Federal Ministry for the
Environment, Nature Conservation
and Nuclear Safety

Asbestos in Kyrgyzstan: practice of use, problems and recommendations

A Review of the Research

This research is prepared by the Ecological Movement "BIOM" jointly with the Women in Europe for a Common Future with the assistance of the European Commission and the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety.

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Edited by V.A. Korotenko

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A review of the research of the usage of asbestos in Kyrgyzstan, mechanisms regulating its handling, technologies employed for the protection of workers and consumers, an assessment of future prospects and also a list of recommendations was conducted by a group of researchers from Kyrgyzstan jointly with experts from the organization “Women of Europe for a common future” with the assistance of the European Commission and the Ministry of Environment and Nuclear Safety of Germany within the scope of the project “Increasing the level of awareness as to the issues of asbestos in Kyrgyzstan by the efforts of civil society”.

The results of the research may be of interest to employees of related ministries and institutions, activists of non-governmental organizations, trade unions, leaders of local communities, scientists and citizens directly in contact with asbestos-containing materials.

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CONTENTS

CONTENTS 3

INTRODUCTION 4

KYRGYZSTAN – POLITICO-ECONOMIC CONTEXT 5

GENERAL INFORMATION ON ASBESTOS 12

Chapter 1. USE OF CHRYSOTILE ASBESTOS IN THE KYRGYZ REPUBLIC 16

Chapter 2. EFFECTS OF ASBESTOS ON HEALTH 30

Chapter 3. INSTITUTIONAL REGULATION OF ISSUES RELATED TO ASBESTOS HANDLING 41

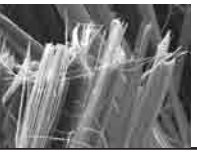
Chapter 4. NATIONAL LEGISLATION REGULATING ASBESTOS HANDLING 44

Chapter 5. INTERNATIONAL AGREEMENTS REGULATING TREATMENT OF ASBESTOS 50

CONCLUSIONS AND RECOMMENDATIONS 22

ATTACHMENT 60

BIBLIOGRAPHY 69



INTRODUCTION

The tension between the objectives of environment and health protection and economic interests is encountered with increasing frequency in every country and region of the world. Daily the global manufacturing flywheels turn out billions of various goods which enter our life in high volumes, bringing us not only comfort and convenience but also certain dangers. The production of wealth is accompanied by the emergence of risks, the majority of which are still unknown for us. This means that our senses are frequently powerless to perceive and cope with such new risks. Many hazardous chemical substances have no smell, and radiation can likewise not be felt immediately. Some invisible or unverified risks can be either overstated or undervalued, notably they remain open for social descriptions. The availability of information and subsequent interpretation are key factors in making decisions and forming attitudes. Thus, the "sensory receptor organs" of science are required to assess situations through various studies, which should in turn seek to provide reliable information on whether a danger is present or not. Thus, knowledge acquires new meaning.

Relative to those events a number of researchers, environmental sociologists such as Bauman, Z and Bek, U., formulated a concept of "Risk communities". However, they pointed out that a risk core appertains to the future rather than to the present. Future generations, namely our children and grandchildren, will feel the consequences of decisions made today.

The subject of asbestos application is closely associated with the "Risk Communities" concept. Today some serious risks to health and the environment incidental to asbestos application have been proved. Moreover, the active use of asbestos is still in progress all over the world, and research is being carried out aimed at fixing the economic price of such risks, and ensuring the fair use of asbestos. At present the output of asbestos-containing products and the international trade in such products has provoked a large variety of prolonged disputes and conflicts. Even the scientific community has a variety of antipodes of opinion on this issue (let us call them provisionally as pro-asbestos and anti-asbestos).

Much research refers to the fact that asbestos is a nature-wide mineral. In this context we are witnesses to the extent which a natural raw material, when used on a world-wide scale, acquires a large scale of impact and a commensurate scale of risks with in relation to human beings.

Kyrgyzstan is an active participant in international processes and a part of the world economic system, therefore all the above directly relates to our country. Our country, in turn, should sooner or later find its own position towards the use of such hazardous substances, assessment and overcoming new risks. That is why, today under the auspices of the International Public Organization "European Women for common future!" and with the support of the European Commission and the Ministry of Environment and Nuclear Safety of the Federal Republic of Germany, the Project "Increasing awareness of asbestos issues in Kyrgyzstan by efforts of civil society" has been implemented, within whose framework it became possible to create this summary of research. Consequently, we hope that a large-scale discussion on this issue will now be initiated.

The authors on pages of this publication endeavored to assess the situation related to the use of asbestos in Kyrgyzstan, to examine existing myths in the light of international experience, to determine existing threats and deal with those threats via the initiation of joint efforts as well as the formulation of recommendations.

We hope that through joint efforts we will be able to make our life and the life of future generations more sustainable and safe!

KYRGYZSTAN – POLITICO-ECONOMIC CONTEXT

The Kyrgyz Republic, which is a mountainous country without any issue to seaports, faces difficult-to-surmount geographical barriers in its challenge to create stable, sustained economic growth.

During the period from 1991 to 1995 the economic development of Kyrgyzstan faced problems which occurred in practically every former Soviet Republic, notably the economic transition towards an open market and price liberalization, shortfalls in investment in resources and demand for internal borrowings.

In 1995 the economic recession reached a deadline. The volume of gross domestic product in 1995 was diminished by 50.7% when compared to figures in 1990. But the country's economy gradually moved back from the brink.

In the latter half of the 1990s (1996-2004), the economic situation in the country took a turn for the better. A critical year in the country's economic development was 1996, when for the first time following a gradual recession the Kyrgyzstan registered a GDP growth of 7%.

The Government Program, Country Development Strategy (CDS), saw the period from 2007 to 2011 focus on four strategic directions; economic development, state management and transparency in the management of state affairs, human development and ecological sustainability. That strategy was furthermore supported by approaches specified in the National Poverty Reduction Strategy (NPRS), 2003-2005. The CDS pays attention to strengthening macroeconomic sustainability achieved over the course of NPRS implementation, and to accelerating structural reforms to promote further growth and poverty reduction.

The Country Development Strategy (CDS), was renewed within the period from 2007 to 2010 but did not alter its objectives and vision, summarizing the goal of strategic development within 2009-2011 as the "improvement of life quality through the improvement of economic growth quality, management and environment". The new CDS includes a chapter specifying challenges and threats confronting the country. This is prefaced with a large list including economic challenges[1]:

- An anemic economy that is vulnerable towards global economic difficulties, has limited resources and fights against relevant problems;
- high level of foreign debt;
- large social obligations;
- aggravated trade deficit;
- loss of industrial power;
- low savings rate;
- high unemployment rate leading to labour migration;
- a shadow economy that makes up about 50% of GDP;
- weak banking system;
- gap between stated economic policy and real actions of Government for 2009;
- very low assessment in the Global index of competitiveness among countries.

1 *Assessment of government expenditure and financial accountability for 2009. Report on public financial management efficiency. Ministry of Finance of the Kyrgyz Republic, 2009.*

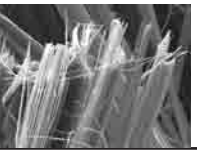


Table # 1

Basic socio-economic indicators in 2005-2009[2].

	2005	2006	2007	2008	2009
Resident population size (as of the end of year), thousand people	5189,2	5247,6	5289,2	5348,3	5418,3
Gross domestic product (GDP), total million soms	100899,2	113800,1	141897,7	187991,9	201222,9
Per capita, soms	20154	22606	28067	37023	39239
Price index of industrial producers (December by December of previous year), in %	106,3	110,4	120,5	117,4	120,4
State fiscal revenue in % of GDP	20,2	22,0	25,4	24,8	27,6
State budget surplus in % of GDP	0,2	-0,2	0,1	0,8	-1,5

Within the period from 2000 to 2007 Kyrgyzstan made essential progress in moving forward to the Millennium Development Goals (MDG). The country achieved considerable success in reducing the poverty and in particular, beggary. Until the financial crisis broke out, the country had demonstrated sustainable economic growth[3].

Table # 2

Indices of socio-economic performance[4]
(cost indicators in comparable prices; in percentage terms by previous year)

	2005	2006	2007	2008	2009
Population size	101,1	101,1	100,8	101,1	101,3
Gross domestic product	99,8	103,1	108,5	108,4	102,9
Output of industrial products	87,9	89,8	107,3	114,9	93,6

Table # 3

Export structure under sectors of Foreign Economic Activity Commodity Nomenclature (million US dollars)

	2005	2006	2007	2008	2009
Products made of stone, gypsum, cement, asbestos, mica and other similar materials; ceramic products; glass and glass products	46,2	43,8	54,8	43,3	6,5

2 *Statistical yearbook of the Kyrgyz Republic. National Statistical Committee of the Kyrgyz Republic, 2010.*

3 *The progress of Kyrgyzstan towards MDG achievement is described in more detail in UN publication "Second periodic report on moving forward to the Millennium Development Goals MDG in the Kyrgyz Republic" dated 2009.*

4 *Statistical yearbook of the Kyrgyz Republic. National Statistical Committee of the Kyrgyz Republic, 2010.*

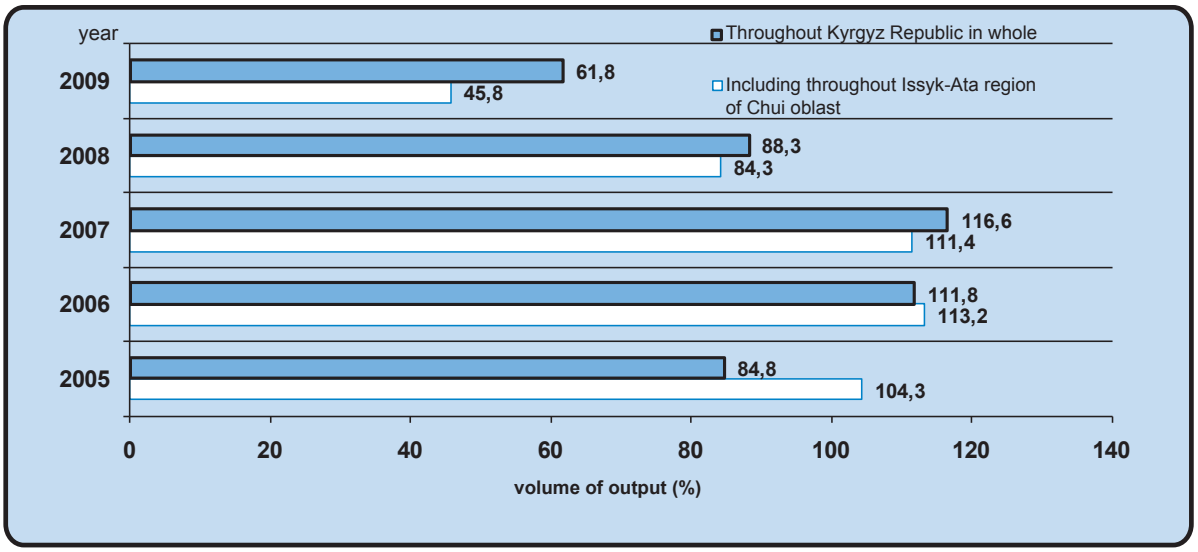
Table # 4

Import structure under sectors of Foreign Economic Activity Commodity Nomenclature (million US dollars)

	2005	2006	2007	2008	2009
Products made of stone, gypsum, cement, asbestos, mica and other similar materials; ceramic products; glass and glass products	16,4	26,2	35,9	56,7	57,9

Before the April and June events of 2010 the economy of Kyrgyzstan was in a stage of recovery from the impacts of the global economic crisis. Given this fact, it was forecasted that in 2010 GDP volume would increase by 4½%. Economic policy was based on the growth of the private sector under conditions conducive to a liberal trading environment, supported by a sharp increase in public capital expenditure, especially in the energy sector. Also a further reduction in the poverty level was expected. The political events shattered prospects of economic growth[5]. In 2005 the economic growth rate was reduced by 3% and in 2010 the output of Gross Product Per Capita decreased to 943 $.

The construction slow-down foresaw a drop in the production of other non-metallic mineral commodities. Physical output decreased by 38% as compared to 2008, and as compared to 2004 – by 45, 5%[6].

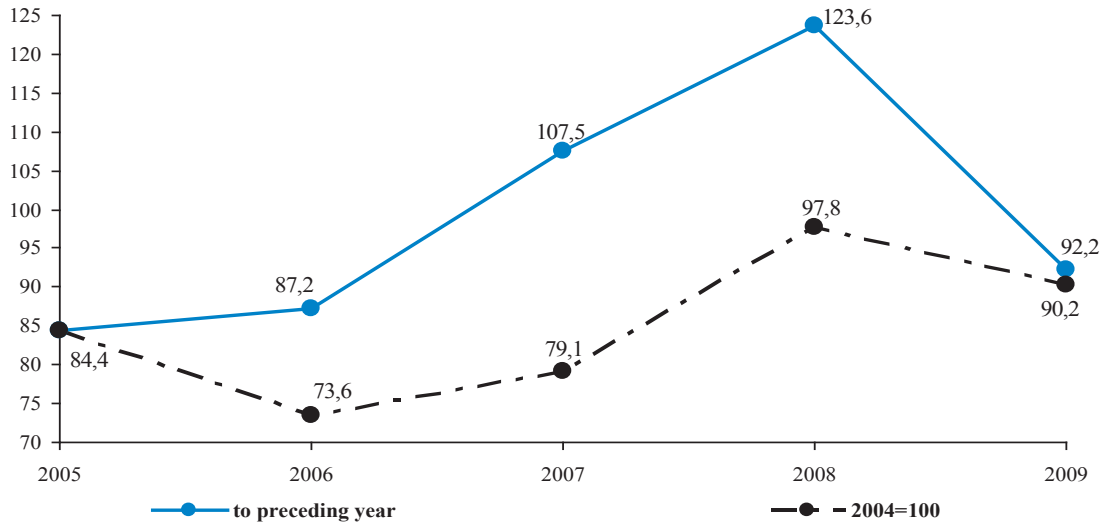


Schedule 1. Indices of physical output of other non-metallic mineral commodities (in percentage terms by previous year)

5 *Kyrgyz Republic. Joint economic assessment: consent and rehabilitation. July 21, 2010. ADB, IMF, WB, EBRD, EC, IFC, UN*

6 *Industry condition of the Kyrgyz Republic in 2005-2009. National Statistical Committee of the Kyrgyz Republic, 2010*

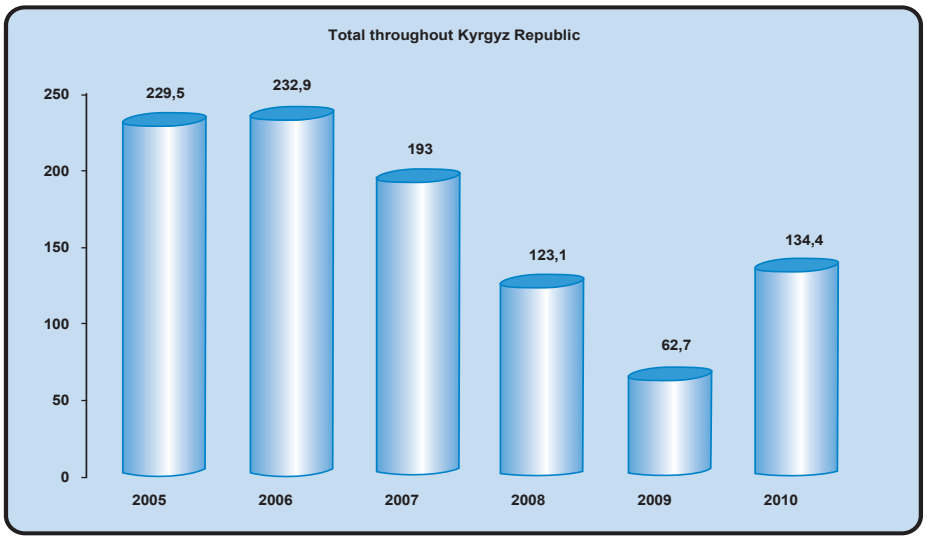
In 2009 the **processing industry** facilities manufactured products at existing values of 81223, 9 million soms, that is less by 7, 8% than in 2008, and less by 9, 8% than in 2004. (schedule 2).



Schedule 2. Indices of physical volume of the processing industry (in percentage terms)

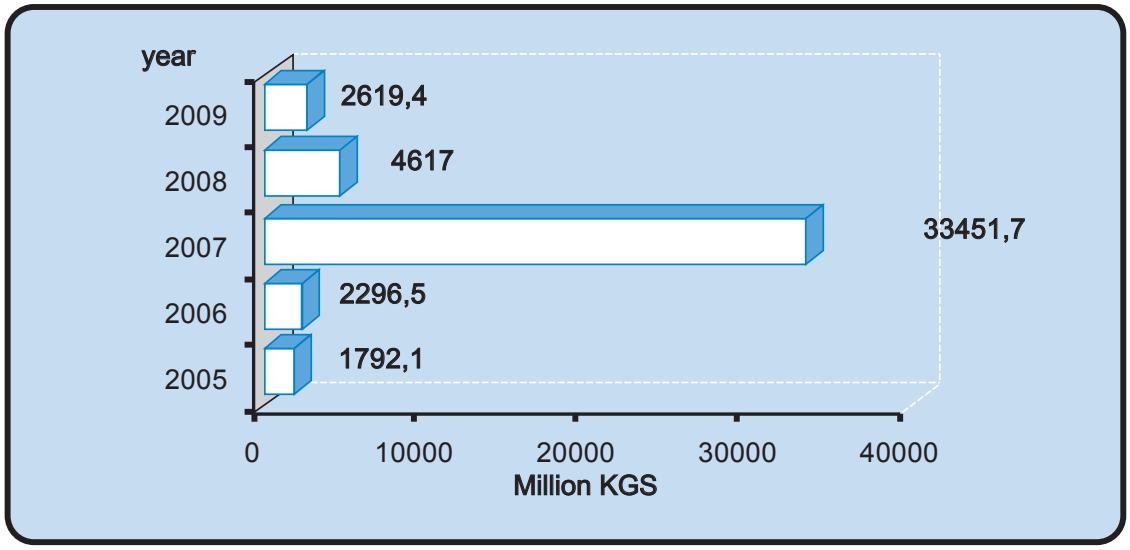
The reduction of output in 2009 was observed in practically all areas of production including cement, slate, lime, concrete, structural steels, central-mixed concrete, building brick etc., except bitumen mixtures and gypsum, the production of which increased by 1,4 times as compared to 2008.

Rate of fixed asset (funds) retirement by economic activities (in percentage terms to assets value at the beginning of year)



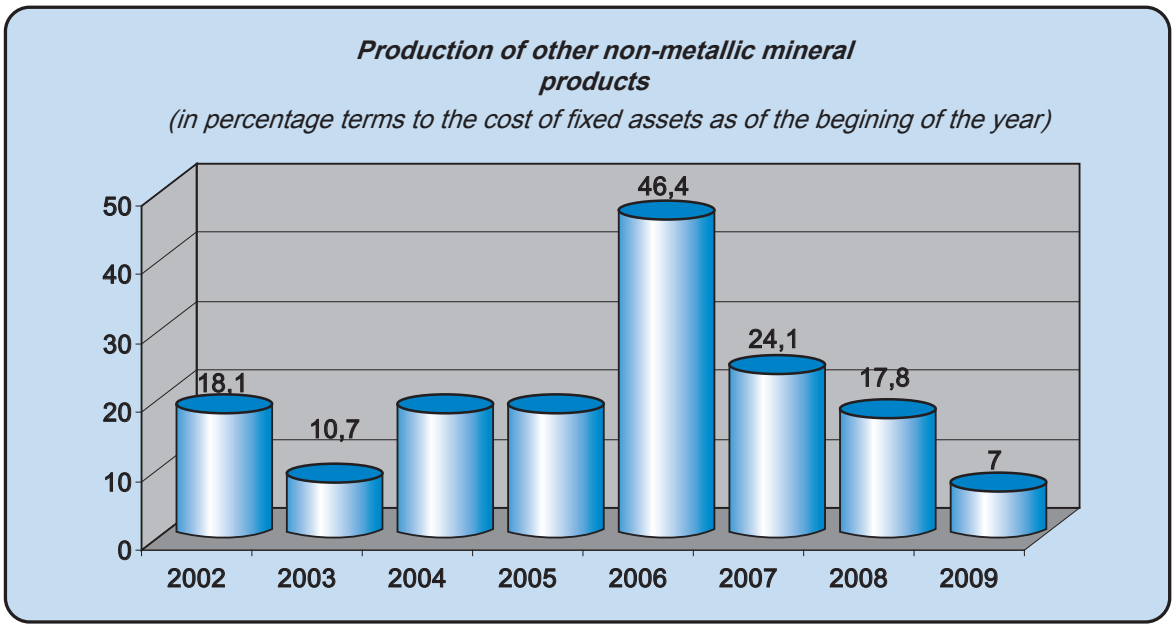
Schedule 3. Corrugated asbestos sheeting production, sheets, panels, paving tile and similar products made of asbestos cement[7] (thousand tons)

7 *Industry condition in the Kyrgyz Republic in 2005-2009. National Statistical Committee of the Kyrgyz Republic, 2010*



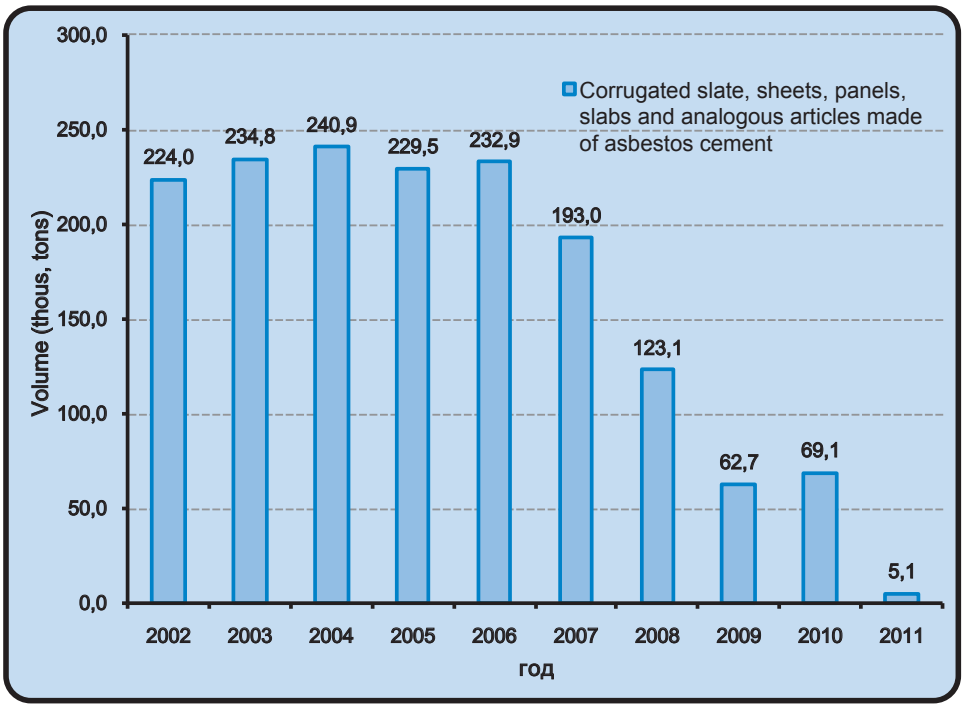
Schedule 4. Corrugated asbestos sheeting, sheets, panels and similar products made of asbestos cement, in millions of soms

Basic indices of output of other non-metallic mineral commodities all over the Issyk-Atinskiy District of Chui Oblast[8]



Schedule 5. Output of other non-metallic mineral commodities all over Kyrgyzstan

8 *Statistical yearbook of the Kyrgyz Republic. National Statistical Committee of the Kyrgyz Republic, 2010*



Schedule 6. Output of other non-metallic mineral commodities in terms of asbestos sheeting (in thousand tons)

Nonmetallic mineral resources of the Kyrgyz Republic

Kyrgyzstan is rich in various types of nonmetallic materials which can be mined or processed.

The raw material base for the cement industry includes stocks of carbonate and argillaceous deposits such as Kurmentinskoe (limestone – more than 53 million tons, loam – 3,7 million tons), Kuvasaiskoe (limestone – 34,3 million tons), Aksaiskoe (limestone – 218 million tons, loam – 33,6 million tons), Karagaily-Bulak (limestone – 220 million tons), Karachatyrskoe (black stone/slate – 14,2 million tons), Tach-Kumyrskoe (clay– 12,5 million tons).

According to their constitution, processing properties and fields of application they can be classified as building materials, crude ore mining, chemical raw materials, agronomical ores, and ornamental stone material[9]. Many of these non-metallic elements can be simultaneously referred to as part of more than one of the specified groups, demonstrating the all-purpose character of their practical usage.

Fire resistant and molding nonmetallic mineral resources are used in metallurgical production. They include serpentines, magnesite, graphite, quartz, quartzite, fireclays, dolomites, lydites, andalusite etc.

In the territory of the Kyrgyz Republic a single Kant serpentine deposit has been explored and its stocks have been estimated [10].

The Quartz sand of the Kolczo-Polovinka deposit can be used as a molding raw material. Graphite

9 *http://www.welcome.kg/ru/kyrgyzstan/nature/pl2/161.html*

10 *http://www.kgs.bishkek.gov.kg/geology_rus.htm 26*

deposits are wide-spread in the Talas, Kungei Ala-Too and Sary-Jaz ranges. The large-scale graphite deposit of Keelyu (Kuilyu) is of central industrial importance.

Fluorite mineralization is widely developed in Kyrgyzstan. It appears in large quantities in Aidarkenskiy and Chauvaiskiy alkali-mercuric, Abshirskiy, Northern Ak-Tachskiy alkali and other deposits. Natural mineral-fillers, heat-insulating and electrical insulating materials include mica, asbestos, talc, pyrophyllite, clays, kaolin, tripoli powder and other mineral pigments. Mica-bearing rocks are developed in the metamorphic strata of the Talas, Turkestan, At-Bashy and Teskei ranges.

Small occurrences of asbestos centre around the rocks on the Northern slope of the Alai range, in Talas, Kyrgyz, Kungei and Teskei Ala-Too ranges and in the Chon-Kemin river basin. Talc and pyrophyllite occurrences are small and therefore poorly studied. The largest number of talc deposits is located over a rocky area in the Kant ribbon. Industrial stocks of talc rocks are discovered in the Shamal-Tal-Kazy deposit. There are also talc occurrences in Kulagan-Tash.

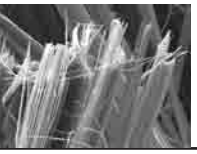
In the territory of Kyrgyzstan there are deposits which occur only rarely in other regions of the world and are specific in their fields of use as nonmetallic feed types: wollastonite (Kara-Korum deposit II in Chatkalskiy region with stocks of about 30 million tons), porcelain stone (Uchkurt, more than 9 million tons), rodusit-asbestos (Karkara, 618 tons), basalt (Sulu-Tegerek, 1,4 million cubic meters) and others.

The nonmetallic mineral resources of both natural and processed variety are of the utmost importance for the economic and social development of Kyrgyzstan. They are commonly used in the civil and industrial engineering, agriculture and in many branches of industry as well as in jewelry.

Since 1980s the extraction of nonmetallic feed to produce building and structural materials was developing successfully and providing completely for the needs of the construction industry in Kyrgyzstan.

At present the building material industry of Kyrgyzstan is represented by a series of enterprises producing cement, asbestos sheeting, lime, asbestos cement products, brick, glass, porcelain, asphalt concrete, ceramic ware, gypsum, facing stones and others.

The deliveries are made in neighboring countries and include cement (about 0, 5 million tons per year), brick, stone casting and facing materials. Two stone milling enterprises have been put into operation in Tokmok city and Ivanovka village. They produce annually up to 100 thousand square meters of facing tile and carved stone products.



GENERAL INFORMATION ON ASBESTOS

Asbestos is a natural raw material known to people from the depths of unrecorded time.

$$(3MgO \bullet 2SiO2 \bullet 2H2O)$$

It is mentioned in the written sources of Egypt, ancient Greece, ancient Rome, China, India, Arab and the East. In the Middle Ages people thought that asbestos was the hair of a creature that looked like a lizard, living in fire and called salamander. Its hair did not combust and one could therefore weave fire-resistant fabrics from it.

In 300-400 BC, the mineral was known in Greece, where it was called “asbestos” which means incombustible. “Inexhaustible”, “inextinguishable”, “persistent”, “indestructible” – all these terms are translations of this natural mineral from Greek.

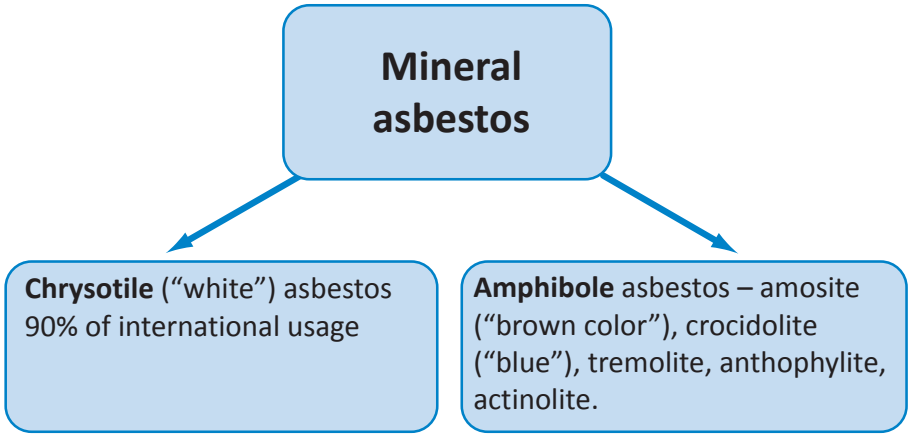
Asbestos is a commercial name for a group of natural minerals of silicate class. The general name “asbestos” includes silicate minerals different in their chemical composition, mineralogical structure, physical and chemical properties as well as biological activity, which have only similar fibrous structure, and as a consequence, some possible useful purposes.

Asbestos also comprise crystalline silicate minerals of fibrous structure of serpentine group and amphibole group. More than 90 % of asbestos extracted and sold throughout the world, is chrysotile asbestos, also known as «white asbestos», which represent a type of serpentine - a mineral belonging to the subclass of sheet silicates.

Asbestos has been known to the world for a long time. As early as 1300 years BC in ancient China and India, priests had fireproof clothing from asbestos, which they would wear to enter a fire. When they emerged from the fire alive, it resulted in the amazement and admiration of the people who worshiped them.

Asbestos-containing rocks are widespread. Almost every rock has asbestos fibers. Occurrence of asbestos is generally shallow, so in nature there is natural weathering and leaching of its fibers from the rocks. This leads to the constant presence of asbestos fibers in the environment, as well as other components - oxygen, nitrogen, carbon dioxide, and various dust (sand, clay, limestone, etc.)

Two main groups of asbestos minerals, serpentines and amphiboles, are of particular interest.



Chrysotile asbestos (chrysotile, parachrysotile), also known as «white asbestos «, is a fibrous variety of serpentine - a mineral of the sheet silicates subclass.

Five minerals belong to the group of amphiboles (from Greek «amphibolos», translated as ambiguous, vague, and which is associated with having a complex changeable composition) – a subclass of banded silicates.

They are amosite (brown asbestos, grunerite), crocidolite (blue, or light blue asbestos, riebeckite) and of rarer occurrence ¬ anthophyllite (grey asbestos), tremolite and actinolite [11].

The types of asbestos somehow differ in their properties (including thickness and length of fibers), but generally, they are characterized by high breaking strength, low thermal conductivity and relatively high chemical resistance.

In the Urals,asbestos was called a stone tow, from which people wove fire-retardant napkins and tablecloths. In Russia, asbestos has been known since the early 18th century. Its use is related to the name of a famous manufacturer Nikita Demidov. In 1722, an asbestos tablecloth was given to the Russian Emperor Peter I as a gift. Asbestos was widely used in industry much later – at the end of the 19th century.

Asbestos easily splits into thin solid fibers, which are crystals of roll or tubular structures. It has high thermal stability: it melts at 15,500° C. Its tensile strength along fibers is up to 30,000 kgf /cm2, which is higher than the strength of steel.

Asbestos is resistant to the action of alkalis, acids and other corrosive liquids. It also has outstanding spinning properties, elasticity, resistance to alkali, high sorption, thermal, acoustic and electric insulating properties.

In terms of their chemical composition, asbestos minerals are hydrous silicates of magnesium, iron, calcium and sodium. The fibrous structure is most clearly expressed in asbestos of the serpentine group, which has only one type of asbestos - chrysotile asbestos, used most commonly in industry[12].

The property of providing fire protection and thermal protection has determined the main areas of asbestos use for many centuries. For many years, asbestos has been used in space technology, in the processing and manufacture of friction materials (brake pads and linings for clutch discs in cars), refractory and insulation materials (special panels, fabrics), special technical paper, as well as in the production of construction materials for the manufacture of asbestos-cement slabs, pipes, culverts, etc. Chrysotile asbestos is the major component of cement, engineering and cardboard products. At the present moment, chrysotile asbestos is being used in 65 countries, home to more than 2 / 3 of the world's population[13].

The largest consumer of asbestos is the asbestos-cement industry, which produces asbestos products such as pipes and sheets containing 10-15 % of asbestos (mainly chrysotile).

The main deposits of chrysotile asbestos

The largest of the world's developed ***chrysotile asbestos*** deposits are located in Russia - Bazhenovskoye deposit (Middle Urals), Kiyembayevskoe (Orenburg reg.) Ak - Dovurakskoye (Tuva)

95 % of world production of asbestos is accounted for by chrysotile asbestos

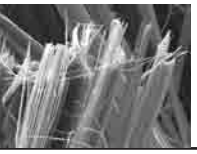
In the north Chita region, the Molodezhnoye deposit was opened, where asbestos with very long fibers is located. There are deposits of chrysotile in the serpentine belt of the Eastern and Western Sayan Mountains, as well as in the North Caucasus. Some major deposits of chrysotile asbestos are also found in Kazakhstan (Dzhetygarinskoye – Zhitikarinskoye in Kostanai region).

Aggregate proven reserves of chrysotile ores of Bazhenovskoye, Kiyembayevskoye and Dzhetygarinskoye deposits are estimated at 3,079.6 million tons, or, on average, a 150 year industrial

11 «Asbestos», Water Technologies Center, http://www.water.ru/bz/param/asbestos-new.shtml

12 «Asbestos», report. Ural State Mining-and-Geological Academy, Mining and Engineering Faculty, Mining Mechanics Department, http://revolution.allbest.ru/geology/00002047_1.html

13 http://ukrchrysotile.com.ua/hrizotil-produkti_dani_pro_vikoristannja.html



lifespan. The share of mining companies in EECCA (Eastern Europe, the Caucasus and Central Asia) in the world production of chrysotile asbestos is 60.8%[14]. Other countries of the world which produce chrysotile asbestos include China, Canada (Quebec), Brazil and Zimbabwe.

Amphibole asbestos

Amphibole asbestos represents the greatest threat to human health. With its resistance to acids, amphibole asbestos cannot be practically egested from the lungs and, consequently, has a detrimental effect on the body. It is this type of asbestos which was widely used in the West, with the technology of deploying asbestos on the metal structures of buildings to add insulation, so it is no coincidence that the anti-asbestos movement arose in the West.

Amphibole asbestos has a high biological and carcinogenic activity. Its fibers, upon inhalation, do not disintegrate under the influence of the internal environment of the body and are thus not egested from the human organism. For this reason, the production and application of amphiboles are completely prohibited worldwide.

Asbestos products

Asbestos cement is one of the most common building materials, which is produced by mixing cement, asbestos fiber and water, with a subsequent hardening of this mixture. The greatest scope of use among asbestos-cement building materials undoubtedly belongs to slate. As builders say, slate is a time-tested material. Slate is one of the most affordable roofing materials. It is very easily handled: sawed and drilled with conventional construction tools; it does not require sophisticated technology and machinery for its mounting. Slate is extremely simple to place. Roofing made from sheets of slate, with the right arrangement is strong and durable. It protects houses effectively from precipitation as slate is damp-proof and waterproof; it is also fire resistant and can withstand significant wind loads. The life of any house depends largely on the quality of its roof.

Slate as a building material, is universal in its nature. It is suitable not only for roofing, but it is also used in construction of dwelling houses, outbuildings and industrial facilities. Modern industrial technologies enable production of new kinds of slate, which have higher strength characteristics. The aesthetic look of slate should also be taken into account - for several years slate has been produced and painted in different colors; allowing for a unique range of shades for the entire house. For this purpose, modern resistant pigments are used. At present, painted slate is enjoying a period of high demand in the building materials market.

Experts note that in accordance with the above properties, slate occupies one of the most prominent places in the very constitution of the construction industry. In addition, an important advantage is its price. Therefore slate excels over all other natural and synthetic roofing materials. A solid «Value for Money» ratio has made slate by far the most common roofing material in the world.

It should be noted that in terms of ecology, slate, as a final product, has no effect on the environment and human health. This provision also applies to other kinds of asbestos-cement products. At the current time, the list of asbestos-cement products produced by industry is rather wide. In addition to slate, asbestos-cement pipes and culverts are the subject of great demand.

Asbestos-cement pipes are used extensively in construction, laying conductor communication lines, etc. Versions, functional purposes, as well as the size and diameter of asbestos-cement pipes are very different. Asbestos-cement pipes of small diameter are widely used by rural residents and gardeners, in particular, a free-flow asbestos-cement pipe, 100 mm in diameter. In their view, this pipe is a general-purpose one. It is used for arranging drainage systems, for laying communications, in the construction of dwelling houses, outbuildings and as supporting pillars for building fences.

14 Olga Speranskaya et al. Asbestos: reality, problems, recommendations. - Astana-Moscow-Kiev – 2008.

There are a wide and diverse range of asbestos-cement products - from a slate roof to a drainage system of asbestos-cement pipes, from an outbuilding to a fence is stipulated by their availability, high quality, low cost, and easy mounting.

Over the last hundred years asbestos has been used extensively in construction. The range of products produced from pure asbestos or in combination with other materials, totals more than three thousand. They include plastic film, various fibers used for making fabrics, panels and coatings, heat resistant and resistant to chemical attack; insulators for electrical equipment (e.g., for clutch facings and brake systems), overalls with safety features, gas masks, etc. Very short fibers and dust are used as filler and for increasing the strength of products such as vinyl, while asbestos is also used in floor tiles. Amphibole asbestos is used in the manufacture of filter gaskets and as a sealing material for pipe joints at chemical plants. They also serve as fillers in welding rods (in the process of welding) and in asbestos plastic materials.

Asbestos layered plates, molded under pressure from asbestos and Portland cement have been widely used in construction as a structural or insulating material for a long time.

Asbestos paper is also produced - thin alternation of asbestos fibers and cellulose, usually strengthened with a solution of sodium silicate (soluble glass).It is white, elastic, strong and fire resistant. There are many industries where workers have to deal with asbestos.

Possible ways of contact with this material are as follows[15]:

•primary - extraction, sorting, grinding;

• industrial - production of asbestos and its products;

• construction - various construction and installation works, for example, installation of boiler equipment, laying of pipelines;

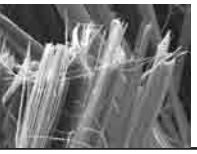
• environmental - industrial emissions resulting from asbestos production, representing a danger to people living nearby;

• destruction of buildings constructed with the use of asbestos and asbestos-containing materials, without compliance with the relevant rules;

• uncontrolled export, release of asbestos waste and dust into the environment;

• domestic - use of asbestos and asbestos-containing materials in the household, for example, asbestos was widely used for a certain period of time in the manufacture of ironing boards.

15 Olga Speranskaya et al. Asbestos: reality, problems, recommendations. - Astana-Moscow-Kiev – 2008.



CHAPTER 1. USE OF CHRYSOTILE ASBESTOS IN THE KYRGYZ REPUBLIC

Enterprises using asbestos in the Kyrgyz Republic

The concerned enterprise that uses asbestos in its production is situated in Chui Oblast, the most densely populated Oblast in the Kyrgyz Republic.

Kant CSF LLC

Kant Cement-Slate Factory is a leader in its market. It used to be a subdivision of Kant Cement-Slate Industrial Complex which was founded in 1964. The factory is now specialized in the production of large sized asbestos-cement boards of standardized and average profiles as well as asbestos-cement pipes 150, 200, 300, and 400 mm in diameter. The high quality output and low cost of production enables the factory to be competitive both in the domestic and international markets.

The factory is situated in Chui Oblast, Issyk-Ata Region, 25 km to the north-west from Bishkek, the capital of Kyrgyzstan.

The factory is surrounded by a sanitary protection zone which is around 1000 m wide. The width of the sanitary protection zone has to be confirmed by calculations of predictable levels of atmospheric contamination of the air with dust containing asbestos, in conjunction with applicable regulations determining the volume of hazardous substances dissipated into the atmosphere, as well as comparisons of laboratory investigations into atmospheric air quality in regions where similar factories operate.

The use of lands assigned for the sanitary protection zone is allowed only in accordance with requirements of sanitary regulations and norms “Sanitary Protection Zones and Sanitary Classification of Factories, Structures And Other Facilities”, in particular with the purpose of reduction of negative impact on environment and human health. The sanitary protection zone or a part of it cannot be considered as a reserved area of the facility, or used for expanding industrial or residential territory. To add to these, there are fields and agricultural lands which are located beyond sanitary protection zone of the factory. A larger wooded, green belt area is necessary for the protection line to fulfill its function.

In 2010 the factory had 240 people employed at it, 90 of whom were women, and 30 of whom were people who worked directly with asbestos. The enterprise has no international certificate ISO 9001.

The Cement-Slate Factory produces asbestos-cement pipes (non-pressure and high pressure) and asbestos-cement sheets (slate).

Table # 5

Factory products

Name of product	Measurement unit	2006 r.	2007 r.	2008 r.	2009 r.	2010 r.
Asbestos-cement sheets	Thousands of conditional sheets /year	180471,2	149461,7	93635,5	49306,44	53 605,76
Asbestos-cement pipes	Km of conditional pipes/year	358,352	260,649	178,335	-	-

Modern technical conditions relating to the state of the primary equipment at Kant CSF LLC allows producing the following number of products (with relatively low costs): up to 600-700 km of conditional asbestos-cement pipes; 160 million conditional asbestos-cement sheets. The cost of these high quality finished products is the lowest in the region. However, during the period from 2006 to 2010, production of asbestos-cement sheets was reduced by 3.5 %, and asbestos-cement pipes were not produced in 2009 and 2010 at all (See Table 5).

Production at Kant CSF LLC is highly competitive in the regional market of Central Asia, comparing favourably to production at enterprises located in Uzbekistan, Kazakhstan, Turkmenistan, Azerbaijan and Russia.

Output from Kant CSF LLC is traditionally exported to Uzbekistan, Turkmenistan, Caucasus, Russia, China and Azerbaijan.

Wear and tear of the primary equipment of the factory is 40-70% leading to a rise in the costs for its maintenance and operation. To maintain the factory in its current working state requires direct investments annually to the amount up to $4-5 million.

Total amount of tax payments imposed from the profit from production of construction materials at the factory reaches 200 million soms annually.

Prices for both cement and asbestos-cement sheets in Kyrgyzstan are the lowest of any country in EECCA [16]. And the factory is authorized as a natural monopolist. According to the current legislation of the Kyrgyz Republic, pricing on such products is under state control.

Kant CSF LLC of Kyrgyzstan uses chrysotile asbestos in production of asbestos-cement sheets and pipes. This asbestos is delivered to the factory from the following deposits [17]:

Table # 6

Asbestos supplying countries

Year	Deposit	Sort	Volume (tons)
2008 г.	Djetigarinskii deposit (Kazakhstan)	A5-50	6948,75
		A6-45	382,5
		A4-20	63,75
			7395
	Bajenovskii deposit (Russia)	A5-50	1645
		A6-45	1489
			3134
2009 г.	Bajenovskii deposit (Russia)	A5-50	**7242**
2010 г.	Djetigarinskii deposit (Kazakhstan)	A5-50	**6056,25**
	Bajenovskii deposit (Russia)	A5-50	**630**

16 Olga Speranskaya Asbestos: reality, problems, recommendations. Astana-Moscow-Kiev – 2008.

17 Kant Cement-Slate Factory data

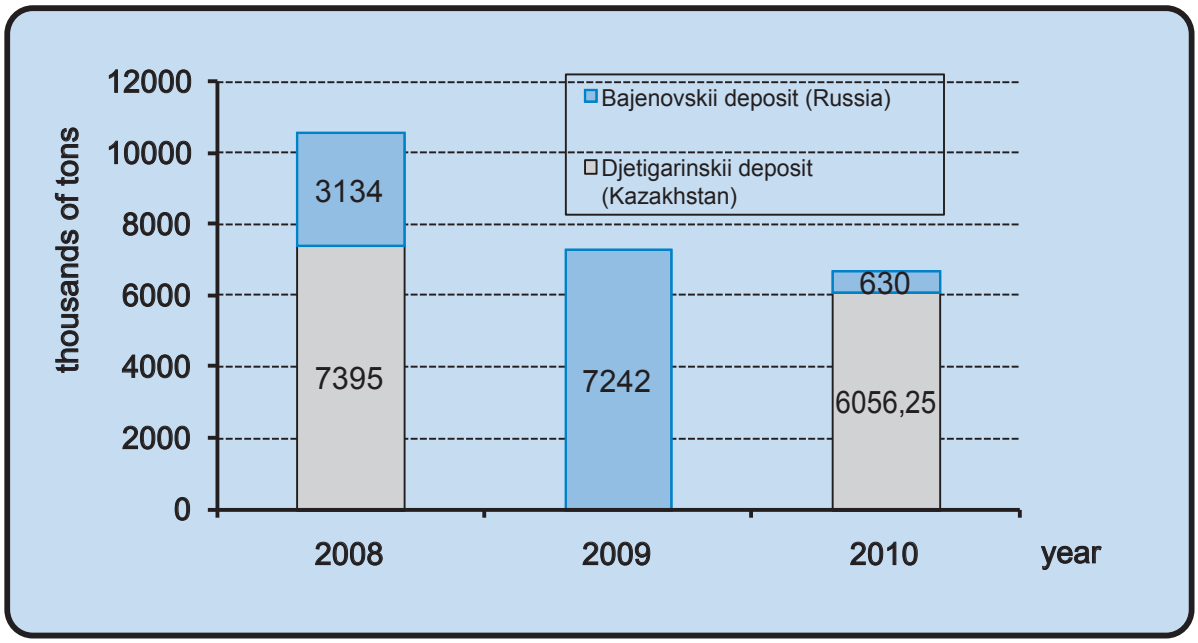


Diagram 7: Annual delivery of asbestos from different deposits

Ecological requirements to location and operation of enterprises using asbestos in production

A sanitary protection zone is established for:

- reduction of the negative impact on the area outside its boundaries to a level required by hygiene norms;
- construction of a sanitary protection barrier between the territory of the factory and the residential area;
- creation of an additional landscaped area necessary to provide shielding, assimilation and filtration of pollutants as well as improvements in small scale comfort.

The selection of an industrial site for construction of enterprises which extract and deliver asbestos, location of production buildings and equipment as well as landscaping of the territory and selection of size of sanitary protection zone should correspond to SNiP “Masterplans of Industrial Enterprises”, and “Sanitary Norms Of Design Of Industrial Enterprises”.

Manufacturing buildings should be located with consideration of wind diagram from the downwind site in relation to administrative and household buildings. When the plan of the enterprise is prepared it is necessary to provide minimal number of transfer groups and reduce the number of different ways in which asbestos and materials containing it are transported to the site.

A territory of the factory located aside from buildings and household facilities must be landscaped. Driveways and walkways should have solid surfacing. Wet cleaning has to be provided where possible.

It is not permitted to locate enterprises that extract, process and use asbestos and thus are sources of atmospheric air pollution with dust containing asbestos, in territories with levels of contamination exceeding permissible norms.

It is not permitted to locate enterprises which extract, process and use asbestos, and dumps of asbestos waste:

- in residential areas;
- in area of groundwater feeds;
- at lower river terraces;
- in areas with multiple clefts;
- in intake zones of sources of central public water supplies;
- in intake zones of sources of mineral waters;
- in recreation zones.

It is necessary to consider the level of ground water when sites for industrial enterprises are selected. A permissible level of ground water is 2 m from the surface of the ground. Distance from the level of ground water from the foot of the building's foundations has to be no less than 0.3 m. In cases where the site for construction of the enterprise has a ground water level high enough, certain measures should be taken to drop the level of ground water and provide vertical waterproofing of the foundations and underground rooms of buildings.

Process of production of asbestos-cement sheets and pipes[18]

The main input products necessary for production of asbestos-cement sheets and pipes are the following: chrysotile asbestos, extracted at Djetigarinskii and Kiembaevskii deposits, cement of M-400 or M-500 sorts, and water.

Asbestos consists of fibers of different length and aggregates. Depending on the length of fibers asbestos is classified into eight groups: 0,1,2,3,4,5,6, and 7.

Depending on limits of particle sizes asbestos of the 0-6 groups can be divided into a number of sorts. Limits of particle size are determined by the dry sieving method carried out with a control device which has 4 sieves. The first sieve has clear particles 12.7 mm of size, the second – 4.8 mm, the third – 1.35 mm, and the fourth – 0.4 mm.

Asbestos which belongs to the 7th group is divided into sorts depending on its packed density.

The main sieve of the control device is the following:

for asbestos of 0-2 groups – the first;

for asbestos of 3,4 groups – the second;

for asbestos of 5,6 groups – the third.

Asbestos of 3 and 4 groups is used for production of asbestos-cement pipes.

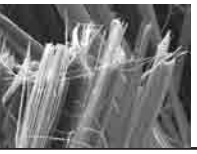
Asbestos of 5 and 6 groups is used for production of asbestos-cement sheets (slate).

Asbestos ores, concentrates, medium-enriched products, and unpacked ready production at asbestos-concentrating factories should be stored in closed warehouses and hoppers.

Asbestos has to be packed in durable, airtight and dustproof packets marked in accordance with GOST "Hazardous Materials. Classification And Marking" and supplied with a safety data sheet or a description which contains the following information:

- name of production on both face and reverse sides;
- address of the manufacturing factory;

18 Ecological Certificate of Kant CSF LLC, Ecological service, 2008



- chemical notation or usual name of all components of production which contains asbestos;
- percentage composition of asbestos in the mixture;
- data on hazardous properties of asbestos for human health;
- directives on personal protective equipment (air-purifying respirators, work clothing);
- other explanations related to ways of treatment of production containing asbestos.

Manufacturing process, machines, mechanisms and equipment should meet the requirements of "Sanitary Rules of Organization of Manufacturing Processes and Hygienic Requirements to Production Equipment", sanitary norms and regulations, standards of labor safety system for separate production factors (noise, vibration, electromagnetic oscillation, etc.), equipment, processes, etc., and GOSTs "Working Place for Standing Works. General Ergonomic Requirements", "Working Place for Sitting Works; General Ergonomic Requirements".

New manufacturing processes, equipment, and materials should correspond to the recommendations of state sanitary and epidemiological surveillance bodies

Production of asbestos-cement sheets (slate)

At the present time asbestos-cement sheets are produced in 8-wave profiles 40/150 – (40 – length of regular wave in mm, 150 – fetch of wave in mm). The factory has 5 slate and 1 pipe manufacturing lines. Now only two slate manufacturing lines are operated.

The process of slate manufacture consists of a number of operations. These include: blending asbestos, crushing it, preparation of asbestos-cement mixture, formation of sheets, formation of waves and hardening of sheets.

Asbestos mixture composition is calculated in accordance with a diagrammatic flow sheet and the availability of asbestos of necessary sorts at the warehouse. Asbestos of each sort is batched separately. Asbestos from batcher bins and receiving hoppers is loaded onto a belt conveyor which delivers the material to mill stones. At this stage of the manufacturing process dust containing asbestos is emitted into atmosphere. In mill stones asbestos is broken down and moistened. The rate of asbestos crushing amounts to 30-35%. The final crushing is carried out by a hydro-crusher which reaches a rate of crushing of up to 85%.

Preparation of the asbestos-cement mixture (blending crushed asbestos with cement) is carried out in a turbo-mixer. The time of mixing is 3-4 minutes. The asbestos-cement mixture is then delivered from the turbo-mixer to the ladle mixer where a certain stock of asbestos-cement mixture (necessary for the continuous operation of the sheet-forming machine) is formed. From the ladle mixer the mixture is delivered through a channel to baths of lattice-like cylinders of sheet-forming machines. At this stage of the manufacturing process, no hazardous substances are emitted into the atmosphere.

The process of manufacturing asbestos-cement products consists of the following stages: primer layers are formed on lattice-like cylinders, then they are delivered to technical felt, after this they go to formatted drum where up rush is formed and later nested into formats of a specified size. After this, the formation of waves takes place on a special machine, and a stockhall stacker stockpiles the sheets onto the conveyor for hardening. When the sheets have hardened they are moistened and piled for storage in stockrooms. At these stages of the manufacturing process no hazardous substances are emitted into the atmosphere.

Amount of asbestos used for formation of products[19]

The diagram given below shows that the amount of asbestos imported in the Republic has reduced by 3 times within the period of the last 5 years.

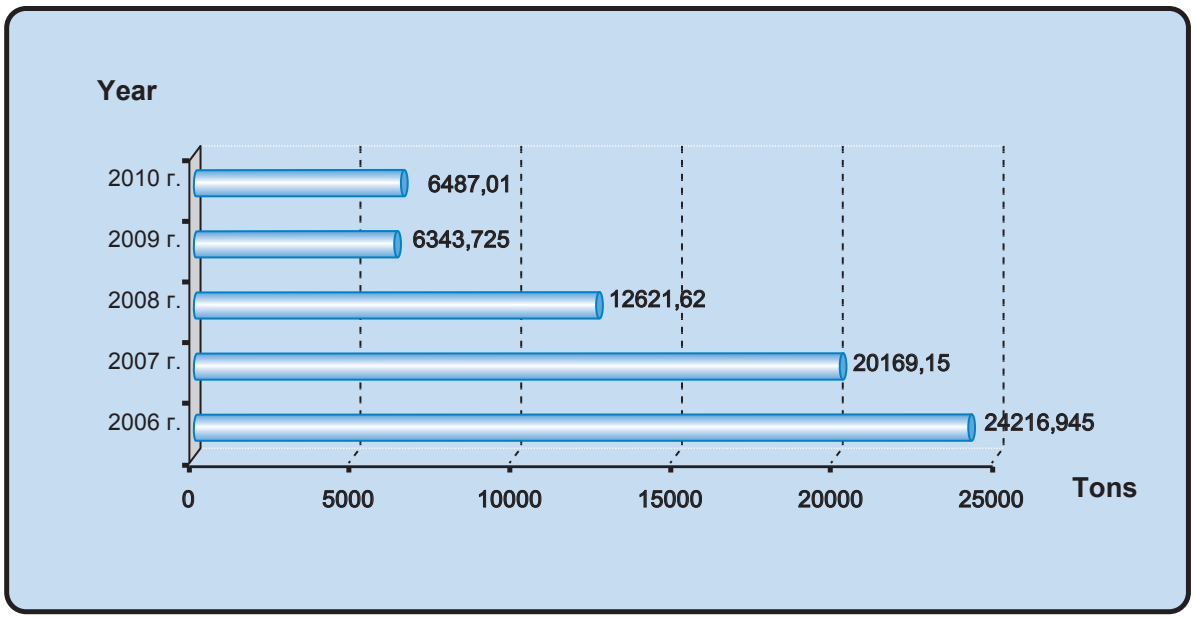


Diagram 8. Amount of asbestos used for production of slate

Production of asbestos-cement pipes[20]

The process of formation of asbestos-cement pipes is not very different from the process of formation of asbestos-cement sheets on sheet-forming machines.

Hardening of asbestos-cement pipes goes through three stages:

1. Preliminary air and then steam-air hardening of pipes is carried out on a wheel conveyor over 6-8 hours at a temperature not lower than 40°C.
2. When pipes have hardened they are piled into baths for water hardening or hydrothermal processing of pipes. The most favorable mode for water hardening of pipes is soaking in water at temperatures not lower than 50°C during 2 days.
3. Final air hardening is carried out at a draft-proof storage warehouse over the course of 10 days.

Before the final air hardening, pipes are subject to mechanical processing. Ends of pipes are cut and turned on special working machines. The turning of the external ends of pipes to sizes specified in normative documents specifies the proper sealing of socket joints with rubber rings when pipe installation is carried out. At this stage of the manufacturing process suspended substances are emitted into the atmosphere.

19 *Report data of Kant CSF LLC*

20 *Ecological certificate of Kant CSF LLC, Ecological service, 2008.*

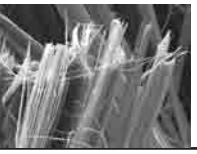


Table # 7

Key figures of manufacture of other nonmetallic mineral products in Kyrgyzstan[21]

	2005	2006	2007	2008	2009
Number of enterprises	149	145	162	190	194
Amount of industrial production, millions of soms	4168,3	5228,8	7437,6	8949,1	5556,3
Number of people employed, thousands of people	10,6	9,8	11,5	11,4	9,5
Balanced financial result (profit minus loss), millions of soms	704,4	544,4	1321,5	966,7	102,4
Production:					
Cement, thousands of tons	972,8	1050,9	1229,5	1218,1	579,4
Building lime, thousands of tons	8,5	9,9	12,9	8,7	4,7
Ready-made concrete building structures, thousands of tons	98,6	114,5	135,3	131,8	101,1
Slag wool, mineral silicate wool, tons	388,1	514,8	597,9	875,2	598,5
Plate glass, thousands of m2	22328	20786	22920	18752	0,0
Construction bricks, blocks for floors and similar ceramic, not fire-resistant products, millions of pieces	112,9	107,0	120,6	80,0	52,9
Channeled slate, sheets, panels, tiles and similar products made of asbestos and cement, thousands of tons	229,5	232,9	193,0	123,1	62,7

Requirements for atmospheric air protection at work stations and outside the workroom

Systems of ventilation, heating and air conditioning in manufacturing and service spaces should satisfy the requirements of SNiP Chapters “Heating, Ventilation And Air Conditioning. Norms of Design” and “Sanitary Norms of Design of Industrial Enterprises”, GOST “Ventilation Systems. General Requirements.”

Before being emitting into the atmosphere, air removed by the ventilation system that contains hazardous substances must be filtered to lower concentrations until only permissible levels of the hazardous substances remain.

Inside working areas and at places where workers spend a lot of time microclimatic conditions should correspond to sanitary rules and norms of “Hygienic Requirements for the Microclimate of Working Areas”.

Standardized parameters of microclimate and purity of air should be reached primarily by taking manufacturing and construction measures: using modern technologies, sealing equipment and providing it with built-in exhaustions, elimination of dust in water and foam in the places

21 Statistical Yearbook of the Kyrgyz Republic 2010.

of its formation.

Aspiration has to be carried out when the following operations take place:

- loading and delivery of material by conveyor belt, crushing, grinding, sieving, separation, mixing and packing of materials containing asbestos;
- carded hackling, spinning, weaving, sewing and cutting asbestos-textile products;
- cutting, punching, drilling, sawing, crushing and any other mechanical processing of asbestos-cement, frictional and heat and sound-proof materials and products containing asbestos.

Losses and leakages of air due to incompactness of air channels should not exceed values indicated in SNiP "Heating, Ventilation and Air Conditioning". Efficiency of dust exhausting devices should be high enough to provide proper simultaneous work of all local exhaustions connected to it.

Dust exhausting systems should be interconnected with production equipment to prevent work of the latter when ventilation system is off.

Dust exhausting systems and gas and dust removal facilities should go off not earlier than 20 minutes after equipment intended for ore concentration is stopped.

Ventilators and filter bags of central systems of pneumatic transport and aspiration should be located in accordance with requirements of SNiP "Heating, Ventilation And Air Conditioning".

Level of noise generated by ventilation systems and pneumatic transport in those should satisfy requirements of sanitary rules and norms "Noise at Work Places, In Living and Public Buildings and Territory Of Residential Structure".

The heating of industrial rooms has to be combined: aerating heating combined with blowing ventilation or water heating. Local heating devices should have a smooth surface.

The way of delivery for incoming air and its fluidity in the working zone should ensure the exclusion of secondary dust formation. Incoming air should be delivered to zones with lower contamination. Release of incoming air should be done through devices that provide an even distribution of air in the working zone. Air velocity in the working zone should be within 0,1—0,6 m/s.

For heating of buildings and structures systems, devices and heat carriers should be provided, which do not produce additional hazardous industrial substances.

Inlet heating and ventilation equipment, and air conditioners which work in rooms where air recirculation is not allowed should be placed in isolated rooms.

In unheated sections, rooms for ensuring the warmth of workers should be provided.

Rooms with operating consoles should be separated from industrial rooms by a tambour-gateway with space air overpressure or equipped with a separate exit to a corridor.

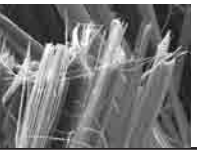
Airways of inlet systems located in vicinity of hot manufacturing equipment or other sources of heating should have heat insulation.

At permanent work places and in rooms subject to excessive heat production it is necessary to provide spot cooling. Temperature and air velocity in such rooms should satisfy the requirements of sanitary norms.

Warm air curtains should be provided:

- at manufacturing openings in periphery walls or walls between heated and non-heated rooms;
- at gates which open more often than 5 times or for longer than 40 minutes during a shift;
- in rooms with significant moist production.

The cars of bridge cranes should be equipped with air conditioning.



All ventilation devices both newly installed and those brought into operation after reconstruction or heavy repair should be tested for their efficiency. By results of tests and adjustment each ventilation system should be provided with a certificate.

Ventilation devices should be equipped with accessories (actuator accesses, connecting pipes, etc.) for control and measurement of speed, temperature and other factors in airways and adjustment of air volumes.

Testing, adjustment and setting-up of ventilation systems should be carried out in accordance with requirements of SNiP "Sanitary and Technical Equipment of Buildings and Structures" and GOST "Ventilation Systems; Methods of Wind-Tunnel Test".

Control of work of ventilation systems and dust-trapping units should be carried out on the regular basis in accordance with requirements "Instructions on Sanitary and Hygienic Control of Ventilation Systems of Manufacturing Areas", instructional lines "Sanitary and Hygienic Control of Ventilation Systems of Manufacturing Areas", and GOST "Nature Protection. Atmosphere, Methods of Determination of Speed and Consumption of Gas and Dust Streams Blowing from Stationary Sources Of Pollution."

For uninterrupted and effective work of ventilation systems and devices personnel for ventilation service should be hired and equipped with all necessary tools and a room.

Each enterprise which extracts, concentrates and processes asbestos should provide a system of laboratory control of atmospheric air pollution. The plan of such controls should be approved by the state sanitary and epidemiologic surveillance bodies.

Laboratory control should be carried out with high-skilled personnel accredited in a certain order manufacturing laboratories or other accredited laboratories.

The system of control for atmospheric air pollution should cover residential territory which is located in the zone of emission of aerosols containing asbestos.

The radius of the control zone should be defined during the elaboration of regulations of permissible levels of emission along with substantiation of inclusion of those into a summary volume of this document.

Residential areas have to be provided with stationary posts for monitoring over atmospheric air pollution, including dust containing asbestos, in accordance with GOST requirements "Rules of Air Quality Control of Residential Areas" and "Guidance on Control of Pollution of Atmosphere of Residential Areas".

State sanitary and epidemiologic control of atmospheric air pollution is carried out with the use of current maximum permissible concentrations of dust containing asbestos.

For maximum permissible concentrations of dust containing asbestos in closed areas, which are not directly related to production, maximum permissible concentrations of dust containing asbestos for atmospheric air are taken.

State sanitary and epidemiologic control over quality of atmospheric air in terms of pollution with mixed dusts containing asbestos and specific technical components should also be carried out in accordance with hygienic regulations regarding these components.

Selection, preparation and analysis of samples for the determination of calculated concentrations of asbestos fibers, should be carried out in accordance with the "Methodology of Measurement of Asbestos Fibers Concentrations in the Atmospheric Air of Residential Areas."

In accordance with the requirements of GOST "Rules of Establishing Maximum Permissible Emissions of Hazardous Substances by Industrial Enterprises" should be reconsidered not less often than once every 5 years.

Institutional services should annually aggregate the results of atmospheric air investigations,

analyze causes of changes in the pollution dynamic over periods of 3 years and elaborate measures on the reduction of atmosphere pollution with specified strategies to be undertaken. Plans of nature-conservative measures should be approved by the institutions of the state sanitary and epidemiologic service and nature-conservative bodies.

Impact of production on quality of atmospheric air

Emissions into the atmosphere are carried out from 10 sources of hazardous substance emissions. Six sources of primary production are organized and equipped with dust-absorbing devices. As results of the investigation of the manufacturing process of the enterprise and secondary production show, 10 different hazardous substances are emitted into the atmosphere, including dust containing asbestos, dust containing 20-70% of SiO2, suspended substances, oxides of carbon, nitrogen and manganese, silicon compounds, anhydrous hydrogen fluoride, fluorides and potassium hydroxide.

Dust containing asbestos, 70% of SiO2, suspended substances, oxides of carbon, nitrogen and manganese, silicon compounds, anhydrous hydrogen fluoride, and fluorides together form a group of polluting substances summation. Considering the sort, quantity and composition of emitted substances, production at Kant CSF LLC belongs to four separate hazard categories.

From 2008 the enterprise has elaborated and used norms on maximum permissible emissions[22] of hazardous substances into the atmosphere. These norms, which are given in table 8, have been approved by the Chui-Bishkek territorial administration.

Table # 8

Comparison table of established norms with total amount of emission during 2010 according to data from the National Statistical Committee of the Kyrgyz Republic.

Contaminant	Established norms of maximum permissible emission (tons)	Total amount of emission in 2010
1. Dust containing asbestos	1,47	0,515
2. Dust containing SiO2	0,6384	0,2775
3. Suspended substances	0,1181	0,1355
4. Silicon compounds	0,00017	
5. Hydrogen fluoride	0,00397	0,002
6. Fluorides	0,00033	

22 Project of standards of maximum permissible emissions for Kant CSF LLC, "Ecological service", 2008

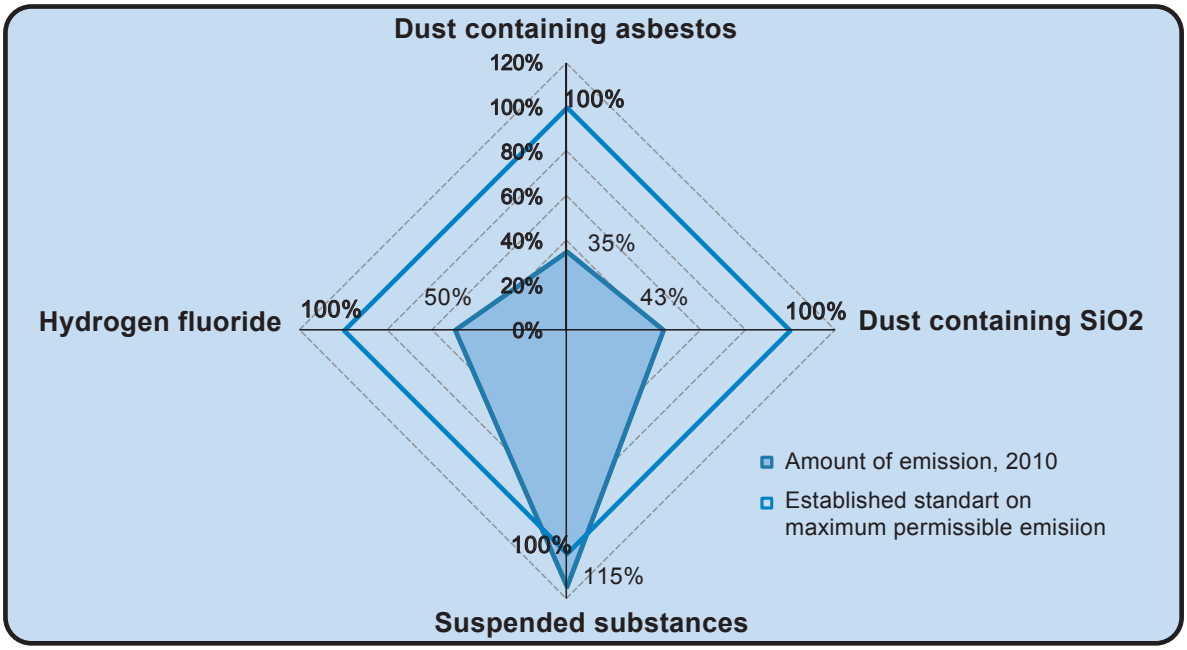


Diagram 9. Comparison of emissions of contaminants to established norms for 2010, according to data from the National Statistical Committee of the Kyrgyz Republic

Having analyzed the total amount of emission of contaminants into the atmosphere and established permissible standards one has to conclude that the actual quantity of emissions is significantly lower than those of established norms. It is supposedly related to the fact norms of emissions are established for the enterprise operating at full capacity, and the factory considered in this study does not operate at full capacity.

Payment for emissions of contaminants from production is 2784,22 soms per year[23] (without indexing coefficient). This is because of the low standard of payment for emissions and non-toxicity of contaminants emitted.

Requirements for the treatment of production waste[24]

At the stage of the design of the enterprise, construction materials should be provided containing information about quantity, quality and hazard category of supposed industrial waste in accordance with predictable volume of production development and measures for the sanitary protection of the environment[25].

If there is no technical possibility of introducing waste-free technology, the project has to provide a complex of measures for maximum use of waste as secondary raw materials.

On general questions related to prevention of pollution of water bodies and soils it is recommended to use current sanitary norms as well as referring to the chapters on "Rules of Protection of Surface Waters from Pollution with Waste Waters."

Liquid waste containing asbestos should be stored in special reservoirs or containers which eliminate any possibility of leakage.

Design, construction, reconstruction and operation of sludge depositories should be carried

23 *Ecological certificate of Kant CSF LLC, Ecological service, 2008.*

24 *Data provided by Kant CSF LLC*

25 *SanPiN 2.2.3.013-03 2.2.3. Enterprises of separate branches of industry, agriculture, communication and transport. Work with asbestos and materials containing asbestos.*

out in accordance with requirements of "Rules of Safe Operation of Tail, Sludge and Sludge Pond Households" and the present rules.

It is necessary to carry out a systematic processing of the surfaces of concentrated waste dumps with special binding solutions, followed by a subsequent re-cultivation of dumps (landscaping, etc.).

Collection and packaging of packets released from asbestos into dust-proof containers should be done in shelters equipped with warning signs and inscriptions, and connected to aspiration system.

It is not permitted to recycle packets released from asbestos as waste paper or containers for any materials. It is possible, however, to use them as secondary raw materials in the manufacture of asbestos-cement products.

Crushing waste for subsequent utilization should be carried out in closed crushing and milling departments equipped with aspiration. Waste containing asbestos should be used in manufacture in ways which eliminate the production of dust.

During construction works with the use of materials containing asbestos it is necessary to provide utilization of irreclaimable construction and household waste containing asbestos. This must be done in coordination with state sanitary and epidemiologic service.

Waste containing asbestos should be accumulated and stored in special closed containers.

In case of the accidental emission of dust during transportation, immediate measures should be taken to the extent corresponding to the amount of material emitted. If the material spilled is scarce, asbestos waste should be collected back into the container. If the loss is significant, material should be moistened and covered.

After unloading to landfill, waste should be covered with a layer of soil not thinner than 25 cm. Waste cannot be left exposed by the end of the work day.

The thickness of the final layer employed to cover asbestos waste should be greater than 2 m.

Wells and mines can be used only for storing lump waste containing asbestos.

If asbestos waste of high density is unloaded at an open landfill, means to bypass this place should be provided.

Asbestos production waste at enterprises in Kyrgyzstan

Co-products produced in the process of asbestos concentration (sand-chip mixtures produced from siftings of serpentinite crushing and serpentinous rocks, crushed serpentinous rocks, building stone, plates and blocks from natural stone, etc.) can be used in all types of construction of the 1st category, production of road-construction materials, asphalt-concrete of different sorts, as well as a filler for concrete mixtures in all types of construction.

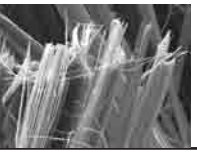
Moist waste of asbestos-cement production (asbestite) and heat-insulated materials containing asbestos should return to manufacture and/or can be used in the production of construction materials (asbestos-cement, asbestos perlite blocks, etc.).

Waste containing asbestos is not used as an addition to dirt roads due to its harmfulness to human health.

In the process of manufacture, 260 tons of production waste[26] is formed. This waste belongs to the 4th category of hazard.

Waste can be of three types: dry, moist and aspiration dust.

26 Ecological certificate of Kant CSF LLC, ecological service, 2008.



Dry waste is formed:

- in the process of forming (breach of manufacturing process);
- in the process of equipment cleaning at technical service and planned maintenance;
- during the processing of defective goods.

Moist waste is formed in the process of forming. Water, which is used in the manufacture of asbestos-cement products, has a closed cycle of work. A part of it is used for production, another part, which is applied for cleaning of technical felt, as well as water from baths of lattice-like cylinders is pumped out into a container (recuperator), where asbestos particles and cement settle to the bottom and then get discharged through a plug valve into a tray of recuperated waters, leading to sedimentation tanks. Asbestos and cement particles settle there and when tanks get full, are transported to a landfill.

Aspiration dust settles in an aspiration dust collector in the process of aspiration ventilation in places where asbestos is unloaded into hoppers, and delivery of asbestos on conveyor belts to the place of processing. Dust collectors are cleaned regularly and their contents are then once again used in manufacture. An insignificant part is emitted into atmosphere.

Storing of dry and moist asbestos-cement waste is carried out at a landfill (place specially designated for it) which is to be re-cultivated when it gets full (waste is covered with soil).

In 2008 a special project “Landfill for Hard Industrial Waste in the Industrial Zone of Kant” was elaborated. The landfill for hard household waste of slate production is a modernized dump with arranged stockpiling of waste. The estimated capacity of the landfill is 1000 tons of industrial waste a year. Emissions of dust containing SiO2 ≤20% from the landfill amount to 1, 984 tons. The area of the designed landfill is located 600-700 m to the east of Kant Cement-Slate Factory LLC, on a construction-free territory.

The project provides for the division of the territory by two separation dams (north-western and south-eastern) into four cards for more rational use of the area. Works on the operation of the landfill include:

- Covering of waste which is delivered to the landfill on a regular basis (twice a week) with an isolating layer of nonreactive material with a thickness of 1m or more.
- Addition of a path which goes around the external perimeter of the landfill with a layer of crushed limestone material.

The total period of landfill operation (time for filling it) is 39 years.

Works on the re-cultivation of the landfill will start serially as soon as the first card of the landfill is full. It will happen on the 12th year of landfill’s operation. It is provided to cover the landfill’s cards with layers of loam soils, sowing of perennial plants, and the planting of bushes. For 2011, 25% of the total amount of finances intended for landfill construction and maintenance has been allocated.

Table # 9

Formation of production waste

Waste from slate and pipe production	Measurement unit	2006r.	2007r.	2008r.	2009r.	2010r.
	tons	2686	2214	1392	705	767

Data given in the table is derived from the results of a three-month calculation of removal of hard and moist asbestos-cement waste. The average coefficient of waste formation was also calculated - (~1,1%). The weight was accounted for in dry conditions.

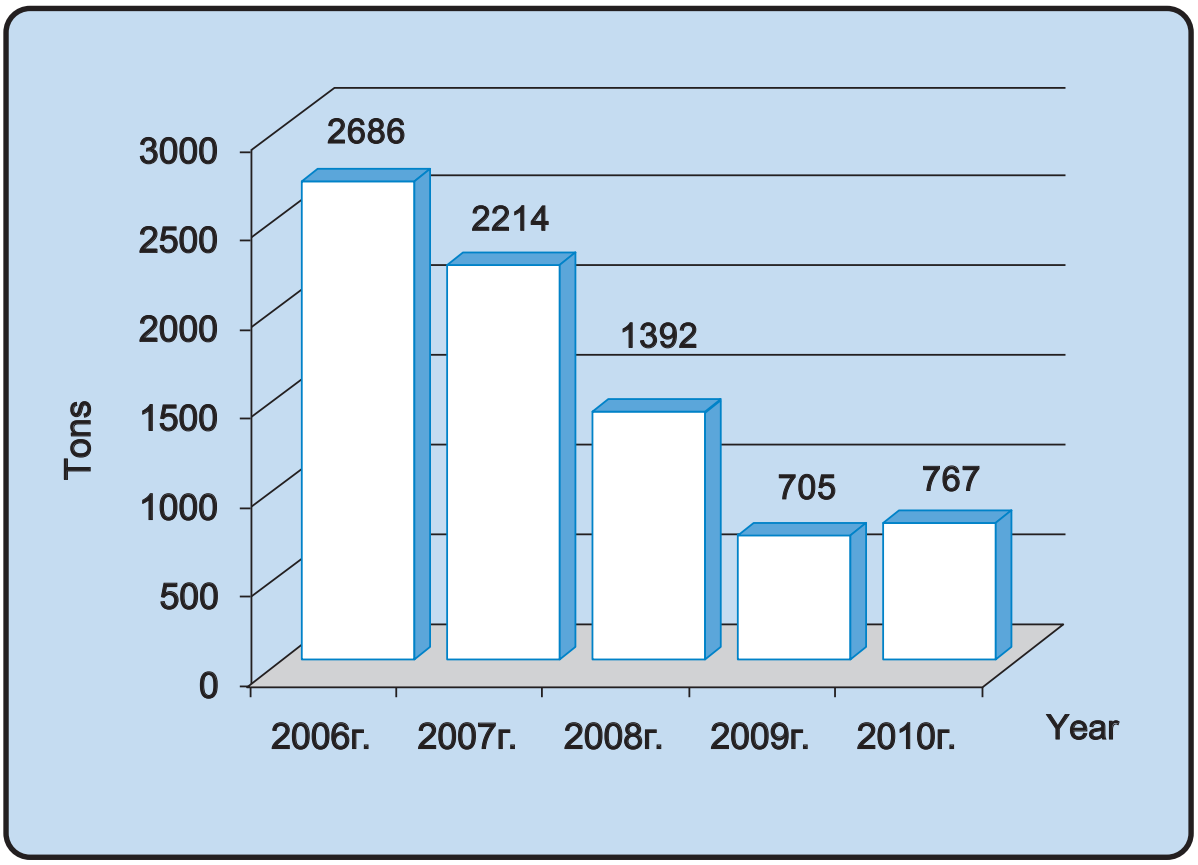
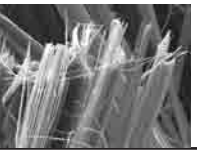


Diagram 10. Quantity of production waste

Summary

- In Kyrgyzstan enterprises which use chrysotile asbestos are situated mainly in Chui Oblast.
- The factory uses chrysotile asbestos for its product cycle.
- In sanitary regulations and rules, requirements have been elaborated to provide environmental protection and protection of human health at work with asbestos.
- The Monitoring of the fulfillment of these requirements by factories is carried out occasionally without the participation of all interested parties.
- Monitoring data is not available to the public .
- Sanitary regulations and rules for enterprises using asbestos need to be reconsidered.



CHAPTER 2. EFFECT OF ASBESTOS ON HEALTH

Routes of asbestos entry into the human organism

Mineral fibers are relatively stable and remain in the environment for a long time. They may be transferred great distances via air mass and water flows. At the same time, mineral fibers usually undergo certain chemical changes both in aqueous mediums and living organisms and, in addition, they are capable of absorbing various organic matters.

The most detrimental effect on human health is caused by asbestos fibers' concentration in the air. Though these fibers form just a small fraction of fibrous aerosol in air, they are present almost everywhere.

According to data belonging to the US Agency for Toxic Substances and Disease Registry, concentration of asbestos fibers in air amounts to 0.03-3 fiber/m3. Asbestos concentration in cities is already equal to 3-300 fibers/m3, and it may reach 2000 fibers/m3 and even more in areas that are located near to asbestos extracting and processing enterprises.

Application of recycled and used asbestos containing various materials, and dust emission might be hazardous for people as well.

Water is the second most important channel for asbestos entry into the human organism. Average concentrations of asbestos in drinking water make 0.3-1.5 μg/l. However, the amount of asbestos decreases significantly in water that has been treated by municipal purification systems.

Asbestos presence in foodstuffs is poorly studied and is accepted to be considered negligible Asbestos-containing materials are no longer used for foodstuff packing.

International studies

Opinions about chrysotile asbestos' effect on the human organism are deeply contrary: from negative to positive perceptions.

Medicine first paid attention to asbestos in 1907 when English doctor Murray discovered a specific lung disease (asbestos) that progressed in employees in contact with asbestos. After this discovery, asbestos attracted the attention of medical science and, starting from thirties, studies have been published with ever-increasing controversy - in our country as well as others - that are devoted to the effect of asbestos-containing dust on the human organism. The asbestos campaign first started in the 1970s.

Moreover, it should be noted that asbestos was produced as a default foundation in sanitary-engineering measures to protect employees even in 50-60s. In other words, liability of employers and public authorities was not stipulated, and thus the production of asbestos was not legitimated.

In 1970-80s of last century, programs were developed in the USA and Western Europe for limiting and restraining asbestos use, as well as for removing asbestos from buildings and facilities built earlier.

According to a conservative estimate of the EU Commission, the EU annually sees approximately 8 thousand people die due to asbestos. ILO (International Labor Organization) judges by their calculations that there are 100 000 fatal cases per year all over the world. More than 17, 000 cases of occupational disease caused by asbestos have been verified since 1978 in Germany. Currently there are registered approximately 7000 cases of such diseases per year.

Alexander Nies,
Department Head,
Ministry of Environment and
Nuclear Safety of Germany;
(Ecos-#4 2009 - #1 2010)

The USA Agency for Toxic Substances and Disease Registry carried out the most active activities on restraining asbestos use and in 1989 the same agency adopted a resolution seeking to ban asbestos by 1996.

William Rayli, Administrator of the USA Agency for Toxic Substances and Disease Registry, recently admitted that "the government and agency must assume a part of the responsibility for the misunderstanding, which led to unjustified disturbances and needless elimination of asbestos". However, the storm of anti-asbestos disturbances spread over to Western Europe.

In 1999 the European Commission adopted a guideline banning usage of asbestos and items made of the same in European Union countries since 1 January 2005. Currently the European Union is attempting to influence other countries in order to organize prohibition therein.

Governments of many countries of the world, foremost all asbestos extracting and using ones, disagree with a total ban on asbestos. In addition, many prominent scientists disagree with it including from those countries where asbestos is banned.

In 1986, a General Conference of the International Labor Organization adopted Convention #162 "On labor protection upon asbestos using". The Convention has proclaimed a principle of controlled asbestos application for the first time at the international level. Governments and labor unions of 125 countries approved it.

Many international organizations have changed their attitude to asbestos over the last few years. As far back as the end of the 1990s the International Labor Organization (ILO) and World Health Organization (WHO) arrived at a decision that it was necessary to prohibit amphibolic groups of asbestos after their research concluded this type of asbestos was a hazard to humans. For chrysotile there was a specified controlled usage procedure at the level of one fiber to one cubic centimeter.

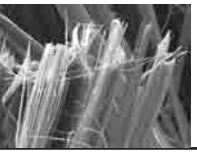
> ***"Evidence of asbestos carcinogenicity for people is recognized to be convincing. Asbestos is referred to as a class 1 carcinogenic risk group under classification of IARC (International Agency for Research on Cancer), that is, it is absolute carcinogen for human," noted V.V. Khudolei, professor of Scientific-Research Institute of Chemistry, Saint-Petersburg State*** *University.*
>
> *V.V. Khudolei, I.V. Mizghirev*
> *Ecologically destructive factors*

However, these organizations have changed their positions significantly for the last time. ILO adopted a resolution on asbestos in June 2006 at the 95th General Conference. The ILO actively promotes global prohibition on asbestos of any type in the resolution.

In spite of anti-asbestos campaigns the majority of countries around the world are still using asbestos[27].

Asbestos is virtually inert and does not dissolve in the liquid medium of the human organism. However, some types of asbestos can cause different impairments of health and diseases upon entering lungs. Airborne asbestos fibers or asbestos-containing dust can, upon prolonged exposure to elevated concentrations, cause occupational disease: development of a specific form of pneumoconiosis (asbestos) and a set of malignant neoplasms (carcinoma of lungs, stomach, pleural mesothelioma etc.).

27 Olga Speranskaya et al. Asbestos: reality, issues, recommendations. Astana-Moscow-Kiev– 2008



Asbestos – the primary cause for occupational mortality in the world[28]

According to forecasts, the peak of mesothelioma morbidity in Western Europe will occur in 2015-2030s[29], and approximately a quarter of a million people will die from mesothelioma induced by asbestos within the next 35 years[30,31,32]. Men born in 1945-1950s will be in the greatest danger of infection.

In Great Britain, death caused by mesothelioma will reach its peak by 2015-2020 at the morbidity rate of 2000 persons per year[33].

In October 2006, WHO published a political statement on the liquidation of diseases conditioned by asbestos. The statement recognizes the danger of asbestos to health and appeals to prohibit the use of any asbestos type all over the world as the most efficient method of struggling against diseases caused by its effects. WHO insists on a broad information campaign about safe substances being employed as alternatives to asbestos and appeals to develop economic and technological mechanisms which stimulate the asbestos replacement process. WHO recommends including these measures into national plans and strategies for combating diseases conditioned by asbestos. WHO cooperates with ILO to implement resolutions on asbestos and works with other organizations towards the complete elimination of diseases caused by exposure to asbestos[34]. At the same time in EECCA countries and a series of other countries there is a different attitude to asbestos usage, which is confirmed by separate research. This attitude consists of the idea that if asbestos is used with observance of all safety measures, it will not cause consequences [35] hazardous to health.

ASBESTOS – AT THE SECOND PLACE

The report of Germany Federal Government on the state of safety and health of employees regards asbestos as second frequent occupational disease in 2008 (1893 cases). Third and fourth places are also taken by occupational diseases caused by asbestos (996 and 765 cases accordingly). In 2008, there were recorded 2430 cases of death in total due to occupational disease in Germany. Almost two-third of employees (61.4%) died (approximately in 13 years after universal restraint of asbestos use) due to occupational disease caused by asbestos. Thus, statistics of occupational diseases with fatal case clearly indicates drastic consequences for human health conditioned by asbestos.

Alexander Nies,
Department Head,
Ministry of Environment and
Nuclear Safety of Germany;
(Ecos-#4 2009 - #1 2010)

Thus, the world community is divided into two camps with respect to the application of asbestos. On one hand, there are enemies of asbestos who insist on the complete prohibition of asbestos, including chrysotile asbestos, while on the other, there are supporters of controlled and safe application of chrysotile asbestos[36].

28 *Banning Asbestos, a Global Responsibility According to International Health Experts, http://www.asbestosnetwork.com/news/nw_061802_asbestosban.htm*

29 *Hansen H.H., Bunn P.A. Jr. et al. Mesothelioma. Lung cancer therapy annual // Taylor & Francis. 2005. P. 127–140.*

30 *Peto R., Darby S., Deo H. et al. Smoking, smoking cessation, and lung cancer in the UK since 1950: combination of national statistics with two case – control studies // B.M.J. 2000. Vol. 321. P. 323–329.*

31 *Peto J., Hodson J.T., Matthews F.E. et al. Continuing increase in mesothelioma mortality in Britain // Lancet. 1995. Vol. 345. P.535–539.*

32 *Peto J., Decarli A., Levi F. et al. The European mesothelioma epidemic // Br. J. Cancer. 1999. Vol. 79. P. 666–672.*

33 *Peto R., Darby S., Deo H. et al. Smoking, smoking cessation, and lung cancer in the UK since 1950: combination of national statistics with two case – control studies // B.M.J. 2000. Vol. 321. P. 323–329.*

34 *http://www.who.int/occupational_health/publications/asbestosrelateddiseases*

35 *Olga Speranskaya et al. Asbestos: reality, issues, recommendations. Astana-Moscow-Kiev– 2008.*

36 *V.B. Ivanov,V.A. Kochelaev,.Anti-asbestos campaign: causes and effects / OJSC «НИИпроектасбест; HO "Chrysotile association". – Asbestos, 2006. – 39 p.*

Disputes around asbestos and the arguments of parties

Currently there is a heated dispute among specialists, scientists, researchers and public organizations with respect to the application of asbestos in the national economy and potential health risks to the population

There are two main attitudes to the issue under consideration:

Attitudes in relation to asbestos application

Attitude 1. "Observance of precautionary measures ensures safety".
Usage of asbestos of amphibolic group should be prohibited. Observance of safety standards in force upon working with asbestoses of the chrysotile group must mean safe working conditions that do not allow for the increased risk of asbestosis and oncological diseases development.

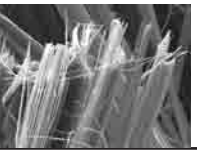
Attitude 2. "There is no safe application of asbestos".
Asbestos causes diseases and loss of life. This concerns all asbestos, including white and chrysotile asbestos, still sold in large quantities by the asbestos industry, groundlessly affirming its safety. There is a clear connection between certain types of cancer, for example mesothelioma, and exposure to chrysotile asbestos.

Arguments of parties; Attitude 1: "Observance of precautionary measures ensures safety"

The Russian Federation Government adopted special Resolution #869 dated 31 July 1998 "On the attitude of the Russian Federation to the issue of chrysotile asbestos application". The Resolution states that the Russian Federation Government, based on the practice of long-term chrysotile asbestos application in Russia, and research by the Russian Academy of Medical Sciences, considers that:

- Accepted asbestos application bans in a series of countries are based on medical-biological data on diseases conditioned by asbestos, mainly as a result of the application of asbestos belonging to the amphibolic group, but failing to take into account national and economic interests, the results of scientific investigations and scientific and technical achievements in the field of chrysotile asbestos production and application recent years .
- Refusal of chrysotile asbestos application has sufficient medical and biological grounds but may result in serious negative consequences for the economies of a series of countries.

RF Government attitude is based on scientific investigations performed by RAMS institutes over the last 60 years. "Asbestos and health" issue received almost 50 years study by scientists from Yekaterinburg Medical Scientific Center under the guidance of Professor F.M. Kogan, a doctor of medical sciences. Scientists studied the effect of chrysotile asbestos' fibers on the human organism after contact with asbestos. They came to the conclusion that "Observance of acting Russian MAC shall provide all employees with safe working conditions, that is, without increased risk of asbestosis and oncological disease development.



In 2002 N.F. Izmerov, S.G. Domnin, L.T. Elovskaya, V.V. Milishnikova, T.B. Burmistrova, E.V. Kovalevsky, S.V. Kashansky, leading scientists of SRI of labor of RAMS and Yekaterinburg Medical Scientific Center, and others, stated firmly in booklet on the subject of "Opinion of Russian group of experts about total banning of asbestos" the following: "Currently there are no alternate materials with processing characteristics like asbestos. None of them have been studied as much as asbestos, which is a predictable, thoroughly studied material of today. Measures have been developed to handle asbestos enabling the prevention of adverse effects on human health, that is, to control and manage its production and application processes".

Among many performed investigations, the most important one is a Russian-Finnish-American project; "Examination of the health status and working conditions of persons involved in extracting and dressing of asbestos at the Ural deposit"[37] . In the course of that study, 1640 persons previously worked and currently working at the enterprises of "Uralasbest" OJSC were subjected to screening and an X-ray examination. Analysis and description of the X-ray pictures was performed by five independent specialists-radiologists from the Scientific-Research Institute of labor medicine of RAMS, Finnish Labor Medicine institute, USA National Institute for labor protection and health of industrial workers, Yekaterinburg Medical Scientific Center and the municipal hospital of Asbest town [38].

The group examined consisted of 1130 men and 510 women. The average age of persons examined was 47 years and varied broadly: from 27 to 78 years. The working experience of persons included in the examined group ranged from 1 to 47 years (22 years at an average). The minimum time since a person had contact with asbestos amounted to one year, maximum time made 59 years (25 years at an average). 884 persons (54%) out of 1640 were smokers, and most of them were men.

Conclusions on X-ray pictures were made in relation to their consistency with the Pneumoconiosis Classification of the International Labor Organization and National Pneumoconiosis Classification (1996). As a result, 1430 persons, who made up 87.2% of the population showed no signs of fibrosis. Pleural plaques were not found in 1489 persons, 90.8% of the overall total surveyed. In addition, radiologists did not reveal pleura calcification in 96.2% of examined persons.

Prior to the implementation of the project, Finnish and American specialists had a preconception that the low level of occupational diseases in Russia caused by asbestos was the result of poor professional competence among Russian medics, as well as low technical level of equipment used in examinations. However, results of the project completely correspond to conclusions about the possibility of the safe production and application of Russian asbestos under controlled conditions, which were made earlier based on numerous investigations carried out by Russian scientists.

Natural properties of chrysotile asbestos belonging to the Bazhenov deposit, that is, absence of mixtures with the amphibolic group of asbestos at that location, significantly contribute to the statements which emerged from the research at the "Uralasbest" OJSC. Scientists relate majority cases of diseases conditioned by asbestos exactly to mixtures of amphibolic group asbestos.

".. Collaboration of all plant's services focused on the preservation and promotion of employees' health and have enabled a decrease in the common sickness rate by 20% over the last 20 years. A stable trend of occupational disease decrease has also been observed. Scientific investigations confirm the possibility of minimizing occupational diseases conditioned by asbestos through prevention of it based on the principles of the controlled production and application of chrysotile asbestos..."[39].

37 Kochelaev V.A., Ghaisin N.K., Sviridyuk A.I., Ensuring of safe working conditions in "Uralasbest" OJSC / "Chrysotile Association", "Uralasbest" OJSC – Asbestos, 2006, - 17 page.

38 Olga Speranskaya et al. Asbestos: reality, issues, recommendations. Astana-Moscow-Kiev– 2008

39 Olga Speranskaya et al. Asbestos: reality, issues, recommendations. Astana-Moscow-Kiev– 2008

Arguments of parties. Attitude 2. "There is no safe asbestos[40]»

Investigations over the last 50 years have established that there is no safe application of asbestos - it causes diseases and loss of life.

WECF, one of the most active international non-governmental organizations in the sphere, delivered samples of chrysotile asbestos from three ECCCA countries to the certified laboratory in Germany to check if Russian asbestos may indeed be safe indeed. By fibre parameters, Russian asbestos in no way differs from the asbestos banned in more than 40 countries of the world. WECF started holding a program focused on increasing the community's information level about the chrysotile asbestos hazard.

Representatives of the asbestos industry often interfered with the holding of informational seminars about asbestos. They affirmed that WECF is trying to lobby for the interests of western countries' industries, currently producing alternative building materials.

At the same time, we, while visiting medical institutions and laboratories, took a clear view that laboratories that would be able, for instance, to determine the availability of asbestos fibers in air, exposure to asbestos and health hazards related to the substance, do not seem to exist in the majority of EECCA countries. Besides it, even irrespective of the fact that diagnosing such diseases as asbestosis or mesothelioma conditioned by asbestos, is not difficult, it seems that such diseases are not recorded in EECCA countries.

In Western Europe many people can of relatives or friends who fell ill or are dying because of exposure to asbestos, especially of men, who worked in the building industry or women-teachers, who worked in schools built using asbestic materials. Most of these people think that the asbestos problem has already been solved and its application is banned and asbestic materials have already been removed from the majority of public buildings. Nevertheless, chrysotile asbestos is still widely used in construction of schools in Russia and other EECCA countries. In some EECCA countries only the primary application of chrysotile asbestos is limited while secondary application is still allowed.

All countries have a full right to protect the health of their citizens from the carcinogenic dangers of asbestos. Large asbestos producing companies around the world belong to the state and national governments contest international agreements that could help developing countries to ensure efficient control over importing and exporting of asbestos. For example, Canada, Kazakhstan and Ukraine blocked the inclusion of chrysotile asbestos into the list of preliminary agreements drawn up at the Rotterdam convention

53 countries where asbestos use is banned or completely refused			Main asbestos using countries
EU countries	Honduras	Taiwan	Russia: 1000 000 tons in 2009 China: 380 000 tons in 2009 Brazil: 288 000 tons in 2009 Kazakhstan: 230 000 tons in 2009
Japan	Argentina	Singapore	
Australia	South Korea	Qatar	
USA	Chili	Oman	
Canada		Israel	
Egypt		Africa	
		Kuwait	

40 Sasha Ghabizon, WECF Director

Situation in Kyrgyzstan[41]

Mesothelioma is traditionally referred to as an "indicator disease" of asbestos exposure [42,43,44]. According to one of the hypotheses, carcinogenic activity of asbestos is related to its fiber structure and depends on fibers' size. It is considered that fibers of about 5 to 20 microns length and less than 1 micron diameter may damage organism and particularly cause cancer[45].

Malignant pleural mesothelioma (MPM) is a tumor characterized by diffusive infiltrative growth. In our country, poor attention is paid to the epidemiology of this neoplasm.

Spreading of rare malignant chest tumors in Kyrgyzstan[46]. Rare malignant chest tumors are represented by malignant pleural mesothelioma (MPM) and mammary gland cancer in men. The majority of persons who fell ill with MPM (55.8%) were revealed as having the third stage of the disease, 42.9% of patients were revealed as having the fourth stage of the disease.

At revealed by ongoing research, MPM morbidity is growing in Kyrgyzstan. In 2005 the MPM morbidity rate was twice as high as in 1995.

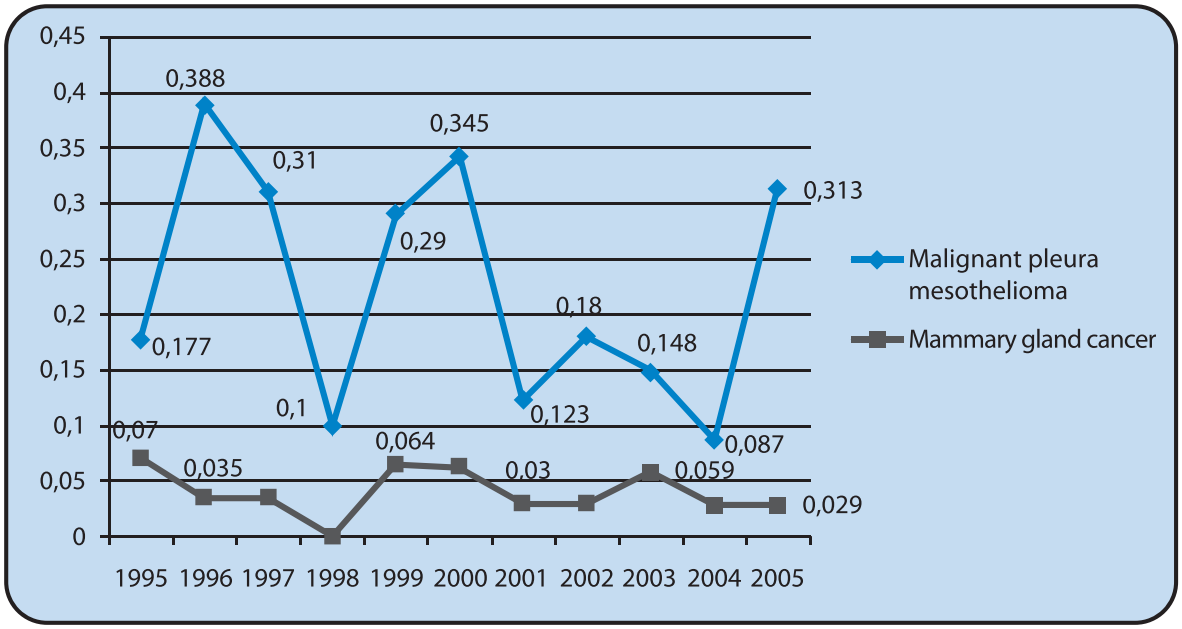


Diagram 11. Dynamics of morbidity with rare malignant tumors of the chest in Kyrgyzstan within 1995-2005[47]

41 *Materials of coordination meeting "Development of national programs to liquidate diseases related to exposure to asbestos-containing dust" Moscow, 9-10 September 2010. "To issue on providing of safe working conditions upon cement producing in Kyrgyzstan".*

42 *RU. Light, Pleura diseases. M:Medicine, 1986, page 376*

43 *Antman K.N. Natural history and epidemiologi of malignant mesothelioma // Chest. 1993. Vol. 103, № 4. P. 373–376.*

44 *Attanoos R.L., Gibbs A.R. Pathology of malignant mesothelioma // Histopatology. 1997. Vol. 30, № 5. P. 403–418.*

45 *Stanton M. Biol. Effects of Asbestos // IARC Press, Lyon. 1973. № 8. P. 180–183.*

46 *S.V. Golovachev, Peculiarities of rare malignant tumors spreading in Kyrgyzstan. Synopsis of medical sciences candidate thesis. Bishkek 2009*

47 *S.V. Golovachev, Peculiarities of rare malignant tumors spreading in Kyrgyzstan. Synopsis of medical sciences candidate thesis. Bishkek 2009*

In the article of S.V. Golovachev on the subject of "Some epidemiologic aspects of malignant pleura mesothelioma" we can find the following data:

Results of investigation - we studied case records for over 2000-2005 from the archives of National Oncology Center (NOC) of the Kyrgyz Republic Ministry of Health by retrospective analysis method in order to achieve the purpose in view.

Results of investigation - at this time, 12 patients with MPM diagnosis revealed they were receiving in-patient treatment at the NOC for the first time. Most of them were men – 7 persons (58.4%). Thus MPM morbidity rate in Kyrgyzstan for 100 000 population amounted to 0.14% for men and 0.1% for women. In geographical terms, the greatest number of patients belong to Chui oblast – 8 persons (three of them lived in Bishkek), which amounted to 66.7%. Two patients are registered in Batken oblast, one patient each in Naryn and Talas oblasts. Average age of patients was 44 years. In this regard first stage of the disease is revealed in one case (8.3%), four cases (33.3%) fell under second and third stage classifications and three cases (25.1%) –fourth stage.

In 1960s for the first time it was established in RSA that out of 33 patients suffering from mesothelioma 32 persons either worked at blue asbestos extracting mine or lived near to those mines. Asbestos exposure was detected in 53% of 76 patients suffering from mesothelioma in England.
Mesothelioma detection rate among miners and workers involved in asbestos dressing operations was less by 10 times than among workers working at the plant producing asbestos-mechanical artifacts (AAP), where blue asbestos was used.

Kogan F.M., Berzin S.A.
Frequency of pleural mesothelioma upon exposure to chrysotile asbestos dust / Labor hygiene and occupational diseases. 1986, #9

Exudative pleuritis on the lesion side was found in eight patients (67%); one patient (8.3%) had metastasis in their left lung, two patients had metastases in distant lymph nodes (level #3).

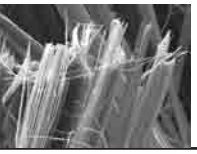
Histologically malignant mesothelioma was confirmed in six patients (50%), one patient (8.3%) had benignant fascicular neurilemmoma, another one (8.3%) was suffering from partially differentiated adenocarcinoma, third one (8.3%) was hit by partially differentiated cancer. Diagnosis of three patients (25%) was histologically not verified as they refused to conduct medical- diagnostic thoracoscopy. The case history of the five patients indicates their occupational exposure to asbestos (asbestos insulating and asbestos cement materials handling).

Thus, malignant pleural mesothelioma is an available problem in Kyrgyzstan as in other countries: more than half of patients are exposed with III and IV stages of disease, quarter part of patients already have distant metastases in organs and lymph nodes. Thoracoscopy remains a "gold standard" in diagnostics as it enables to detect process prevalence and execute histological verification. Principal treatment method is chemoradiotherapy as surgical treatment is poorly proved due to high postoperative lethality and delayed results[48]

The Kyrgyz Republic has not seen special investigations related to asbestos effect conducted. However, there are some investigations air and area pollution at Kant City's pipe-slate enterprise. Issyk-Ata District Center of the State Sanitary and Epidemiological Supervision (DCSSES) investigated asbestos dosage in the air at working places at the enterprise, examined the preparation department's operator and a sheet-forming machine operator. Results of investigation showed: asbestos dust concentration in air of breathing zone of asbestos dosing person exceeded MAC by 1.2 times. Asbestos dust concentration in air of breathing zone of working places belonging to preparation department's operator and sheet-forming machine operator were within the MAC.

In order to prevent negative effect on employees' health and reduce pollutants emission Kant City's pipe-slate enterprise is maintaining manufacturing supervision. There are allocated funds

48 УДК 616.25–006.4–036.22 (575.2) (04) S.V. Golovachev SOME EPIDEMIOLOGIC ASPECTS OF MALIGNANT PLEURAL MESOTHELIOMA, KRSU Vestnik. 2008. Vol. 8. # 4



for purchasing of special milk, detergent means, special clothing and footwear and personal protective equipment.

According to the Order of the Kyrgyz Republic Ministry of Health #70 dated 20.03.2000 "On the conduct of mandatory preliminary and periodical medical examinations of workers", there was an occupational medical examination held at the Kant City's pipe-slate enterprise. Examination results showed that there are no occupational diseases related to asbestos handling.

Applicable safety requirements in Kyrgyzstan at enterprises upon asbestos handling

In manufacturing of pipes and slates, the main occupational hazards are: adverse production factors (increased air dustiness, contact with materials and liquids and intensive noise in the mechanical sectors).

It is necessary to execute sanitary control of working area's air dustiness at working places for extraction, dressing, processing and application of asbestos. If equipment and manufacturing operations are identical, selective control at certain working places or areas may be executed.

Only laboratories accredited as applicable can execute production laboratory control of the working area's air as is consistent with their accreditation in the field. The program must be focused on the organization of production with a view to laboratory control and employees' working conditions, coordinated with centers of State Sanitary and Epidemiological Service. Enterprises that control working area's air must use certified methods and equipment.

Content of asbestos-containing dust in working area's air must be controlled in compliance with requirements of standards "Maximum allowable concentrations (MAC) of harmful substances in working area's air", "Working area's air. Requirements concerning techniques of harmful substances' concentrations measurement" and procedural guidelines contained in "Measurement of aerosol concentrations of mainly fibrogenic effect".

Frequency and periodicity of scheduled sanitary control shall be established depending on the hazard class of harmful substances emitted. Specified control must be executed at least once per month if harmful substances belonging to the second class are emitted into the working area's airspace. If the class of harmful substances is 3, the control must be made at least once every quarter.

Value of one-time and shift-average MAC of asbestos-containing dust for working area's air shall be selected depending on the percentage of asbestos in airborne dust composition. MAC values are specified in the HR (hygienic regulations) "Maximum allowable concentrations (MAC) of harmful substances in working area's air."

All the obtained measurement results must be registered in special logs and stored at the enterprises as consistent with archive requirements.

Each year departmental services must generalize the findings of investigations, analyze pollution trends over the last 3 years and develop plans of measures devoted to the reduction of the working area's air pollution with certain terms for performance. One should coordinate plans of measures with the authorities of State Sanitary and Epidemiological Service.

Results of departmental control over working areas' air pollution must be submitted to the institutions of the State Sanitary and Epidemiological Service under an agreed format.

Employees must be provided with personal protective equipment according to "Typical industry regulations for free issuing of special clothing, special footwear and other personal protective equipment of workers and employees", "Instruction for the procedure of providing workers and employees with special clothing, special footwear and other personal protective equipment" and "Regulations for free issuing of warm working clothes and safety shoes to workers and employees according to climatic zones".

One should use personal protective equipment in view of occupational peculiarities under "Catalogue of working clothes, safety shoes and other personal protective equipment models". Workers that are not provided with personal protective equipment or having faulty personal protective equipment must not be allowed to work.

All persons handling asbestos and asbestos-containing materials must be provided with respirators. One can use only those types of respirators approved by the Kyrgyz Republic Ministry of Health.

Safety signs must be installed at entrances to work rooms, areas or sites, where concentrations of airborne asbestos-containing dust exceed or may exceed established MACnorms according to State standard "Warning colors and safety signs". Safety signs should contain verbal instruction: "Work using respiratory organs protective equipment".

Employers must define types of respirators with respect to the largest concentration of dust ever established at the working place. There must be always be available a fair number of relevant personal protective equipment at the working place. Workers obliged to wear respirators must be trained how to use them. Training programs and labor protection briefing of workers involved in the production and application of asbestos should include the following:

- circumstances requiring the wearing of respirators, a method of defining such circumstances;
- methods of application to the face – checking it fits;
- methods of checking correct functioning of a respirator and keeping it in good order.

Employers must ensure control over correct and mandatory application of personal protective equipment, cleaning and storing of that equipment. Respirators must be stored in a specially equipped premise when unused.

If there are several equally efficient types of respirators, workers shall enjoy a right of choosing of a respirator that is most acceptable for them as regards to protection and convenience.

If a respirator does not completely adhere to face, a worker must use a positive pressure respirator.

Respirators issued to workers must be in their individual use.

Specially trained personnel must clean respirators before issuing them once again. Respirators must pass cleaning once per week or oftener. Primary filters of filtering respirators must be replaced and in each case filters must be inspected.

Persons working under conditions of noise and vibration exposure exceeding maximum allowable levels must be provided with personal protective equipment according to State standards "Hearing organ protective equipment; General technical conditions" and "Hands protective equipment against vibration; General requirements".

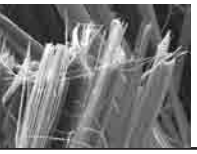
There must be available personal protection devices (goggles, shields, masks) for workers to protect eyes and faces. Choosing of devices shall depend on certain conditions of production process.

Where workers are required to wear respirators, there must be available protective clothes for them as well.

Protective clothes must completely close personal clothing and be impervious to dust. It is necessary to provide for protection of head.

Working clothes polluted must undergo periodic (at least two times per month) dust elimination and laundering as consistent with "Sanitary regulations for industrial and municipal specialized laundries for decontamination of working clothes and additional personal protective equipment" and "Instruction for the procedure of providing workers and employees with special clothing, special footwear and other personal protective equipment".

It is strongly prohibited to blow off working clothes using compressed air.



If there is possibility of contacting with wet asbestos-cement mass, it is necessary to protect skin of body's exposed parts with ointment, pastes, silicone cream or petrolatum. There should be ensured supplying of acidified water (0.1% solution of hydrochloric acid) in toilet rooms for washing of hands. One should treat hands with fattening ointments after completion of shift.

All the personal protective equipment must be issued to workers free of charge and maintained in good working order at the expense of an employer. Faulty parts of personal protective equipment shall be replaced with new parts as soon as they are revealed.

Summary

At the level of enterprises

Currently there exists a range of issues in Kyrgyzstan in the field of adhering to established safety requirements on asbestos handling, despite the efforts of enterprises dealing with asbestos:

- specified requirements are not fulfilled or are incompletely fulfilled due to the shortage of funds for these needs;
- unawareness of both employers and employees about risks of asbestos handling and its consequences for health.

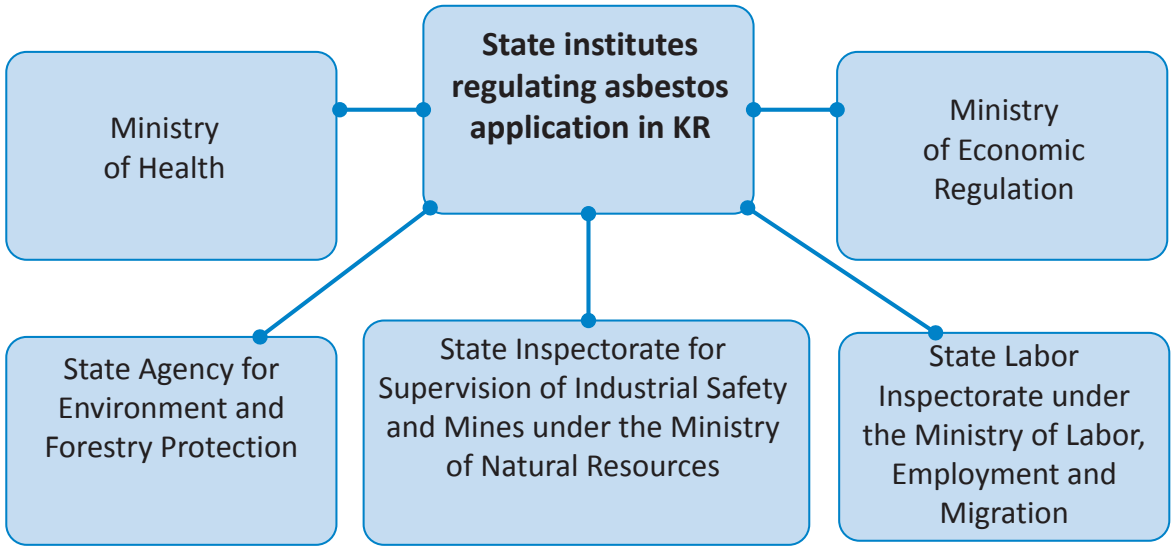
At the level of public at large and local communities

- artifacts made of asbestos have c become customary to Kyrgyzstani people and are perceived as usual and bearing no accompanying hazards;
- there is an absence of available information about health risks caused by asbestos application;
- there is a focus on cheaper and more readily available building materials.

CHAPTER 3. INSTITUTIONAL REGULATION OF ISSUES RELATED TO ASBESTOS HANDLING

3.1. State institutes and asbestos management

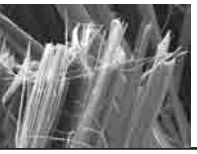
A series of ministries and departments are involved in the sphere of asbestos handling in the Kyrgyz Republic



Ministry of Economic Regulation is an authorized public executive body in the field of tariff and license policy, trade and manufacturing industry technical regulation.

The ministry executes the following specified functions as and when applicable:

- takes part in development of principal directions, economic forecasts, conceptions and state programs;
- issues licenses for goods and servicing exporting and importing, sets quotas;
- ensures fulfillment of Kyrgyz Republic obligations as consistent with agreements of World Trade Organization on technical barriers in trade and on application of sanitary and phytosanitary measures;
- implements state policy in the field of domestic and foreign trade;
- analyzes balance of trade and develops measures to regulate these;
- studies and analyzes market conjuncture and coordinates a policy with regard to improving export and import structure;
- prepares forecasts and recommendations for native commodity producers;
- monitors the state of the consumer market and prepares predictive calculations and products demand analysis, necessary to determine the demand for commodity resources;
- based on analytical and marketing researches, it develops market conditions for production of import-substituting and export-oriented products in the country;
- works out recommendations to harmonize foreign trade activity as consistent with the standards and regulations of World Trade Union (WTU) as well as with obligations to partners on EurAsEC;
- participates in anti-dumping proceedings and procedures for the protection of the Kyrgyz Republic's domestic market;



- implements measures in the field of export control;
- draws up proposals to create economic clusters, chains for supplying and promotion of native goods and services.

State Agency for Environment and Forestry Protection under the Kyrgyz Republic Government executes functions on implementation of united policy in the field of environment protection and ensuring of the state's environmental security with the provided authorities, particularly:

- control over nature protection activities of the enterprise;
- monitoring of emissions into atmosphere caused by production;
- control over formation and disposal of wastes;
- preventing of possible adverse effects of planned management, economic and other activities performance on environment;
- enforcement of obligations under international nature conservation agreements, contracts, conventions and minutes to the same, which entered into force in accordance with the procedure established by legislation, whereto the Kyrgyz Republic becomes a party;
- levies payment for application of natural resources and environment pollution as well as for expenditure of funds for nature conservation purposes;
- exercises state control of environmental legislation, established rules, limits, quotas and regulations of nature management, guidelines for emission and discharge of pollutants and waste disposal into environment;

Primary task of the Kyrgyz Republic Ministry of Health is formation of a united state policy in the field of health protection and promotion, sanitary and epidemiological welfare, including:

- working area's air quality control;
- holding of preliminary and periodic medical examinations of workers;
- coordination of activities of the Kyrgyz Republic state run public authorities and economic entities as to ensuring the sanitary and epidemiological welfare of population;
- sanitation-and-epidemiological rating, improvement of legal regulation of issues related to population health protection – in connection to effect on human;
- organization and implementation of state sanitary and epidemiological supervision;
- exercising of radiological control of raw material for obtaining of cement and slate.

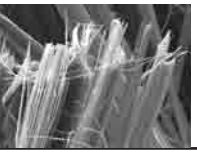
State Inspectorate for Supervision of Industrial Safety and Mines under the Ministry of Natural Resources enjoys state supervision over technological, technical and industrial safety, observance of general and special technical regulations' requirements on technological, technical and industrial safety while performing production processes, installing and ensuring the safe operation of equipment at the hazardous facilities.

State Labor Inspectorate under the Ministry of Labor, Employment and Migration enjoys state supervision and control over observance of Kyrgyz Republic laws on labor, labor protection, safety engineering and occupational sanitation.

Summary

In spite of the wide range of state institutes which have functional obligations including issues relating to asbestos application regulation, there are a number of related difficulties in the Kyrgyz Republic:

- Public authorities have insufficient power to conduct adequate inspections and oversee the elimination of violations (Law on inspections, see further);
- Frequent change of managers, numerous reforms of ministries and departments draws employees' attention away from work in this direction;
- There is no adequate information to take adequate and timely decisions.



CHAPTER 4. NATIONAL LEGISLATION REGULATING ASBESTOS HANDLING

Regarding asbestos handling, Kyrgyz Republic legislation rests on the Constitution of the Kyrgyz Republic (Article 48) and consists of laws, other regulatory legal acts of the Kyrgyz Republic as well as international agreements entered into force as applicable. However, if international agreements entered into force as applicable establish other rules than provided for hereby, then international agreements rules shall be applied.

We can structure the whole set of laws regulating the field under consideration into three main groups for convenience:

1. RLA (regulatory legal acts) that regulate citizens safety and health issues upon asbestos using;
2. RLA that regulate environment protection issues;
3. RLA that regulate economic relations related to asbestos application.

Group 1. RLA that regulate citizens safety and health issues upon asbestos use

Kyrgyz Republic Law "On public health" (2009) is focused on the improvement of population health through increasing of access to public health care services, promotion of issues related to society health protection and promotion in whole. Public health care is a system of measures focused on protection of public health, prevention of diseases, prolonging of life and promotion of human health due to organizational efforts of all interested parties, informing of population, public and private organizations, communities and individuals. To protect workers' health and prevent occupational diseases, the Law provides for following measures:

- Chapter 3. Public supervision in the area of public health;
- Article 8. Safety of products of commercial and household purpose and the technique of their manufacture;
- Article 12. Air safety;
- Article 13. Safety of soil, collection and disposal of wastes;
- Article 14. Industrial, public, dwelling premises, buildings, facilities, equipment and transport operating safety;
- Article 15. Working conditions safety;
- Article 17. Compulsory medical examinations

Kyrgyz Republic Law "On sanitary and epidemiological welfare of the population" adopted in 2001 is focused on ensuring of sanitary and epidemiological welfare of the population and consolidates state guarantees in exercising of constitutional rights of citizens for health protection and favorable environment[49].

Sanitary and epidemiological welfare of the population shall be ensured through:

- disease prevention as consistent with sanitation-and-epidemiological situation and forecast of its change;
- performance of sanitary-anti-epidemic (preventive) measures and compulsory observance of sanitary rules by citizens, individuals and legal entities as a constituent part of activities executed by them;
- state sanitation-and-epidemiological setting;
- state sanitary and epidemiological supervision;

49 Закон «О санитарно-эпидемиологическом благополучии населения» (2001 г.)

- certifying of products, works and services presenting potential hazard to human;
- state registration of chemical and biological substances, certain types of products, radioactive substances, production and consumption wastes as well as of certain types of products imported to the territory of Kyrgyz Republic for the first time that are potentially hazardous for humans;
- conduct of social-hygienic monitoring.

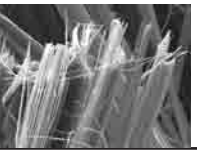
The Law sets requirements for manufacturing facilities and working conditions of workers.

Working conditions, working place and labor process must not prove to adversely affect humans. Individuals or legal entities shall be obliged to suspend or terminate their activities or operation of certain shops, sections, operating of buildings, facilities, transport, performance of certain types of work and rendering of services in cases if performance of specified activities, works and services violate sanitary regulations.

In accordance with **Kyrgyz Republic Labor Code,** an employer is to create healthy and safe working conditions for workers, introduce appliances and technologies enforcing sanitary-hygienic norms and requirements of labor protection standards. In order to arrange safe production, carry out measures devoted to working conditions improvement, there shall be established work safety services at the enterprises and organizations.

In accordance with **Kyrgyz Republic Law "On labor protection"** entered into force since August 2003, an employer shall be obliged to ensure:

- safety of workers upon operating of buildings, facilities and equipment, exercising manufacturing processes as well as raw stuff and materials used in production;
- application of personal and collective protective equipment by workers;
- working conditions at each working place meeting labor protection requirements;
- purchasing - by use of internal funds - special clothing, special footwear and other personal protective equipment, milk and other equal foodstuff, washing agents and detergents to workers involved in operations with harmful and hazardous working conditions as well as in operations to be performed under special temperature conditions or related to contamination in accordance with enforceable standards;
- training towards safe working methods and techniques, labor protection briefing, probation of workers at working places and checking of their knowledge with respect to labor protection regulations and standards;
- holding of compulsory preliminary (when employed) and periodic (over the course of labor activity) medical examination of workers, unscheduled medical examinations (inspections) of workers under their request according to medical counsels with preservation of a place of employment (position) and average salary when workers pass specified medical examinations established in accordance with Kyrgyz Republic legislation;
- preventing of workers from execution of employment duties if they have not passed compulsory specified medical examinations and if there are medical contra-indications;
- informing employees about conditions and labor protection at working places, about existing risk of injury to health and about compensations and personal protective equipment due to them;
- delivery of information and documents to occupational safety state administration bodies, state agencies inspecting and controlling compliance with labor protection requirements needed for exercising of powers;
- investigation of industrial accidents and occupational diseases in the manner prescribed by the Kyrgyz Republic legislation;



- sanitary-household and medical and preventive servicing of workers under the labor protection requirements;
- compulsory social insurance of workers against industrial accidents and occupational diseases;
- submission of approved state statistical reporting about health status, labor protection and occupational traumatism to state statistical authorities;

Hygienic requirements for enterprises manufacturing building materials and structures. Sanitary and hygiene regulations and standards – SanPin 2.2.3.005-03 / KR MH – Section: Occupational hygiene – 2.2.3. Occupational hygiene, enterprises of separate branches of industry, agriculture, communication. Approved by the Decree # 45 dated 29 October 2003 of Chief State Sanitary Inspector of KR – (KR MJ, registration #115-03 dated 11 November 2003).

There are established hygienic requirements for enterprises manufacturing building materials and structures, working conditions and organization of working process, preventive measures and environment protection as well as requirements to verify whether or not they are observed. Hygienic requirements to production of asbestos, artificial mineral fibers, cement and asbestos-cement articles are specified in different sections 19, 20 and 24[50].

19. Production of asbestos and artificial mineral fibers (AMF) - mineral cotton, fiberglass, glass wool, basalt, siliferous and other fibers and articles.

20. Production of binding material: cement, gypsum, alabaster, lime etc.

24. Production of asbestos-cement articles and gypsum boards.

Sanitary Inspector of KR issued Order #9 on 20.02.2004 , registered by the Ministry of Justice of the Kyrgyz Republic, registration #34-04dated 19.03.04, **Sanitary regulations and standards 2.2.3.013-3 "Handling of asbestos and asbestos-containing materials"**[51]. The present regulations must be regarded as the main requirements for the protection of workers and population health against adverse effect of asbestos-containing dust.

Regulations are binding for all types of works related to emission of asbestos-containing dust and shall cover:

- extraction and dressing of asbestos-containing minerals;
- manufacturing of materials and articles containing asbestos;
- use and application of asbestos-containing materials and articles for engineering needs;
- new construction, extension, reconstruction, technical re-equipping, repair, conservation and demolition of buildings built with application of asbestos-containing materials;
- transportation and storage of asbestos, asbestos-containing materials and articles;
- production and application of construction and road-building material based on by-products that are formed upon extraction and dressing of asbestos-containing raw material;
- engineering processes of loading, unloading, placement of ballast and other works to be performed on asbestos-containing ballast while repairing, running-maintenance and constructing of rail ways (second tracks or new railway lines), conditions to store and transport them.

Meeting of requirements of the present rules is binding for legal entities, individuals and citizens carrying out:

- extraction, dressing, processing and application of asbestos;
- development and issue of building projects, machinery, mechanisms and equipment to produce asbestos and articles made of the same;

50 SanPin 2.2.3.005-03 "Hygienic requirements to enterprises manufacturing building materials and structures"

51 SanPin 2.2.3.013-3 "Handling of asbestos and asbestos-containing materials"

- construction, reconstruction, technical re-equipping, repair, conservation and demolition of buildings, facilities, installations, railways and motor ways and other specials purpose facilities with application of asbestos-containing materials;
- medical attendance of workers contingent running into manufacturing contact with asbestos and asbestos-containing materials.

The present SanPin (sanitary regulations and standards) sets up maximum allowable concentrations (MAC) of asbestos-containing dust in working area's air of enterprises.

An employer shall be held liable for enforcement of sanitary regulations' requirements, development and execution of measures devoted to monitoring and prevention of effect of industrial environment and work process harmful factors on workers' health with ensuring of industrial laboratory control.

"… 1.2. Regulations shall be binding for all types of works related to asbestos-containing dust emission;

1.4. The present regulations must be regarded as main requirements to protection of workers and population health against adverse effect of asbestos-containing dust;

1.6. An employer shall be held liable for meeting requirements specified herein;

1.15. It is prohibited to extract, dress and use amphibolic group asbestos (blue asbestos, tremolite etc) in materials and articles of civilian designation;

1.18. It is prohibited to use asbestos substitutes and materials made of them in production, if there was not made toxicological (sanitarian-hygienic) assessment and were not developed safety and (or) harmlessness criteria as well as control techniques in background objects.

3.1.8. It is prohibited to place asbestos extracting, processing and using enterprises as well as asbestos-containing wastes dumps:

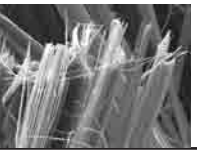
- in residential zones of human settlements;
- in underground water feed zones;
- in lower river terraces;
- in well-fractured areas;
- in water intake zones of centralized public water supply sources;
- in water intake zones of mineral water sources;
- in recreation zones.

3.1.9. While choosing sites for industrial construction one should take into account the level of underground water. The admissible level of underground water is 2 m from the ground surface. Distance from underground water level to the bottom of buildings' foundation must be not less than 0.3m. Upon assigning a site with higher underground water stand for enterprise construction one should provide for measures directed at reduction of underground water level and vertical waterproofing of foundations and basements of buildings".

Under the Decree of Chief State Sanitary Inspector #20 dated 28 May 2004, there are registered hygienic regulations ГН 2.1.3.1338-03 "Maximum allowable concentrations of (MAC) pollutants in atmospheric air of population aggregates"[52]" by the Kyrgyz Republic Ministry of Justice (registration #64-04 dated 10.06.2004), which set up a standard of maximum allowable concentration of asbestos-containing dust with serpentine asbestos fibers up to 10%.

Regulations act on the whole territory of the Kyrgyz Republic and establish a safe level of pollution involving harmful substances and their concentration in the air near urban and rural settlements.

52 *Hygienic regulations ГН 2.1.3.1338-03 "Maximum allowable concentrations of (MAC) pollutants in atmospheric air of population aggregates"*



The present Regulations are established in virtue of calculation on toxicolometry parameters of substances, by means of interpolations and extrapolations in the series of compounds similar in terms of chemical structure, physical and chemical properties and nature of action.

Hygienic regulations ГН 2.1.6.1339-03 "Tentative safe exposure level (TSEL) of pollutants in atmospheric air of population aggregates"[53] are registered with the Kyrgyz Republic Ministry of Justice on 10 June 2004, registration #64-64 and approved by the Decree of Kyrgyz Republic Chief State Sanitary Inspector on 28 May 2004. The regulations stipulate a standard of maximum allowable concentration of asbestos-containing dust (with 20% of asbestos) as being equal to 0.08 mg/m3.

Group 2. RLA THAT REGULATE ENVIRONMENT PROTECTION ISSUES[54].

KR Law "On production and consumption waste"

The present Law regulates relationships originating upon generation, collection, storage, application, neutralization, transportation and disposal of production and consumption wastes (hereinafter – wastes) as well as state administration, supervision and control in the field of wastes handling.

2002 saw the adoption of KR Law "On rate of payment for environment pollution (emission, discharges of pollutants, waste disposal)", which specified the rate of payment for equated tons of polluting agents.

"Hygienic requirements for disposal and neutralization of production and consumption waste" were approved in 2003.

The present sanitation-and-epidemiological rules stipulate hygienic requirements for the placement, installation, technology, mode of operating and reclamation of places of production and consumption waste centralized application, neutralization and burial.

In 2005, Kyrgyz Republic Ministry of Ecology and Emergency Situations approved a procedure for accumulation, transportation, neutralization and burial of toxic wastes, which was developed due to requests from various ministries and branch departments concerning methods of determining the separate hazard class concerning toxic industrial wastes for collection, packing, loading onto transport, delivery to landfill and burial.

In addition, they accepted the following provisions and instructions in 2005:

- Instruction #6 dated 5 January 2005, for determination limits to the accumulation of toxic industrial wastes on an enterprise's territory;
- Instruction #6 dated 5 January 2005, for calculation of the maximum content of poisons in industrial wastes accumulated in storage facilities located outside the enterprise's territory;
- Procedure #6 dated 5 January 2005, for primary accounting of toxic wastes handling;
- Provision on state waste inventory and executing of dangerous waste certification, approved by the KR Government Decree #389 dated 19 August, 2005.

Despite the fact that regulatory acts include general provisions for waste management, there is no clear organizational structure to enforce and finance these acts enforcement. Moreover, there is

53 Hygienic regulations ГН 2.1.6.1339-03 "Tentative safe exposure level (TSEL) of pollutants in atmospheric air of population aggregates"

54 Analysis of regulatory effect of Kyrgyz Republic Laws in the field of environment protection. Working group: S.V. Bortsova, "EcoPartner" LLC, I.V. Gorshkova, State Agency for Environment and Forestry Protection under the Kyrgyz Republic Government, I.A. Konyuhova, "Independent environment impact assessment" PO, I.V. Nekrasova, State Agency for Environment and Forestry Protection under the Kyrgyz Republic Government,O.V. Pechenyuk, "Independent environment impact assessment" PO, L.E. Sherbakova, "Independent environment impact assessment" PO.

a lack of economic incentives in waste management. Absence of detailed waste regulatory acts and the existence of several departments with overlapping responsibilities in waste management leads to controversies over regulatory acts, their fulfillment and supervision of fulfillment.

Group 3. RLA that regulate economic relations related to asbestos application

The Government of the Kyrgyz Republic, by its Decree #223 dated 9 June 2007 'On measures to provide domestic market of Kyrgyz Republic with cement and slate", established an Interdepartmental Commission on sales of goods manufactured by the Kant cement-slate combine.

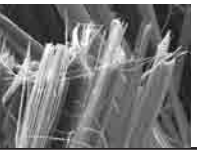
Under the decision of the Commission, the specified volume of cement designed for delivering to domestic market by the combine, shall be distributed in accordance with applications submitted to the following customers subject to mandatory servicing by "KCSC" OJSC:

- "Kyrgyzresources" SE – providing earthquake-vulnerable areas with cement and slate;
- enterprises of industrial construction materials and building organizations licensed to produce reinforced concrete products, structures, concrete articles, ready-mixed concrete and solution;
- building organizations licensed to carry out building activities, constructing of buildings and facilities for budget and loan funds under a tender.

Summary

Kyrgyzstan enjoys legislation on health and environment protection. At the same time, there exists a range of difficulties related to:

- the presence of controversies between regulatory acts in different regulatory spheres (economic and environmental. For instance laws on inspection and health and environment protection);
- Many laws have no mechanisms expressed in sub-legislative regulatory legal acts;
- Poor law enforcement control and monitoring system, there is no assessment of law enforcement practice.



CHAPTER 5. INTERNATIONAL AGREEMENTS REGULATING TREATMENT OF ASBESTOS[55]

In October 2006 a third Conference of the Rotterdam Convention participants was held in Geneva. One of the main questions of the agenda was introduction of chrysotile asbestos into Attachment No 3 of the Convention, which, in its essence, is a list of particularly hazardous chemical substances, the international trade of which is guided by the procedure of preliminary reasonable consent. This procedure actually makes the international trade of the enlisted substances impossible. De facto the initiators of the discussion of this matter strive for the introduction of worldwide prohibition for chrysotile asbestos sale. It should be mentioned that it is already the second consideration of this question, first EC and Chile raised a question concerning prohibition of chrysotile in September 2004, but the decision was not made, because 13 countries including Russia voted against this discriminatory decision due to the absence of necessary scientific proofs of chrysotile asbestos being a hazard to the population and the environment. In spite of this fact EC and Australia again put this question to the agenda of the second Conference, and again fiasco ensued. Ten countries including the Ukraine, Canada, Kyrgyzstan, Iran, India, Russia, Zimbabwe, Peru, Indonesia and Iraq voted against this decision.

In the opinion of the authorized representatives and experts of these countries the desire of the European Community countries to impose a world ban on chrysotile trade is dictated by their economic interests, because removal of the most available and, therefore, the most asked-for natural fiber from the market opens way to the manufacturers of expensive fiber substitutes, most of which are located on EC territory. In his speech, the representative of India related that the question of chrysotile usage was a vital question for developing countries. It is not surprising; because cheap construction materials based on chrysotile asbestos (asbestos boards and pipes) provide billions of people all over the world with roofs and drinking water.

According to the decision of the second Conference of the Rotterdam Convention, participants the question of chrysotile introduction into Attachment No 3 was postponed for further periods.

At the same time, today there are a number of international agreements that regulate the use of asbestos.

Rotterdam Convention on the procedure of the preliminary reasonable consent concerning certain hazardous chemical substances and pesticides in international trade is celebrating its tenth anniversary in 2008.

The aim of the Rotterdam Convention is to favour the introduction of mutual responsibility and coordinated efforts of the Parties in the international trade of certain hazardous chemical substances in order to protect health of people and the environment from potentially harmful effects, and to encourage their ecologically feasible usage via promotion of the exchange of information about their properties, introduction of a decision-making procedure concerning their importation and exportation on the national level and circulating these decisions among the Parties.

The Rotterdam Convention facilitates countries sharing responsibility and cooperating in selling certain hazardous chemical substances. It promotes the ecologically rational use of such substances, helping to exchange information about their properties, setting a national decision-making process regarding the importation and exportation of chemicals and informing Parties of the agreement about the decisions made.

55 Review "ASBESTOS: REALITY, PROBLEMS, RECOMMENDATIONS", Authors-compiles: Olga Speranskaya, A program on chemical safety of "Eco-Consent" Centre, Russia. Olga Tsyguleva, All-Ukranian ecological public organization "MAMA-86", the Ukraine. Lidia Astanina, Information analytical Centre "Greenwomen", Kazakhstan, 2008

The Convention came into force on February 24, 2004. It was signed by 73 countries, and 120 countries ratified it. Kyrgyzstan signed the Convention on August 11, 1999, and ratified it on May 25, 2000.

The Convention sets a list of substances that were prohibited or seriously restricted at least in two regions. Before any enterprise in the country being a Party of the Convention may export chemical substances from the Convention list into a developing country, it should preliminary inform the government of that country, which may later refuse the importation of such substances.

At the present time Attachment III of the Rotterdam Convention contains 39 chemical substances, namely, 28 pesticides and 11 industrial chemicals, which are prohibited or seriously restricted in the countries the Parties of the Convention. Prohibition or restriction of the use of these substances was introduces for ecologic reasons and for safety reasons for human health. Among the substances included into the Convention list there is asbestos crocidolite, actinolite, anthophyllite, amosite and tremolite.

At the present time the basic document for the workers of the asbestos industry is **Convention of the International Labor Organization (ILO) No 162 "Labor protection at the use of asbestos"** that was adopted at the 72nd Session of the General Conference on June 24, 1986 in Geneva and came into force on June 16, 1989. It covers all types of activities connected with asbestos influence on workers in the industrial process. The Convention determines such notions as "asbestos", "asbestos dust", etc. The document stipulates measures of protection and prophylaxis for the prevention of asbestos impact, regulates monitoring methods of harmful industrial factors and people's health. It binds parties to render assistance in the distribution of information and education of workers concerning harmful factors for health arising in the process of industrial activities, as well as assistance in education of people working with asbestos and questions connected with the environment protection.

The first item of Article 3 of the Convention runs: "National legislation or regulations direct measures to be taken for the prevention, control and protection of workers due to the effect of hazardous to health factors arising at the work with asbestos". One of the directions of this article in terms of realization is the development of normative-methodical documentation for the provision of safety controlled usage of asbestos that should be conducted on the basis of National legislation with taking into consideration the international experience.

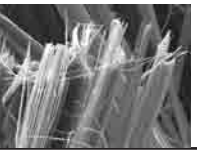
Convention 162 imposes definite responsibility on enterprises working with asbestos. Thus, according to Article 6 of the Convention, businessmen bear responsibility for the fulfillment of prescribed measures.

Article 14. Enterprises extracting and supplying asbestos, as well as producing and supplying asbestos containing goods bear responsibility for the proper labeling of packages and, if necessary, of the goods, and such labeling, according to the prescription of a competent body, should be made in such language and in such manner that interested workers and consumers could understand it easily.

Article 16. Each businessman bears responsibility for the development and fulfillment of practical measures aimed at prevention and control over the impact of asbestos on people working at the enterprise, as well as at the protection from harmful factors arising during work with asbestos.

The Kyrgyz Republic ratified 28 **ILO Conventions**, 6 of which are aimed at labor protection at working places and prevention of occupational diseases. But the Kyrgyz Republic did not sign **Convention of the International Labor Organization No 162 "Labor protection at the use of asbestos", Geneva, June 4, 1986.**

Recommendation 172 about labor protection at the use of asbestos supplements ILO Convention No 162 and has an official name: Recommendation of 1986 about asbestos. It should



be applied to all types of activities connected with the risk of asbestos impacting on workers during work.

A summary of practical regulations on labor protection during usage of asbestos was published by the International Labor Office in 1984. These regulations set principles of the national policy and activities at the national level. Convention 167 about labor safety and hygiene in construction was adopted in Geneva on 20.06.1988 at the 75th Session of ILO General Conference and covers all types of construction activities, namely, construction, civil construction, erection and dismantling, all working processes, operations or transportation at the site from the preparation of the site to the completion of the final product.

Questions concerning exportation and importation of asbestos goods are also being solved at the international legal level.

Convention about assessment of the influence on the environment in trans-boundary context (Espoo)

The main aim of the Convention is to provide a more responsible attitude towards activities inside countries that may lead to negative ecological consequences on the territory of other countries. The Convention requires concordance and assessment of such activities' impact by bringing together all interested parties.

Item 5 of this Convention in Supplement 1 (A List of types of activities) stipulates: "Installment for asbestos extraction and processing and transformation of asbestos and asbestos-containing products: in relation to asbestos-cement products with annual production of more than 20,000 t of ready products; in relation to friction materials with annual production of more than 50 t of ready products; and in relation to other types of asbestos usage – with the use of more than 200 t a year".

Strategic approach to the international regulation of chemical substances

In 2006 governments and interested groups approved a new global policy and strategy named the Strategic approach to the international regulation of chemical substances (SAIRCS).

The aim of the Strategic approach is to change the production and usage of chemical substances in order to minimize harmful impact on people's health and the environment. SAIRCS was adopted by consensus by ministers of the environment, health care and other delegates from more than one hundred governments taking part in the first International conference on regulation of chemical substances (ICRCS-1), which was held in Dubai in February 2006. The Conference was organized by the UN program on the environment (UNEP) with the active support of the World Health Organization and other international organizations having programs connected with chemical substances.

SAIRCS consists of three texts: Dubai declaration on international regulation of chemical substances, General program political strategy and Global plan of activities.

SAIRCS secretariat was established for holding meetings and rendering assistance. A short-term Program of SAIRCS quick start, including a small trust fund, was established for the assistance to developing countries at the beginning of the execution of SAIRCS.

One of the aims of the Strategic approach is directed to the decrease of risks, namely: "Protection of workers from contact with substances causing asbestosis, other diseases connected with the asbestos effect, cancerous diseases of occupational origin, and with substances included in the Rotterdam Convention on the basis of occupational risks to health caused by them, and other hazardous chemical substances due to of occupational risks for human health caused by them".

In October 2006 WHO published a political statement about the elimination of asbestos conditioned diseases. The statement admits the hazardous effects of asbestos for health and calls for prohibition of any type of this substance all over the world as the most effective way of struggle against illnesses

caused by its impact. WHO insists on a broad informational approach regarding alternatives to asbestos - safe substances - and calls for the development of economic and technological mechanisms for encouraging the process of asbestos replacement. WHO recommends including these measures into national plans and strategies for the elimination of asbestos-conditioned diseases. WHO cooperates with ILO on the execution of the Resolution on Asbestos and works with other organizations in the direction of the full elimination of diseases caused by asbestos[56].

But concern about people's health is not the only reason why leading industrial countries and the growing number of other countries have prohibited usage of chrysotile asbestos. They are anxious about economic expenditure spent in the struggle with the epidemic of asbestos-related diseases, and ecological expenses for the purification of contaminated territories, where asbestos threatens the health of people. The first payment amounting to 45 thousand pounds was received in 1993 by Gordon Priorovy as compensation for mesothelioma, which was the result of his living near an asbestos factory "Capes East London". In 1995, 65 thousand pounds were paid to June Hencock, who played near an asbestos plant in her childhood and fell ill with mesothelioma. In the case of natural calamities, such as earthquake or hurricane, countries face the necessity to clean territories of asbestos-containing construction materials from ruinous buildings. The report of the Regional Seminar on stable regulation of hazardous wastes of health care and agriculture, which was held by the UN Organization on food and agriculture on June 26-29, 2006, raised the question of cleaning territories of asbestos-containing construction materials after the tsunami. The need to liquidate of a great number of building refuses containing asbestos was underlined.

The sixtieth session of the World Health Assembly WHA60.26

Item 12.13 of the agenda, May 23, 2007.

Health of workers: Global plan of activities

The sixtieth session of the World Health Assembly approved the Global plan of activities on health protection of workers for 2008 – 2017.

Item 10 of the Plan is formulated in the following version:

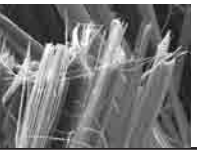
WHO will cooperate with member-countries in order to strengthen the potential of health ministries that will allow them to play the leading role in activities connected with health protection of workers, to develop and to fulfill a policy and plans of activities and to encourage inter-sectoral cooperation. Its activities will include global campaigns aimed at liquidation of diseases connected with asbestos, with taking into consideration a differentiated approach to regulation of its different forms, corresponding international juridical documents and last actual data for the conduction of effective measures, as well as vaccination of medical workers against B hepatitis and other measures aimed at the achievement of prior results in the sphere of health protection connected with labour conditions. A differentiated approach to regulation of different forms of asbestos is postulated.

Position of international and non-governmental organizations[57]

World Health Organization (WHO) and International Labor Organization (ILO), International Program of Chemical Safety, European Community, International Association of Social Safety, World Trade Organization, International Commission of Labour Hygiene, International Federation of Builders and Workers of Woodworking Industry, International Federation of Workers of Metallurgy Industry and governments of more than 40 countries call upon to ban chrysotile asbestos. Referring to the results of multiple researches they call upon for all countries to refuse from production and use of asbestos-containing products.

56 http://www.who.int/occupational_health/publications/asbestosrelateddiseases

57 Olga Speranskaya at alias. Asbestos: reality, problems, recommendations. Astana-Moscow-Kiev – 2008.



Such a position is supported by nongovernmental organizations, which confirm that advocacy of industrial interests is killing the essence of the Rotterdam Convention by putting profits above the interests of people's health. To their mind, only full prohibition of the production and trade of asbestos-containing products, regardless of the type of asbestos used, can significantly decrease the level of asbestos-related diseases.

Directly at the meeting of experts of the Committee on new chemical substances of the Rotterdam Convention, which was held in March 2008 in Geneva, nongovernmental organizations prepared a statement addressed to the Committee members, where they attracted their attention to the inadmissibility of following the interests of the asbestos industry to the prejudice of people's health and, first of all, of the health of workers at asbestos extractive and asbestos processing enterprises.

This appeal was signed by 58 nongovernmental organizations from different countries of the world including states of EECCA region, namely, Azerbaijan, Armenia, Moldova, Russia, Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan.

They expressed their concern about the use of chrysotile asbestos in the world, especially in developing countries, about suspense with treatment of asbestos-containing waste, and on-going emissions of asbestos into the air, which are the main entry sources of this hazardous substance to the human organism.

SUMMARY

On the level of international processes in the sphere of regulated use of asbestos, effective measures were developed to reduce the level of asbestos-dependent diseases, in particular, Convention of the International Labour Organization (ILO) No 162 "Labour protection at the use of asbestos", joining to which will increase the efficiency of Kyrgyzstan's activities in this sphere.

CONCLUSIONS AND RECOMMENDATIONS

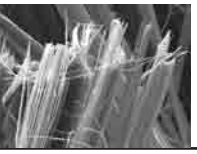
REGIONAL CONTEXT

According to the results of the Review "Asbestos: reality, problems, recommendations" executed by experts on chemical safety in Russia, Ukraine and Kazakhstan, together with European experts, a number of conclusions were made and recommendations were given. The authors of this review consider that these conclusions are fully applicable to Kyrgyzstan, also providing a framework nature to take concrete measures for the improvement of chemical safety in our country. They are listed in the box below :

Conclusion of the Review "Asbestos: reality, problems, recommendations"[58]

- Asbestos (the name includes all types of asbestos) is a carcinogen of the first group (according to MAIR classification).
- However, there is an opinion of specialists about the greater danger of amphibole asbestoses, already included into Attachment III of the Rotterdam Convention and falling under the procedure of prior reasonable consent concerning certain hazardous chemical substances and pesticides in international trade, when compared with chrysotile asbestos.
- Independent assessment of risks confirms that all types of asbestos can cause carcinoma of lungs, mesothyleoma and asbestosis. It has not been possible to determine a threshold level, below which asbestos is not carcinogenic.
- The absence of a threshold level for carcinogenic risk of chrysotile requires further investigation; concentration of chrysotile asbestos in the air of a working zone should not exceed its maximum permissible concentration (MPC).
- Asbestos is especially harmful when inhaled in the form of dust.
- The number of cases of diseases caused by asbestos correlates with fiber type, fiber size, chemical and biological properties, dose and technology of asbestos processing.
- Smoking increases the risk of carcinoma of lungs on exposure to asbestos.
- As asbestos-conditioned diseases are characterized by a long latent period, present reduction of asbestos use will lead to decrease of deaths caused by its impact after several decades.
- The existing data about the influence of asbestos on people's health both in Kyrgyzstan and in EECCA region is rather limited and cannot give a full picture of asbestos problems at the present stage of the countries' development. In these countries it is necessary to start work to conduct broad epidemiological research about the impact of asbestos on people's health.
- It is necessary to use modern information technologies in investigation of occupational diseases including those connected with asbestos.
- In the EECCA region there are all grounds for observing and toughening of the regulations of work with asbestos and searching for less aggressive substitutes.

58 Olga Speranskaya at alias. Asbestos: reality, problems, recommendations. Astana-Moscow-Kiev – 2008



It seems expedient that the states in their assessment and actions sequentially use principles allowing for reasonable decisions in the sphere of hygiene and ecology, including those connected with asbestos.

Such principles are:

1. Principle of replacement: if possible, finding an adequate replacement to re-orient production more actively towards the use of safe substances as alternatives to asbestos.
2. Principle of "right to know": the community, workers and inhabitants of the territories exposed to the impact of asbestos industry should know about dangers of asbestos and diseases caused by it, about volume of asbestos emission from enterprises, asbestos concentration in the air around asbestos enterprises and directly at working places. Such information should be freely accessible and should be actively distributed by the enterprises themselves, by medical institutions and by state controlling bodies.
3. Principle of precaution: even if data about dangers of asbestos to health received in countries of EECCA region are not sufficient (by the opinion of experts), it is necessary to observe a principle of precaution and WHO recommendations for taking measures reducing risks of asbestos impact on health on conditions that they are accepted on the national level.

Insufficient control and gaps in legislation allow the illegal penetration of construction materials containing asbestos of the amphibole group (already prohibited) and contaminated chrysotile asbestos into the counties of EECCA region, and it can cause serious harm to the health of population of this region.

In the counties of the EECCA region, there is practically no informative work among the population concerning the influence of asbestos on health. There are no popular manuals concerning safe work with asbestos-containing materials at home, there is no information about measures for prevention and reduction of the influence of asbestos-containing dust on the health of people living in the immediate vicinity of asbestos extractive mines and processing enterprises. It is necessary to organize wide information and educational campaigns with the population and workers in asbestos extractive and asbestos processing industries aimed at the maximum reduction of risks of asbestos related diseases in the region.

NATIONAL CONTEXT

Recommendations for the Kyrgyz Republic

State policy

- To develop and to realize a national program of diagnostics, reduction and elimination of asbestos conditioned diseases in cooperation with WHO and ILO. This requirement was adopted at the regional WHO European Bureau in Moscow in September 2010 and is a part of the Parma Declaration on the environment and health.
- Ratification of ILO Convention No 162 by the Kyrgyz Republic.
- To provide coordination among different ministries, agencies, researchers, public and business structures concerning risk reduction in the use of asbestos.

- To provide public control over the working environment at enterprises and waste disposal technologies.

Science and scientific research

- To conduct identification and thorough investigation of the influence of all types of activities connected with asbestos on health.
- To keep medical statistics of asbestos-conditioned diseases.

Economics and industry

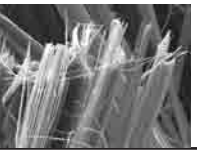
- To develop programs and plans for measures on reduction of air dustiness in working zones at enterprises and industries where asbestos and asbestos-containing materials are used.
- To provide adequate protection of workers, population and the environment of Kyrgyzstan from the potential danger of asbestos.
- To oblige employers to take measures preventing ingress of asbestos-containing dust to the air of the working zone and atmospheric air.
- To monitor labour conditions at enterprises attracting sanitary-industrial and ecological laboratories.
- To control health of workers, to take measures on the prevention of occupational diseases and further improvement of labor conditions.

RECOMMENDATIONS FOR TARGET GROUPS

Through joint efforts we will ensure safety

For populations

- If you use roofing slate and other goods containing asbestos, observe precautionary measures: when sawing goods use protective means. Roofing slate and other asbestos-containing goods should be covered with paint or other adhesive compositions;
- When choosing construction materials, learn the market and, if possible, use materials replacing the asbestos-containing ones (if you are sure of their safety);
- Do not throw away asbestos-containing debris onto the street, do not keep it at home - throw it away on landfills of construction materials;
- Asbestos-containing debris should be collected into closed containers, sacks or other packages to exclude ingress of asbestos dust into the environment;
- When doing construction works in your house try not to use asbestos-containing materials;
- If you already have asbestos in your house, do not try to remove it yourself. Contamination with fibers at its removal is much more dangerous;
- You can significantly reduce the effect of asbestos by insulating it with another material. For example, with the insulation covering of pipes use special tape, lacquer, paint, etc. to cover the surface.



If you live close to the enterprise producing asbestos:

- Pay attention that the waste of this enterprise does not litter the environment, but is stored at landfills strictly determined by the enterprise and closed to the population;
- Enquire with the enterprise and state bodies of protection of the environment concerning information of air purification quality;
- Join inspection checks of the enterprise.
-

For workers of enterprises using asbestos

Asbestos-containing materials are hazardous, when their dust with asbestos fibers gets into the air.

If you work at the industry using asbestos:

- Get acquainted with the requirements of legislation concerning standards of labor safety at hazardous production;
- Require the employer to observe these requirements;
- If the requirements of safety and workers protection are not fulfilled, appeal to trade unions, The Ministry of Health of the Kyrgyz Republic, Inspection of the Labor Protection at the Ministry of Labor, Employment and Migration of the Kyrgyz Republic, the State Agency of the Environment Protection and Forestry at the Government of the Kyrgyz Republic;
- Regularly pass medical examinations, watch over your health.

For your own safety:

- Be sure that the processed asbestos-containing material is wet;
- Use prescribed means of individual protection: protective clothing, respirator, etc.;
- Clean working rooms, do not leave asbestos-containing waste;
- Do not take your work clothing home;
- Pack asbestos-containing waste into double plastic sacks and mark them to be more noticeable;
- Place asbestos-containing waste into specially destined containers;
- Eliminate appearance of asbestos dust, keep your work place clean;
- Take a shower after a working shift.

Workers under 18 years of age are not allowed to engage in work associated with asbestos dust release

If you are the head of the enterprise using asbestos:

- Fulfill all requirements set by Law in relation to work with asbestos;
- Be careful with the health of employers, organize preventive measures;
- Ensure proper maintenance of personal service rooms (shower cubicles, cloakrooms, rooms for food, women's hygiene, etc.);
- Get acquainted with the requirements of ILO Convention No 162 "Labor protection at the use of asbestos", observe the Convention requirements.

For politicians and state functionaries

- Be guided by the highest safety standards in respect of use of asbestos;
- Pay great attention to research conducted and monitoring of enterprises using asbestos;
- Look for ways to extend public access to information concerning harmful effects on people's health and the environment;
- Develop programs on different levels with protected budgets in respect of the chemical safety of population;
- Fulfill the decision made at the 5th Ministry Conference on the Environment and Health Protection (Parma, March 10-12, 2010) about the necessity of the development of national programs on the elimination of diseases connected with asbestos before 2015.

For special authorized bodies in the sphere of protection of health and environment

- To strengthen control over production objects of asbestos-containing construction materials with regular check measurements of emission, over efficiency of gas-dust-purifying installments and over collection and landfill of asbestos-containing debris;
- To develop and to keep a National cancer register of Kyrgyzstan;
- To control regularly the conduct of preventive and periodical medical inspections;
- To strengthen control over labor conditions at working places of enterprises using asbestos and asbestos-containing materials;
- To use modern methods to determine the presence of asbestos fibers in the air;
- To realize the requirements of international agreements ratified by the country, which regulate the importation and use of asbestos of the amphibole group and products containing it.

ATTACHMENT.

NOMENCLATURAL LIST OF PRODUCTS MANUFACTURED AT KANT CEMENT-SLATE WORKS

Cement

Name of products	Name of a standard GOST		Chemical composition, %							Technical Characteristics		
			Sio2	A|203	Fe20	CaO	Mg O	SO3	Total	Ultimate strength, MPa Specific surface		
										Bending	Compression	m^2/kg
Portland cement with mineral additives M-400 D20	10178-85 (s 12:1989)	2,69	22,99	4,63	3,97	60,14	2,19	2,10	98,71	6,0	42,5	300
Sphere of use: for ferro-concrete monolith structures; for the production of precast concrete with steaming at grade of concrete up to 200; for concrete of road and aerodrome covering, use of at most 15% of granulated slag as an additive												
Plasticized Portland cement M-400 D20	10178-85	2,69	22,99	46,66	4,04	59,93	2,19	2,26	98,59	6,5	4,8	322
Sphere of use: for outer parts of river hydraulic structures, road and aerodrome covering, and other structures subject to repeated freezing and defrosting during operation												
Sulfate-resistant portland cement M-400 D20	10178	1,83	23,30	4,73	4,80	59,92	2,23	2,15	98,95	6,0	43,7	285
Sphere of use: for concrete and ferro-concrete structures subject to sulfate aggression at the variable level of elevation of water												
Portland cement without additives M-400 B/D M-500 B/D	10178-85	 1,43 1,97	 21,502 0,70	 5,01 4,91	 4,26 4,24	 61,71 61,69	 2,38 1,86	 2,99 2,85	 99,28 98,88	 6,1 6,6	 43,9 50,2	 280 300
Sphere of use: for concrete of road and aerodrome covering, ferro-concrete pressure and non-pressure pipes, ferro-concrete sleepers, bridgework, tower bodies of high-voltage transmission lines, contact system of railway transport and lighting, asbestos-cement products												
Sulfate-resistant M-400 B/D		1,45	22,77	4,94	4,80	60,03	2,26	2,75	98,40	6,3	44,8	280
Sphere of use: for hydraulic structures and prestressed concrete structures subject to sulfate aggression, for production of piles, bridge footing structures, piers to be used in mineralized water.												

Roofing slate

Name of products	Name of standard GOST	Length, mm	Technical characteristics		
			Width, mm	Ultimate bending strength, kgf/cm^2	Height of cover wave, mm
Asbestos-cement slates: UV - 6,0 (6-waves) SV - 40 (8-waves)	GOST 20430-84 GOST 20450-84	1750 +/- 15 1750 +/-15	1125 +10/-5 1130 +10/-5	16,0 16,0	45 +4/-6 30 +6/-4
Sphere of use: for roofing					

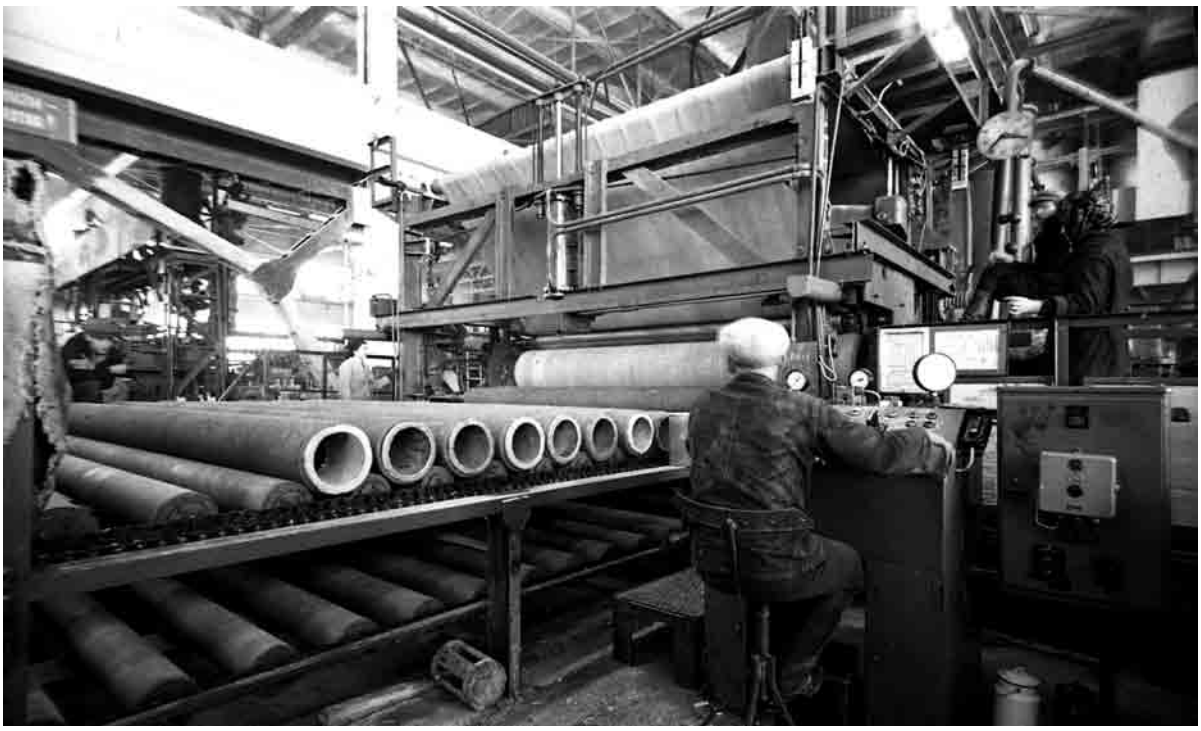
Pipes

Name of products	Name of standard GOST	Technical characteristics				
		Outer diameter, mm	Inner diameter, mm	Length,mm	Crushing load, kgf	Bursting hydraulic pressure , kgf/cm^2
Asbestos-cement pipes: VT–9 pressure pipes, diameter:						
150 mm	11310-90	At most 168	141	3950	1210	31
200 mm	11310-90	224	189	3950	1320	31
300 mm	11310-90	324	279	3950	1540	27
400 mm	11310-90	427	368	3950	1980	27
Sphere of use: for pressure pipelines						
Non-pressure pipes:	11310-90	161 +/-2,5	141	3950	400	
BN 150 mm	11310-90	211 +/-2,5	189	3950	320	
BN 200 mm	11310-90	307+/-3,0	279	3950	420	
BN 300 mm	11310-90	402 +/-3,0	368	500		
BN 400 mm						
Sphere of use: for outer pipelines of sewage, collector ditches for reclamation systems and laying of telephone communication						

Joints

Name of products	Name of standard GOST	Technical characteristics			
		Outer diameter, mm	Inner diameter, mm	Length,mm	Bursting hydraulic pressure , kgf/cm^2
Asbestos-cement joints:					
CAM-9 pressure, diameter:					
150 mm	11310-90	225,5	173,5	140	18
200 mm	11310-90	287,0	229,5	150	18
300 mm	11310-90	397,0	329,5	150	18
400 mm	11310-90	517,0	433,5	160	18
Non-pressure:					
BN 150 mm	11310-90	212,0	188 +/-2,0	150 +/-3,0	4
BN 200 mm	11310-90	260,0	234 +/-2,0	150 +/-3,0	4
BN 300 mm	11310-90	366,0	344 +/-3,0	150 +/-3,0	4
BN 400 mm	11310-90	477,0	441 +/-3,0	150 +/-3,0	4
Sphere of use: as connecting elements to asbestos-cement pipes					

View of Kant cement-slate works. Kant Settlement, 1967
Central State Archives of photo documents, KR



Combined production system of pipes at Kant cement-slate works, 1970
Central State Archives of photo documents, KR

Enterprise "Kant TShP" LTD, 2011

"Kant TShP" LTD, overview of the enterprise, 2011

USE OF ASBESTOS IN THE PRODUCTION OF "Kant TShP" LTD

Packing of asbestos during the manufacture of roofing slates

Forming of roofing slates

Warehouse of finished products at "Kant TShP" LTD

Landfill of "Kant TShP" LTD for asbestos-containing waste

SALE OF ASBESTOS-CONTAINING PRODUCTS AT MARKETS IN KYRGYZSTAN

Selling of asbestos-cement pipes, livestock market.

Selling of used roofing slates, livestock market.

Roofing slates for sale at markets in Bishkek

Slate roof, Bishkek

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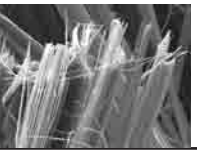

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