of thin cotton fibres that suspended in the atmosphere, especially in spinning and weaving sectors

These two factors are presented reversely in the productive process:

- Dust is found in high levels in the initial stages where the cotton (wool) is impure and it is decreased within progressive cleaning
- Cotton fibres are found in low levels in the beginning and are increased in the advanced stages while the processing product slims

In previous years cotton dust constituted the main reason of byssinosis in this sector, which was its most characteristic illness. The first symptoms of illness are difficulty in breathing and perhaps a constriction in the chest, which becomes particularly stronger at the first day of return in the work after absence of few days. The workers can also have cough with faints. While in the initial stages of illness difficulties in the breathing are reversible, the damage in the advanced stages of illness is permanent.

The exposure in cotton dust can also result to increased probabilities of chronic bronchitis or emphysema. In modern textile units the levels of pendulous particles have been decreased considerably under the value limits.

### **M4-EN.9.2 Respiratory problems (continuous)**

No specific symptoms of respiratory system, as alleviation of respiratory operation and decreased sensitivity of ventilators, constitute precocious responses of the respiratory system in the effect of dust. Contrary to asthma, that as long as the

exposure in the irritant factors is repeated symptoms are worsened, in the byssinosis as long as the patient is exposed in allergenic, so much faster the symptoms are disappeared.

The frequency of byssinosis, chronic bronchitis and respiratory dysfunction in cotton grinning workers oscillated from 15% until 50%, depending on the quality of raw material, the concentration of dust and smoking. In inferior percentages, yarning workers were presented and their percentage depends on the distance they worked from cotton grinning unit, the ventilation of space but also from the remaining factors (smoking, dust etc).

Byssinosis, is an illness without known diagnostic criteria, it allocates only characteristic symptoms. It does not have pathological characteristic points, no characteristic radiological discoveries, but also no pathogenic discoveries that they would certify or reject the diagnosis.

The prevention is achieved with the reduction of concentration at Gram (-) negative microbial executives of dust in workplaces. In order to do this measures are taken in cotton cultivation and in its processing. Values that concern male workers are generally higher comparing with those of female workers due to the habit of smoking (despite the age-related differences, which are not statistically important).

For male workers, between smokers and not smokers, values that concern the latter are higher comparatively with those of the smokers.

#### **M4-EN.9.3 Prevention metres**

- The employer's program of dust control should include at least:
  - Floor sweeping with absorption or other means that limits the diffusion of dust
  - Management of dust with a way that dust scattered just a little
- Use of mechanic methods for the stowing, storage and more generally management of cotton or dust, where this is possible
- Control, cleaning and immediately repair of equipment for dust restriction and ventilation systems. The compressed air should not be used for the cleaning of clothes and floor, but only for the cleaning of equipment if no other way exists and if workers wear protective masks. If the above measures do not achieve the dust reduction under the permissible limits, the employer should take additional control measures. Worker that because of health problems cannot use mask should have the possibility to be transferred in other workplace where the levels of pendulous dust is below limits, without reduction of salary, place in the hierarchy or other rights and privileges provided that is possible. Apart from the reduction of dust in air, the employer should provide free annual medical examinations, included respiratory examinations for all workers in areas where exists cotton dust. In order to ensure that workers know the dangers from the cotton dust, employers should carry out an educational program at one time per year. Warning signals should be placed in workplaces where the level of cotton dust is higher than limits.

#### M4-EN.9.4 Levels of pendulous particles

Work in textile industries in Greece, one of the main countries of production of textiles in Europe, the levels of pendulous particles in the various stages of production are as follows:

(it is marked that the inhaleable fraction concerning what goes through the respiratory system with value limit 10 mg/m<sup>3</sup> and the respirable fraction that reaches the lung with value limit 5 mg/m<sup>3</sup>)

Processing	Specific processing sector	Mean of respirable fraction (mg/m <sup>3</sup> )	Mean of inhalable fraction (mg/m <sup>3</sup> )	Cotton fibres (mg/m <sup>3</sup> )
Cotton ginning	Seed cotton feeding	0,080		
	Seed cotton warehouse	0,080		
	Dispenser	0,470		
	Separator-feeder	0,320		
	Burner-blower	0,450		
	Drier	0,490		
	Inclined cleaner	0,310		
	Lint cleaner	0,400		
	Press	0,480		
	Openers	0,320		0,740
Cotton yarning	Cleaners	0,350	0,420	
	Cards	0,230	0,790	
	Drawers	0,257	0,346	
	Combing preparation	0,284	0,370	
	Combers	0,252	0,370	
	Roving frames	0,210	0,301	
	Spinning frames	0,190	0,292	
	Winding frames	0,177	0,234	0,140
	Openers	0,170	0,236	
Wool yarning	Cards	0,640	0,828	
	Spinning frames	0,211	0,247	
	Winding frames	0,153	0,159	
	Warping frames	0,112	0,167	
Weaving	Lustring	0,176	0,290	
	Looms with new type arrow	0,377		
	Looms with old type arrow	0,570	0,872	1,150
	Air-jet looms	0,160	0,262	
	Seed cotton feeding	0,200		0,445