

About Non Destructive Testing (NDT)

Non Destructive Testing (NDT) refers to the testing of material and components without inhibiting its further usefulness. Applied scientific principles such as electromagnetic induction, magnetism, capillary action, mechanical vibration, electromagnetic waves, etc. are utilised to identify and characterise discontinuities within tested samples or areas of interest.



Training for Non-Destructive Testing (NDT) is provided by the SAIW in compliance with the ISO/TS 25108 in accordance with the syllabus provided in ISO/TS 25107 (ANSI/ASNT CP 105 as well as IAEA Tecdoc 628 are also incorporated) and recognised by an ISO/IEC 17024 accredited Personnel Certification Body (PCB) under the scope of ISO 9712, i.e. SAIW Certification PCB, which operates the SAIW Certification NDT Scheme.

The SAIW Certification NDT scheme is the very first NDT qualification and certification scheme developed 'in Africa by Africans for Africans' that is registered under the ICNDT Mutual Recognition Agreement (MRA) Schedule 2 through the SAIW Certification Personnel Certification Body (PCB).

Training is sector specific and can be subdivided into the following main sections

- 1 Terminology and history
- 2 Physical principles
- 3 Product technology and method capabilities
- 4 Equipment
- 5 Testing information
- 6 Testing process
- 7 Interpretation / evaluation and reporting
- 8 Assessment
- 9 Quality Aspects
- 10 Developments

Assessment quality aspects and developments training, qualification and certification is subdivided into three levels as stipulated by ISO 9712 new issue published in 2021.

- An individual certified to **LEVEL 1** has demonstrated competence to carry out NDT according to written instructions and under the supervision of Level 2 or Level 3 personnel. Level 1 personnel may be authorized to perform the following in accordance with NDT instructions: set up NDT equipment; perform the tests; record and classify the results of the tests according to written criteria; report the results.
- **LEVEL 2** personnel may be authorized by the employer to perform certain tasks which include: select the NDT technique for the testing method to be used; define the limitations of application of the testing method; translate NDT codes, standards, specifications, and procedures into NDT instructions adapted to the actual working conditions; set up and verify equipment settings; perform and supervise tests; provide guidance for personnel at or below Level 2; report the results of NDT.
- **LEVEL 3** personnel may be authorized to perform certain tasks which include: assume full responsibility for a test facility or examination centre and staff; interpret standards, codes, specifications, and procedures; carry out and supervise all tasks at all levels; provide guidance for NDT personnel at all levels.

NDT Booking Procedures

- Please ensure that you comply with the course access conditions prior to enrolling for the course.
- Refer to the access conditions indicated on the NDT Access Conditions Table.
- Further information is available on the SAIW website: www.saiw.co.za
- Full payment is to be made prior to the commencement of the course and exam.
- All prices indicate the combined total for both the training and initial qualification examination costs.
- All prices quoted include VAT.

1. THE FOLLOWING DOCUMENTATION IS REQUIRED FOR COURSE ENROLMENT

- 1.1 "Course Enrolment Application Form" – completed in full.
- 1.2 Confirmation of full payment
- 1.3 Legible copy of highest academic qualifications (School, college, University, etc.) and / or, pass mark in Proficiency Test.
- 1.4 Company letter stating delegate's current employment status (if applicable).
- 1.5 Legible copy of ID or Passport.
- 1.6 When doing any Level II or Level III course, confirmation of the preceding Level qualification (training record and examination result letter) is required.

PLEASE NOTE

Once we have received all correct documents and payment has been confirmed, you will receive, via email, a "Booking Confirmation Notice" This booking confirmation notice will include the date of the NDT course, venue and full address.

2. WHAT YOU NEED TO BRING ALONG

- 2.1 For NDT Courses, you would require 4 Coloured ID photo's taken within the previous 6 months.
- 2.2 Copy of your ID or Passport.
- 2.3 Stationery, e.g. pen, pencil, note book, eraser and highlighter and scientific calculator.
- 2.4 Copy of the booking confirmation letter.
- 2.5 A 100% attendance of the course is a prerequisite for the qualification examination.

3. CANCELLATION OF TRAINING

- 3.1 The SAIW reserves the right to cancel the holding of a course at short notice, should student numbers not meet our minimum course requirements. Candidates shall be informed of the cancellation two weeks prior to the training start date and arrangements will be made to book the candidate on the next available course. Should the student / applicant decide the alternative arrangement is unsuitable, the full course fees will be reimbursed in these circumstances. Personal costs relating to accommodation and travelling cannot be claimed.
- 3.2 If the course booking is cancelled by the applicant less than 30 (thirty) days prior to the training start date, then the cancellation charge will be equal to the full course cost and no refund is applicable.
- 3.3 If the course booking is cancelled by the applicant 30 (thirty) days or more prior to the training start date, a cancellation charge of 4% (plus VAT) of the course fees will be charged by the SAIW as an administration fee and the balance of the fees refunded to the applicant. In these circumstances only the balance of the course fees will be reimbursed and no personal costs relating to accommodation and travelling may be claimed by the applicant.

4. DRESS CODE

- 4.1 NDT: Wear long pants, shirt and safety boots. Also consider suitable protective clothing such as overalls for the practical sessions.

Training: NDT

ACCESS CONDITIONS

Level 1 : MT, VT, PT	<p>Direct access to the course shall be granted if the candidate has passed both mathematics and science in Grade 10 (Proof of Grade 10 – or equivalent such as N1; certificate is required).</p>
Level 1 : UT, RT, ECT	<p>Please note that RT Safety is mandatory for access to an RT 1 course and no RT 1 certificate shall be issued unless a RT Safety certificate in accordance with DOH and issued by SAIW Professional Body can be shown.</p> <p>Direct access to the course shall be granted if the candidate has passed both mathematics and science in Grade 12 (Proof of Grade 12 – or equivalent such as N3 certificate is required).</p>
	<p>Alternatively, the candidate shall be required to pass a Proficiency Exam for surface methods, prior to being eligible to sit the applicable NDT course.</p> <p>Please note that the Proficiency test is free of charge and only assesses the basic skills relating to mathematics, science, comprehension and communication capabilities required within the applicable NDT method. The pass mark for the Proficiency test is 70%. Please contact Harold Jansen (harold.jansen@saiw.co.za) to ascertain availability and to make a booking. Proficiency tests are performed on Thursdays between 8:00 and 11:00. In the case of candidates not being able to attend the Proficiency test due to transport problems, arrangements can be made to have the test e-mailed to a suitable invigilator and returned via email once completed.</p>
Level 2 - All Methods	<p>Candidate shall be qualified i.e. have received training in accordance with ISO9712 requirements and have passed the Level 1 qualification examinations (certified is preferred) as a Level 1 NDT Technician in the applicable method and sector. Access to advanced / derived techniques requires a valid Level 2 certificate in the relevant method.</p> <p>Direct Access to Level 2: Candidate shall have passed both mathematics and science at Grade 12 level (Equivalent to N3 - Proof of Grade 12 certificate is required) and have applicable tertiary qualification(s) and/or relevant NDT experience. Combination of Level 1 and Level 2 Training hours in accordance with an approved syllabus and training programme as per SAIW Certification NDT Scheme requirements and based on Certification body approval. The Level 1 qualification examinations shall also have been successfully passed.</p>
Level 3 - All Methods	<p>Candidate shall be qualified i.e. received training in accordance with ISO9712 requirements and have passed the Level 2 qualification examinations (certified is preferred) as a Level 2 NDT Technician in the applicable method and sector, appropriate tertiary qualifications (relevant to the NDT method - chemistry, mathematics or physics; and/or to the product or industry sector - chemistry, metallurgy, engineering etc.) are advantageous.</p> <p>All candidates for Level 3 Certification in any NDT method shall have successfully completed the Level 2 Practical exam. (If not certified as Level 2, the practical examination shall have been passed within 1 year from date of writing the Level 3 main method examination).</p> <p>Valid Level 2 Certificate in the applicable method and sector is mandatory when equipment operation or accepting tested components are required.</p> <p>Direct Access to Level 3: Combination of Level 1, 2 and 3 Training hours in accordance with an approved syllabus and training program as per ISO 9712 and SAIW Certification NDT Scheme requirements and based on Certification body verification. The Level 2 qualification examinations shall also have been successfully passed. No reduction in requirements for industrial experience. Suitable tertiary qualifications (relevant to the NDT method - chemistry, mathematics or physics; and / or to the product or industry sector - chemistry, metallurgy, engineering etc.) are mandatory.</p>

Eddy Current Testing

COURSE INFORMATION

Eddy Current Testing (ECT) is an electromagnetic testing method in which electromagnetic induction is utilised to detect any discontinuities. The basic requirement for eddy current testing therefore is that the material being tested or in the case of paint thickness measurement the substrate, should be electrically conductive. ECT can be regarded as both a surface as well as subsurface testing method since the depth to which the inspection can effectively be performed depends on the frequency of the excitation current, the electrical conductivity as well as magnetic properties of the material being tested.



If this sounds like a mouthful, then we invite you to dust off your high school knowledge regarding electrical transformers and attend an ECT course.

The techniques utilised in eddy current testing depends on the sample being tested, i.e. whether it is a surface, tube, bar or other more complex shapes since it dictates the type of probe to be used. Furthermore, the number of frequencies and the inspection mode(s) such as absolute or differential determines the multi- frequency and / or mode technique description. The presence of magnetic saturation weak magnetic alloys, shielding or focussing nature of the probe as well as the display capabilities extends the technique description.

The training course is based on general theory as well as sector specific applications relating, but not limited to, the following standards and specifications:

- ASME Boiler & Pressure Vessel Code - Section V - Subsection A - Article 1 & 8
- ASME Boiler & Pressure Vessel Code - Section V - Subsection B - Article 26
- ISO 15549 ECT – General principles
- ISO 15548 Part 1 ECT – Instrument Characteristics and verification
- ISO 15548 Part 2 ECT – Probe Characteristics and verification
- ISO 15548 Part 3 ECT – System Characteristics and verification
- ISO 17643 ECT – Welds
- ISO 2360 ECT - Non-Conductive coatings – Amplitude sensitive equipment
- ISO 21968 ECT - Non-Conductive coatings – Phase sensitive equipment
- ISO 12718 ECT - Vocabulary



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EDDY CURRENT TESTING – SAIW CERTIFICATION NDT SCHEME (ISO 9712) NON-DESTRUCTIVE TESTING – SURFACE METHOD

NDT Method and Level	Industrial Sector	Product Sector / Category	Duration 1 day = 8 hours	Prices (Inclusive of VAT)			Course & Initial Exam Dates						
				Training & Initial Examination Non-Corporate Members	Training & Initial Examination Corporate Members	Initial Certification							
Eddy Current Testing Level 1	Pre- and in-service	ECT 1.1: Surface (s)	Training 4 days	ECT 1.1 R 17,285	ECT 1.1 R 15,990	ECT 1.1 R 2,780	Course Code	ECT 1.1 - JHB 01	ECT 1.2 - JHB 01	ECT 1.1 - JHB 02	ECT 1.2 - JHB 01		
				Exam	ECT 1.1 R 17,285	ECT 1.1 R 15,990	ECT 1.1 R 2,780	Training	24 - 27 Jan	06 - 09 Jun	04 - 07 Jul	03 - 06 Oct	
		ECT 1.2: Tubes (t)	Exam 1 day	ECT 1.2 R 17,285	ECT 1.2 R 15,990	ECT 1.1 R 2,780	Course Code	ECT 1.1 - CPT 01	ECT 1.2 - CPT 02				
				Training	31 Jan - 03 Feb	01 - 04 Aug	Exam	04 Feb	05 Aug				
		Eddy Current Testing Level 2	Pre- and in-service	ECT 2.1: Surface (s)	Training 4 days	ECT 2.1 R 17,285	ECT 2.1 R 15,990	ECT 2.1 R 2,780	Course Code	ECT 2.1 - JHB 01	ECT 2.1 - JHB 02		
						Exam	ECT 122 R 17,285	ECT 2.2 R 15,990	ECT 2.1 R 2,780	Training	22 - 25 Mar	05 - 08 Dec	
ECT 2.2: Tubes (t)	Exam 1 day			ECT 122 R 17,285	ECT 2.2 R 15,990	ECT 2.1 R 2,780	Exam	28 Mar	09 Dec				

Please note that any comments, compliments or complaints related to:

1. Training can be forwarded to quality@saiw.co.za
2. Examination and Certification can be forwarded to quality@saiw.co.za

MAGNETIC PARTICLE TESTING

COURSE INFORMATION

Magnetic Testing (MT) refers to a surface and very limited subsurface NDT method that relies on the magnetic nature of the relevant material being tested, to reveal any discontinuities on the surface or major longitudinal indications just below the surface.

The material should therefore allow for magnetic fields to be generated inside or pass through the material, hence the requirement for material is that it should be ferromagnetic which means that the material should have a magnetic permeability much greater than 1.



If you are interested in magnetism and would like to find out how magnetic fields are used to detect discontinuities in ferromagnetic material then Magnetic Testing is the place to start your career in NDT.

Inspection techniques depend on the type of current being used to magnetise the material, whether the excitation current is maintained during the application of magnetic particles or not as well as nature of the magnetic field generated i.e. linear or circular. In addition the technique description should also refer to the type of magnetic particles used to make indications visible.

The training course is based on general theory as well as sector specific applications relating, but not limited to, the following standards and specifications:

- ASME Boiler & Pressure Vessel Code - Section V - Subsection A - Article 1 & 7
- ASME Boiler & Pressure Vessel Code - Section V - Subsection B - Article 25
- ISO 9934 Part 1 MT – General Principals
- ISO 9934 Part 2 MT – Detection media
- ISO 9934 Part 3 MT – Equipment
- ISO 12707 MT - Vocabulary
- ISO 17638 MT – Welds
- ISO 4986 MT – Castings
- ISO 23278 MT – Acceptance Levels



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MAGNETIC PARTIAL TESTING - SAIW CERTIFICATION NDT SCHEME (ISO 9712) NON-DESTRUCTIVE TESTING - SURFACE METHODS												
NDT Method and Level	Industrial Sector	Product Sector / Category	Duration 1 day = 8 hours	Prices (Inclusive of VAT)			Course & Initial Exam Dates					
				Training & Initial Examination Non-Corporate Members	Training & Initial Examination Corporate Members	Initial Certification						
Magnetic Testing Level 1	Pre- and in-service	MT 1.1 Forging (f)	Training 4 days Exam 1 day	R 17,285	R 15,990	R 2,780	Course Code	MT 1 A - JHB 01	MT 1 A - JHB 02	MT 1 A - JHB 03	MT 1 A - JHB 04	MT 1 A - JHB 05
							Training	10 - 13 Jan	21 - 24 Feb	04 - 07 Apr	20 - 23 Jun	15 - 18 Aug
		Exam					14 Jan	25 Feb	08 Apr	24 Jun	19 Aug	
		Course Code					MT 1 A - JHB 06	MT 1 A - JHB 07				
		Training					26 - 29 Sep	28 Nov - 01 Dec				
		Exam					30 Sep	02 Dec				
		Course Code					MT 1 A - DBN 01	MT 1 A - DBN 02		MT 1 A - CPT 01	MT 1 A - CPT 02	
		Training					17 - 20 Jan	29 Aug - 01 Sep		10 - 13 Jan	14 - 17 Nov	
		Exam					21 Jan	02 Sep		14 Jan	18 Nov	
		Magnetic Testing Level 2					Pre- and in-service	MT 2.1 Forging (f)	Training 4 days Exam 1 day	R 17,285	R 15,990	R 2,780
Training	07 - 10 Feb		07 - 10 Mar	30 May - 02 Jun	22 - 25 Aug	10 - 13 Oct						
Exam	11 Feb		11 Mar	03 Jun	26 Aug	14 Oct						
Course Code	MT 2 A - JHB 06			MT 2 A - DBN 01								
Training	31 Oct - 03 Nov			06 - 09 Jun								
Exam	04 Nov			10 Jun								
Course Code	MT 2 A - CPT 01											
Training	21 - 24 Nov											
Exam	25 Nov											

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Penetrant Testing

COURSE INFORMATION

Penetrant or Liquid Penetrant Testing (PT) refers to a surface type non-destructive testing method that allows a liquid (containing dye to increase visibility) to fill an empty void, which is open to the surface, due to the capillary action of the liquid.

Once the excess penetrant is removed from the surface a developer is applied to the surface which allows the penetrant to be absorbed into a contrasting medium (normally white powder) revealing the presence of a discontinuity.

PT can effectively be applied to any type of material, as long as the discontinuity sought, is open to the surface.



If you enjoyed chemistry at school and your interest in liquids exceeds that of swimming and the occasional beer, then we invite you to start your career in one of the most basic yet useful NDT methods around.

Inspection techniques depend on whether the dye used is under normal light or backlight conditions (or both), the type of penetrant, excess penetrant removal process as well as developer used during testing. Furthermore, since temperature has an effect on the liquid properties such as viscosity and evaporation special techniques are applicable at excessively high and low temperatures.

The training course is based on general theory as well as sector specific applications relating, but not limited to, the following standards and specifications:

- ASME Boiler & Pressure Vessel Code - Section V - Subsection A - Article 1 & 6
- ASME Boiler & Pressure Vessel Code - Section V - Subsection B - Article 24
- ISO 3452 Part 1 PT – General Principals
- ISO 3452 Part 2 PT – Testing of penetrant materials
- ISO 3452 Part 3 PT – Reference test blocks
- ISO 3452 Part 4 PT – Equipment
- ISO 3452 Part 5 PT – Testing at temperatures > 50 °C
- ISO 3452 Part 6 PT – Testing at temperatures < 10 °C
- ISO 12706 PT – Vocabulary
- ISO 23277 PT – Acceptance Levels

PENETRANT TESTING - SAIW CERTIFICATION NDT SCHEME (ISO 9712) NON-DESTRUCTIVE TESTING - SURFACE METHODS													
NDT Method and Level	Industrial Sector	Product Sector / Category	Duration 1 day = 8 hours	Prices (Inclusive of VAT)			Course & Initial Exam Dates						
				Training & Initial Examination Non-Corporate Members	Training & Initial Examination Corporate Members	Initial Certification							
Penetrant Testing Level 1	Pre- and in-service	PT 1.1 Forging (f) PT 1.2 Castings (c) PT 1.3 Welds (w)	Training 4 days Exam 1 day	R 17,285	R 15,990	R 2,780	Course Code	PT 1 A - JHB 01	PT 1 A - JHB 02	PT 1 A - JHB 03	PT 1 A - JHB 04	PT 1 A - JHB 05	
							Training	10 - 13 Jan	21 - 24 Feb	04 - 07 Apr	20 - 23 Jun	15 - 18 Aug	
							Exam	14 Jan	25 Feb	08 Apr	24 Jun	19 Aug	
							Course Code	PT 1 A - JHB 06	PT 1 A - JHB 07				
							Training	26 - 29 Sep	28 Nov - 01 Dec				
							Exam	30 Sep	02 Dec				
							Course Code	PT 1 A - DBN 01	PT 1 A - DBN 02				
							Training	24 - 27 Jan	12 - 15 Sep				
							Exam	28 Jan	16 Sep				
							Course Code	PT 1 A - CPT 01	PT 1 A - CPT 02	PT 1 A - CPT 03			
							Training	17 - 20 Jan	30 May - 02 Jun	31 Oct - 03 Nov			
							Exam	21 Jan	03 Jun	04 Nov			
Penetrant Testing Level 2	Pre- and in-service	PT 2.1 Forging (f) PT 2.2 Castings (c) PT 2.3 Welds (w)	Training 4 days Exam 1 day	R 17,285	R 15,990	R 2,780	Course Code	PT 2 A - JHB 01	PT 2 A - JHB 02	PT 2 A - JHB 03	PT 2 A - JHB 04	PT 2 A - JHB 05	
							Training	07 - 10 Feb	07 - 10 Mar	30 May - 02 Jun	22 - 25 Aug	10 - 13 Oct	
							Exam	11 Feb	11 Mar	03 Jun	26 Aug	14 Oct	
							Course Code	PT 2 A - JHB 06		PT 2 A - DBN 01	PT 2 A - DBN 02		
							Training	31 Oct - 03 Nov		09 - 12 May	07 - 10 Nov		
							Exam	04 Nov		13 May	11 Nov		
							Course Code	PT 2 A - CPT 01	PT 2 A - CPT 02				
							Training	28 - 31 Mar	07 - 10 Nov				
							Exam	01 Apr	11 Nov				

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Visual Testing

COURSE INFORMATION

Visual Testing (VT) is the most simple and commonly used NDT method utilised today.

VT is very often the first inspection that is performed on any component or in any environment since you have to observe what you need to inspect and the inspection area.

VT is very much a surface inspection method. Visible light (within the 390 – 700nm range of the electromagnetic spectrum) and the interaction of it with a solid surface are used to detect indications that are open to the surface and that is not masked by any foreign material or debris. So effectively, what you can see is what you can detect.



If you enjoyed working with lenses and mirrors in high school and if lasers fascinates you, then you are invited to attend a course in the most basic of all NDT methods and challenge you to become the next ‘Sherlock Holmes’ – certainly the most famous ‘visual testing specialist’ of all times.

The Visual Testing method can be divided into three main techniques depending on the access to the surface. The techniques are direct, indirect and translucent and depend on the type of material to be tested.

The training course is based on general theory as well as sector specific applications relating, but not limited to, the following standards and specifications:

- ASME Boiler & Pressure Vessel Code - Section V - Subsection A - Article 1 & 9
- ISO 3058 VT – Low power magnifiers
- ISO 8785 VT – Geometrical product specifications
- ISO 13385 Part 1 VT – Geometrical product specifications : Callipers
- ISO 13385 Part 2 VT – Geometrical product specifications : Calliper depth gauges
- ISO 11971 VT – Castings
- ISO 17637 VT – Welds



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VISUAL TESTING - SAIW CERTIFICATION NDT SCHEME (ISO 9712) NON-DESTRUCTIVE TESTING - SURFACE METHODS												
NDT Method and Level	Industrial Sector	Product Sector / Category	Duration 1 day = 8 hours	Prices (Inclusive of VAT)			Course & Initial Exam Dates					
				Training & Initial Examination Non-Corporate Members	Training & Initial Examination Corporate Members	Initial Certification	Course Code					
Visual Testing Level 1	Pre- and in-service	VT 1.1 Forging (f) VT 1.2 Castings (c) VT 1.3 Welds (w)	Training 4 days Exam 1 day	R 16,470	R 15,240	R 2,780	Course Code	VT 1 A - JHB 01	VT 1 A - JHB 02	VT 1 A - JHB 03	VT 1 A - JHB 04	VT 1 A - JHB 05
							Training	17 - 20 Jan	28 Feb - 03 Mar	09 - 12 May	06 - 09 Jun	01 - 04 Aug
							Exam	21 Jan	04 Mar	13 May	10 Jun	05 Aug
							Course Code	VT 1 A - JHB 06		VT 1 A - DBN 01	VT 1 A - DBN 02	
							Training	03 - 06 Oct		25 - 28 Jul	26 - 29 Sep	
							Exam	07 Oct		29 Jul	30 Sep	
							Course Code	VT 1 A - CPT 01	VT 1 A - CPT 02	VT 1 A - CPT 03		
							Training	04 - 07 Apr	20 - 23 Jun	10 - 13 Oct		
Exam	08 Apr	24 Jun	14 Oct									
Visual Testing Level 2	Pre- and in-service	VT 2.1 Forging (f) VT 2.2 Castings (c) VT 2.3 Welds (w)	Training 4 days Exam 1 day	R 16,470	R 15,240	R 2,780	Course Code	VT 2 A - JHB 01	VT 2 A - JHB 02	VT 2 A - JHB 03		
							Training	07 - 10 Mar	16 - 19 May	27 - 30 Jun		
							Exam	11 Mar	20 May	01 Jul		
							Course Code	VT 2 A - DBN 01	VT 2 A - DBN 02		VT 2 A - CPT 01	VT 2 A - CPT 02
							Training	01 - 04 Aug	14 - 17 Nov		28 - 31 Mar	01 - 04 Aug
							Exam	05 Aug	18 Nov		01 Apr	05 Aug

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Radiographic Testing

COURSE INFORMATION

Radiographic Testing (RT) makes use of electromagnetic waves within the 0.01 to 10 nanometre (X-rays) or the < 0.01 nanometre (Gamma-rays) spectrum. At these ranges, the electromagnetic wave can effectively pass through a solid material, and an image can be created, either on film or electronic detection sensors, of what the internal structure of the material might be.

Therefore Radiographic Testing is a volumetric testing method effective for finding any discontinuities that exceeds a 2% cross-sectional void or material change in relation to the actual beam orientation.

The energy levels of these very short waves exceed 100eV and put the operator at risk of harmful ionisation radiation which cannot be seen, heard, felt, tasted or smelt. Radiation safety training is therefore essential in order to achieve and maintain an ALARA (As Low As Reasonably Achievable) exposure rating.

If you are interested in photography and Superman is your favourite DC character, then this is the right NDT method for you. However, please keep in mind you must have a sound knowledge of exponents and logarithms. Radiographic techniques depend on the type of wave used, the exposure configuration and the image formation.

The training course is based on general theory as well as sector specific applications relating, but not limited to, the following standards and specifications:

- ASME Boiler & Pressure Vessel Code - Section V - Subsection A - Article 1 & 2
- ASME Boiler & Pressure Vessel Code - Section V - Subsection B - Article 22
- ISO 10675 Part 1 & 2 RT - Acceptance levels
- ISO 17636-1 RT - X and gamma ray techniques
- ISO 19232 Parts 1 to 5 RT - Image quality of radiographs
- ISO 11699 Parts 1 & 2 RT - Industrial radiographic films
- ISO 5580 RT - Metallic materials using X- or gamma rays - Basic rules
- ISO 5576 RT - Vocabulary

Details of specific codes utilised in the limited (RT 2.Int) as well as derived or advanced techniques courses (RT 2.9) can be found in the relevant training documents.

Please contact course administrator on ndt@saiw.co.za – 011 298 2111 for further information

RADIOGRAPHIC TESTING - SAIW CERTIFICATION NDT SCHEME (ISO 9712) NON-DESTRUCTIVE TESTING - VOLUMETRIC METHODS											
NDT Method and Level	Industrial Sector	Product Sector / Category	Duration 1 day = 8 hours	Prices (Inclusive of VAT)			Course & Initial Exam Dates				
				Training & Initial Examination Non-Corporate Members	Training & Initial Examination Corporate Members	Initial Certification					
Radiographic Testing Level 1 + RT Safety	Pre- and in-service	RT 1.5 X-Ray of Dense Alloy Welds RT 1.6 Gamma-Ray of Dense Alloy Welds	Training 15 days Exam 5 days	R 49,990	R 46,240	R 2,780	Course Code	RT 1 A - JHB 01	RT 1 A - JHB 02	RT 1 A - JHB 03	
							Training	17 Jan - 04 Feb	06 - 27 Jun	31 Oct - 18 Nov	
							Exam	07 - 11 Feb	28 Jun - 01 Jul	21 - 25 Nov	
LIMITED Radiographic Interpreters Level 2	Pre- and in-service	Film Interpretation of Dense Alloy Welds Only (No operational RT)	Training 9 days Exam 1 day	R 30,025	R 27,770	R 2,780	Course Code	RT 2 INT - JHB 01	RT 2 INT - JHB 02	RT 2 INT - JHB 03	RT 2 INT - JHB 04
							Training	21 Feb - 03 Mar	03 - 12 May	25 Jul - 04 Aug	29 Aug - 08 Sep
							Exam	04 Mar	13 May	05 Aug	09 Sept
							Course Code	RT 2 INT - DBN 01			
							Training	24 Oct - 03 Nov			
							Exam	04 Nov			
							Course Code	RT 2 INT - CPT 01	RT 2 INT - CPT 02		
Training	04 - 14 Jul	21 Nov - 01 Dec									
Exam	15 Jul	02 Dec									
Radiographic Testing Level 2	Pre- and in-service	RT 2.5 X-Ray of Dense Alloy Welds RT 2.6 Gamma-Ray of dense Alloy Welds	Training 10 days Exam 5 days	R 37,490	R 34,680	R 2,780	Course Code	RT 2 A - JHB 01			
							Training	16 - 27 May			
							Exam	30 May - 03 Jun			
ADVANCED see point [1]	Pre- and in-service	RT 2.9 Digital Radiography	Training 10 days Exam 5 days	R 37,490	R 34,680	R 2,780	Course Code	Please refer to our website for more information			
							Training				
							Exam				

*** OTHER CATEGORIES AVAILABLE ON REQUEST AND SUBJECT TO DEMAND. [1] RT 2 A CERTIFICATION IS REQUIRED AS PREREQUISITE**



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Ultrasonic Testing

COURSE INFORMATION

Ultrasonic Testing (UT) method utilises mechanical vibration within the ultrasonic range (> 20kHz) to detect volumetric discontinuities within solid materials.

Both compression and shear waves are used to investigate the internal nature of components while the interaction of waves with linear, planar or volumetric 'vacancies' are used to characterise any discontinuities detected.

The sound beam is the primary inspection medium and both the qualification (properties) and quantification (calibration) thereof is essential for the interpretation of signal response. If you enjoy playing pool and have a knack for geometry and trigonometry, then we invite you

to attend an ultrasonic testing course. It will change the way that you look at any engineering material or weldment. Compression and shear wave applications having various angles and frequencies are building blocks for determining the techniques used.

Also the send-or-receive / send-and-receive capabilities of the sensors are some of the technique parameters together with the scanning methodology used for example the tandem technique.

The training course is based on general theory as well as sector specific applications relating, but not limited to, the following standards and specifications:

- ASME Boiler & Pressure Vessel Code - Section V - Subsection A - Article 1, 4 & 5
- ASME Boiler & Pressure Vessel Code - Section V - Subsection B - Article 23
- ISO 16810 UT – General Principles
- ISO 11666 UT – Acceptance Levels
- ISO 17640 UT – Techniques, Testing levels and assessment
- ISO 23279 UT – Characterisation of discontinuities in welds
- ISO 5577 UT – Vocabulary
- ISO 18175 UT – Performance characteristics (no electronic instruments)
- ISO 16827 UT – Characterisation and sizing of discontinuities
- ISO 16826 UT – Discontinuities perpendicular to the surface
- ISO 16811 UT – Sensitivity and range
- ISO 12710 UT – Evaluating electronic characteristics of UT instruments
- ISO 10375 UT – Characterisation of search unit and sound field
- ISO 7963 UT – Calibration block No 2
- ISO 4992 Parts 1 & 2 UT – Steel castings
- ISO 2400 UT – Calibration block No 1
- ISO 22232 Parts 1/3 UT – Equipment characterisation

Details of specific codes utilised in the limited (UT 1.WT) as well as derived or advanced techniques courses (UT 2.7; 2.8; 2.9; 2.10 and 2.11) can be found in the relevant training documents.

Please contact course administrator on ndt@saiw.co.za – 011 298 2111 for further information

ULTRASONIC TESTING - SAIW CERTIFICATION NDT SCHEME (ISO 9712) NON-DESTRUCTIVE TESTING - VOLUMETRIC METHODS												
NDT Method and Level	Industrial Sector	Product Sector / Category	Duration 1 day = 8 hours	Prices (Inclusive of VAT)			Course & Initial Exam Dates					
				Training & Initial Examination Non-Corporate Members	Training & Initial Examination Corporate Members	Initial Certification						
LIMITED Ultrasonic Testing Level 1 Limited – Wall Thickness	Pre- and in-service	Limited to wall thickness measurement using compression probe only	Training 4 days Exam 1 day	R 16,470	R 15,235	R 2,780	Course Code	UT 1 WT - JHB 01	UT 1 WT - JHB 02	UT 1 WT - JHB 03	UT 1 WT - JHB 04	
							Training	27 - 30 Jun	25 - 28 Jul	12 - 15 Sept	07 - 10 Nov	
							Exam	01 Jul	29 Jul	16 Sept	11 Nov	
							Course Code	UT 1 WT - DBN 01	UT 1 WT - DBN 02			
							Training	27 - 30 Jun	28 Nov - 01 Dec			
							Exam	01 Jul	02 Dec			
							Course Code	UT 1 WT - CPT 01	UT 1 WT - CPT 02	UT 1 WT - CPT 03		
							Training	31 Jan - 03 Feb	25 - 28 Jul	05 - 08 Dec		
							Exam	04 Feb	29 Jul	09 Dec		
							Ultrasonic Testing Level 1	Pre- and in-service	UT 1.1 Wrought Product/Forgings UT 1.2 Castings UT 1.3 Butt Welds in Plate UT 1.4 Butt Welds in Pipe	Training 12 days Exam 3 days	R 37,495	R 34,680
Training	21 Feb - 08 Mar	03 - 18 May	29 Aug - 13 Sep									
Exam	09 - 11 Mar	19 - 23 May	14 - 16 Sep									
Course Code	UT 1 A - DNB 01	UT 1 A - CPT 01										
Training	31 Jan - 15 Feb	29 Aug - 13 Sep										
Exam	16 - 18 Feb	14 - 16 Sep										
Ultrasonic Testing Level 2	Pre- and in-service	UT 2.1 Wrought Product/Forgings UT 2.2 Castings UT 2.3 Butt Welds in Plate UT 2.4 Butt Welds in Pipe UT 2.5 T-joints & other configurations UT 2.6 Nozzles	Training 12 days Exam 3 days	R 37,495	R 34,680	R 2,780	Course Code	UT 2 A - JHB 01	UT 2 A - DNB 01	UT 2 A - CPT 01		
							Training	09 - 24 May	27 Jun - 12 Jul	27 Jun - 12 Jul		
							Exam	25 - 27 May	13 - 15 Jul	13 - 15 Jul		
ADVANCED	Pre- and in-service	UT 2.10 Ultrasonic Phased Array	Training 12 days Exam 5 days	R 62,430	R 57,750	R 2,780	Course Code	Please refer to our website for updates relating to advanced / derived techniques.				
							Training					
							Exam					

PLEASE NOTE: ADVANCED OPTIONS UT 2.8 - CRITICAL FLAW SIZING; UT 2.9 - AUSTENITIC STAINLESS STEEL AND UT 2.11 - TIME OF FLIGHT DIFFRACTION ARE AVAILABLE ON REQUEST AND SUBJECT TO DEMAND. [1] UT 2 A CERTIFICATION IS REQUIRED AS PREREQUISITE



Scan this QR code to download the SAIW Course Prospectus App onto your cellular phone.

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Portable Hardness Testing

COURSE INFORMATION

The main purpose of hardness testing is to determine the suitability of a material for a given application.

Conventional hardness testers, like Rockwell, Brinell or Vickers machines, require the test piece be brought to the testing device, but this is not always possible.

Portable hardness testing devices have been developed that permit in-situ hardness measurements thus offering quick and economical supplements to conventional, stationary testing machines.

This three day course will define hardness, conventional methods of hardness testing and various methods of portable hardness testing. Practical session during the course will give hands on experience on the portable hardness testing machines with various samples ranging from steel, stainless steel, aluminium and plastics.

After the course, the person will be competent to undertake in-situ hardness testing.

COURSE DURATION

2 days + 1 day exam

PRICING (Including VAT)

Corporate Member **R 9,595**

Non-Corporate Member **R 10,375**

JOHANNESBURG

	HRS	JHB 1	JHB 2
<ul style="list-style-type: none">Principles of hardness testing – various techniquesSimilarities and differences between portable and conventional hardness testingImportance of calibration and surface preparationBehaviour of different materials	16	20 - 21 Jun	24 - 25 Oct
Examination	8	22 Jun	26 Oct



Replica Metallography

COURSE INFORMATION

Metallographic inspections play a key role in determining the remaining life assessment, creep life of pressure vessels, pipelines, power plants and in verifying the material and heat treatment of fabricated equipment.

In those instances, destructive metallographic tests are unsuitable as further usability of the component is required. Replica metallographic technique is an *in-situ*, non-destructive technique to reveal the microstructure of components.

The usual method of metallographic investigation involves cutting pieces from the component so that laboratory preparation and examination can be performed. However, in replica metallography, after proper surface preparation through the use of cellulose acetate sheets, the technician makes a copy (for this reason it is called “replica”) of the microstructure of the metal surface, which will be examined using an optical microscope. The

four day course on replica metallography will give an insight into the different types of materials, importance of metallography, and how to do lab metallography and replica metallography. On successful completion of the course, the candidate will be a competent replica technician. Evaluation of the metallographs is undertaken by a qualified metallurgist.



Scan this QR code to download the SAIW Course Prospectus App onto your cellular phone.

COURSE DURATION

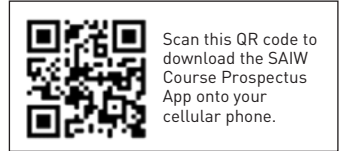
3 days + 1 day exam

PRICING (Including VAT)

Corporate Member **R 12,790**
 Non-Corporate Member **R 13,830**

JOHANNESBURG			
	HRS	JHB 1	JHB 2
<ul style="list-style-type: none"> Principles of metallography Similarities and differences between on-site and laboratory surface preparation Etching of samples/surfaces and importance of time and temperature Placement of acetate film and final transfer to optical slide Importance of proper identification of replicated area 	24	22 - 23 Aug	07 - 08 Nov
Examination	Theory - 2 hrs + Prac - 4 hrs	24 Aug	09 Nov

LEVEL 3 ELEGIBILITY PRACTICAL EXAMINATIONS	
MT Level 2	On request
PT Level 2	On request
RT Level 2	On request
UT Level2	On request



NON-DESTRUCTIVE TESTING – LEVEL 3 – BASIC & MAIN METHODS SAIW CERTIFICATION NDT LEVEL 3 – ISO 9712								
NDT Method and Level	Industrial Sector	Product Sector / Category	Duration 1 day = 8 hours	Prices (Inclusive of VAT)			Course & Initial Exam Dates	
				Training & Initial Examination Non-Corporate Members	Training & Initial Examination Corporate Members	Initial Certification		
NDT Level 3: Basic	Pre- and in-service	Part A: Materials & Processes Part B: Qual & Cert Schemes Part C: NDT Level 2	Training 10 days Exam 1 day	R 33,025	R 30,550	R 2,780	Course Code	NDT 3 A - JHB 01
							Training	TBA
							Exam	TBA
Magnetic Testing: Level 3 (Main Method)	Pre- and in-service	Part D: (Gen) + Parts E1 & E2 (Specific + codes) + Part F (Procedure) Forgings (f), Castings (c) & Welds (w)	Training 5 days Exam 2 days	R 24,200	R 22,390	R 2,780	Course Code	MT 3 A - JHB 01
							Training	TBA
							Exam	TBA
Penetrant Testing: Level 3 (Main Method)	Pre- and in-service	Part D: (Gen) + Parts E1 & E2 (Specific + codes) + Part F (Procedure) Forgings (f), Castings (c) & Welds (w)	Training 5 days Exam 2 days	R 24,200	R 22,390	R 2,780	Course Code	PT 3 A - JHB 01
							Training	TBA
							Exam	TBA
Radiographic Testing: Level 3 (Main Method)	Pre- and in-service	Part D: (Gen) + Parts E1 & E2 (Specific + codes) + Part F (Procedure) Welds in Dense Alloys: X and Gamma	Training 5 days Exam 2 days	R 24,200	R 22,390	R 2,780	Course Code	RT 3 A - JHB 01
							Training	TBA
							Exam	TBA
Ultrasonic Testing: Level 3 (Main Method)	Pre- and in-service	Part D: (Gen) + Parts E1 & E2 (Specific + codes) + Part F (Procedure) Forgings (f), Castings (c) & Welds (w) - all categories	Training 5 days Exam 2 days	R 24,200	R 22,390	R 2,780	Course Code	UT 3 A - JHB 01
							Training	TBA
							Exam	TBA

PLEASE NOTE: EDDY CURRENT TESTING & VISUAL TESTING LEVEL 3 ARE AVAILABLE ON REQUEST AND SUBJECT TO DEMAND.

RE-WRITES	
Basic/MT/PT	On request
Basic/MT/PT/RT/UT	On request

NON-DESTRUCTIVE TESTING CPD COURSES						
Course Name	Details	Duration 1 day - 8 hours	Prices (Inclusive of VAT)		Course & Initial Exam Dates	
			Training & Initial Examination Non-Corporate Members	Training & Initial Examination Corporate Members		
ASME - Eddy Current Testing Code Application	Refer to website for list of applicable sections covered	Training 2 days Exam N/A - Assignments	R 7,725	R 7,150	Course Code	ASME - ECT - JHB 01
					Training	On request
					Exam	N/A
ASME - Liquid Penetrant Testing Code Application	Refer to website for list of applicable sections covered	Training 2 days Exam N/A - Assignments	R 7,725	R 7,150	Course Code	ASME - PT - JHB 01
					Training	23 - 24 Mar
					Exam	N/A
ASME - Magnetic Particle Testing Code Application	Refer to website for list of applicable sections covered	Training 2 days Exam N/A - Assignments	R 7,725	R 7,150	Course Code	ASME - MT - JHB 01
					Training	28 - 29 Mar
					Exam	N/A
ASME - Visual Testing Code Application	Refer to website for list of applicable sections covered	Training 2 days Exam N/A - Assignments	R 7,725	R 7,150	Course Code	ASME - VT - JHB 01
					Training	On request
					Exam	N/A
ASME - Radiographic Testing Code Application	Refer to website for list of applicable sections covered	Training 2 days Exam N/A - Assignments	R 7,725	R 7,150	Course Code	ASME - RT - JHB 01
					Training	06 - 07 Apr
					Exam	N/A
ASME - Ultrasonic Testing Code Application	Refer to website for list of applicable sections covered	Training 2 days Exam N/A - Assignments	R 7,725	R 7,150	Course Code	ASME - UT - JHB 01
					Training	03 - 04 May
					Exam	N/A
ISO - Eddy Current Testing Code Application	Refer to website for list of applicable sections covered	Training 2 days Exam N/A - Assignments	R 7,725	R 7,150	Course Code	ISO - ECT - JHB 01
					Training	On request
					Exam	N/A
ISO - Liquid Penetrant Testing Code Application	Refer to website for list of applicable sections covered	Training 2 days Exam N/A - Assignments	R 7,725	R 7,150	Course Code	ISO - PT - JHB 01
					Training	24 - 25 Jan
					Exam	N/A
ISO - Magnetic Particle Testing Code Application	Refer to website for list of applicable sections covered	Training 2 days Exam N/A - Assignments	R 7,725	R 7,150	Course Code	ISO - MT - JHB 01
					Training	31 Jan - 01 Feb
					Exam	N/A
ISO - Visual Testing Code Application	Refer to website for list of applicable sections covered	Training 2 days Exam N/A - Assignments	R 7,725	R 7,150	Course Code	ISO - VT - JHB 01
					Training	On request
					Exam	N/A
ISO - Radiographic Testing Code Application	Refer to website for list of applicable sections covered	Training 2 days Exam N/A - Assignments	R 7,725	R 7,150	Course Code	ISO - RT - JHB 01
					Training	28 Feb - 01 Mar
					Exam	N/A
ISO - Ultrasonic Testing Code Application	Refer to website for list of applicable sections covered	Training 2 days Exam N/A - Assignments	R 7,725	R 7,150	Course Code	ISO - UT - JHB 01
					Training	07 - 08 Mar
					Exam	N/A

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