

1.13.11. THE INFLUENCE OF FREQUENCY ON ULTRASONIC TEST OF NUDULAR CAST IRON

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Cast Iron is the most common casting alloy which is utilized in different branches industries. The micro structure consists of a mixture of graphite in the steel matrix. Although, there are many tricks to improve the graphite's shape which lead to optimizing mechanical characteristics and developing applications of the cast iron, but naturally the iron alloys contain many types of discontinuities and defects, which will be increased directly by increase in the thickness of sections. In other words, a numerous internal and external defects might be detected in cast iron parts (particularly with thick sections). As a result, a wide range of NDT methods are used to find out those internal and external defects in cast iron parts. Normal methods for internal defects are UT for medium and thick sections and RT for thin ones. It should be mentioned that thick sections are more critical, not only by their structures but also by their applications.

For these reasons, NDT (specially UT) plays an important role for testing of cast iron parts, but performing UT on these alloys are so complicated and the indications are so sophisticated to interpret due to the micro structures and the presence of graphite (which is the main reason for some phenomena like the sound attenuation and diffraction in the cast irons). Although there are a lot of procedures and specifications to guide UT operators, no global settlement on detecting, sizing and making decision about the exact type of discontinuities can be found. Finally, it seems that more experimental efforts are needed to find out the outlines of UT method which is applied for Cast Irons. In this investigation, the influence of frequency as an effective parameter on UT has been reviewed. According to experimental works, the optimum range of frequency for UT of nodular cast iron parts has been introduced.