



SGS NDT training & examination centre

PROFESSIONAL SERVICES FOR YOUR SAFETY AND REPUTATION





About Non-destructive testing (NDT)

NDT plays a key role in assessing conformity and reliability of equipment and components used in various industries such as infrastructure, Oil & gas, power, chemical, railways, aviation and many more other industries. With the selection of right NDT method and appropriate selection of technique will provide the desirable results for integrity & quality assessments.

The key difference between NDT and other forms of materials evaluation is that NDT allows insitu evaluation or inspection of the part without modifying or permanently damaging the part. NDT is a highly valuable inspection methodology, in one hand it can save both money and time, and in other it ensures safety by product evaluation, troubleshooting, and research. Therefore, a need to quality training is always in demand.

The reliability of the NDT depends on many factors and operator training is one of the critical areas that are only too often overlooked.

SGS training and certification services helps you to manage risks and deliver products which meet international standards and compliances. SGS offer various NDT training course which meets requirements stated in international standards.

About SGS NDT training & examination centre

China represents huge business opportunities for every ambitious company in the industrial markets. The market of China is ever increasing at an incredible pace. Almost all the world recognized organization have their footprint in China. At one hand China is the largest producer in various fields and supplying product across the world and in other hand China industries always look to produce quality products meeting international requirements. Often after delivery from the manufacturer if it is found that the quality of the materials and products are not meeting the clients' requirements and expectation, then it leads to defaming the reputation and the cost to repair or re supply.

To manage this risk (i.e. reputation & repair associated), in addition to production process the quality verification done be NDT needs to be ensured. NDT inspections are performed from raw material to finish product at various stage by qualified personnel and if the qualification training is compromised

then the whole purpose of conducting NDT would be of no use.

SGS China offers internationally recognized NDT training and certification services. The aim is to create a wider availability of quality inspectors and technicians who are trained and certified in accordance with the European, American and ISO standards. Our training by professional & experience trainer in a well designed manner would ensure to add value to understanding of inspectors, enhanced their theoretical and practical knowledge will lead to mitigate the risk associated with NDT personnel performing testing.

The training and examinations that SGS Offer are in accordance. With the highest European and American standards (ISO 9712/SNT-TC-1A), with a particular focus on the extensive training syllabus for all NDT methods and will offer personal Certification of NDT (PCN) which are issued by the British Institute of NDT (BINDT).

The need for high quality NDT service in China is growing at a rapid pace and this new service is attractive for all companies and institutions that are doing business with international customers.

The courses will be held in Shanghai, Shenzhen and at company premises should it specifically requested.

Examples of these services are

- Basic NDT awareness for engineers and managers
- PCN/ISO 9712 Level 1, 2 and 3 courses in RT, UT, MT. PT. VT, TOFD, PAUT
- SNT-TC-1A Level 1, 2 and 3 courses in RT. UT, MT. PT. VT, TOFD. ET
- SGS NDT T & E Centre Level 1, 2 and 3 courses in RT, UT, MT. PT. VT, TOFD, PAUT, ET
- Customized NDT Course
- ASNT, PCN/ISO 9712 Level 3 consultancy services



Magnetic particle inspection (MT)

This method involves the component having ferromagnetic material and during inspection same is being magnetized. While the component is under magnetization the process is supplemented by the application of ferromagnetic particles. Any change in permeability of material and its discontinuity will lead to leakage of flux and the magnetic particles are attracted to areas of flux leakage (escaping magnetism) and indications formed at that point. This method is used to test surface or slightly sub-surface defects in the sectors of welds, castings and forgings.

WORK EXPERIENCE AND TRAINING HOURS REQUIREMENTS FOR MT EXAMINATION

LEVEL 1

- 32 hours training
- 1-month work experience

LEVEL 2

- 40 hours training
- 4 months work experience

We can provide Magnetic Particle training courses and examinations suitable for any of the following certification schemes.

- PCN/ISO 9712 Level 1, 2 and 3

- SNT-TC-1A Level 1, 2 and 3 in accordance with your written practice

We can also provide:

- Preparation training for ASNT Level 3
- Preparing and approving written practice/procedures/working instruction
- Level 3 witness

SGS can tailor make the syllabus to satisfy the requirements of an individual's company specific written practice if requested.

Liquid penetrant inspection (PT)

This method involves applying a liquid to the surface of a material and leaving the dye to "dwell" on the surface for a predetermined period of time. The liquid can be either a colour that is easily visible under normal lighting conditions or a yellow/green fluorescent colour that requires special lighting conditions to be seen effectively.

This liquid dye enters into discontinuities that are open to the surface of the material through a phenomenon called "capillary action". This capillary action takes place throughout the dwell time and the discontinuity retains this dye when the excess dye is cleaned from the surface. a type of developer is then applied to the surface of the material and the dye that is trapped inside the surface

discontinuities of blotted back out on to the surface and forms an indication. This indication is then interpreted by a qualified interpreter.

The PT method suitable on most nonabsorbent materials.

WORK EXPERIENCE AND TRAINING HOURS REQUIREMENTS FOR PT EXAMINATION

LEVEL 1

- 32 hours training
- 1-month work experience

LEVEL 2

- 40 hours training
- 4 months work experience

We can provide Liquid Penetrant (PT) training courses and examinations

suitable for any of the following certification schemes.

- PCN/ISO 9712 Level 1, 2 and 3
- SNT-TC-1A Level 1, 2 and 3 in accordance with your written practice

We can also provide

- Preparation training for ASNT Level 3
- Preparing and approving written practice/procedures/working instruction
- Level 3 witness

SGS can tailor make the syllabus to satisfy the requirements of an individual's company specific written practice if requested.



Radiographic testing (RT)

This method is based on the same principle as medical X-ray in a hospital. A piece of radiographic film is placed on the remote side of the material under inspection and radiation is then transmitted through from one side of the material to the remote side where the radiographic film is placed.

The radiographic film detects the radiation and measures the various quantities of radiation received over the entire surface of the film. This film is then processed under dark room conditions and the various degrees of radiation received by the film are imaged by the display of different degrees of black and white, this is termed the film density and is viewed on a special light emitting device.

Discontinuities in the material affect the amount of radiation being received by the film through that particular plane of the material. Qualified inspectors can interpret the resultant images and record the location and type of defect present in the material. Radiography can be used on most materials and product forms. e.g. welds, castings, composites, etc. Radiographic testing provides a permanent record in the form of a

radiograph and provides a highly sensitive image of the internal structure of the material.

Radiography is split into two main categories

- Radiographic Testing
- Radiographic Interpretation

The Radiographic Testing course is for NDT who execute the practical inspection using radioactive material or radiation emitting devices. The radiographic interpretation course is designed purely for the interpretation of the resultant radiographic image. However, to understand the principles of image formation, sensitivity and correct techniques the general theory syllabus is the same for both courses.

The two sectors of Radiographic Testing examination that are not required for the Radiographic Interpretation examination are Basic Radiation Safety (BRS) Practical Examination of the Specimens

WORK EXPERIENCE AND TRAINING HOURS' REQUIREMENTS FOR RT EXAMINATIONS

LEVEL 1

- 80 hours training
- 3 months work experience

LEVEL 2

- 120 hours training
- 12 months work experience

We can provide Radiographic Testing and Interpretation training courses and examinations suitable for any of the following certification schemes.

- PCN /ISO 9712 Level 1, 2, and 3
- SNT-TC-IA Level 1, 2 and 3 in accordance with your written practice

We can also provide

- Preparation training for ASNT Level 3
- Preparing and approving written practice/procedure/working Instruction
- Level 3 witness

SGS can tailor make the syllabus to satisfy the requirements of an individual's company specific written practice if requested. Radiographic Testing is split into specific product sectors for certification at Level 1 and 2, this is

- Welds
- Castings

Each of these categories is further split into sub-groups.

- Light metal X-ray
- Dense metal X-ray (and/or Gamma ray)
- Light and dense Metal, both X-ray and Gamma ray



Ultrasonic testing (UT)

This method employs high frequency sound pulses that are emitted from a transducer; this sound wave is induced in to the material through a probe which is usually in contact with the material. These sound waves propagate through the material, and are reflected back to the probe when they reach an interface, the reflected waves are transmitted back through the probe and connecting leads to a detector which can either analogue or digital. The sounds waves are then displayed as a series of signals on a monitor and the qualified inspector can measure. and interpret these signals to allow accurate evaluation of the material.

Ultrasonic testing can not only be used to indicate a surface or subsurface flaw. it can also be used to determine the depth, size and type of flaw. Another advantage of using UT is the accurate measurement of the thickness of the material. The method can be applied to most materials providing the material can transmit sound waves. UT is considered

to be a fast and effective way of inspection providing highly sensitive results.

WORK EXPERIENCE AND TRAINING HOURS' REQUIREMENTS FOR UT EXAMINATIONS

LEVEL 1

- 80 hours training
- 3 months work experience

LEVEL 2

- 120 hours training
- 12 months work experience

We can provide Ultrasonic training courses and examinations suitable for any of the following certification

- PCN/ ISO 9712 Level 1.2, and 3
- SNT-TC-1A Level 1. 2 and 3 in accordance with your company written practice

We can also provide

- preparation training for ASNT Level 3
- Preparing and approving written instruction
- Level 3 witness

SGS can tailor make the syllabus to satisfy the requirements of an individual's company specific written practice if requested.

In the PCN certification scheme Ultrasonic Testing is separated into three specific product sectors for certification purposes. these are

- Welds
- Wrought products (Forgings)
- Castings

The welds sector is further divided into sub-groups. these are

- Plate butt welds
- Pipe butt welds
- Constructional "T" joint
- Nozzles
- Nodes

Eddy current testing (ET)

Eddy current inspection is one of several NDT methods that use the principal of 'electromagnetism' as the basis for conducting examinations. Several Other methods such as Remote Field Testing (RFT), Flux Leakage and Barkhausen Noise also use this principle. One Of the major advantages of eddy current as an NDT tool is the variety of inspections and measurements that can be performed. In the circumstances, eddy currents can be used for

- Cracks detection
- Material thickness measurements

- Coating thickness measurements
- Conductivity measurements

Some of the advantages of eddy current inspection include

- Sensitivity to small cracks and other defects
- Detects surface and near surface defects
- Inspection gives immediate results
- Equipment is very portable
- Method can used for much more than flaw detection
- Minimum part preparation is required
- Test probe does not need to contact the part

- Inspects complex shapes and sizes of conductive materials

We can provide

- ET training and examinations suitable for SNT-TC-1A
- Preparing and approving written practice/procedure/working instruction
- Level 3 Witness



Time of flight diffraction (TOFD)

Time of Flight Diffraction (TOFD) is becoming one of widely used nondestructive testing method for weld inspection. The main difference of TOFD technique is based on received ultrasonic diffractions which are from tip of imperfections instead of received reflected signals in conventional method.

The basic arrangement Of the TOFD technique consists of two probes in the pitch-and-catch configuration, with one probe acting as the transmitter and the second probe as the receiver. Such an arrangement provides a large volume for inspection and provides for unambiguous location Of the position and depth Of the reflectors.

This advanced ultrasonic technique has special features such as highest probability of defect detection, very accurate sizing of defects (better than 0.2 mm), increased speed of

inspection, permanent digital record of the inspection data, efficient detection of defect independent of defect orientation and highest reliability of inspection quality.

The application of TOFD technique can be classified into areas i.e., preservice inspection of linear butt welds on vessels, pipeline and plates. inservice inspection which includes corrosion monitoring, cladding measurement and condition monitoring (growth Of flaws) on different product sectors like marine engineering oil & gas, large-sized steel structure, wind power industry. aircraft industry and so on.

WORK EXPERIENCE AND TRAINING HOURS' REQUIREMENTS FOR TOFD EXAMINATIONS

LEVEL 1

- 40 hours training
- 3 months work experience

LEVEL 2

- 80 hours training
- 12 months work experience

All candidates attempting PCN examination must hold BINDT recognised appropriate level of certification in conventional Ultrasonic Weld Testing, issued by a certification body recognised by BINDT. We can provide TOFD training courses and examinations suitable for any of the following certification schemes.

- PCN/ ISO9712 Leve 1, 2 and 3 preparing and approving written practice/procedures/working instruction
- Level 3 witness
- SNT-TC-1A Level 1, 2 and 3 in accordance with your company written practice

Visual inspection (VT)

This method involves both direct and indirect visual inspection techniques, direct inspection is where the material is inspected directly by the human eye with no additional visual aids, indirect inspection may involve the use of magnifying glass, mirror. borescope (mini camera), closedcircuit TV, and etc.

Visual Inspection is a crucial NDT method which is often overlooked, this should be the basis for inspectors starting out in the NDT industry. for example, a visual examination of an operational plant can often reveal obvious problem areas, such

as leaks, excess vibration, corrosion or misalignment, this inspection is a very cost-effective exercise and can be used to identify areas that require further NDT applications.

WORK EXPERIENCE AND TRAINING HOURS' REQUIREMENTS FOR VT EXAMINATIONS

LEVEL 1

- 32 hours training
- 1-month work experience

LEVEL 2

- 40 hours training
- 4 months work experience

We can provide visual test training courses and examinations suitable for any of the following Certification Schemes.

- PCN/ISO 9712 Level 1, 2 and 3
- SNT-TC-1A Level 1, 2 and3 in accordance with your written practice

We can also provide

- Preparation training for ASNT Level 3
- Preparing and approving written practice/procedures/working instruction
- Level 3 witness

SGS can tailor make the syllabus to satisfy the requirements of an individual's specific written practice if requested.



Phased array ultrasonic testing (PAUT)

Phased array detection (PAUT) is widely used in medical and industrial field; Phased array technology modifies electronically the acoustic (ultrasonic) probe characteristics to generate small waves that interact with each other. This interaction can be exploited to obtain focusing and beam steering at desired positions within the test medium. By using the superposition, Ultrasonic energy can be emitted as one single source that radiates out into a medium, achieving focus and controlling sound beam direction in the ideal position. In the same way, the computer is to process the collected signal to form a permanent record of the relatively easy to analyzed image.

Phased array technology is the mainstream of the common ultrasonic detection (UT), representing the future of ultrasonic testing. Realistically though there are many advantages to phased array technology, and one of the most obvious is the power of the imagining capability. The advantages of Phased Array over traditional UT system are basically to do with the ability to form and dynamically steer the ultrasonic beam.

Industrial field for phased array inspection technology includes: ocean engineering, energy, Petroleum Chemical Industry, rail transit and construction. Product categories include: weld, forging, casting, failure analysis and anything that can be used to test the acoustic echo.

WORK EXPERIENCE AND TRAINING HOURS' REQUIREMENTS FOR UT EXAMINATIONS

LEVEL 1

- 80 hours training
- 1 months work experience

LEVEL 2

- 120 hours training
- 3 months work experience

PCN examination must hold current valid Level 2 or Level 3 certification in Ultrasonic Testing issued by a certification body recognised by BINDT.

We can provide Ultrasonic training courses and examinations suitable for any of the following certification

- PCN/ ISO 9712 Level 1.2, and 3
- SNT-TC-1A Level 1. 2 and 3 in accordance with your company written practice

We can also provide

- Preparing and approving written instruction
- Level 3 witness

SGS can tailor make the syllabus to satisfy the requirements of an individual's company specific written practice if requested.

In the PCN certification scheme Ultrasonic Testing is separated into three specific product sectors for certification purposes. these are

- Welds
- Wrought products (Forgings)
- Castings

PAUT examination contents include phased array specific theory, data collection, data analysis and etc.



Basic radiation safety (BRS) & Radiation protection supervisors (RPS)

BRS

To be eligible for the Radiographic Testing examination at either Level 1 or Level 2, the candidate must first successfully pass a Basic Radiation Safety (BRS) examination.

The minimum training hours for this examination is 16 hours and is in addition to the hours required for either Level 1 or Level 2 Radiographic Certification.

BRS COURSE CONTENT

- Basic Radiation Physics
- Radiographic Equipment
- Radiation Units
- Biological Effects
- Dose Limits
- Radiation Detection and Measurement
- Protection against Radiation
- Calculations for Radiation Protection

- Storage of Radiation Sources
- Transport of Radioactive Substances
- Appointments & Responsibilities
- Local Rules and Contingency Plans
- Personal Dosimetry
- Normative Documents
- Knowledge and Understanding of IRR 2017

RPS

For candidates Who are working with ionizing radiation in supervisory roles an additional advanced training course and examination are available, which is the PCN — Radiation Protection Supervisor (RPS). The minimum requirements for taking this examination are

- Must hold a current BRS certification
- An additional 24 hours training
- Must have held BRS certification for a minimum of 9 months

RPS COURSE CONTENT

- Review of Basic Radiation Safety
- Normative Documents and Legislative Structure
- Biological Effects
- Radioactive Substances Act
- Dose Limitation
- The Regulation of Work with Radiation
- The Role of the RPA and RPS
- Advanced Scientific Calculations for Radiological Protection
- Principles and Practices of Radiation Protection
- Radiation Monitoring
- Transport of Radioactive Substances
- Personal Dosimetry
- Emergency Procedures
- The Ionising Radiations
- Regulations 2017
- Knowledge and Understanding of IRR 2017

How to book your training course

To book a training course or to receive a quotation from the SGS NDT Training and Examination Centre, simply call + 86 (0)21 6818 3905 and we will be happy to discuss your requirements with you. If necessary, we can provide advice on which type of training and certification is appropriate for you or your company, SGS can also conduct a specific training and examination course to meet your company requirements. Enquiries may also be made via email to Sophia.bian@sgs.com

On confirmation of the booking we will send to you an application form which must be completed and returned to us in order to confirm the booking process. Our staff will on hand to provide the necessary assistance and support in completing the required information.

SGS NDT TRAINING & EXAMINATION CENTRE

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SGS NDT training & examination centre

BELOW YOU CAN SEE OUR COURSE SCHEDULE FROM 2021 JAN-DEC: (MONTH/DAY)

COURSE	JAN			FEB			MAR		
MT			1/21-1/28 Shanghai	2/1-2/5 Shenzhen		2/25-3/4 Shanghai			
PT	1/6-1/13 Shanghai			2/1-2/7 Shanghai		2/19-2/24 Shenzhen		3/18-3/25 Shanghai	
VT		1/14-1/20 Shanghai	1/22-1/28 Shenzhen		2/19-2/25 Shanghai		3/10-3/17 Shanghai		3/19-3/25 Shenzhen
UT 3.1/3.2, Wrought, Castings	1/7-1/29 Shenzhen			2/22-3/16 Shanghai			3/4-3/26 Shenzhen		
UT 3.7/3.8/3.9		1/25-1/28 Shenzhen			3/5-3/16 Shanghai			3/22-3/25 Shenzhen	
RT (Welds or Casting)	1/7-1/29 Shanghai						3/4-3/26 Shanghai		
RI (Welds or Casting)		1/11-1/20 Shanghai						3/8-3/17 Shanghai	
TOFD Welds									
UTPA									
10 year Recertification		1/21-1/27T 1/28-29E Shanghai			2/1-2/5T 2/7-2/8E Shanghai			3/18-3/24T 3/25-3/26E Shanghai	
(PCN Level 3)									
COURSE	APR			MAY			JUN		
MT	4/6-4/13 Shanghai	4/19-4/23 Shenzhen				5/20-5/27 Shanghai	6/17-6/23 Shenzhen		6/23-6/30 Shanghai
PT		4/22-4/28 Shanghai	4/25-4/29 Shenzhen		5/12-5/19 Shanghai		6/1-6/8 Shanghai		6/24-6/28 Shenzhen
VT		4/14-4/21 Shanghai		5/6-5/11 Shanghai		5/25-5/31 Shenzhen		6/16-6/23 Shanghai	
UT 3.1/3.2, Wrought, Castings	4/6-4/27 Shanghai			5/10-6/1 Shenzhen			6/8-7/1 Shanghai		
UT 3.7/3.8/3.9		4/19-4/27 Shanghai			5/26-5/31 Shenzhen			6/21-6/30 Shanghai	
RT (Welds or Casting)				5/7-5/28 Shanghai					
RI (Welds or Casting)					5/10-5/19 Shanghai				
TOFD Welds				5/10-5/25 Shanghai					
UTPA	4/7-4/29 Shanghai								
10 year Recertification		4/20-4/25T 4/26-27E Shanghai			5/20-5/26T 5/27-5/28E Shanghai			6/23-6/29T 6/30-7/1E Shanghai	
(PCN Level 3)						5/24-6/8 Shanghai			

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SGS NDT training & examination centre

BELOW YOU CAN SEE OUR COURSE SCHEDULE FROM 2021 JAN-DEC: (MONTH/DAY)

COURSE	JUL			AUG			SEP		
MT			7/26-8/2 Shanghai	8/9-8/13 Shenzhen		8/18-8/25 Shanghai		9/10-9/17 Shanghai	9/23-9/28 Shenzhen
PT	7/7-7/14 Shanghai			8/2-8/9 Shanghai	8/16-8/20 Shenzhen				
VT		7/15-7/22 Shanghai	7/26-7/30 Shenzhen		8/10-8/17 Shanghai		9/2-9/9 Shanghai		9/10-9/16 Shenzhen
UT 3.1/3.2, Wrought, Castings	7/1-7/23 Shenzhen			8/4-8/26 Shanghai			8/30-9/17 Shenzhen		
UT 3.7/3.8/3.9		7/19-7/22 Shenzhen			8/17-8/26 Shanghai			9/13-9/16 Shenzhen	
RT (Welds or Casting)	7/1-7/23 Shanghai						8/30-9/18 Shanghai		
RI (Welds or Casting)		7/5-7/14 Shanghai						9/1-9/9 Shanghai	
TOFD Welds									
UTPA		7/5-7/27 Shenzhen or Shanghai							
10 year Recertification		7/15-7/21T 7/22-7/23E Shanghai			8/18-8/24T 8/25-8/26E Shanghai			9/10-9/16T 9/17-9/18E Shanghai	
(PCN Level 3)									
COURSE	OCT			NOV			DEC		
MT		10/19-10/25 Shenzhen	10/25-11/1 Shanghai			11/18-11/25 Shanghai	12/1-12/7 Shenzhen		12/16-12/23 Shanghai
PT	10/8-10/14 Shanghai	10/12-10/18 Shenzhen		11/3-11/10 Shanghai			12/1-12/8 Shanghai	12/8-12/14 Shenzhen	
VT		10/15-10/22 Shanghai			11/11-11/17 Shanghai	11/19-11/25 Shenzhen		12/8-12/15 Shanghai	
UT 3.1/3.2, Wrought, Castings	10/11-11/2 Shanghai			11/4-11/26 Shenzhen			12/2-12/24 Shanghai		
UT 3.7/3.8/3.9		10/22-11/2 Shanghai			11/22-11/25 Shenzhen			12/15-12/24 Shanghai	
RT (Welds or Casting)				11/4-11/26 Shanghai					
RI (Welds or Casting)					11/8-11/17 Shanghai				
TOFD Welds		10/11-10/26 Shanghai							
UTPA				11/8-11/30 Shanghai					
10 year Recertification		10/25-10/29T 11/1-11/2E Shanghai			11/18-11/24T 11/25-11/26E Shanghai			12/16-12/22T 12/23-24E Shanghai	
(PCN Level 3)			10/25-11/9 Shanghai						

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WHEN YOU NEED TO BE SURE

