MANUFACTURE OF ASBESTOS PRODUCTS

B. J. Pigg

President
Asbestos Information Association/North America
United States of America

It is my genuine pleasure to participate in this important meeting. I represent the Asbestos Information Association/North America or AIA/NA (Slide 1). The Association was established in 1970 and it is a non-profit industry-supported organization of about 45 North American companies engaged in the mining, milling or sale of asbestos fiber and manufacture, sale or use of products containing asbestos. The principal focus of AIA/NA's work is on the educational and scientific areas. The objectives of our Association are:

* To provide industry-wide information on the asbestos health relationship and on industry efforts to eliminate problems associated with asbestos dust;
* To cooperate with government agencies in the development and implementation of standards for worker protection, and for the control of asbestos emissions into community air and water;
* To exchange information on asbestos dust control methodology;
* To assist members in the solution of asbestos-health related problems; and
* To increase public knowledge of the benefits to be derived from and the importance of asbestos-containing products.

In view of the assigned topic of my presentation, I propose to divide it into four sections. First, a brief overview of asbestos use in the United States; second, a review of federal regulations which would be a little more extensive than Mr. Chevalier's; third, some components and comments on significant segments of the U.S. asbestos industry; and finally, a slide presentation which focuses on the present day uses of asbestos in the United States.

The U.S. continues to be a major consumer of asbestos. The three operating mines in the States produced 57,422 metric tons in 1984. The U.S. consumed about 226,000 metric tons in 1984 with over 90% of this tonnage being chrysotile imported from Canada. Almost 6,000 tons of crocidolite and a very small amount of amosite were imported from the Republic of South Africa.

The current U.S. demand for asbestos is about 1/3 of the 1976 record high of over 725,000 metric tons. U.S. demand in 1984 showed the first increase since 1978. The quest for substitutes remains strong, but substitute materials generally fail to compete with asbestos when measured by quality and/or economic yardsticks. In addition, there is a growing concern regarding the potential health effects of the uncontrolled use of substitutes. As a matter of fact, at our Annual Conference held in September, one scientist emphatically urged for substitutes to be regulated to the same degree as asbestos.

(Slide 2) This slide will give you a picture of the specifics associated with as-
bestos consumption in the United States. As you will see, the five principal uses in order of consumption are: asbestos-cement products (pipe and sheet); friction products; flooring products; roof coatings and compounds; and packings and gaskets. It is significant to note that these principal uses are all in the category of "locked-in" or "encapsulated", i.e. the current uses of asbestos-containing products in the States are different from those friable insulation products that were marketed years ago, and which relate to the unfortunate adverse effects that are observed today.

As you may know, the use of asbestos in the United States has been regulated since May of 1971, when the first standard for occupational exposure was issued by the U. S. Occupational Safety and Health Administration (OSHA). Since that date, regulations have been issued by the following federal agencies: (Slide 3)

* U. S. Environmental Protection Agency (EPA)
* U. S. Food and Drug Administration (FDA)
* U. S. Mine Safety and Health Administration (MSHA)
* U. S. Consumer Product Safety Commission (CPSC)
* U. S. Department of Transportation (DOT)

so asbestos is thoroughly and comprehensively regulated in the States.

Generally speaking, the regulatory agencies which have the most impact on the commercial uses of asbestos are of course, OSHA and EPA. Perhaps it would be of interest to review what has transpired in the way of initiatives by these agencies during the recent past.

This slide (Slide 4) will give you some perception as to the unstable nature of regulatory actions which were to be followed by a reasonable and objective approach.

As the slide indicates, we bottomed out in 1979 when both the CPSC and the EPA issued advanced notices of proposed rulemakings which covered a wide range of regulatory options, including prohibition of commercial and industrial use of asbestos fibers and consumer products containing asbestos. With our challenge to these initiatives and a change in our national administration, we saw more reasonable times in 1981 and 1982.

However the two-year cycle continued to prevail, and in 1983 we saw a return to the 1979 condition, except the situation was much worse. Both EPA and OSHA combined to take what we would consider a draconian and unjustified step in their approach to the regulation of asbestos. For example EPA announced that it intended to issue two proposed regulations— one would ban the use of asbestos-cement pipe, flooring and roofing felts, and vinyl asbestos tile; the second proposed regulation would phase out the remaining commercial uses of asbestos over a 10-year period. And then in 1983 also, after a long period of inactivity, OSHA abruptly decided to issue an Emergency Temporary Standard (ETS) which lowered the permissible exposure limit in the workplace for all types of asbestos from 2 f/cc to 0.5 f/cc. I might add, as an aside, that the industry in general was at or below a 0.5 standard.

However, faced with the reality of this unjustified ETS which, by its very nature implies that there is a very great danger in the workplace, and because of EPA's
announced intentions, AIA/NA chose to challenge OSHA's actions through its only recourse, a petition for judicial review. Our challenge was completely successful and the ETS was ruled by the court to be invalid in March, 1984. Thus, the current standard of 2 t/cc continues.

We were pleased that OSHA then elected to proceed with a revision of the asbestos standard through normal rulemakings. The industry had long advocated this. We had no objection to a further lowering of the standard to reasonable levels, but not on the basis that a grave danger existed to workers. There was absolutely no foundation for that. A full and fair public hearing was conducted by OSHA last summer. About 100 witnesses participated in that hearing. It now appears that OSHA will issue final standards in the near future, one for the manufacturing or general industry, and one for the construction industry. We are hopeful that they will not be unreasonable. It may be expected that a revised Permissible Exposure Limit (PEL) will be either 0.5 t/cc or 0.2 t/cc for all types of asbestos. Compliance with that standard will be required through engineering controls and work practices and the use of respirators, in that order.

Now, as to the more serious situation regarding EPA's threat, which would ensure the demise of the U.S. asbestos industry, our Association began making representation to the agency in the fall of 1983 and we have continued to do that to this very date. The EPA proposals were not made public, however the gist of their content had been released as they were undergoing formal review within the government prior to publication.

The industry's strong opposition was very basic in nature. Concerns were expressed about EPA's legal authority under the Toxic Substances Control Act (TSCA), as well as to the wisdom and appropriateness of EPA regulating "lifecycle"—or another term is "cradle to grave"—from mining to disposal, of asbestos exposures, while the most important and significant of such exposures i.e. those occurring in the workplace, were being looked at by OSHA. In addition, we made the point in emphasize that the international regulatory community, after exhaustive study of asbestos, had ruled in favor of control as opposed to banning.

The news media reported that the EPA conducted a survey of countries around the world regarding its proposed intentions on asbestos. The response, as it was reported in the news media, was overwhelmingly negative. There was one European country that submitted support for EPA's intentions. During the review process of these two proposals, the U.S. Office of Management and Budget (OMB) advised EPA that it too opposed the drastic measures set forth in the two proposed regulations.

There was, in addition to the U.S. asbestos industry, a substantial international response. Some eight national governments, plus the EEC filed protests with the U.S. State Department (Slide 5).

There were two central themes in this international response to EPA's announced intentions; they were (Slide 6):

* Banning of asbestos would be contrary to the international consensus of controlling its use; and

* Concern expressed over the adverse impact that such drastic action in the U.S. would have on approaches to asbestos regulation by other countries.
A welcome change in the regulatory posture of EPA was announced this past February 1st. The agency stated that it intended to refer occupational safety or consumer risks associated with asbestos to OSHA and to the Consumer Product Safety Commission (CPSC) respectively. This transfer of authority would have placed on hold indefinitely the EPAs two pending proposals.

The EPAs referral decision resulted in an immediate firestorm of criticism from the Agency's staff and some influential members of the U.S. Congress. The end result of this intense political pressure, not scientific but political, was the EPAs decision on March 8th, to give further review to “the legal and policy questions” raised by the referral. The questions principally relate to a determination of the findings associated with risks, i.e. may EPA, under the law, that is TSCA, transfer to other government agencies part, rather than all, of any perceived risk associated with asbestos. We now await the outcome of this review.

What then will be the outcome? What is next on the U.S. regulatory scene for asbestos? (Slide 7) First we have to say that we, the industry, are unable to make any definite forecast. However, while a review of the decision announced earlier by EPA to refer asbestos regulation to OSHA and CPSC is disappointing to the U.S. asbestos industry, we are not dismayed. There are some positive factors that provide us with reason to maintain our determination and our hope for long-term survival of the U.S. asbestos industry. Among those factors are (Slide 8):

* This Association’s strong opposition to the EPAs ban approach rests on a solid foundation. It is not emotional.
* EPA did make a conscious decision to refer asbestos regulation to OSHA and CPSC, even though further review of this decision is underway.
* Failure of EPA to obtain approval from OMB of draft proposed regulations to ban asbestos.
* International opposition in general to regulation of asbestos by ban rather than control.

Suffice it to say in regard to regulations, that AIA/NA has been, is, and proposes to continue its efforts to ensure that asbestos can safely be mined and used in manufacturing and commerce.

Now, as to the major uses of asbestos in the United States, I would like to refer briefly to a study conducted last year for AIA/NA by Dr. Gordon Bragg of the University of Waterloo in Ontario, on the technical feasibility of controlling asbestos dust in primary and secondary industries in the manufacturing environment. This study was conducted in conjunction with OSHA's public hearing regarding their proposal to lower the asbestos standard to 0.5 ft/cc or 0.2 ft/cc. And as I mentioned earlier, some 100 witnesses participated in a full and fair hearing that lasted three weeks last summer.

First of all, I will discuss asbestos-cement pipe. There are three U.S. manufacturers of A/C pipe with the core market being located in the Southwest of the country. The control measures used in the five asbestos cement pipe plants consist of a complete array of engineering controls and work practices. Wherever possible, wet processing has been employed. Dr. Bragg found that in most working situations, average exposures were found to be below 0.2 ft/cc.
Second, asbestos-cement sheet. Data available in 1984 showed consistent difficulty in achieving fiber exposure levels below 0.5 ft/cc. However, the average range found by Dr. Bragg was from 0.28 ft/cc to 0.72 ft/cc; and these we would suggest are relatively low levels.

Third, friction materials. Control methods used are local exhaust ventilation and housekeeping practices. It appears that typical exposure values show that there would be difficulty in complying with the 0.5 ft/cc by engineering controls and work practices. Most exposures were in the 0.5 ft/cc to 1.0 ft/cc range with none exceeding 2.0 ft/cc.

Fourth, vinyl asbestos tile. The process of floor tile manufacturing consists of debagging and wet processing. In some cases, the complete shrink wrapped bag can be dumped into the process without opening. As a result, exposures are low. 1980 averages for various process steps do not exceed 0.5 ft/cc and, in most instances, are well below this level.

Fifth, roof coatings and sealants. In this segment, the production consists mainly of mixing the product and packaging. Fiber debagging and introduction to the mixture is the only process likely to produce exposures. Average exposures were found to be in the 0.1 ft/cc to 0.2 ft/cc range.

Sixth, a brief reference to asbestos paper products as the base product for gaskets in the United States. Here again, as in the manufacturing process for vinyl asbestos tile, oftentimes the fiber introduction process is accomplished by adding unopened kraft paper bags to a wet pulping system. 1983 average exposure readings indicate that the paper making process itself will be below 0.5 ft/cc in about 95% of the cases. The counts are, of course, much lower in the fabrication of asbestos-containing gaskets – by following certain recommended work practices that the Association has developed and published – these counts will average less than 0.1 ft/cc.

As to overall methods of control in the U. S., Dr. Bragg concluded that there has been significant improvement in the reduction of fiber level concentration in the manufacturing process over the last 4-8 years. This improvement was fundamentally based on an increase in the expertise of those attempting the controls, as opposed to technological breakthroughs. He further noted that there are unlikely to be any significant innovations in the field of asbestos control in the foreseeable future.

In conclusion, AIA/NA is convinced that present-day asbestos-related disease is an unfortunate legacy of the past that is due to the heavy exposures years ago and that these high exposures have no comparison with the low exposures of today. Improved handling techniques and the selective development of product lines now allow asbestos and asbestos-containing products to be used at exposure levels many times below those which are associated with health hazards. We believe that asbestos is an economically valuable industrial raw material which can be used safely for the betterment of the world’s societies.

*Slide presentation entitled “Asbestos: a natural product for modern needs”.*
DISCUSION/DISCUSSION

Sandoval (CHILE)
La posición del Sr. Chevalier-Bultel es muy interesante, pero yo le pediría que, en beneficio del clima que debe prevalecer en esta reunión y como éste es un tema extraordinariamente polémico, expresiones que fueron mencionadas por él, fueran retiradas: porque cuando se dice “grupos interesados que cabildean para que se proscriba el uso del amianto” se está tratando adjetiva y peyorativamente a cualquiera que pudiera tener una posición en ese sentido, posición para la cual existen evidencias científicas y epidemiológicas y que precisamente deben confrontarse y discutirse. Posteriormente, cuando se plantea que la posición de los que tenemos opiniones al uso del asbesto es “emocional”, nuevamente se está adjetivando y tratando peyorativamente un planteamiento que también puede tener soporte científico. Y por último, cuando se dice de que la oposición al uso del asbesto es “política”, nuevamente se descalifica una posición que debe respetarse si se quiere mantener un nivel científico en este debate.

Barrera (COLOMBIA)
Como su institución agrupa varias empresas, yo quisiera saber si éstas a su vez tienen filiales en países en vías de desarrollo, y si las mismas medidas de control que se utilizan en Canadá para evitar los riesgos para la salud de los trabajadores se utilizan en dichos países.

Chevalier-Bultel (CANADA)
Las compañías canadienses no tienen subsidiarias fuera del Canadá. El Instituto del Amianto representa a la compañía minera del Canadá y las compañías que transforman la fibra, y todas son canadienses. Es deseo del Instituto volverse internacional y poder acudir a otras asociaciones para discutir todas las medidas que han sido tomadas en Canadá y permitir a nuestros amigos aprovechar nuestra experiencia. Por el momento, nosotros nos aseguramos de que las normas existentes sean respetadas en Canadá.

McDonald (CANADA)
In view of the serious concern there has been about amphibole asbestos and particularly crocidolite and amosite, is the industry yet able to produce large pipe without the use of amphibole?

Pigg (U. S. A.)
If I may, I would like to defer the answer to that question to the President of the Asbestos-Cement Pipe Producers Association, who I think can speak more clearly than I would be able to.

Jackson (U. S. A.)
The answer is yes and no. It depends on what country is producing it, on what diameter we are talking about, and probably most significant, on the production rate at which the pipe is being produced. Crocidolite is used primarily as a process aid rather than a structural reinforcement fiber. If we were to stop using crocido-
lite in asbestos-cement pipe in the United States at this time, the production rate would probably be reduced by 30 to 40%.

**Demner (COLOMBIA)**
Quisiera resaltar que en Colombia desde hace meses está suspendido el uso de la crocidolita y que se están haciendo los tubos con muy buenos resultados, solamente con crisotilo.

**Durao (OPS)**
Se ha dicho aquí que en cierta forma se le daba un tratamiento especial al asbesto y que no había preocupación por otros riesgos. Quiero afirmar que los responsables de los programas de prevención prestan atención a todos los riesgos en forma global: específicamente la Organización Mundial de la Salud y la Organización Internacional del Trabajo. Se deben eliminar los riesgos, pero si no es posible hacerlo, es necesario disminuirlos o mantenerlos bajo control. Este concepto es muy importante porque es una base de la salud ocupacional y ambiental.

Hemos visto diapositivas de fábricas y minas de Canadá, yo me pregunto si en las otras minas del mundo las condiciones de trabajo son similares. ¿No se observó que se utilizara martillo neumático en las minas de Canadá debido a la automatización?

Canadá se propone auxiliar a los países que tienen más problemas. Estamos en una reunión sobre América Latina y se está hablando de 2 f/cc. 0.5 f/cc o de 0.1 f/cc. ¿Qué opinan del caso de Brasil que tiene una norma de 4 f/cc, o del de México que adoptó recientemente una de de 5 f/cc?

Aunque los productos sean naturales, muchas veces son riesgosos. Hay plantas que son venenosas y no les decimos a nuestros hijos que las pueden comer porque son naturales; es una cuestión de sentido común, no es necesario ninguna investigación científica para hacer una afirmación de este tipo.

**Dunnigan (CANADA)**
I am not sure if I will be able to respond to all the comments that you have made because I may have missed some. You asked whether the mining and milling sectors in Canada were automated, and what was the situation in other mining areas all over the world. Well, I am not an expert in mining technology and therefore I do not know. The only thing that I can say, to use Dr. Finkelstein's example of the coal miners' canaries, is that the experience that we have in Canada indeed shows that we have lost some canaries, but I am very happy to tell you, that now our canaries are well and alive. Therefore this demonstrates that with determination and vigilance, it is possible to use not only asbestos, but any technology which has a potential for risk, i.e. hydroelectricity, pesticides, etc., as long as we are determined to use the proper work practices. All these products or technologies do have their place in our modern society, but they have to be used in an appropriate manner.

**Nicholson (U. S. A.)**
I would just like to make a couple of comments with respect to Mr. Chevalier's talk on the principles for evaluating whether there was a hazard or not and what principles one might utilize in either accepting risks from asbestos exposure or
controlling its use. I was very pleased to see the efforts made to identify the products with asbestos and to control the exposure in the mines and mills, and also what has been done in the factories, but unfortunately, I view the use of asbestos in buildings, as a problem, and an on-going one, and I am not laying the blame for that problem on the mining industry. But, in the attempt to control asbestos use, I think it is important that problems, where existing, be recognized, and all efforts of the industry, as well as others, be utilized to address them, particularly for the maintenance workers in buildings where studies have shown that 10-25% of such individuals may have abnormal X-rays from their work in these buildings.

Now, regarding schools, I have seen buildings with the material literally falling down on the children. In some cases, children would take it and throw it at one another. In some buildings, the asbestos conditions are intolerable, in many others they are very good and there is certainly no need to have wholesale removal; but on the other hand it is not appropriate to dismiss that as a non-problem. I think that the problem must be recognized and all efforts made to address it there.

The second issue I would raise is just what is an acceptable risk in asbestos use. I will speak briefly about this later. I think acceptability depends not only upon a comparison of a risk in one use, in this case of asbestos, with another risk that is accepted by the public. I would hate to have standards based upon what the public accepts as a risk of cigarette smoking. I would not even want occupational risks to be best based upon risks of accidents in mining, for example. I think it is important to look at what can be achieved, and at that point decide whether that achieved risk is a socially acceptable one, considering the benefits.

I do not think it is appropriate to compare a risk from asbestos use with some other "socially acceptable" risk. You will have to look at that asbestos risk in its own internal context and see what can be done to eliminate it.

Pigg (U. S. A.)

I would like to respond to the first point made by Dr. Nicholson. As I said in my presentation, we do expect OSHA to be issuing two standards: one for the construction industry and one for the general industry. As far as the construction industry is concerned, our Association recently recommended that in OSHA’s construction standard, one of the requirements be that when asbestos-containing materials are placed in buildings, that information be appropriately transmitted to the building owner for the purpose of ensuring that maintenance people know where the asbestos-containing materials might be.

Of course, as you are well aware, today in the construction industry, some specialized uses are roof coatings and flooring; spraying has been prohibited since 1973, but nonetheless, the point that you raise is a good one. An affirmative action has been taken on the part of our Association to ensure through regulation that workers are informed of where asbestos-containing products are in the building.

Michaels (U. S. A.)

A few comments primarily regarding Mr. Chevalier’s presentation: there are several points raised in some of the slides which I think are worth modifying if we are to consider them for a formal statement or document to come out from this meeting. You stated that there was no evidence of significant risk from general
exposure in ambient air for the population. We obviously have to define what that means, since we have no shortage of cases of mesothelioma in people who live near factories and shipyards where asbestos is used. It is much more difficult to identify, for methodological reasons, cases of persons who develop mesothelioma, or certainly as you know, lung cancer, when we cannot identify the source of exposure; but based on the information we know about levels near factories, we have every reason to assume that some of the mesotheliomas that we see in people who do not have occupational exposure, near factories, are likely to be caused by ambient exposure. Because there is no sufficient methodology to find those cases, it is probably not adequate to state that there is no evidence to say that there is a significant risk.

I think we will have to say that persons who live near asbestos-using facilities are under increased risk of cancer and environmental-related diseases and that we do not yet have adequate evidence to say if others are at risk or not. A similar point is this question of whether exposure to chrysotile asbestos at levels of 2 f/cc is in fact a safe level. When you say there is no evidence that exposure to chrysotile at that level will be a cause of disease; I expect you mean cancer, though you did not use that word. I do not know of any study that we could consider sufficient in terms of size, power and length of follow-up to detect that in a population. I do not know if the population that has been exposed to the 2 f/cc or less, has been followed far enough time to actually see that. The Peto and Doll document that I brought along with me, in fact extrapolates or polinterpolates, from their recently published study of the Rockdale textile workers in England, the number of cases of cancer that will be seen if workers are exposed to pure chrysotile asbestos at levels of 0.25 f/cc, which is 1/8 of what you were talking about. Therefore again, I think the statement should be modified, we have no evidence directly on this question, but I think we could say that, based on other evidence, with people subject to relatively low exposures or higher than that, we can expect to see cancers at that level.

Chevalier (CANADA)

I would like Dr. Dunnigan to answer your questions, because I am a technician and not a physician.

Dunnigan (CANADA)

I am very much tempted to again pass it around to one man who has done such studies, also from Canada, but let me mention just a few points which have to be taken into consideration when mentioning mesothelioma. The assumption is that mesothelioma is the disease which is specifically related to exposure to asbestos. The information that I have gathered from the world literature is that there are in the neighborhood of 30% of mesothelioma, which are totally unrelated to exposure to asbestos. A second point is that whenever they have been associated with exposure to asbestos, the overwhelming evidence is that the type of asbestos was amphibole.

A third comment is that you are quoting some possible theses of exposures of neighborhood communities, around asbestos plants. Well, there is a great number of people actually living around the western world center of asbestos mining, in Quebec in the Thetford mine area and in the Asbestos mine area, and the recent
study by the Department of Health of the Province of Quebec sees absolutely no relationship between exposure of the general population, taking the wives of the workers as a proxy for control and mesothelioma.

Now, as to the question of whether 2 fl/cc exposure could be considered as a "safe" level, again when we are talking of asbestos, we must specify the type of asbestos we are referring to. There is a reason why in Great Britain there are different standards set for asbestos exposure, depending on whether it is amphibole or chrysotile. There must be a reason why the Royal Commission in Ontario has adopted the same view.