



## HISTORY AND DEVELOPEMENT OF STEEL PIPE PRODUCTION IN THE UNITED STATES

The American steel pipe industry credits its beginning to the development of the butt-welding process in 1832 by the Pascal Iron Works, Philadelphia, Pennsylvania. A significant improvement over the wrought iron pipe making process, which was invented in England by Comeilus Whitehouse, butt-welding is a one-step process that resulted in a better quality pipe that could be made faster and at lower cost.

Butt-welded pipe was made by drawing a hot iron plate of given width and thickness through a cone-shaped die - known as a welding bell - that transformed the flat plate into a cylinder. Simultaneously, the die brought the longitudinal edges of the plate together with sufficient mechanical pressure to forge-weld the butt joint.

The Pascal Iron Works continued in the forefront as a pipe producer and in 1862 was instrumental in the standardization of pipe manufacturing. In that year, Robert Briggs, then superintendent at Pascal, compiled a table of nominal pipe sizes ranging from NPS 1/8 through NPS 10, listing outside diameters, wall thicknesses and threads per inch for each pipe size. Briggs' move toward uniformity of thread and pipe size had a profound and lasting influence on the industry. The Briggs' table covered what is known today as a standard-weight Schedule 40 pipe.

In 1884, the pipe industry took another giant step with the first commercial production of pipe from Bessemer steel. The steel pipe produced by the Riverside Iron Works of Wheeling, West Virginia, proved to be superior to and less expensive than, wrought iron pipe. Around 1890, the rotary piercing method for making seamless pipe was perfected. These two technological advances did much to accelerate the growth of the U.S. pipe industry.

In 1911, John Moon conceived the idea that butt-welded steel pipe could be produced continuously, and in 1922, Fretz Moon Tube Company, formed in partnership with Sam Fretz, started production. At first, only small-diameter pipe was made, but continuing development soon led to a full range of sizes up to 4 inch nominal, the largest continuous weld pipe that can be efficiently produced on this equipment.

Today, butt-weld pipe, now known as continuous-weld pipe, is produced by feeding an uninterrupted ribbon of steel, called "skelp", through a long, narrow furnace. When heated to a suitable temperature, the skelp is formed and welded into a tube by a series of rolls at the exit of the furnace .

By 1930, development engineers had refined and commercialized the electric resistance-weld (ERW) method of pipe manufacture. Five years later, another forward step was taken when the American Standards Association, now known as the American National Standards Institute ANSI (ASME) Standard B-36.10. This standard covers pipe sizes and wall thicknesses designated as Schedules 10 and 80.

Actually, ANSI had formally adopted many of these steel pipe standards much earlier: Twentieth Century Industrialization had placed greater pressure demands and other mechanical requirements on steel pipe than could be accommodated with pipe made to "Briggs' Standard" dimensions, or Schedule 40 steel pipe. As a result, pipe of ' heavier walls came into existence.

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