

# Certificate of Approval

This is to certify that the Management System of:

## Sheffield NDT Limited

Acres Hill Lane, Sheffield, S9 4LR, United Kingdom

has been approved by LRQA to the following standards:

ISO 9001:2015



David Derrick - Area Operations Manager UK & Ireland

Issued by: Lloyd's Register Quality Assurance Limited

Current issue date: 6 September 2019  
Expiry date: 5 September 2022  
Certificate identity number: 10215629

Original approval(s):  
ISO 9001 – 6 September 2019

Approval number(s): ISO 9001 – 00021916

The scope of this approval is applicable to:  
Non destructive testing services including Ultrasonics, MPi and dye penetration.



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## ABOUT US

Based in Sheffield, the company was established in June 2018 because of a demand predominantly in the petrochemical & engineering industries for non-destructive testing services.

Our professional team has over 60 years combined experience and are approved in all applications of Non-Destructive testing covering forgings, wrought products, weld plates, pipes and castings. We are ISO 9001 2015 approved company through Lloyds Register.

We can test on site or at our premise's where we have handling facilities by overhead cranes up to 10 tonnes. We also have forklift truck with a capacity of 3 tonnes. We can also transport up to 16 tonnes; we can collect from and return to site at a competitive rate.

### DYE PENETRANT TESTING

Liquid Penetrant Testing (LPT), also called Dye Penetrant Inspection (DPI) and Penetrant Testing (PT), is widely used to detect surface defects in castings, forging, welds. Typical defects are marterial cracks, porosities and possible fatigue failure areas.

The material is cleaned and then coated with a visible or fluorescent dye solution. Technicians remove the excess solution after waiting a specified time (Dwell Time) then apply a developer to the material. The developer acts like a blotter, pulling the dye solutions out of the imperfections.

Visible dyes will show a sharp contrast between penetrant and developer making the "bleed-out" easy to see.

Fluorescent dyes are viewed with an ultraviolet lamp, which makes the "bleed-out" fluoresce brightly revealing any material imperfections.

### VISUAL TESTING

Visual Testing (VT) is the most common and usually the first NDT examination step when an inspector using their eyes to look for defects. The human eye has an amazing ability to differentiate between colours, hues, shapes, sizes contrast and texture.

Inspections may require the use of magnifying glasses, mirrors or borescopes for a closer look or when viewing material with areas of limited access.

### MAGNETIC PARTICLE TESTING

Magnetic Particle Testing (MT) is used to detect surface and subsurface defects in ferroelectric materials such as iron, nickel, cobalt, and some of their alloys. The process puts a magnetic field into the part. The piece can be magnetised by direct or indirect magnetisation. Direct magnetisation occurs when an electric current is passed through the test object and a magnetic field is formed in the material.

Indirect magnetization occurs when no electric current is passed through the test object, but a magnetic field is applied from an outside source. The magnetic lines of force travel perpendicular to the direction of the electric current which may be either alternating current (AC) or some form of direct current (DC). The presence of a surface or subsurface discontinuity in the material creates magnetic flux leakage. Ferrous iron particles are applied to the part. The particles may be dry or in a wet suspension. If an area of flux leakage is present the particles will be attracted to this area. The particles will build up at the area of leakage and form what is known as an indication. The indication is then evaluated to determine what it is, what may have caused it, and what action should be taken if any.

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## WHAT IS ULTRASONIC FLAW DETECTION?

Ultrasonic testing (UT) is a family of non-destructive testing techniques based on the propagation of ultrasonic waves in the object or material tested. In most common UT applications, very short ultrasonic pulse-waves with centre frequencies ranging from 0.1-15 MHz, and occasionally up to 50 MHz, are transmitted into materials to detect internal flaws or to characterise materials.

## WROUGHT PRODUCTS

Ultrasonic Thickness Measurement (UTM) is frequently used to assess corrosion, erosion, and mechanical damage of the structural materials on tanks, vessels, piping, castings and structural steel. The testing is accomplished with portable equipment and the results are evaluated to industry standards, codes, or customer specifications. This method can locate and measure the amount of corrosion, erosion or voids within a material. This data is then used to assess the life expectancy of the component or if repairs are required before returned to service.

## CASTINGS

In metalworking, metal is heated until it becomes liquid and is then poured into a mould. The mould is a hollow cavity that includes the desired shape, but the mould also includes runners and risers that enable the metal to fill the mould. The mould and the metal are then cooled until the metal solidifies. The solidified part (the casting) is then recovered from the mould. Subsequent operations remove excess material caused by the casting process (such as the runners and risers). Defects found in castings, porosity, airlocks, blowholes, non-metallic inclusions, pipe/shrinkage, segregation, cold shuts, hot tears (cracks), sinks, scabs.

## ULTRASONIC THICKNESS CHECKING

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## WELDS PLATE AND PIPE 3.1 & 3.2

Ultrasonic Testing involves utilisation of ultrasonic sound waves to detect defects inside a material. The welded joints have possibilities of defects inside the welds, or sometime near the weld zone. The type defects that are often found in welds are porosity, cracks, slag inclusion, lack of fusion, lack of penetration, root concavity, crater pipes, sharp undercuts, burn through, HAZ cracks and more. Ultrasonic scanning is utilised to detect these discontinuities.