

LNG플랜트용 플라스틱배관 비파괴검사기술 현장 적용

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Polyethylene (PE) pipes were introduced for transport of natural gas in the late 1960's. Electrofusion pipe welding is a process for joining pipes using implant resistance welding. The electrofusion technique is mainly used for welding PE pipes for the water and natural gas utilities. The electrofusion welding process uses a fitting or a coupling socket with resistive wire wound on the inside. Electrofusion fittings are typically available in sizes ranging from 16 mm to 710mm. The two pipe ends to be joined are cleaned and scraped and then inserted into the fitting. We developed a simple and user friendly ultrasonic non-destructive evaluation (NDE) and inspection device for electrofusion welds. With this device it is possible to detect various flaws including wire deviations and regions with lack of fusion. This paper studies the defect detection technique for electrofusion fittings of polyethylene piping is utilized by the ultrasonic phased array technique to obtain ultrasonic images of electrofusion joints. We inspected 4 cases at fields with this technique. First case is for the 300mm diameter polyethylene electrofusion joint by using 3.5MHz phased array sensor, second is for the 350 mm diameter saddle electrofusion joint, third is for the 400mm diameter electrofusion joints and the last one is for the 400mm diameter piping joints which will be used at 300kPa supplying pressure.