



Trade Development Authority of Pakistan

A Report on
TALC (Soap Stone)



Prepared By:

Mustansar Mehmood (Product Officer)

Supervised By:

Dr. Sajid Hussain (Consultant)

Minerals & Metals Division

Table of contents

Contents	Page #
Executive Summary	3
Formation of Talc	4
Chemistry of Talc	5
Physical and Chemical Properties of Talc	5
Colors of Talc	6
Whence Talc	6
Types of Talc Deposits	7
Occurrence of Talc	8
World Reserves of Talc	9
Talc Producers in World	10
Talc in Pakistan	12
Uses of Talc	13
Health & Safety Issues	17
Talc Export Analysis	18
World Top Ten Exporters of Talc-2009	19
Asia Top Ten Exporters of Talc-2009	20
Asia Top Ten Importers of Talc-2009	21
World Top Importers of Talc-2009	22
Talc-Pakistan Product wise Analysis (FY2007 to 2010)	23
Talc-Pakistan Average Unit Price (FY2009-10)	23
Talc Pakistan Export Markets July-June (FY2009-10)	24
Talc-Pakistan Major Exporters	26
Talc-Constraints	30
Talc-Action Plan	31
Conclusion	32
References & Terminology	33

Executive Summary

Talc is a mineral composed of hydrated magnesium silicate with the chemical formula $H_2Mg_3(SiO_3)_4$ or $Mg_3Si_4O_{10}(OH)_2$. It is very soft and can be cut with a knife. Talc is insoluble in water, but it is slightly soluble in dilute mineral acids. Its colour ranges from white to grey or green and it has a distinctly greasy feel. Its streak is white.

Talc is used in many industries such as paper making, plastic, paint and coatings, rubber, food, electric cable, pharmaceuticals, cosmetics, ceramics, etc. A coarse grayish-green high-talc rock is soapstone or steatite and has been used for stoves, sinks, electrical switchboards, etc. Talc is sometimes coupled with Asbestos Minerals which is fatal for human body. Talc is mostly linked with pulmonary diseases like Lung Cancer, Skin Cancer and also Ovarian Cancer.

Currently, after China, the world's largest talc-producing countries are the U.S., India, Finland and France. The France-based Luzenac Group is the world's largest producer and supplier of mined talc. Pakistan also has major resources of best quality Talc Deposits in the world. Its mines are situated in Khyber Pakhtoonkhwa with largest deposits located in Sherwan (Hazara), Swat, Jamrud, Kurram Agency, Safed Koh (near Parachinar), Landi Kotal.

China, Netherlands, France, Finland, Belgium, Austria, Italy, USA, Canada and Japan are major exporters of Talc in the world. Due to poor law and order situation in talc bearing areas like Jamrud, Kurram Agency & Landi Kotal Pakistan share in world export of Talc is less than 2%. The annual export of Talc from Pakistan was around US\$ 2.51 Million during FY2007-08, in FY2008-09 export increased to US\$ 8.21 Million. During July-June 2009-10 export value of Talc from Pakistan is US\$ 10.74 Million with encouraging trend of 30.82%.

As Pakistan holds one of the best quality Talc deposits in the world, efforts are considered necessary to capture the international market. EU is the main market for Talc consumption and 82% of Pakistan Talc Export is made to EU Countries. Thailand is leading Importer of Talc in the world with 19% of total world Talc imports. Presently Pakistan share is just around 0.25% in Thailand's Talc Imports. Talc demand in India is on the rise; currently Pakistan share is approximately 15% in India's Talc Imports. Similarly domestic production in China is of predominantly low- and medium-grade talc. As Pakistan holds the best quality Talc, efforts are needed to penetrate the Chinese Talc Market.

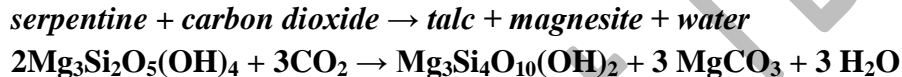
In order to increase the Talc export, which is far behind its actual potential, exploration may be carried out in virgin areas for locating additional deposits leading more export and import substitution. Joint venture with leading Talc dealing companies may be made to bring latest technology in mining and subsequent processing as per international market standards.

Formation of Talc

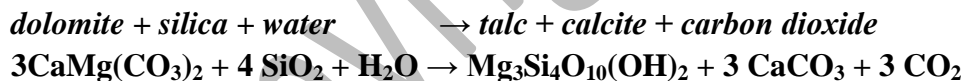
Talc is a metamorphic mineral ⁽¹⁾ resulting from the metamorphism of magnesium minerals such as Serpentine, Pyroxene, Amphibole, Olivine, in the presence of Carbon Dioxide and Water. This is known as **Talc Carbonation** or **Steatization** and produces a suite of rocks known as **Talc Carbonates**.

Talc is a mineral of Hydrated Silicate of Magnesium with Chemical Formula of $Mg_3Si_4O_{10}(OH)_2$.

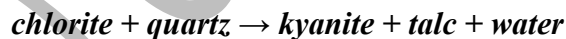
1. Talc is primarily formed via hydration and carbonation of serpentine, via the following reaction:



2. Most talc is formed from the alteration of Dolomite ($CaMg(CO_3)_2$) or of Magnesite (MgO) in the presence of excess dissolved Silica (SiO_2). Talc can be formed via a reaction between Dolomite and Silica, which is typical of skarnification of Dolomites via silica-flooding in contact metamorphic aureoles:



3. Serpentine or Quartzite can also form talc. Talc can be formed from magnesian chlorite and quartz in blueschist and eclogite metamorphism via the following metamorphic reaction:



Associated Minerals:

Dolomite, Magnesite, Quartz, Olivine, Pyroxenes, Serpentine, Amphiboles and Biotite

(1) **Metamorphic Mineral** is the result of the transformation of a pre-existing rock type. They are formed by the intrusion of molten rock, called magma, into solid rock where the temperatures are high.

Chemistry of TALC (Soap Stone)

Chemistry of all types of Talc is as follows:

Chemistry:	(1)	(2)	(3)
SiO ₂	60.06	62.16	63.37
Al ₂ O ₃	1.60	0.88	
FeO	1.74	1.41	
MgO	30.83	30.86	31.88
CaO	0.40		
H ₂ O	5.02	4.92	4.75
Total	99.65	100.23	100.00

Talc, when pure, has a composition of 31.88% of MgO, 63.37% of SiO₂ and 4.75% of Water.

Physical and Chemical Properties of TALC (Soap Stone)

Hegman Grind*:	3- 6
Density (g/cm₃):	2.7- 2.85
Specific Gravity:	2.6- 2.85
Oil Absorption:	30-55
Solubility in H₂O:	Insoluble
Appearance:	White Powder, Grey, Green etc
Odor:	None
Mohs Hardness @20°C**:	1.0- 1.5
pH***:	8.4-9.4
Crystallography:	Lamellar
G.E. Brightness:	85- 97
Refractive Index:	1.59- 1.60

* **Hegman Fineness of Grind:** Device that measures the fineness of dispersion of a pigment. A **Hegman gauge** is a device used to determine how finely ground are the particles of pigment (or other solid) dispersed in a sample of paint (or other liquid).

** The **Mohs scale of mineral hardness** characterizes the scratch resistance of various minerals through the ability of a harder material to scratch a softer material. It was created in 1812 by the German mineralogist Friedrich Mohs. The hardest known naturally occurring substance when the scale was designed, diamonds are at the top of the scale.

*****pH** is a measure of the acidity or Basicity of a solution. Pure water is said to be neutral, with a pH close to 7.0 at 25 C (77 F). Solutions with a pH less than 7 are said to be Acidic and solutions with a pH greater than 7 are said to be Basic or Alkaline.

Talc is also name as Soapstone, French Chalk and Steatite.

- **Soapstone** refers to all massive gray to bluish or greenish talcose rocks which generally have a slippery feeling and can be carved by hand.
- **French Chalk** is a soft variety of talc used for making cloth.
- **Steatite** is a grade of talc suitable for making electronic tube insulators.

Colors of TALC (Soap Stone)

Talc Major Colors are:

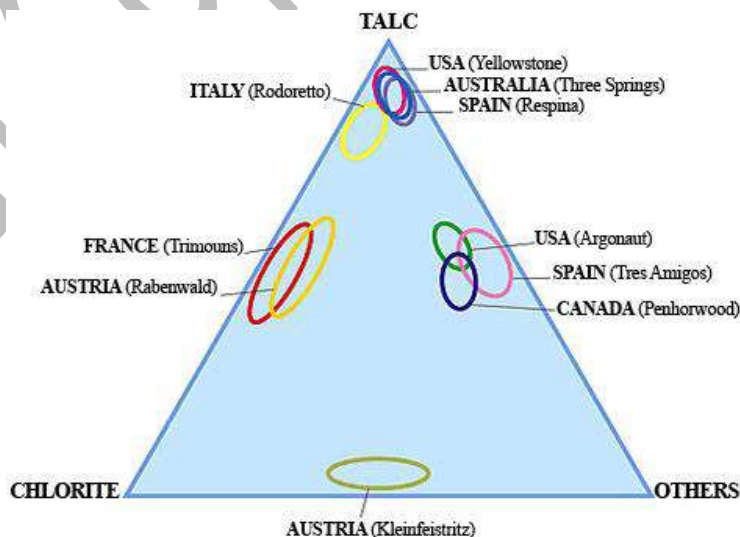
- White
- Grey
- Green
- Blue
- Pink
- Violet
- Silver

It all depends upon the talc's chemical composition, and what proportions of such elements as Aluminum, Iron, Manganese and Titanium may also be present.

Whence Talc?

Talc is mined from talc-bearing metamorphic rock. Within this rock, bodies of talc can often range in thickness from tens of meters to over 100 meters. How the talc formed within the rock and the nature of the rock itself determines the quality of the talc.

Different Types of Talc

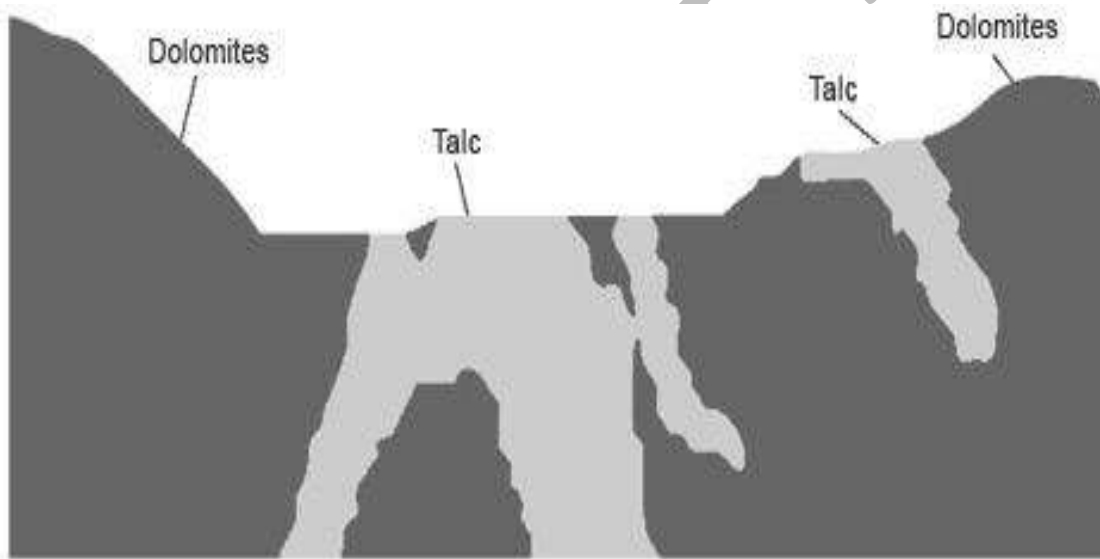


Source: Luzenac Group

Types of Talc Deposits

Talc is one of the many minerals that are deposited in more than one way. Many minerals are deposited by hydrothermal earth activities. In cases of deposits when hydrothermal activities take place, the deposits are usually classified according to the parent rock from which they derived. Talc has at least four types of talc deposits.

1. The first type of deposit is derived from Magnesium Carbonates. Found in ancient metamorphosed carbonate sequences, this talc deposit is usually the purest form of talc. It is mostly white and provides almost 50% of the world's talc production. These deposits, which form the majority of large deposits to be found in the U.S. today, produce some of the purest and whitest talc.



Source: Luzenac Group

2. The second type of talc deposits are made from Serpentine, which provide 40% of the world's talc production. This type of talc comes from the metamorphosis of Serpentine into a mixture of reactional Magnesium Carbonates and Talc, forming the ore commonly known as "Soapstone." This deposit formation of talc is usually grey and does not serve much commercial use. Soapstone itself is often used domestically in countertops and the surrounds of fireplaces and stoves.

3. The third type of talc deposit is derived from Alumino-silicate rock. Only about 10% of this type of talc deposit is mined to meet the world's talc supplies. It is found mostly in a gray crude ore and alongside many other hydrothermal minerals. This type of Talc is found at Trimouns in the French Pyrenees.
4. Finally, talc is deposited from magnesium sedimentary deposits. This type of deposit is not mined currently and does not bring good economical value. A talc deposit can be formed by direct transformation of magnesium clay. This talc deposit can be found in many locations. The wide diversity of talc deposits has given rise to a massive array of ores and product grades of talc for human uses.

Occurrence of Talc (Soap Stone)

Talc is a common metamorphic mineral in metamorphic belts which contain Ultramafic Rocks (2) such as Soapstone (a high-talc rock), and within Whiteschist and Blueschist (3) Metamorphic Terranes.

- Prime examples of Whiteschists include the Franciscan Metamorphic Belt of the western United States.
- The Western European Alps especially in Italy, certain areas of the Musgrave Block.
- Collisional Orogens such as the Himalayas which stretches along Pakistan, Kashmir and Nepal.
- Talc carbonated Ultramafics are typical of many areas of the Archaean Cratons, notably the Komatiite Belts of the Yilgarn Craton in Western Australia.
- Talc carbonate Ultramafics are also known from the Lachlan Fold Belt, Eastern Australia, from Brazil the Guiana Shield, and from the Ophiolite Belts of Turkey, Oman and the Middle East.
- Notable economic talc occurrences include the Mount Seabrook talc mine, Western Australia, formed upon a Polydeformed Layered Ultramafic Intrusion.

(2) **Ultramafic Rocks** are rocks with very low silica content (less than 45%), generally 18% MgO, high FeO, low potassium, and are composed of usually greater than 90% mafic minerals (dark colored, high magnesium and iron content). The Earth's mantle is composed of ultramafic rocks.

(3) **Schist** A highly foliated, medium-grained metamorphic rock that splits easily into flakes or slabs along well-defined planes of mica. The mineral composition of schist is varied and is often reflected in the name given to the rock.

Blueschist is a rock that forms by the metamorphism of basalt and rocks with similar composition at high pressures and low temperatures, approximately corresponding to a depth of 15 to 30 kilometers and 200 to ~500 degrees Celsius.

World Reserves of Talc (Soap Stone)

Talc, which is a clay mineral, is found in many locations throughout the world. Many countries actually use talc production as a major source of export capital. Talc is found in a variety of forms which gives talc its economic value. Some forms, such as pure white talc, can bring a good price in the mineral market.

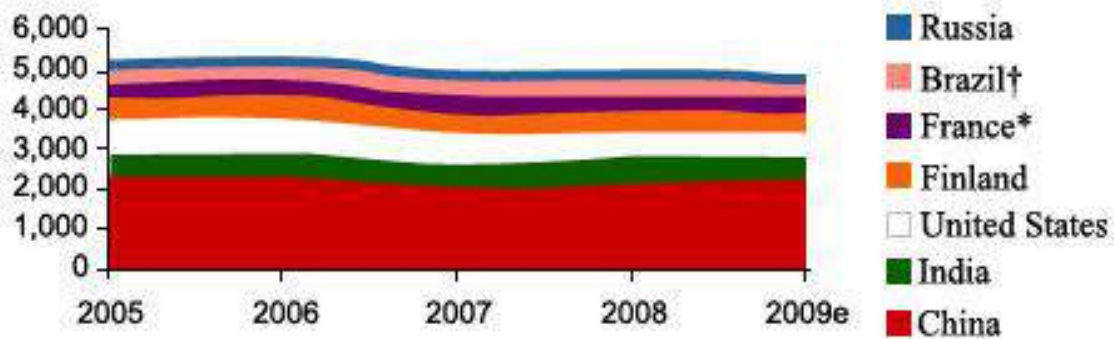
Country	Reserves (‘000 Metric Tons)	Production (‘000 Metric Tons)
China	Large	2,200
USA	140,000	527
Brazil	180,000	405
Japan	100,000	350
Republic of Korea	14,000	800
India	4,000	650
Finland	Large	525
Pakistan	600	21

Source: USGS & GSP

Along with above mentioned countries France is one of the major Crude Talc Producer. The France-based Luzenac Group is the world's largest supplier of mined talc.

The Luzenac Group is the largest talc producers in the world. According to Rio Tinto, "every year, Luzenac produces, ships and sells in excess of 1.2 million tonnes of talc from over 30 mines and processing plants in Europe, North America, Central America and the Asia-Pacific region. Luzenac supplies over 25 per cent of talc consumed worldwide."

World Talc Production - 2005-2009 ('000 Tonnes)



Notes: °Estimated *Crude talc †Talc and Pyrophyllite

(Source: USGS)

Talc Producers in World

A) United States of America

In United States of America talc is mined by three companies at six mines in three states:

1. Montana (the largest producing state)

In fact, Montana has led the U.S. in talc production for more than 20 years. It supplies more than one-third of the quality talc used in the U.S. The biggest talc mine in the U.S. is found near Ennis, Montana called the Yellowstone mine.

2. Texas
3. Vermont

Talc Producers in USA:

- **Luzenac Group:**

The largest producer in the U.S. is the Luzenac Group-part of Rio Tinto (Rio Tinto is one of the world's leading mining and exploration companies) at its mines in Montana and Vermont.

- **American Talc Company** in Texas
- **Specialty Minerals Inc.** in Montana

B) China

China is considered the world leader in talc production (Agnihorti & Chandra, 2003). The three centers of China's talc industry are:

- 1) **Liaoning**
- 2) **Shandong**
- 3) **Guangxi**

In 2008, it was estimated that the three provinces produced some 500,000 tonnes per annum of high-grade white talc alone.

Following companies are the major Chinese talc producers:

- Liaoning Aihai Talc Co. Ltd.**
- Haichen Beihai Minerals Co. Ltd.**
- Haichen Shuiquan Talc Mining Co. Ltd.**
- Haichen Pailou Talc Co. Ltd.**
- Shandong Pingdu Talc Co. Ltd.**
- Shandong Laizhou Talc Co. Ltd.**
- Guilin Guiguang Talc Development Co. Ltd.**
- Guangxi Longguang Talc Development Co. Ltd.**
- Guangxi Longsheng Huamei Talc Development Co. Ltd.**

The above nine companies, together with the North Sea Group, Three Springs Talc Mining Co. Ltd, Talc Mine Qixia and Lung Kwong Talc Development Co. Ltd. were recently reported to account for 80 percent of all talc production in China and 95 percent of its talc exports.

C) Finland

Mondo Minerlas owned by London-based HgCapital, is the second-largest talc-mining and processing company in the world, with mines in Finland and processing operations both in the Netherlands and Finland. It is also Europe's largest talc producer, with a capacity to produce some 650,000 dry tonnes per year.

In April 2009, Mondo announced a joint venture with the Beihai Group, a major Chinese talc producer, based in the Haicheng district of Liaoning province.

D) India

The main talc producers in India are:

- **Golcha Group**
- **Golcha Associated Group**

Golcha Group is dominating the Indian Talc Market. To benefit from increasing demand across Southeast Asia, the group recently opened a new talc mill in Thailand, to be operated in a joint venture with Chemintac S. A. Thailand (a subsidiary of Chemintac S. A. Europe). The plant is expected to produce 36,000 tonnes of talc and other minerals per year. Of these, some 70-80 percent will be utilized in Thailand, and the remainder to plastic compounding industries in the Asia Pacific region.

- **Jai Group** based at Rajasthan

TALC (Soap Stone) in Pakistan

RESERVES IN PAKISTAN

- Talc reserves are estimated 0.6 Million Tons
- Talc reserves size is from “Medium to Large”
- Talc Annual Production is 20,885 Metric Tons.

POTENTIAL DEPOSITS IN PAKISTAN

- Pakistan has major resources of best quality Talc Deposits in the world. Its mines are situated in green valleys of Khyber Pakhtoonkhwa with largest deposits located in Sherwan (Hazara), Shangla Par (Swat), Jamrud, Kurram Agency, Safed Koh (near Parachinar), Landi Kotal, Zhob in Baluchistan, Nauseri in Azad Jammu & Kashmir and Chalt in Gilgit-Baltistan.
- Talc (Soap Stone) deposits located in Kurram Agency are of good quality matching to International Standards i.e. brightness ranging from 92% to 98%. However, detailed exploration is needed to prove the exact quantity & quality of reserves.

Source: GSP

Uses of TALC (Soap Stone)

Talc basically has five characteristics that make it a valuable mineral for industrial and domestic applications.

- i. Softness
- ii. Chemical inertness
- iii. Lamellarity
- iv. Whiteness
- v. Affinity for Organic Chemicals

In fact, talc is found in everything from animal feed to tires, and has been for millennia. As long as 15,000 years ago, cave dwellers used talc in their paints. For at least 5,000 years, it has been used in cosmetics, especially as a skin lightener, and 1,000 years ago, the Chinese began using it in their glazed pottery. Listed below are several of Talc's uses for the industries of the world:

1) Paper Industry:

Talc's number one consumer is the **Paper Industry**. It is used as filler and coating for paper products. Furthermore, talc helps control the paper's pitch while the paper is being processed. It improves paper smoothness, water retention in certain papers, and printability and runnability for coated papers.

2) Ceramics Industry:

The **Ceramics Industry** is another talc consumer. The glazing and bodies of the ceramics rely on talc to give ceramics their gloss, whiteness and shape. Dinnerware, Sanitary ware, tiles, porcelain, and electrical insulation are all part of ceramics made with talc. It is also used as a flux and to control thermal expansion - particularly in catalysts and particulate filters.

3) Paints Industry:

Talc is a major ingredient in **Paint & Coatings**. It helps control glosses, improves durability, fights rust (anti-corrosive), prevents cracking, and enhances smoothness. Pigment control and stability are also applications that talc adds to paint and coatings.

4) **Food Industry:**

- **Additives in Foods :** Talc coats some foods such as Chewing Gum, Candy and Cured Meat as an anti-sticking agent
- **Olive Oil Processing:** To improve oil extraction & clarity.

5) **Personal Care Industry:**

Due to Inert, soft and fragrance-retentive nature of Talc; it is used in manufacturing of *Cosmetic Products*.

- The softness and oil absorption it offers make it a primary ingredient in blushes, eye shadows and powder compacts.
- The oleophilic nature of talc makes it popular for dusting on the body in both baby powder and body cream. It helps absorb wetness and odor produced by the human body.
- The powder can be applied to help in chaffing and rubbing of the body extremities.
- Foot powder is usually made from talc, to help stop odor and wetness.

Talc used in cosmetics is required to be of high purity and is reduced to fine particles for preparation.

6) **Soap Industry:**

Since pre-historic age Talc is being used as soap that is why Talc is also named as *Soap Stone*.

- Reducing the cost of detergents, talc acts as a carrier for many soaps. Talc is harmless to our skin and is inert making it the ideal mineral to put in detergents as a filler.
- Body soap is sometimes made of talc. It acts as a filler and does not hurt the skin.

7) **Plastics Industry:**

Plastics are involved with talc as well. Talc adds the following properties to plastic:

- It improves impact absorbing strength, gives stability, and helps in the electrical insulation of plastics.
- Talc helps to improve plastic's ability to resist chemical and heat forces, as well as improves plastic's hardness, tensile strength and stiffness.
- Talc has a huge demand as the filler mineral in plastics, because it is platy, inert, and an electrical resister.

8) **Rubber Hoses, Membranes, Sealing, Stoppers & Tires:**

Talc's many uses can also be found in *Rubber Companies*. It helps give rubber its bounce. Rubber hoses made with talc are used in just about every automobile on the market. With its high heat resistance and bonding power talc helps make the hoses less permeable.

9) **Pharmaceutical Industry:**

- Many anti- fungal powders include talc to help kill bacteria off and improve the odor of the body.
- Talc is used in many commercial antacids for stomach and indigestion problems. The high resistance of acids and chemicals in the stomach make talc a good filler for the tablets.
- Many ointments include talc because of its ability to not react with chemicals. These ointments are used to treat things like scabies and insect bites.
- Pills are often coated in talc to help keep moisture out of them. This is why talc is a vital pharmaceutical mineral.



10) Farming Industry:

The **Farming Industry** uses talc to help preserve their cattle feed. Talc forms an anti-caking wrap on the feed that helps stop moisture from entering or leaving the feed. Talc is also used to help reduce the bacteria in the feed troughs for the animals.

11) Electrical Industry:

- **Electrical Insulators** are often made with talc. This lowers the wasted energy produced from electrical devices.
- **Cables:** To improve electrical insulation and flame retardancy.

12) Textile Industry:

Finely ground Talc is used for bleaching of cotton sacks.

13) Some Other Uses:

- Talc accelerates sedimentation of bacteria in **Wastewater Treatment Plants**.
- Talc makes a wonderful **Smooth Filler** for many products. Pencils need talc to keep their softness and improve their adhesion.
- **Counter Tops** are often made from the mineral talc. Talc's resistance to chemical acids and bases make it the ideal candidate for the job.
- Talc is an **Odor Absorber** and improves **Heat Resistance** in many industrial products.
- Talc is used by the **Gymnast** to dry their hands for a better grip on rings, beam, floor, bars, vault and horse. In addition, talc is used on the gymnasts feet so they may get a better foot grip on the beam and floor. Gymnastic equipment is usually covered with talc after a practice.
- Cereal polishing, shoe polish, ink, dry fire extinguishing powder, many floor waxes and joint compounds include talc as well.

Health & Safety Issues

Hazards Identification

Health Rating:	4 - Extreme (Cancer Causing, if Asbestos is found)
Flammability Rating:	0 - None
Reactivity Rating:	0 - None
Contact Rating:	1 - Slight
Lab Protective Equip:	Goggles; Lab Coat
Storage Color Code:	Blue (Health)

Potential Health Effects

Talc is mostly linked with pulmonary diseases like Lung Cancer, Skin Cancer and also Ovarian Cancer. Talc is sometimes coupled with **Asbestos Minerals**. Talc Products containing asbestos fibers are fatal to human body. Some of the probable effects of Talc on health are as follows:

- **Inhalation:**

Inhalation of large amounts of this fine dust may lead to pulmonary edema. May cause irritation to the upper respiratory tract. Tickling cough is a common symptom.

- **Ingestion:** Large doses may cause gastric irritation, nausea, and diarrhea.
- **Skin Contact:** May cause irritation.
- **Eye Contact:** May cause redness or irritation of eyes.
- **Chronic Exposure:** Prolonged inhalation of dust is associated with respiratory effects.
 - Long term excessive exposures to talc may cause **Talcosis**, a pulmonary fibrosis which may in turn lead to severe and permanent damage to the lung.
 - Crystalline Silica: Chronic inhalation of dust can produce **Silicosis**, a disease of the lungs. Chronic inhalation of crystalline silica is a lung cancer hazard.
 - Cardiopulmonary impairment may occur.



TALC (Soap Stone)

Export Analysis

World Top Ten Exporters of Talc-2009

Value in '000US\$

Sr. #	Exporters	Value	%age Share
	World	549,051.00	100
1	China	71,898.00	13.09
2	Netherlands	71,450.00	13.01
3	France	64,933.00	11.83
4	Finland	51,893.00	9.45
5	Belgium	47,018.00	8.56
6	Austria	46,713.00	8.51
7	Italy	44,469.00	8.10
8	United States of America	43,460.00	7.92
9	Canada	14,637.00	2.67
10	Japan	12,287.00	2.24

Source: ITC

Asia Top Ten Exporters of Talc-2009

Value in '000US\$

Sr. #	Exporters	Value	%age Share
	Asia Aggregation	118,145.00	100.00
1	China	71,898.00	60.86
2	Japan	12,287.00	10.40
3	India	11,173.00	9.46
4	Pakistan	10,744.43	9.09
5	Republic of Korea	4,649.00	3.93
6	Chinese Taipei	2,584.00	2.19
7	Bhutan	1,970.00	1.67
8	Singapore	1,932.00	1.64
9	Democratic People's Republic of Korea	1,415.00	1.20
10	Thailand	837.00	0.71

Source: ITC & FBS

Asia Top Ten Importers of Talc-2009

Value in '000US\$

Sr. #	Importers	Value	%age share
	Asia Aggregation	291,282.00	100.00
1	Thailand	144,240.00	49.52
2	Japan	42,695.00	14.66
3	China	14,190.00	4.87
4	Republic of Korea	14,174.00	4.87
5	Indonesia	13,965.00	4.79
6	Chinese Taipei	12,797.00	4.39
7	Malaysia	8,892.00	3.05
8	Singapore	8,171.00	2.81
9	Turkey	5,226.00	1.79
10	Philippines	4,679.00	1.61

Source: ITC

World Top Importers of Talc-2009

Value in '000US\$

Sr. #	Importers	Value	%age share
	World	757,902.00	100.00
1	Thailand	144,240.00	19.03
2	Germany	110,608.00	14.59
3	Netherlands	48,241.00	6.37
4	Japan	42,695.00	5.63
5	Belgium	41,966.00	5.54
6	United States of America	35,218.00	4.65
7	France	30,399.00	4.01
8	Italy	24,672.00	3.26
9	Spain	23,455.00	3.09
10	United Kingdom	20,339.00	2.68
11	China	14,190.00	1.87
12	Republic of Korea	14,174.00	1.87
13	Indonesia	13,965.00	1.84
14	Mexico	13,510.00	1.78
15	Chinese Taipei	12,797.00	1.69
16	Austria	11,872.00	1.57
17	Canada	11,101.00	1.46
18	Sweden	10,772.00	1.42
19	Malaysia	8,892.00	1.17
20	Singapore	8171.00	1.08

Source: ITC

TALC (SOAP STONE)-Pakistan**Product wise Analysis (FY2007 to 2010)**

Value in '000US\$

Sr. No	HS Code	Products	Export		%age Change	Export		%age Change
			(09-10)	(08-09)		(08-09)	(07-08)	
1	25261010	Talc Not Crushed Not Powdered	8,900.76	6,898.61	29.02	6,898.61	2,178.02	216.74
2	25261090	Other Natural Steatite N-Cru/Powder	12.81	11.94	7.32	11.94	42.51	(71.91)
3	25262000	Steatite/Talc, Crush/Powder	1,830.86	1,302.34	40.58	1,302.34	293.23	344.14
TOTAL			10,744.43	8,212.89	30.82	8,212.89	2,513.75	226.72

Source: FBS & RAD, TDAP

TALC (SOAP STONE)-Pakistan**Average Unit Price (FY2009-10)**

Sr. No	HS Code	Products	Average Unit Value \$/MT	
			(09-10)	(08-09)
1	25261010	Talc Not Crushed Not Powdered	154.67	101.75
2	25261090	Other Natural Steatite N-Cru/Powder	240.74	48.00
3	25262000	Steatite/Talc, Crush/Powder	156.08	141.49

Source: FBS & RAD, TDAP

TALC (SOAP STONE)**Pakistan Export Markets July-June (FY2009-10)**

Source: FBS & RAD, TDAP

Value in '000US\$

Sr #	Country	Export July-June (09-10)				Export July-June (08-09)				Change	
		HS Code 25261010	HS Code 25261090	HS Code 25262000	Total	HS Code 25261010	HS Code 25261090	HS Code 25262000	Total	Value	%
		Talc Not Crushed Not Powdered	Other Natural Steatite	Steatite/ Talc, Crush/ Powder		Talc Not Crushed Not Powdered	Other Natural Steatite	Steatite/ Talc, Crush/ Powder			
1	Netherlands	3,516.23		218.88	3,735.11	952.31			952.31	2,782.81	292.22
2	Italy	1,911.48		1,302.75	3,214.22	2,422.13		745.30	3,167.43	46.79	1.48
3	Spain	1,033.24		160.97	1,194.21	575.86		37.36	613.22	580.98	94.74
4	Greece	548.16			548.16	542.46			542.46	5.70	1.05
5	Turkey	521.68			521.68	339.86			339.86	181.82	53.50
6	Thailand	334.90			334.90	356.06			356.06	(21.16)	(5.94)
7	Slovenia	279.17			279.17	918.87			918.87	(639.69)	(69.62)
8	Saudi Arabia	170.31		70.57	240.88	-		490.46	490.46	(249.58)	(50.89)
9	India	163.67			163.67	131.87			131.87	31.80	24.12
10	Japan	113.63		2.31	115.94	347.40			347.40	(231.47)	(66.63)
11	Iran	61.28		16.33	77.61	8.90		7.34	16.23	61.38	378.08
12	Portugal	70.34			70.34	157.18			157.18	(86.84)	(55.25)
13	Rep. of Korea	69.28			69.28				-	69.28	100.00

TALC (SOAP STONE)**Pakistan Export Markets July-June (FY2009-10)**

Source: FBS & RAD, TDAP

Value in '000US\$

Sr. No	Country	Export July-June (09-10)				Export July-June (08-09)				Change	
		HS Code 25261010	HS Code 25261090	HS Code 25262000	Total	HS Code 25261010	HS Code 25261090	HS Code 25262000	Total	Value	%
		Talc Not Crushed Not Powdered	Other Natural Steatite	Steatite/Talc, Crush/Powder		Talc Not Crushed Not Powdered	Other Natural Steatite	Steatite/ Talc, Crush/ Powder			
14	Bangladesh	15.80	-	36.97	52.77	17.05	11.94	-	28.99	23.78	82.01
15	Sri Lanka	8.77	0.21	17.09	26.07	-	-	-	-	26.07	100.00
16	China	24.46	-	-	24.46	29.20	-	5.59	34.78	(10.32)	(29.67)
17	Belgium	20.83	-	-	20.83	8.27	-	-	8.27	12.56	151.82
18	Malaysia	1.22	12.60	5.00	18.82	-	-	1.10	1.10	17.72	1,612.28
19	Indonesia	15.29	-	-	15.29	-	-	-	-	15.29	100.00
20	South Africa	9.98	-	-	9.98	6.25	-	-	6.25	3.73	59.70
21	U. S. America	9.75	-	-	9.75	-	-	-	-	9.75	100.00
22	Germany	1.27	-	-	1.27	74.17	-	-	74.17	(72.90)	(98.29)
23	Austria	-	-	-	-	10.78	-	-	10.78	(10.78)	(100.00)
24	Russian Federation	-	-	-	-	-	-	15.20	15.20	(15.20)	(100.00)
	Total	8,900.75	12.81	1,830.86	10,744.42	6,898.60	11.94	1,302.34	8,212.88	2,531.54	30.82

TALC (SOAP STONE)

Pakistan Major Exporters

Sr. #	Name of Exporter	Address	Importing Countries
1	Omar Associates (Pvt.) Ltd.	714-C/2, Central Commercial Area, Tariq Road, P.E.C.H.S, Karachi.	Italy, Spain, Japan, USA & Saudi Arabia
2	North West Trading & Services Co.	Office 7 & 8 Army Stadium, Peshawar	Netherlands, Republic of Korea & India
3	Spring Rose International Gem Stones	Bannu Road, Behzadi Chakar Kot , Near Faraz Motors, Kohat	Spain
4	Zarwali Khan & Co.	Main Bazar Torkham, Khyber Agency	Afghanistan

Source: SBP

Omar Associates (Pvt.) Ltd. is one of the pioneer and leading exporter of Talc in Pakistan for almost a decade. They have won the Best Exporter's Award for Talc in FY 2007-08 & FY 2008-09 and also nominated for FY2009-10 with export of Talc valuing around 10.00 Million US\$.

Omar Associates (Pvt.) Ltd. is also in the process of signing an agreement with IMI FABI headquartered in Postalesio, Italy (a leading Talc manufacturer with mining & milling locations around the world) for Talc exploration, subsequent processing and export under the title of OMAR-IMI.

TALC (SOAP STONE)

Pakistan Major Exporters

Sr. #	Company Name	Contact Person	Address	Products
1	Khyber Minerals	Mr. Niaz Muhammad	Office #28 1st Floor, Shah Shopping Plaza, Industrial Estate Jamrud Road, Peshawar	Flourspar Lumps, Talc Lumps Graphite, Chrome Ore Copper Ore, Manganese Ore Mica,
2	Frontier Chemical Industries	Mr. Mumtaz Khan	Plot No 134/A Industrail Estate Hayatabad, Peshawar Ph: +92-91-5823056, 5828616	Soapstone Lumps, Gypsum Lumps, Egg Trays, Adhesive Glues, Industrial Chemicals
3	Cedar Internatonal	Mr. Mohammad Ajmal Khan	House# 1 New Defence Town Near Army Public School & College OPP. Hamara Foundation Warsak Road Peshawar. Ph: 92-91-5200446	Flourspar, Talc Lumps, Barite, Manganese ore, Chrome ore
4	Mazhar International	Mr. Sajjad Ahmad	Plot # 38/A Industrial Estate Jamrud Road Hayatabad Peshawar Ph: +92-91-5891528	Talc Lumps, Fluorspar, Talc Ores, Fluorspar Lumps, Calcium Carbonate Lumps/Powder, Rock Phosphate Lumps,P2O5 Lumps, Rock Phosphate Lumps, Magnesite Ore
5	North West Trading & Services Co	Ashfaq Bangash	Office No 7-8 First Floor Army Stadium Khyber Road Peshawar Ph: +92-91-9213338	Talc, Soap Stone Blocks, Fluorspar Lumps, Calcium Carbonate Lumps, Talc Lumps

TALC (SOAP STONE) Pakistan Major Exporters

6	Tanoli Trading Co.	Mr. Rizwan Ahmed Tanoli	Supply Bazar, Chandni Chowk, Abbotabad. Ph:+92-346-2830767	Talc, Soapstone Crush, Iron Ore, Rock Phosphate, Barite
7	Spring Rose Int Gems And Mineral	Mr. Asghar Farooq	Bunnu Road Behzadi Chaker Kohat. C/O Faraz Motor. Kohat	Gems And Mineral
8	Minex Industrial Minerals	Mr. Kashif Younus	11-B, Askari-3, School Road, Karachi Ph: +92-300-2162874	Talc, Talc Lumps, Talc Powder
9	Talc Minerals	Mr. Shahzad Khan	Jodia Bazar, Karachi Ph: +92-321-2998724	Talc Rock, Talc Lumps
10	Asr Mineral Zone	Mr. Meesam	1205, Kashif Center, Shahrah-e-Faisal, Karachi Phone:+92-21-35221872-74	Talc, Bauxite, Iron Ore, Fluoride etc
11	Gohar Syndicate	Mr. Jawad Gohar	C 265 Block 6 Ext PECHS, Karachi Ph: 92-21-34301287	Chromite, Soapstone, Quartz, Potash
12	Omar Associates (Pvt.) Limited	Mr. Nadeem Omar	714-C, Block-2, C. C. Area, PECHS Tariq Road, Karachi 0092 - 021 - 34527687, 34542094, & 34520516	Micronized Talc, Median Particle Size, Cosmetic, Paints, Plastic, Pharmaceutical Industries



TALC (Soap Stone)

Action Plan

TALC (SOAP STONE)-Constraints

- **Poor Law & Order Situation** in the Talc bearing locations in Jamrud, Kurram Agency & Landi Kotal is the main reason for its insignificant export.

Mondo Minerals, a company from Finland owned by London-based HgCapital, is the largest talc producer in Europe & second-largest talc-mining and processing company in the world, with capacity to produce some 650,000 tons per year. It has expressed its willingness to bring FDI to the tune of Euro 86 Million for development of Kurram Talc Deposits for mass scale production and subsequent export to European Countries. The project has a potential to become a viable venture, once the law & order situation improves in the area.

- **Talc Export Consignment Examination at Karachi Ports**

Export consignment examination at Karachi Ports, repacking and reloading is becoming a potential threat to Talc Export from Pakistan.

TDAP has received an official complain from “M/s Northwest Trading & Services Company” regarding re-packing & re-loading of their Talc Mineral Ore consignment for export to South Korea and Netherlands at Qasim International Container Terminal & Karachi International Container Terminal. The complaint is focused on the very poor re-packing/re-loading and mixing of other materials with the subject mineral after customs examination. This has resulted into cancellation of order of M/s Northwest Trading & Services Company by M/s Mondo Minerals the exporter is also under the threat of losing another valuable client M/s Youngwoo Chemtech of Korea.

All stakeholders are seriously concerned about this maltreatment of Talc consignment, which is adversely affecting the export of mineral from Pakistan.

- **Lack of Infrastructure**
- **Obsolete Technology**
- **Lack of Human Skill Development**

Action Plan - TALC (SOAP STONE)

- **Export Marketing:**

- EU is the main market for Talc consumption and 82% of Pakistan Talc Export is made to EU Countries. Thus European Union may be persuaded to add Talc (Soap Stone) to the list of Duty-Free items receiving Tariff Cuts under EU Trade Assistance Plan to Pakistan which is presently applicable on 75 types of Pakistani-made goods.
- Thailand is leading Importer of Talc in the world with 19% of total world Talc imports. Presently Pakistan share is just around 0.25% in Thailand's Talc Imports. To benefit from increasing demand across ASEAN countries, an Indian firm Golcha Group recently opened a new Talc Mill in Thailand, to be operated in a joint venture with Chemintac S. A. Thailand (a subsidiary of Chemintac S. A. Europe). It plans to produce 36,000 metric tonnes per year of Talc and other minerals for the Cosmetics, Paper, Ceramic, Paints and Plastic Industries. Of this, 70-80% will be used in the Thai market mainly supplied to leading Talcum Powder brands in Thailand while 20-30% will be slated for export.
- China is considered the world leader in talc production. Domestic production in China is of predominantly low- and medium-grade talc. Due to increase in demand of Talc in domestic industry of China, the Chinese Government is discouraging the export of Talc by imposing VAT & Quota System and is in search of more import of Talc to China. As Pakistan holds the best quality Talc, efforts are needed to capture the Chinese Market via FTA with China.
- Expansion in India's paint, paper and plastics industries in the last several years have led to substantially increased demand for talc in India. Presently Pakistan share is just around 15% in India's Talc Imports.

- **Re-induction of Rebate on Talc Export**

Government used to offer 25% Rebate on export of Talc but due to certain reasons for last couple of years this offer has been withdrawn from HS Codes only related to Talc. Efforts should be made for Re-induction of Rebate on Talc export.

- **Infrastructure**

Development of Infrastructure for Mining & Logistics

- **Technological Advancement**

Introduction of better mining practices

- **Human Skill Development**

Training facility under foreign collaboration

- **Import Substitution**

In Pakistan most of the Paint manufacturers use imported Talc which involves huge consumption of foreign exchange. As Pakistan Talc reserves are of good quality efforts are needed for import substitution by adopting modern technology in Talc exploration.

Conclusion

Exploration may be carried out in virgin areas for locating additional deposits leading more export and import substitution. Joint venture with leading Talc dealing companies like Luznac Group, Mondo Minerals, Liaoning Aihai Talc Co. Ltd., Haichen Beihai Minerals Co. Ltd., Shandong Pingdu Talc Co. Ltd. may be made to bring latest technology in mining of Talc deposits with subsequent processing as per standards of international market.

Pakistan Mineral Development Corporation (PMDC) has a well established Mineral Wing for mineral exploration. PMDC carried out about two dozen exploration schemes on a variety of industrial minerals. Presently PMDC is working on following Talc Projects:

- Dir-Swat Talc & Fluorite Project
- Exploration & Development of Soapstone in Kurram Agency, FATA.

Joint venture can also be made with PMDC for Infrastructure Development and Human Resource Development.

These measures will help in escalating the export of Talc from Pakistan, which is currently not worth mentioning i.e. around 11 Million US\$, far behind its actual potential.

References:

1. Books & Journals:

- *Minerals & Rocks for Industry* by Zaki Ahmad & Razi Ahmad Siddiqui issued by Geological Survey of Pakistan, Quetta
- *Mineral statistics of Pakistan* by Nazrul Islam, Syed Anwar Hussain, Syed Qamar Abbas & Muhammad Ashraf issued by Geological Survey of Pakistan
- *Geological Bulletin* by University of Peshawar
- *Journal of Himalayan Earth Sciences* 39 (2006) page 55-59 by Irshad Ahmad I and Noor Jehan, Department of Environmental Sciences, University of Peshawar
- *Dana's System of Mineralogy*, (6th edition), Page 678-680.

2. Organizations:

- Geological Survey of Pakistan (GSP)
- Pakistan Mineral Development Corporation (PMDC)
- Federal Bureau of statistics (FBS)
- Omer Associates (Pvt.) Ltd.
- Research Analysis Directorate, TDAP

3. Websites:

- www.en.wikipedia.org/wiki/soapstone
- www.ima-eu.org/en/talcwhat.html
- www.ima-na.org/talc
- www.usgs.gov
- <http://pubs.usgs.gov>
- www.luznac.com
- www.haichenco.com
- www.bisnetindia.com;
- www.golcha.com;
- www.mineral.galleries.com;
- www.wvmag.net
- www.trademag.com
- www.gsp.gov.pk
- www.pmdc.gov.pk

Terminology used:

(1) **Metamorphic Mineral** is the result of the transformation of a pre-existing rock type. They are formed by the intrusion of molten rock, called magma, into solid rock where the temperatures are high.

(2) **Ultramafic Rocks** are rocks with very low silica content (less than 45%), generally 18% MgO, high FeO, low potassium, and are composed of usually greater than 90% mafic minerals (dark colored, high magnesium and iron content). The Earth's mantle is composed of ultramafic rocks.

(3) **Schist** A highly foliated, medium-grained metamorphic rock that splits easily into flakes or slabs along well-defined planes of mica. The mineral composition of schist is varied and is often reflected in the name given to the rock.

Blueschist is a rock that forms by the metamorphism of basalt and rocks with similar composition at high pressures and low temperatures, approximately corresponding to a depth of 15 to 30 kilometers and 200 to ~500 degrees Celsius.

* **Hegman Fineness of Grind:** Device that measures the fineness of dispersion of a pigment. A **Hegman gauge** is a device used to determine how finely ground are the particles of pigment (or other solid) dispersed in a sample of paint (or other liquid).

** The **Mohs scale of Mineral hardness** characterizes the scratch resistance of various minerals through the ability of a harder material to scratch a softer material. It was created in 1812 by the German mineralogist Friedrich Mohs. The hardest known naturally occurring substance when the scale was designed, diamonds are at the top of the scale.

*****pH** is a measure of the acidity or Basicity of a solution. Pure water is said to be neutral, with a pH close to 7.0 at 25 C (77 F). Solutions with a pH less than 7 are said to be Acidic and solutions with a pH greater than 7 are said to be Basic or Alkaline.