Seamless pipe and tubes are produced either by the plug rolling mill or the mandrel mill in Chita Works. The former process is used for producing medium-diameter pipe and the latter for small-diameter pipe. On either type of mill, a heated billet is pierced through its center on the piercing mill. The pierced billet, then, moves to the plug rolling or mandrel mill where it is rolled with a plug or a mandrel bar inserted inside. After the plug or the mandrel is withdrawn, the rolled shell is reheated before the process on a sizing mill or a stretch reducing mill where the desired OD and wall thickness are obtained. During transportation of oil and gas, occurrence of CO₂ corrosion becomes increasingly common due to the impurity of oil and gas. To respond to this major problem, JFE has developed a martensitic stainless steel for line pipe applications, and successfully established its production technology based on the Mannesmann piecing process. In addition to these hot rolled pipe and tubes, JFE also manufactures cold drawn pipe and tubes for the use where closer dimensional tolerances are required. To consistently ensure high quality, the company conducts thorough testing and inspection by employing eddy current, ultrasonic, magnetic leakage flux and other advanced equipment.

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### Seamless Pipe Mill

Seamless pipe and tubes are produced either by the plug rolling mill or the mandrel mill in Chita Works. The former process is used for producing medium-diameter pipe and the latter for small-diameter pipe. On either type of mill, a heated billet is pierced through its center on the piercing mill. The pierced billet, then, moves to the plug rolling or mandrel mill where it is rolled with a plug or a mandrel bar inserted inside. After the plug or the mandrel is withdrawn, the rolled shell is reheated before the process on a sizing mill or a stretch reducing mill where the desired OD and wall thickness are obtained. During transportation of oil and gas, occurrence of CO₂ corrosion becomes increasingly common due to the impurity of oil and gas. To respond to this major problem, JFE has developed a martensitic stainless steel for line pipe applications, and successfully established its production technology based on the Mannesmann piecing process. In addition to these hot rolled pipe and tubes, JFE also manufactures cold drawn pipe and tubes for the use where closer dimensional tolerances are required. To consistently ensure high quality, the company conducts thorough testing and inspection by employing eddy current, ultrasonic, magnetic leakage flux and other advanced equipment.

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### Medium-Diameter Seamless Pipe

- **Round billet**
- **Rotary heating furnace**
- **Piercer**
- **Plug mill**
- **Reheating furnace**
- **Reeler**
- **Plug mill**
- **Electromagnetic inspection**
- **Visual and dimensional inspection**
- **Hydrostatic testing**
- **Magnetic particle inspection**
- **Ultrasonic inspection**
- **Straightening**
- **Cooling table**
- **Marking**
- **Oil coating**
- **Shipment**

### Small-Diameter Seamless Pipe

- **Round billet**
- **Rotary heating furnace**
- **Piercer**
- **Mandrel mill**
- **Plug mill**
- **Heat treatment**
- **Cold drawing**
- **Reheating furnace**
- **Visual and dimensional inspection**
- **Hydrostatic testing**
- **Weighing and measuring**
- **Marking**
- **Oil coating**
- **Shipment**