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9 SUPERIOR COURT OF CALIFORNIA

10 COUNTY OF SAN FRANCISCO – UNLIMITED JURISDICTION

11
12 IN RE: SAN FRANCISCO COUNTY
13 COMPLEX ASBESTOS LITIGATION

) Case No.: 828684

) **DECLARATION OF PLAINTIFF'S**
) **EXPERT BARRY CASTLEMAN, Sc.D. IN**
) **SUPPORT OF PLAINTIFF'S**
) **OPPOSITION TO DEFENDANT**
) **METALCLAD INSULATION**
) **CORPORATION'S MOTION FOR**
) **SUMMARY**
) **JUDGEMENT/ADJUDICATION**

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18 I, BARRY CASTLEMAN, DECLARE AND STATE AS FOLLOWS:

19 **BARCKGROUND AND QUALIFICATIONS**

20 1. My name is Barry I. Castleman. I received a Bachelor's Degree in Chemical
21 Engineering from Johns Hopkins University 1968. I have a Master's Degree in Environmental
22 Engineering, which was mainly in areas related to air pollution control from Johns Hopkins
23 University, 1972. I have a Doctor of Science Degree in Health Policy from Johns Hopkins
24 School of Hygiene and Public Health, 1985.

25 2. My professional experience goes back over 30 years in the area of asbestos and
26 other occupational and environmental health problems. My field is occupational and
27 environmental health policy, which is a branch of Public Health, mainly oriented towards the
28 recognition of risk factors and the prevention of disease from industrial activities.

1 3. The Doctoral degree was awarded for two years of course work, various
2 examinations, and the writing of a doctoral dissertation. The course work was mainly in the
3 areas of toxicology, epidemiology, biostatistics, physiology, and public health policy. These are
4 the tools that are used to understand how the body works and can be damaged by toxic
5 substances, how these effects can be identified by means of various studies of people, studies of
6 animals experimentally exposed, etc.

7 4. My Doctoral thesis was, Asbestos: An Historical Case Study of Corporate
8 Response to an Industrial Health Hazard, and is largely identical to a book published in 1984 by
9 Prentice Hall Law and Business called Asbestos: Medical and Legal Aspects (now in its 5th
10 Edition, 2004). The doctoral thesis is an historical review of the asbestos problem as a public
11 health problem in society worldwide, but mainly in the United States. It encompasses a
12 comprehensive review of medical literature of all kinds, as well as other literature available in
13 libraries and published sources such as government publications, safety magazines, engineering
14 journals, trade magazines, insurance publications, encyclopedias, popular magazines, and
15 newspapers. The doctoral thesis also involved research based on unpublished government
16 records. The government records included workers' compensation claims files where claims had
17 been made by individuals alleging that they had asbestos-related diseases of the lungs, claims
18 against various companies that were their employers, some of which companies were also
19 manufacturers of asbestos insulation products these individuals has used in the course of their
20 work.

21 5. In addition to published information of all kinds, I examined files, unpublished
22 information available from the U.S. government archives, the archives of scientists and the
23 archives of institutions that had worked for and with asbestos companies.

24 6. I have also looked at unpublished information which was obtained in legal
25 discovery. This included trade association minutes, corporate documents, and testimony of
26 corporate officials who were associated with asbestos hazards over the years – doctors, plant
27 managers, executives, and other people who were aware of events that transpired. For example,
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1 I have reviewed documents obtained from the American Petroleum Institute ("the API") and the
2 Industrial Health Foundation, formerly known as the Industrial Hygiene Foundation ("the IHF").

3 7. In addition to published information and corporate knowledge that came primarily
4 out of legal discovery, I have also interviewed numerous current and former leading officials in
5 the field of industrial medicine and hygiene. They included physicians who were active in the
6 field of occupational medicine, such as Harold Stewart, who first published on asbestosis in
7 1931, and Alfred Angrist, who first published on asbestos and lung cancer in 1942. They are
8 both pathologists. Another, Dr. Wilhelm Hueper, was a leading United States authority in the
9 field of occupational cancer and first director of the environmental cancer section of the National
10 Cancer Institute. Dr. Harriet Hardy, Dr. Thomas Mancuso, Dr. Gerrit Schepers, and others I
11 interviewed were involved in the area of asbestos and health over the past decades.

12 8. I have acted as consultant for The National Science Foundation, the European
13 Commission, the Environmental Defense Fund, and the Natural Resources Defense Council. I
14 have provided testimony to United States congressional committees concerning the hazards of
15 asbestos and other toxic substances. I have also testified before United States congressional
16 committees regarding the development of asbestos knowledge. I have been a paid consultant to
17 the Office of Toxic Substances of the United States Environmental Protection Agency and have
18 performed research on environmental asbestos hazards. I have performed consulting work for
19 the United States Occupational Safety and Health Administration. In my research, I have
20 reviewed thousands of publications and documents pertaining to asbestos-related disease and
21 have interpreted and related the contents of the same.

22 9. I have testified as an expert witness in over two hundred (200) cases throughout
23 the nation on issues related to asbestos state-of-the-art and historical development of asbestos
24 knowledge.

25 **THE BODY OF KNOWLEDGE ABOUT ASBESTOS DISEASES**

26 **ASBESTOSIS**

27 10. The originally published reports in the era of the modern asbestos industry came
28 at just before the turn of the last century, and the first reports in the English language were

1 included in the annual reports of the chief inspector of factories and workshops in Great Britain.
2 The report published in 1899, the report for the year 1898, talked about the observation of lung
3 disease in individuals who had worked in asbestos manufacturing plants and about the "evil
4 effects of asbestos dust."

5 11. The medical literature of asbestos disease mainly developed after the publication
6 of a case report in the British Medical Journal by Dr. Cooke, a pathologist in Britain in 1924.
7 This was called, "Fibrosis of the Lungs Due to the Inhalation of Asbestos Dust." Dr. Cooke
8 reported on the death of a 33-year-old woman who had worked off and on in asbestos plants
9 from the age of 13. According to Cooke, the scarring of her lung tissues was largely attributable
10 to the inhalation of asbestos in the course of her work. There followed a number of other reports
11 in British sources, and this is reflected as well in the United States in editorials of the Journal of
12 the American Medical Association. In one on January 14, 1928, called "Pulmonary Asbestosis,"
13 reference is made to Cooke's case and other reports on the disease now called asbestosis. The
14 Journal of the American Medical Association recommended that further attention be paid to this
15 disease, as it may well be occurring in the United States. The Journal of the American Medical
16 Association issued another editorial in 1930 about asbestosis, this time noting the asbestosis had
17 become a compensable occupational disease in Great Britain under the workers' compensation
18 law. The Journal of the American Medical Association was believed to have been read by 80
19 percent of American physicians in those years, medical historians have written. Additionally,
20 there were additional reports of asbestosis published in the British Medical Journal, which is in
21 every medical library I have ever walked into. The reports mainly involved deaths of individuals
22 who were verified as having asbestosis by autopsy.

23 12. In 1930, a report was published by a physician, Dr. E.R.A. Merewether, and an
24 engineer named C. W. Price. Merewether and Price reported a survey that had been conducted
25 by the Factory Inspectorate in England, including 363 asbestos workers who were actively
26 employed. Of these individuals, 26 percent were found to have asbestosis. Merewether and
27 Price reported that the people longest exposed had the highest prevalence of the disease: 80
28 percent in workers with 20 years or more in the industry. There were no cases of asbestosis in

1 individuals with less than five years, and Merewether referred to that phenomenon that the
2 disease was delayed in appearance and developed gradually over a period of years. It could in
3 seven years be substantially developed in the most severe cases, but more often 11 years or more
4 would elapse before the disease had become largely developed in exposed individuals. This is
5 the time from the onset of exposure. Merewether urged that workers be “educated to a sane
6 appreciation of the risk” to health posed by asbestos dust. Merewether’s 1930 writings on
7 asbestosis are among those most often cited in the literature on asbestosis.

8 13. By 1932 there were 60 or more publications in print on asbestosis. These were
9 noted by way of reference in a bibliography published by the International Labor Organization in
10 1932. These publications continued to emerge from many countries. The first cases of
11 asbestosis in the United States were reported in 1930. Asbestosis was also described in an article
12 in the trade magazine Asbestos in the United States in the March 1930 issue, amid numerous
13 advertisements from asbestos mining and manufacturing companies.

14 14. In 1932, the first case of asbestosis in an asbestos product user was reported at a
15 conference held by the Industrial Commission of Wisconsin, which published their proceedings.
16 Here, Dr. Albert Russell of the United States Bureau of Mines described an individual who had
17 worked maintaining the insulations on pipes in a government hospital and had been diagnosed as
18 having asbestosis and had been compensated by the government for disability sustained from this
19 asbestos condition. This is the first published product user case. There were other cases reported
20 in the United States in 1933 by Philip Ellman and also reported by Ellman in 1934 in The British
21 Journal of Radiology. Wood and Gloyne reported in 1934 reported on cases of asbestosis
22 including a boiler riveter who would have been exposed to asbestos because it was used as an
23 insulation material on boilers. Wood & Gloyne’s report was called “Pulmonary Asbestosis: A
24 Review of 100 Cases.” That was published in The Lancet, the world’s oldest medical journal, in
25 1934. The Lancet is, like the British Medical Journal, a general medical journal published in
26 England and available very widely in medical libraries in the English-speaking world. This
27 article was widely cited in subsequent literature. Of the hundred cases of asbestosis they
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1 reported on, the shortest duration of exposure in any case was six months, in the case of two
2 women who had worked in an asbestos plant.

3 15. Literature on asbestosis was substantially developed by 1935. The disease was
4 shown to have a distinctive pathological appearance with asbestos bodies, types of scarring that
5 would form around the asbestos fibers trapped in the lung tissues. This was commented upon a
6 great deal by pathologists in the 1920s. The disease was shown to have an identifiable
7 radiological appearance on chest X-ray distinctly different from such diseases as TB and
8 silicosis. The disease was also characterized by shortness of breath, which would become more
9 pronounced as the individual became more seriously affected by the disease.

10 **ALAN DOOLEY AND THE PENNSYLVANIA STUDY**

11 16. In 1934 and 1935, the Industrial Hygiene Section of the Pennsylvania Department
12 of Labor and Industry published a report on asbestosis in the asbestos fabricating industry in the
13 state. This article was called Asbestosis, published by William B. Fulton and three of his
14 coworkers at the Pennsylvania Department of Labor and Industry. Alan Dooley was one of
15 Fulton's co-authors.

16 17. One-fourth of the workers examined by Fulton, Dooley and their team, had
17 asbestosis. Their article included an impressive bibliography of 125 references to asbestos-
18 related disease previously published in journals in the United States, England, France, Italy,
19 Germany and other countries. Among the references cited by Fulton, Dooley et. al. were the
20 historic 1930 report by Merewether and Price for the British government and the version
21 published later that year in the US in the Journal of Industrial Hygiene. The Merewether reports
22 made recommendations for the control of asbestos dust in asbestos plants, recommended
23 periodic medical examinations of workers exposed to this dust, recommended dust suppression
24 measures in processes involving the use of asbestos, and noted the hazards of asbestos insulation
25 work in shipyards. The Pennsylvania study was one of the first surveys of this kind in the United
26 States similar to that which had been done by Merewether and Price and published in Great
27 Britain and the United States separately in 1930.

1 18. The Pennsylvania study also included an effort to relate dose and response. The
2 authors had sampled the exposure of the workers to dust in four asbestos plants, including one
3 that produced asbestos containing insulation known as 85 percent magnesia, and found that,
4 overall, average concentrations of dust could be broken down into three groups that varied from
5 4.64 million particles per cubic foot up to 44 million. Asbestosis was reported in all three
6 groups, with the prevalence and severity of disease greater in the more heavily exposed groups.
7 But no level of exposure was found to be free of the disease, including levels below 5 million
8 particles per cubic foot. In summary, in the Pennsylvania study at least 25 percent of the
9 workers were diagnosed as having asbestosis and levels of exposure even below 5 million
10 particles per cubic foot were found to cause asbestosis. Alan Dooley, who would become
11 Texaco's industrial hygienist for many years, was a co-author of this report.

12 19. In 1938, a study similar to the Pennsylvania study was done by the Public Health
13 Service, including an effort to account for workers who had been discharged before the Public
14 Health Service was admitted to the North Carolina asbestos textile plants to do the study. An
15 estimated asbestosis rate in the workplace was given as 27.5 percent. The report recommended
16 that dust exposure in asbestos plants be limited to 5 million particles per cubic foot. This
17 guideline was recommended as a tentative occupational exposure limit, though it was noted that
18 the Pennsylvania study had found cases of asbestosis at that level of exposure.

19 20. By the mid 1930s, cases of asbestosis were found not only among workers in
20 asbestos fabricating plants, but also among users of some asbestos products, mainly insulation
21 products such as these used by insulation workers.

22 21. Another source of information about asbestos during this period was the National
23 Safety Council, a national organization founded in 1912 as management's response to the
24 industrial safety issue. Starting in the 1930's, the National Safety Council published numerous
25 articles, pamphlets and other materials concerning the hazards of asbestos. Many of the annual
26 NSC annual "congresses" included forums and discussions about dust disease. The
27 "transactions" of these meetings were automatically mailed to the industrial members. For
28 example, at the 21st Annual Safety Congress in 1932, Dr. Leroy Gardner presented a paper

1 entitled "The Effects of Mineral Dusts" that discussed asbestos dust as a lung hazard.
2 Subsequently, at the 23rd Annual Safety Conference in 1934, Dr. Gardner delivered another
3 paper entitled "Types of Dust That Cause Occupational Diseases." That paper noted that "the
4 only other type of dust which is generally recognized as a cause of severe pulmonary injury is
5 asbestos, a silicate of magnesium."

6 22. By the late 1930s, at least one company in the oil refining business was well
7 aware of the dangerous propensities of asbestos and the existence of asbestos related diseases. In
8 1937, an industrial hygienist for Standard Oil of New Jersey (Roy Bonsib, Chief Safety
9 Inspector) authored a document entitled Dust Producing Operations In The Production Of
10 Petroleum Products And Associated Activities. In my opinion, this report establishes the "state
11 of the art" concerning a variety of dust hazards in refining operations generally, including for
12 asbestos dust. For example, the Bonsib report described a variety of dust producing operations
13 typically occurring in petroleum refining operations, including the use of 85 percent magnesia
14 insulation (15 percent asbestos) to insulate steam lines. It specifically stated that insulating 12
15 inch steam lines with 85 percent magnesia created "dust concentrations considered too high for
16 working without adequate protection." It also stated that "any atmosphere in which dust is
17 visible to the naked eye is certainly too dusty to be breathed with safety by human beings, and
18 the wise, farsighted, human employer will immediately start to decrease the dust content in any
19 atmosphere where dust is visible." The Bonsib report identified asbestosis as a recognized
20 disease and stated that asbestos dust, with its fibrous particles, did not seem to be readily handled
21 by the protective mechanism of the lungs. The report also called for specific measures to reduce
22 dust hazards in refineries - including the use of respirators, the isolation of dusty processes and
23 the use of wet methods of operation to suppress dust at the point of its origin.

24 23. This report also noted as follows:

25 Bathing and locker facilities – A conveniently located locker and wash room shall
26 be designated... Separate lockers should be provided for street clothes, work
27 clothes, and one for Unionalls... The floors of the locker rooms where the men
28 change their dust covered Unionalls and the benches shall be thoroughly
moistened before being cleaned."

ASBESTOS AND LUNG CANCER

24. In 1935, another aspect of the hazard of asbestosis was identified with the publication of medical case reports of asbestosis in combination with lung cancer. The first such reports were published by Lynch and Smith in the United States in 1935 in the American Journal of Cancer and by Dr. Gloyne in Great Britain in Tubercle in two separate reports in 1935 and 1936.

25. In these reports, the question was raised that chronic irritation of the lung tissues from asbestos might be producing cancer as well as lung scarring already well identified as an asbestos-related phenomenon.

26. There were additional reports of lung cancer in combination with asbestosis reported by Egbert and Geiger at Yale in 1936, and Nordmann in 1938. An abstract of this last publication appeared in the United States in the Journal of Industrial Hygiene & Toxicology, also in 1938. The article was entitled "The Occupational Cancer of Asbestos Workers." The German author, Nordmann concluded that asbestosis was definitely related to lung cancer, that lung cancer was in fact an occupational disease of asbestos workers. Various features of the six cases Nordmann knew of were tabulated to justify that. Nordmann noted, among other things, that the prevalence of lung cancer among autopsied victims of asbestosis was one in six both in Germany and Great Britain. This was very much higher than the prevalence of lung cancer in the general population, which tended to be more like 1 percent or several percent at most. The high rate of lung cancer among people dying with asbestosis would be a most consistent finding around the world.

27. There were additional publications of cases of lung cancer and asbestosis in 1939 in the United States and in 1941 and 1942 in Germany. Holleb and Angrist reported in the American Journal of Pathology on two individuals who had been pipe coverers (users of asbestos products) diagnosed at autopsy as having both asbestosis and lung cancer. These were the first cases of cancer and asbestosis in users of asbestos products published in the medical literature. Holleb and Angrist tabulated a total of 10 cases of lung cancer in combination with asbestosis that had been published in the United States, Britain, and Germany.

1 28. Of special interest in this case may be the fact that articles linking asbestos and
2 cancer appeared in the *Archives of Industrial Hygiene and Occupational Medicine* in the early
3 1950s. Recently, volumes of this journal from 1951 to 1955 were located in the library of Lamar
4 University in Beaumont, Texas. The March, 1952 edition of this journal, which was in the
5 Lamar library, contains an article by Dr. Wilhelm Hueper entitled "Occupational Cancer
6 Hazards in American Industries." In the article, Dr. Hueper discusses the excessive incidence of
7 lung cancer associated with asbestosis in a series of 235 documented cases of asbestosis.

8 29. Dr. Wilhelm Hueper is an important figure in the history of the knowledge of
9 occupational cancer and in the development of the knowledge of asbestos hazards. In 1942, Dr.
10 Hueper published a book on occupational cancer called Occupational Tumors and Allied
11 Diseases, nearly 900 pages long. It included a lengthy section on asbestosis and cancer from
12 asbestos, in which a large number of references from the United States, Great Britain and
13 Germany were cited in support of the view that asbestos most likely did cause occupational
14 cancer. Dr. Hueper made unequivocal statements the next year in the article called: "Cancer in
15 its Relation to Occupational and Environment" published in the Bulletin of the American Society
16 for the Control of Cancer. There, Hueper said that "asbestosis cancer of the lung" as he called it
17 then, was the newest proved occupational cancer of the lung, to be listed with the ones that were
18 already known at that time. In the Journal of the American Medical Association (JAMA), there
19 appeared an editorial called "Environmental Cancer" in 1944, in which asbestos was listed
20 among agents known and suspected of causing occupational cancer.

21 30. In 1946, Dr. Hueper also published an article in the Journal of the American
22 Medical Association (JAMA) discussing asbestos and other cancer causing substances that were
23 used in industry. In 1944 and 1949, at the invitation of the editors of JAMA, Dr. Hueper wrote
24 editorials for JAMA that discussed asbestos as a cause of lung cancer. Beginning in 1948, Dr.
25 Hueper became Chief of the Environmental Cancer Section of the National Cancer Institute
26 ("NCI").

27 31. In 1946, Dr. Hueper also published an article in the Journal of the American
28 Medical Association (JAMA) discussing asbestos and other cancer causing substances that were

1 used in industry. In 1944 and 1949, at the invitation of the editors of JAMA, Dr. Hueper wrote
2 editorials for JAMA that discussed asbestos as a cause of lung cancer. Beginning in 1948, Dr.
3 Hueper became Chief of the Environmental Cancer Section of the National Cancer Institute
4 ("NCI").

5 32. In my opinion, during his tenure at the NCI, Dr. Hueper was the federal
6 government's leading official concerned with environmental cancer. Indeed, it is my opinion
7 that he was considered by many to be the world's foremost authority on environmental cancer in
8 the 1940s, 50s, and 60s.

9 THE AMERICAN PETROLEUM INSTITUTE

10 33. In the early 1940s, the American Petroleum Institute ("API"), one of the primary
11 trade organizations of the petroleum industry, established a Medical Advisory Committee
12 ("MAC"). A document was published and disseminated that was entitled "The Carcinogenicity
13 of Bituminous Compounds" and dated April 30, 1945.

14 34. This literature review contained an abstract of the article published by Dr. Hueper
15 in June, 1943, "Cancer In Relation To Occupation and Environment." The abstract stated that
16 asbestos was a cause of occupational cancer.

17 35. Additionally, in July, 1945, MAC Committee members also received a literature
18 review authored by H.H. Zuidema of the Shell Oil Company that described asbestos as having
19 cancer producing ability.

20 36. It is my opinion that the API Medical Advisory Committee was aware of Dr.
21 Hueper's writings that asbestos was a cause of cancer. In 1948, members of the API's Medical
22 Advisory Committee received a memorandum that was a summary of a paper presented by Dr.
23 Hueper on occupational cancer before the American Public Health Association. The summary
24 was sent by Clyde Berry, an Industrial Hygienist for Esso-Standard Oil Company to Dr. McIver
25 Woody, Esso-Standard's Medical Director and, at that time, chairman of the API's Medical
26 Advisory Committee. Mr. Berry's summary of Dr. Hueper's presentation stated that recent
27 evidence had pointed out a definite correlation between cancer incidence and exposures to
28 substances like asbestos. It was the practice of the committee to circulate copies of

1 memorandums such as this to its members. API documents show that Allan Dooley
2 corresponded with Dr. McIver Woody, chairman of the MAC, on the day after Mr. Berry sent his
3 memorandum on Dr. Hueper to Dr. Woody.

4 37. Additionally, in the early 1950s, Dr. Hueper was invited to appear at one of the
5 API Medical Advisory Committee meetings. Then, in January 1953, another of Dr. Hueper's
6 articles entitled "Environmental Cancers: A Review," originally published in 1952 in the journal
7 Cancer Research, was reprinted and circulated to members and associates of the Medical
8 Advisory Committee. This article pointed to asbestos dust as a carcinogenic agent for the
9 development of lung cancer. It also discussed an increased incidence of lung cancer among
10 persons with asbestosis and discussed the underreporting in the medical literature of "asbestosis
11 cancer of the lung."

12 38. In 1955, another of Dr. Hueper's articles describing asbestos as an occupational
13 cancer hazard was provided to the API. This article, "Occupational Cancer Hazards" was
14 written by Dr. Hueper for a U.S. Department of Labor publication and was originally presented
15 to the National Petroleum Association in 1954. It was then circulated by a member of the API's
16 Medical Advisory Committee to other members prior to a meeting of the API's Medical
17 Advisory Committee and its Subcommittee on Carcinogenicity in April 1955. API documents
18 show that Alan Dooley and Dr. Newquist were both listed as members of that subcommittee at
19 that time.

20 39. In sum, it is my opinion that the medical and scientific literature established a
21 definite connection between asbestos exposure and the development of lung cancer by the late
22 1940s.

23 40. It is my further opinion that members of the API Medical Advisory Committee
24 during the 1940s and 1950s were aware that asbestos was a cause of cancer from the information
25 provided to them through their activities with the API.

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1 44. Between 1949 and 1959, the *Industrial Hygiene Digest* published numerous other
2 abstracts that reporting that asbestos was injuring workers by causing asbestosis and cancer.
3 Three particular reports are illustrative.

4 45. In August 1949, the *Digest* reprinted an abstract of JAMA's editorial solely on
5 asbestosis and lung cancer unsigned but authored by Dr. Hueper. The abstract stated the
6 following: "Records of English, American and German physicians and the Annual Report of the
7 Chief Inspector of Factories in England for 1947 show that the occurrence of cancer of the lung
8 is related to pulmonary asbestosis. This relation is supported by the following observations: (1)
9 the incidence rate of cancer of the lungs in asbestosis patients is 10 to 15 times as high as among
10 the general population. (2) the male-female ratio is more nearly equal than it is for the general
11 populations, which indicates that and environmental and evidently occupational carcinogen
12 tended to equalize the incidence rate of cancer of the lungs for both sexes. Recent experimental
13 observations support this interpretation of the clinical evidence."

14 46. It should also be mentioned that the original JAMA editorial from 1949 discussed
15 the dangerous propensities of asbestos for "asbestos consuming industries." Certainly, oil
16 refining would have to be considered in that category.

17 47. In 1952, the *Digest* published an abstract of an article entitled "Asbestosis
18 Associated With Bronchiogenic Carcinoma" from the Archives of Internal Medicine. The
19 abstract provided that "Investigators have found carcinoma in 7.5 to 14.8 percent of cases of
20 asbestosis... the opinion is suggested that the silicate in asbestos must itself be carcinogenic. It
21 establishes an additional reason for preventive measures in the use of asbestos."

22 48. In 1955, the *Digest* contained in abstract from the article "Mortality from Lung
23 Cancer in Asbestos Workers," by R. Doll and published in the *British Journal of Industrial*
24 *Medicine* in April, 1955. This study reported that among 18 asbestos textile workers out of a
25 cohort of 105 asbestos textile workers, 18 died from lung cancer. Of those 18, 15 of the workers
26 had underlying asbestosis.

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1 49. In an editorial published shortly after Doll's study was published, the prestigious
2 British medical journal *The Lancet* editorialized that Doll's study confirmed that lung cancer is
3 an occupational hazard of workers regularly working with asbestos.

4 ASBESTOS AND MESOTHELIOMA

5 50. The disease mesothelioma of the pleura was attributed to exposure to asbestos or
6 asbestosis starting in 1943 with the report of Dr. H.W. Wedler in Heidelberg. Between 1943 and
7 1960, there were additional reports in the German literature as well as British literature. The
8 case reports that appeared prior to 1960 are annotated and cited by way of reference in Chapter 2,
9 table 5 of my book. Dr. Wedler was the first to state that he believed the pleural cancers were
10 occupational cancers, and his work was prominently cited in the United States in the 1940s.
11 Other German pathologists starting with Leicher in 1954 would identify peritoneal mesothelioma
12 as an asbestos disease.

13 51. Of special note is the study by Dr. H.B.Eisenstadt and Dr. F.W.Wilson in the
14 *Journal-Lancet* in 1960. Dr. Wilson was a medical doctor employed by Texaco at their Port
15 Arthur facility. The study reported on two mesothelioma cases among Port Arthur refinery
16 workers, one of whom had asbestosis. The report noted that, "the etiologic association of
17 asbestos and mesothelioma has been repeatedly discussed in the literature", citing references
18 from the US, the Netherlands, Germany, and Italy. It did note that not all investigators agreed
19 that asbestos predisposed to the very uncommon malignancy of the pleura, but that the patient's
20 history of asbestos exposure "alerted the suspicion of the authors in the second case."

21 52. A major report of pleural mesothelioma came from South Africa by Wagner and
22 his coworkers, published in the *British Journal of Industrial Medicine* in 1960. Within a very
23 short time it was widely accepted: that asbestos did cause mesothelioma; that levels of asbestos
24 exposure present from environmental exposure as well as occupational exposure were sufficient
25 to cause mesothelioma.

26 53. In 1964, Dr. Irving Selikoff and his coworkers published a mortality study in
27 *JAMA* showing that there was a substantial excess of occupational cancer and deaths from
28 asbestosis among people involved in the insulating trades. A group of workers who installed

1 insulation and removed it regularly was found to have 45 deaths from pulmonary cancer in a
2 group where only six or seven such deaths would have been expected. There were four deaths
3 from peritoneal and pleural mesothelioma in this cohort, and this was described as a very rare
4 disease and a substantial excess over what would have been expected. There were also 12 deaths
5 from asbestosis in this work force. The study also noted that the symptoms of these disease
6 might not become manifest until decades after the exposures.

7 54. Subsequently, later in 1964, at an international conference held in New York and
8 published in 1965, Selikoff and coworkers reported that around 80 percent of the people who
9 were in the insulating trade had developed asbestosis by the time they had been in trade for 20 or
10 30 years or more. At the conference in New York, British researchers Newhouse and Thompson
11 presented a report on 76 deceased mesothelioma patients and an equal number of "controls,"
12 based on interviews with relatives. Their report showed strong evidence that mesothelioma
13 patients were far more likely to have had occupational, household, or neighborhood exposure to
14 asbestos than the comparison patients who died from other causes at the same hospital.

15 55. As alluded to above, there were a number of studies and other publications that
16 touched on the fact that workers who used asbestos products were at risk of asbestos-related
17 disease. By the early 1940s, there were cases of asbestosis in insulation workers which had been
18 confirmed by autopsy. Throughout the 1940s and 1950s, there are a number of published reports
19 and/or studies which remark on asbestos-related illness, asbestosis, and/or lung cancer (in the
20 end-users of asbestos-containing products). Examples of such articles and/or reports is contained
21 on Pages 324 through 328 of my book, Asbestos: Medical and Legal Aspects, 5th Edition,
22 Castleman (2005).

23 56. In conclusion, even in the absence of direct knowledge, by the years 1965 and
24 1966, a company engaged in the business of selling and distributing asbestos-containing
25 products, and asbestos containing thermal insulation products (pipe coverings, blocks and muds)
26 in particular, either knew or reasonably should have known, and provided warnings, about the
27 hazards presented through exposure to the asbestos containing thermal insulation products it was
28 selling and distributing.

METALCLAD

57. Metalclad did have actual knowledge of asbestos hazards. This is, in part, evidenced by historical Worker's Compensation claims for asbestos-related disease filed against Metalclad, for the following claimants and years: James Whitcomb Riley (1960); Clifford Harding (1961); Lola J. Crader (1966); Dean Clark (1966); John Faulkner (1963); Henry Puetz (1966); Melvin Hunt (1966); Leo Streithorst (1964); Vernon Lumbatis (1966); and John Swartout (1956), copies of which are attached hereto as Exhibits A – J respectively.

58. These workers' compensation claims allege that workers who worked for Metalclad using asbestos-containing insulation had sustained injuries for asbestos exposure. Thus they are relevant to notice on the part of Metalclad as to the dangers of performing insulation work. Specifically, these show that Metalclad had actual knowledge, and direct notice as early as 1960 that people working with and around asbestos-containing insulation could sustain potentially disabling and even life threatening illnesses, namely asbestosis. Shortly after that, through their involvement in the same worker's compensation claims, Metalclad would have learned that lung cancer was also a risk to those who work with or around asbestos insulation. Additionally, there is a large body of medical and scientific literature that Metalclad should have acquainted itself with by that time to the effect that people encountering asbestos from insulation work were at risk of developing potentially totally disabling or fatal occupational disease.

59. As such, Metalclad knew in the early 1960s that insulators, as well as bystanders working around the insulators, were at an increased risk of asbestos-related disease, and disability or death. Therefore in the early 1960s, Metalclad was aware of the adverse health effects of its products.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct. Executed this 24 day of August, 2010, in Garrett Park, Maryland.


BARRY I. CASTLEMAN, Sc.D.