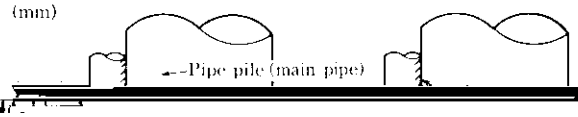
KAWASAKI STEEL TECHNICAL REPORT No. 21 November 1989

Development of Underwater Plasma Arc Cutting Method

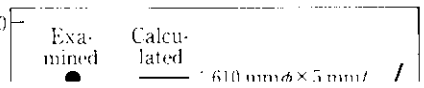
Synopsis:

Interlocked steel pipe piles are driven into the ground for construction of piers located in rivers or the sea. In

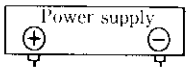


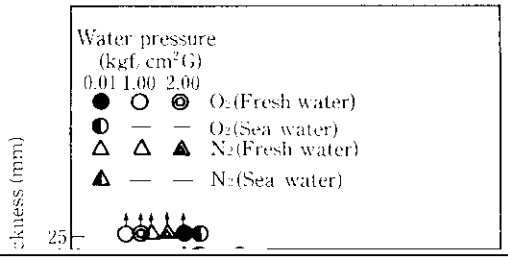
2 Basic Conditions for Underwater Cutting

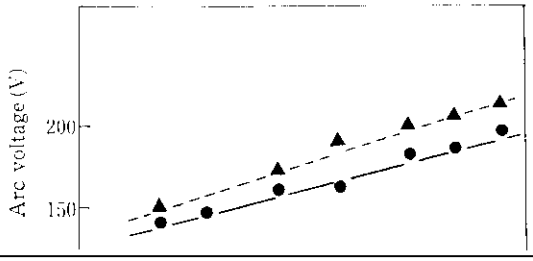
plasma arc method is the best method for cutting the main pipes based on an overall evaluation, taking into consideration the environmental conditions when steel



increasing cutting force, indicating that there is an appropriate cutting force range. When the cutting force




Water pressure
(kgf/cm²G)
0.01 1.00 2.00
O₂(Fresh water)
O₂(Sea water)
N₂(Fresh water)
N₂(Sea water)
25


Arc voltage (V)
200
150

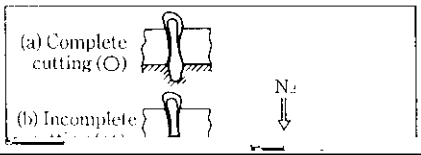


Table 2 Specifications of the newly developed underwater cutting machine

Pipe piles	

4.2 Test of Cutter Performance

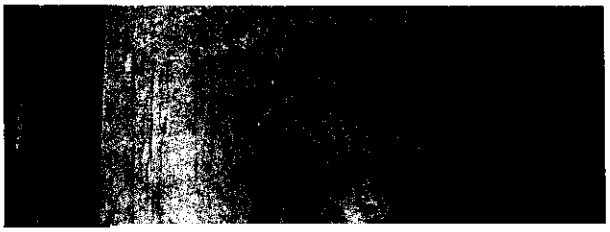
21 min. Cutting with the grinder is shown in **Photo 2**,

The performance of the newly developed underwater

The specimen after cutting was examined and it was

method is shown in **Fig. 9**. The specimen consisted of

of the cuts of the junction pipes and main pipe was



speed of steel pipe using plasma arc is very high. When oxygen plasma at a load current of 260 A is used, it is possible to cut a steel pipe 800 mm in diameter with a 16 mm wall thickness in about 2 min.

(3) In this newly developed underwater cutting apparatus, it is possible to cut the junction pipes with a grinder cutter and the main pipes by a noncontact-