

**SOLUTION OF SUBSTITUTION TO ASBESTOS
ON ROOFING SHEET MANUFACTURING
IN VIET NAM**

Dr. Do Quoc Quang (quangdq@yahoo.com)

*RESEARCH INSTITUTE OF TECHNOLOGY FOR MACHINERY
(RITM - VIETNAM)*

VIENNA - MAY 2014

Research History

- 2001: Starting research non asbestos technology in manufacturing roofing sheet after the issuance of Decision No.115/ 2001/ QĐ – TTg of Vietnam Government.
- 2003 - 2005: State Project code KC.06.15 “*Reseraching, Designing, Frabricating and Trial Running Manufacturing Line of Non Asbestos Roofing Sheet with capacity of 500.000 m²/year*”.
- 2007: Designing, Fabricating and Operating the first Manufacturing Line of Non Asbestos Roofing Sheet of Vietnam in Tan Thuan Cuong Ltd Company (TTC) – Hai Duong Province.
- 2009: Fabricating, Installing and Operating Manufacturing Line of high technology fiber roof ttile in Fuji Vietnam – Hai Duong Province.
- 2012- 2014: State Project code KC.03.DA.03/11 - 15 “*Completing technology of manufacturing line for non asbestos corrugated and flat sheet production with capacity 3 - 5 million m²/year*”.

Research History

PATENTS OF RITM IN NON ASBESTOS PRODUCTS MANUFACTURE

- Patent No.8375: Procedures and Manufacturing Line of Non asbestos Roof Sheet, valid from April 12, 2010.
- Industrial Patent No.9569 “*Hatschek Machine for Corrugated Fiber Cement Sheet*” valid from August 17, 2006.
- Industrial Patent No.13540 “*Hatschek Machine for Production Line of Fiber Cement Roof Sheet*” valid from August 28, 2009.
- Industrial Patent No.12264 “*Forming Machine for Roofing Sheet* ” valid from August 29, 2008.
- Registration Certificate of Trade-mark No.87537, valid from August 29, 2007.



First Non-Asbestos Roof Sheet Manufacturing Line in TTC (Hai Duong Province-2007)



Corrugator

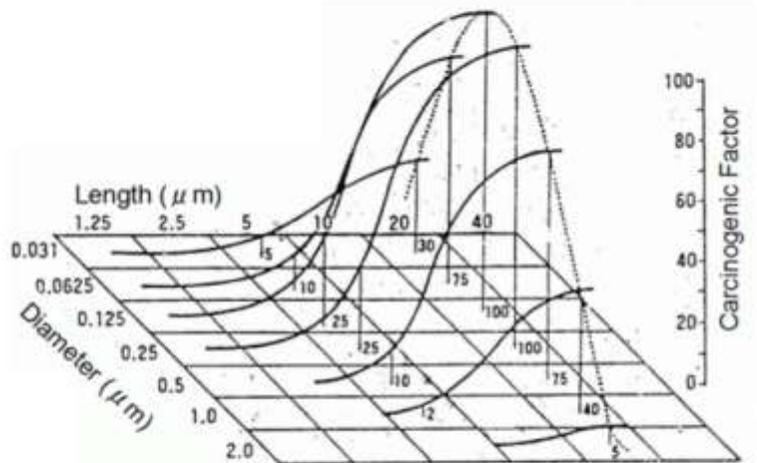


Pulp Preparation

NON ASBESTOS PRODUCTS SAFENESS

PVA FIBER SUBTITUTE ASBESTOS FIBER

Hypothesis of the Effect of Fiber Diameter and Length on Carcinogenesis



K. Takemoto, *Gekkan Kenchiku Shiage Gijutsushi*, 2, 1990

Dangerous fiber defined by WHO

- Diameter < 3μm
- Length > 5μm
- Aspect Ratio > 3

KURALON

- Diameter : 14μm
- Length : 4-6mm

KURALON™ for Non-Asbestos Products

Top

What's KURALON™?

Product & Application

Safeness

Service

WHO Hypothesis

Safeness

Safeness of KURALON (1)

This figure shows the hypothesis the effect of fiber diameter and length on carcinogenesis.

And WHO defined dangerous fiber as the diameter was less than 3 micrometer and the length was more than 5 micrometer and the aspect ratio was more than 3.

As for KURALON fiber, the diameter is 14 micrometer. So KURALON is not includes in such dangerous fiber.

Hypothesis of the Effect of Fiber Diameter and Length on Carcinogenesis

NON ASBESTOS PRODUCTS



Non asbestos products of TTC (left) show good quality compare other oversea company (right)

NON ASBESTOS PRODUCTS



Non asbestos products of TTC exported to
South Korea (since 2008 up to now)
Quality Standard applied: JIS A 5430: 2004

NON ASBESTOS PRODUCTS



High technology
Roof tile of Fuji
Vietnam (2007)

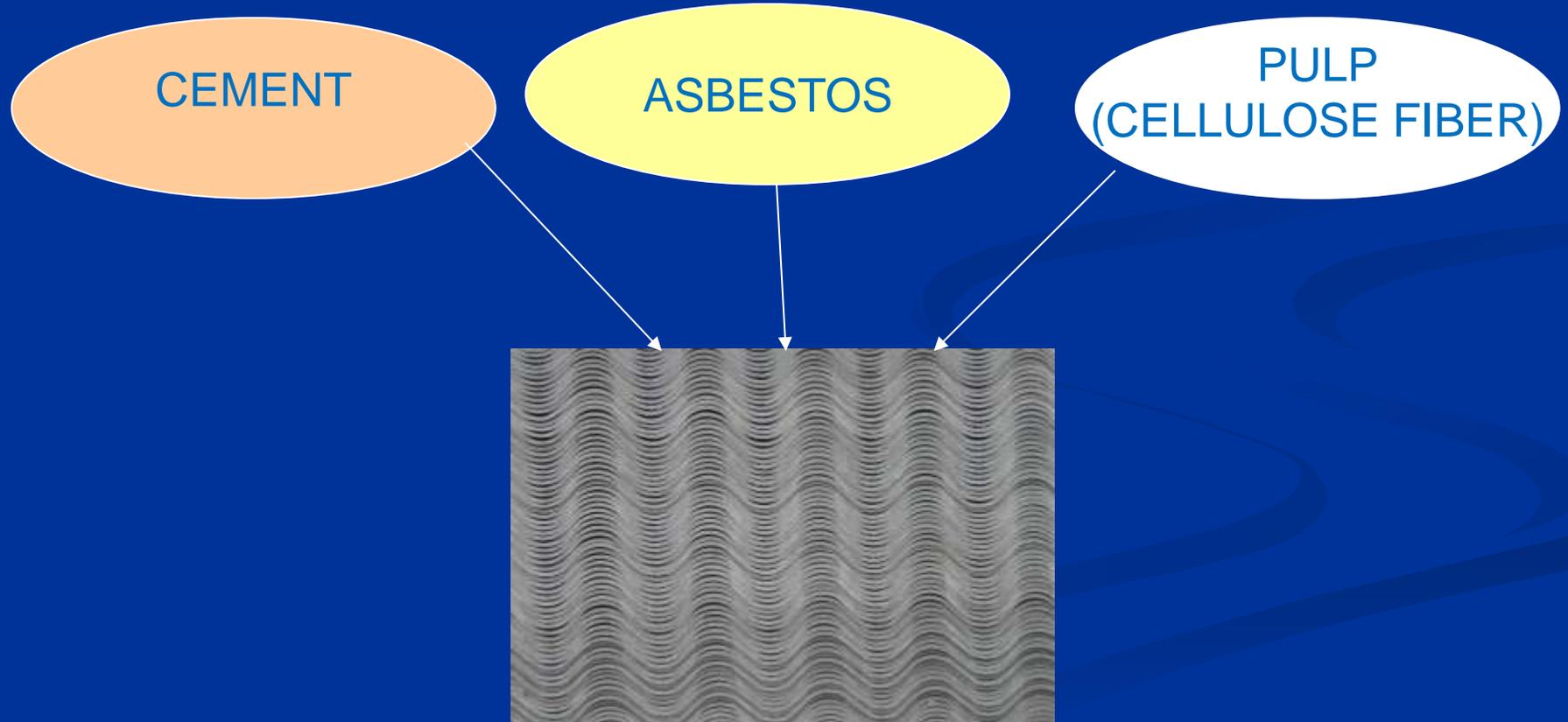


NON ASBESTOS PRODUCTS

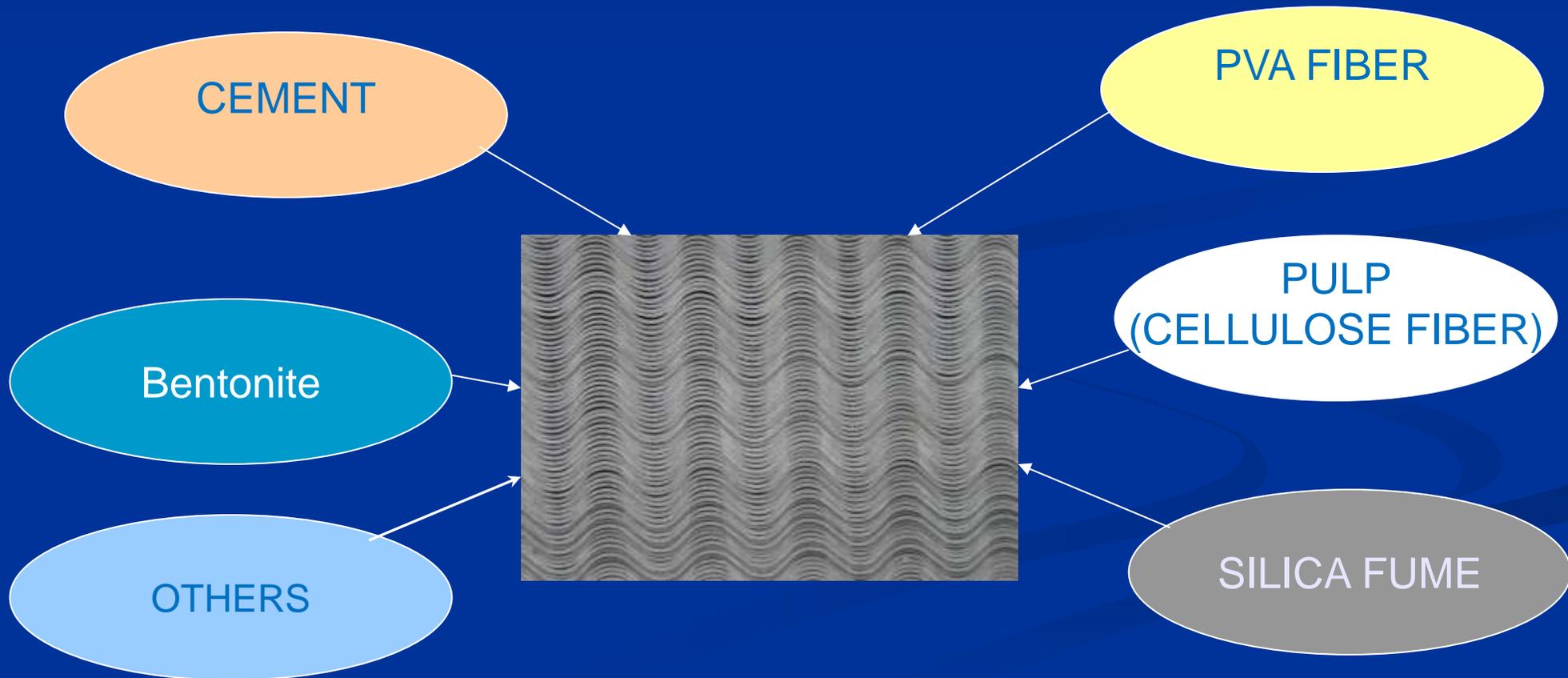
Products of Fuji Vietnam exporting to Japan



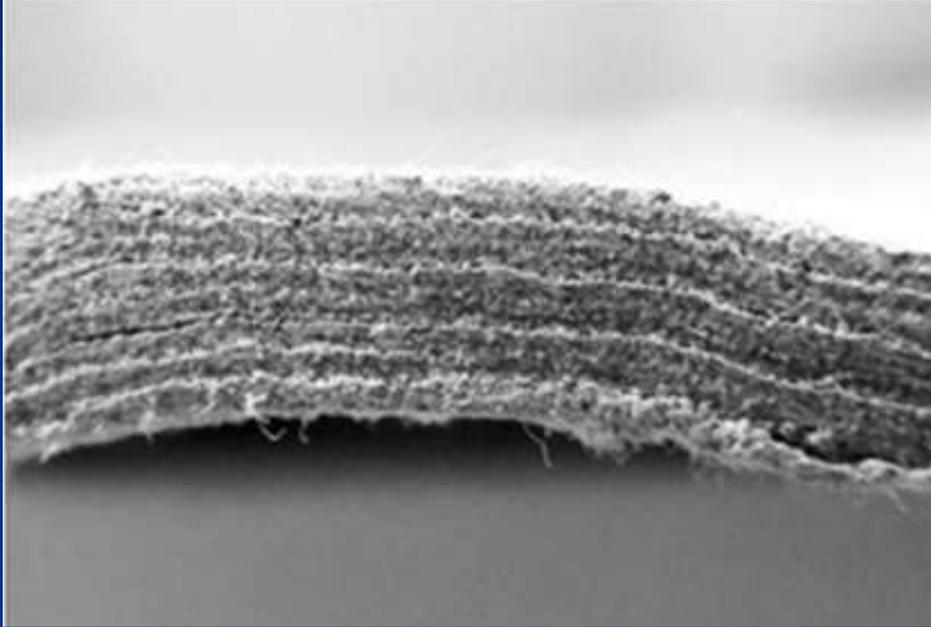
ASBESTOS CEMENT PRODUCT



MATERIALS SUBTITUTE ASBESTOS



Defects on none asbestos products



Delaminate

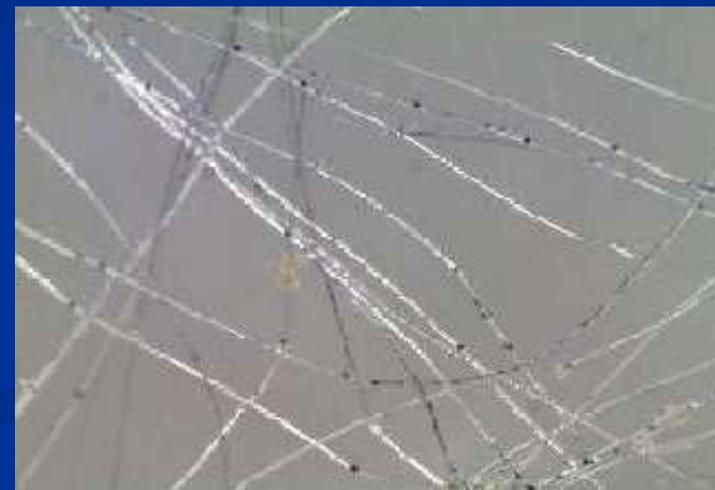


PVA fiber balling

Defects on none asbestos products



Cracks



Fiber damage

Defects on none asbestos products

- The defects that shows upper slides are very common on the non asbestos products particularly for the new manufacturers who change from asbestos product to non asbestos one.
- Defects have strong affect to the strength and durability of NT products. In the other hand, this is reason why the price of NT product seem to be too high comparing to the asbestos product.
- Solutions:
 - * Having a suitable formulation and machines in the production.
 - * Having a know – how that base on good knowledge of non asbestos material technology (NT).
 - * Having technical support from experienced specialist.
 - * Having suitable training for manager, engineers and workers.

Product of State Project: Trial Manufacturing

Manufacturing line of non asbestos corrugated and flat sheet of advance technology at Navifico – District 9, Ho Chi Minh City (start from 2013)



Product of State leveled Project: Trial Manufacturing

- November 2013: second manufacturing line of non asbestos corrugated sheet in Vietnam- based at Navifico. High quality final products meeting requirement of both domestic and international markets.
- February 2014: Navifico processed the first order of non asbestos roof sheet exporting to Middle East.
- Putting into operation of the manufacturing line at Navifico plays an important role as it is the success of changing asbestos product manufacturing to non asbestos one totally by domestic technology and equipment.



Product of State Project: Trial Manufacturing Fiber Cement Laboratory (FC Lab)

Objectives:

- Designing equipment, technology procedures of non asbestos with high quality.
- Researching, trial running non asbestos products of reasonable price with Vietnam's market condition.



CHALLENGES IN CHANGING TO NON ASBESTOS PRODUCT MANUFACTURING

- Technology of manufacturing cement asbestos sheet (AC sheet) is simple, small investment, easy to manage, high demand in the market (about 100 million m²/year).
- Manufactures and even users have never been ready to change AC products, hazardous characteristic of asbestos has not been aware.
- Technology to produce non asbestos products (NT) is more complicated, requiring bigger investment for equipment and technology procedures. Current price of NT product is higher than AC product about 15 – 30% (depend on maker's experience).

CHALLENGES IN CHANGING TO NON ASBESTOS PRODUCT MANUFACTURING

- Impacted by asbestos suppliers, Roof Sheet Association of Vietnam does not support NT product, even research activities.
- Policy to go to NT product in Vietnam are not clear enough to provide encouragement to manufacturers who have been changing to non asbestos technology.
- Information of NT is not transparently addressed to public (durability of the product, high quality technology, price, banning or not banning asbestos ...) for the manufacturing and consuming. Less of exchanging information among researching and managing organizations, policy makers and public...

OPPORTUNITIES

Some Activities like Science Workshop on Asbestos Diseases and Alternative Materials have good affected to the manufactures, consumers and policy makers.



**Scientific Workshop on Asbestos
Related Diseases Prevention in Hanoi
Feb.2014**



**Scientific Workshop on Alternative
Materials in Hanoi Mar.2013. This is
Annual workshop in Vietnam to provide
the knowledge of NT products to domestic
and international manufacturers.**

OPPORTUNITIES

1 – Primary legal basic of Government's policy applied to asbestos. relating Ministries , NGO have started projects to study hazardous characteristics of asbestos and concerning solutions to minimize asbestos' hazard...

Last December, Committee of Science, Technology and Environment of Vietnam National Assembly has a document to warning about asbestos diseases to relative Ministries. This is very important step to new policy of restrict to use asbestos in Vietnam.

2 – Vietnam succeeded in researching to new material, technology solution, equipment, type of non asbestos products at industrial scale long time ago. Many countries like Laos, Thailand, Malaysia, Indonesia, Iran and Uzbekistan have been shared and applied with Vietnamese concerning experience.

3 – Almost countries in the world have been aware of the hazard of asbestos and banning asbestos in concerning industries. Only 7/150 countries still want to use asbestos.

4 – Some domestic manufacturers have been aware of asbestos' hazards and they realize that changing to non asbestos products manufacturing is really needed and feasible.

5 – The International Inorganic Bonded – Fiber Composites Conference – IIBCC 2014 hold in Da Nang, Viet Nam in September 2014 will be the good chance for Vietnam to meet and exchange information with international manufacturers, researchers, consultant, suppliers... in fiber cement industry, non asbestos usage.

ACTIVITIES PLANNED IN 2014

- 1 – Further research on material, technology, equipment to increase quality, reduce price providing manufacturers with economic and technical feasibility to investment in non asbestos products.**
- 2 - Cooperating with manufacturers to build up the second fiber cement laboratory for those activities concerning to non asbestos product manufacturing.**
- 3 – Publishing, addressing information of non asbestos technology to manufacturers planning for the third manufacturing line of non asbestos roof sheet in Vietnam.**
- 4 – In coordinating with organizer of IIBCC 2014 to provide and encourage manufacturers, researchers, policy makers to attend the conference in middle of September, 2014 in Da Nang. Seeking for sponsors for logistic arrangement. After IIBCC 2014, it is expected that attendance with have wider view and acknowledgement of fiber cement products, non asbestos usage.**

*Thank you
for your attention*

