

High Productivity Process of Large Diameter Pipes by NEO Press

1.1 Introduction

Therefore, after welding, the pipe is formed into a circular shape by an expander like that used in UOE pipe production. Fig. 2 shows the expander and the pipe expansion method. The expander is equipped with 12 expanding dies on the outer side of a 12-sided cone, and the dies are spread to the outside in a radial direction by pulling the tapered cone. By inserting this expander into the pipe and pulling the cone, the diameter of the steel pipe is expanded.

Fig. 3 is the schematic illustration when the expander is inserted into pipes with different numbers of press stages. If the number of press stages is 11, all of the concave and convex parts are in contact with the dies in the same way. The results of the calculation of the amount of pipe unevenness before and after expansion by the finite element method are shown in Fig. 4²⁾.

There is less unevenness of the pipe after expansion in the case of 11 press stages. Therefore, the pipe shape with 11 press stages of bending is the most suitable shape to produce a circular pipe with expansion.

2.2 Productivity of NEO Press

The NEO press machine that utilizes the high productivity press bending process was installed alongside the U-ing press and O-ing press at JFE Steel's West Japan Works, Fukuyama District. The appearance of the NEO Press is shown in Fig. 5. It has a pressing force of 100 MN, and the available steel pipes are those with outer diameters of 20 to 56 inches and a length of 12 m.

By reducing the number of press stages, the productivity of the press bending method by NEO Press is approximately 3 times higher than that by a conventional press machine, and the productivity is the same as the UOE process. In addition, its pressing force is 1/7 that of the press machine of the UOE method.

The available size range of SAWL (longitudinal submerged arc welding) pipes at JFE Steel is shown in Fig. 6

accuracy is equal to that of the UOE pipes.

3. Conclusion

JFE Steel developed a high productivity press bending method and achieved a mass production of high quality, heavy-walled, high strength steel pipes by installing a NEO Press. The pipes produced by this process are used in major projects in the oil industry.