

PLAINTIFF EXHIBIT

JMM 5201

## THE STORY OF TRANSITE PIPE

Its Origin, Its Many Uses, How It Is Made

PLAINTIFF'S  
EXHIBIT

JMMC-162

Johns-Manville began manufacturing a flat, asbestos-cement board in 1904 for use as fireproof protection beneath cars of the Brooklyn Rapid Transit Company. It was so successful in eliminating fires caused by sparks and short-circuits on newly-electrified trains that Johns-Manville named the new product "Transite" after the transit company it first served.

Transite was soon being widely used as a structural building board. As the cost of steel buildings increased, a new demand developed for a roofing material capable of supporting itself on wide spans. Johns-Manville, by natural evolution, developed Transite in corrugated form to fill these needs. Around 1921 the company began manufacturing Transite in 2-5/8-inch corrugated sheets. These corrugated Transite sheets were effective on roof spans up to 45 inches long.

As steel building construction costs kept rising, contractors found it economical to increase steel spans still further. Johns-Manville kept pace with these new industrial requirements by developing stronger Transite sheet in 1929, with a 4.2-inch corrugation, that was effective on spans as great as 4-feet, 6-inches. This corrugated Transite product is still in wide demand today, having withstood rigorous tests in all the intervening years.

The performance and excellent service record of Transite in both flat and corrugated form, with its established corrosion-resistant qualities inherent in the raw materials from which it is manufactured, made it a natural material for the rugged service required of underground piping or industrial lines. Johns-Manville began producing Transite in cylindrical or tubular form in 1929 to service this type of industrial need.

As in flat or corrugated Transite, three basic ingredients are used in the manufacture of Transite Pipe. These are asbestos fibres stronger than many types of steel wire, cement and silica. They are consolidated under pressure to form a pipe wall of dense, uniform and homogeneous structure. After the pipe is formed it is subjected to air and steam curing process.

From Press Book for Opening of Denison, Texas Plant 6/20/58

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The steam curing contributes much to the stability and structural integrity of the pipe. Under action of high-pressure steam in sealed autoclaves, Transite assumes a new chemical identity. The silica in its composition unites chemically with the free lime ordinarily associated with cement products and converts it into highly stable calcium silicates. As a result, the cured Transite pipe is unusually resistant to corrosive attack by acids, chemicals or fumes throughout its entire structure. A curious chemical fact is that the finished pipe weighs more than its original ingredients and thus gains added strength.

Since Transite was first produced in tubular form in 1929, many thousands of miles of Transite pipe have been installed in the United States and Canada for use as water and sewer mains, irrigation and industrial pipe lines, building sewer pipe, telephone and electrical conduit, air conditioning and other ducts, vents, flues and stacks.

In keeping pace with ever-increasing demands by industry, homes, farms and thousands of municipalities, Johns-Manville has expanded its Transite pipe manufacturing facilities to seven locations in the United States and Canada, strategically placed to speed deliveries and keep shipping costs down.

In addition to the newest Johns-Manville Transite Pipe plant at Denison, Texas, other factories are in production at Marrero, Louisiana; Manville, New Jersey; Stockton, California; Watson, California; Waukegan, Illinois and Toronto, Ontario.

The Johns-Manville Pipe Division, which operates the American plants, is represented at the company's Research and Engineering Centers at Manville, New Jersey. These are the largest facilities of their kind in the world devoted to building materials, insulations, asbestos-cement pipe, and allied industrial products. A permanent group of industrial research scientists and technicians are constantly occupied there in seeking new ways to improve and use Transite Pipe. They have at their disposal a completely equipped Transite Pipe pilot plant where the latest improvements are developed and factory-tested before being put into production at the seven operating locations.

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In manufacture of Transite pipe, asbestos fibres of various grades are selected and blended. Then, in predetermined proportions, the asbestos fibres are mixed with cement and silica. Enough water is added to disperse the fibres uniformly throughout the mixture.

This mixture or slurry, as it is called, flows into a tank where a revolving drum of fine wire mesh deposits it in a thin coating on a broad, endless felt band. The moving felt carries it in a wide ribbon over vacuum chambers which remove excess moisture. The mixture is transferred to a revolving steel mandrel. Here the coating builds up continuously under pressure of heavy, hydraulically loaded rollers which compress it into a dense, homogeneous structure.

In this way, a section of pipe the length of the mandrel is built-up until the desired wall thickness is reached. After the pipe is removed from the mandrel it is subjected to high pressure steam curing.

Modern equipment forms various types of Transite asbestos-cement pipe into 10-foot and 13-foot lengths, with some types ranging in diameter from 3 to 36 inches. Various types have different strengths, depending upon the purpose for which manufactured. Some pipe sections are available in half, quarter and one-third lengths, depending on the particular kind of pipe. This gives users great flexibility of choice.

Most water and sewer pipes and many industrial lines and electrical conduits for distribution of power are buried underground where they are immediately subjected to two types of corrosive attack - chemical and electrolytic. Chemical corrosion is caused by acids and salts encountered in the soil. Electro-chemical corrosion, an extremely complex process similar to action that takes place in a dry cell battery, occurs in metallic pipe when installed underground. Transite pipe, being non-metallic, does not conduct electricity and is immune to electro-chemical corrosion and is highly resistant to other types of corrosion.

In addition to its high resistance to ordinary corrosion, Transite pipe has an added advantage of high flow capacity because of its permanently smooth interior surface. Liquids and gases flow easily with a minimum of friction, permitting high carrying capacity and low pumping costs.

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