ICNDT Certification Workshop

SINGAPORE NDT CERTIFICATION

NDTSS - SGNDT Certification Scheme in compliance with ISO 9712:2021 & SS ISO 9712:2022

Contents

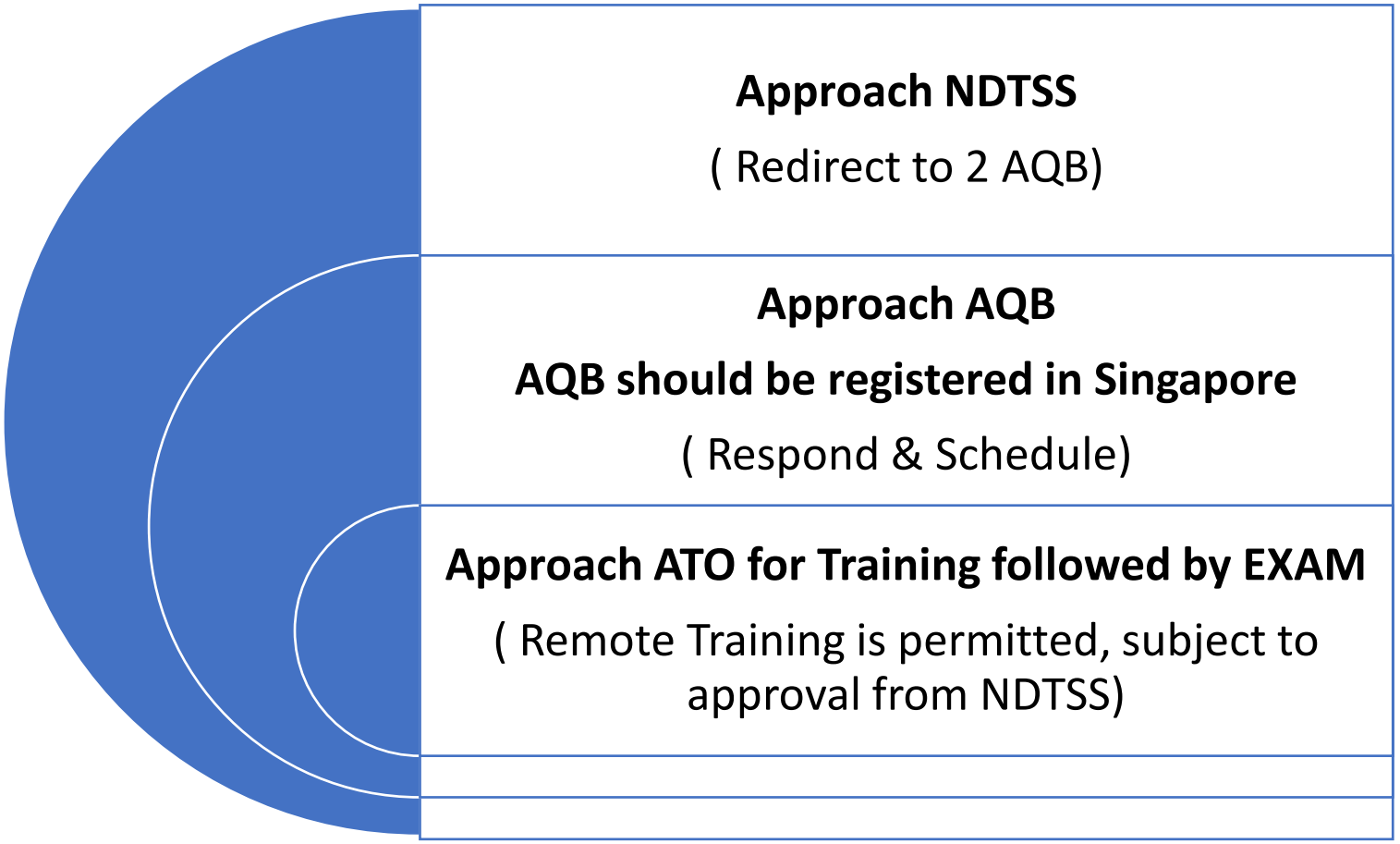
- Application Process
- Impartiality, Confidentiality, Integrity
- Security of Examinations
- Scheme Manual update
- Process of Renewal, Recertification (New forms), Structured Credit system
- Conducting Examination, Invigilation process
- Records & returning of documents to NDTSS.
- Certification Mark

Q&A session

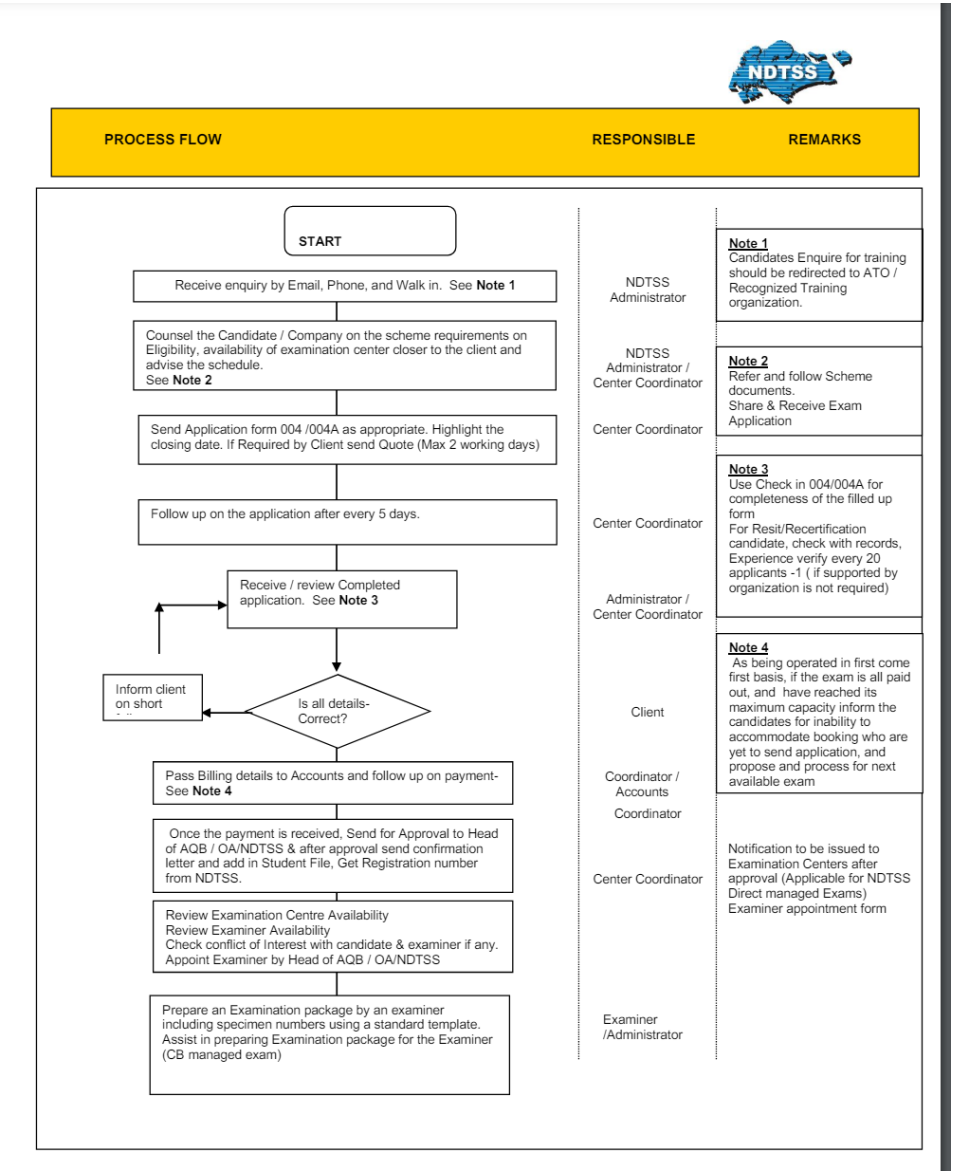
Application Process

Chapter 1

Application Process

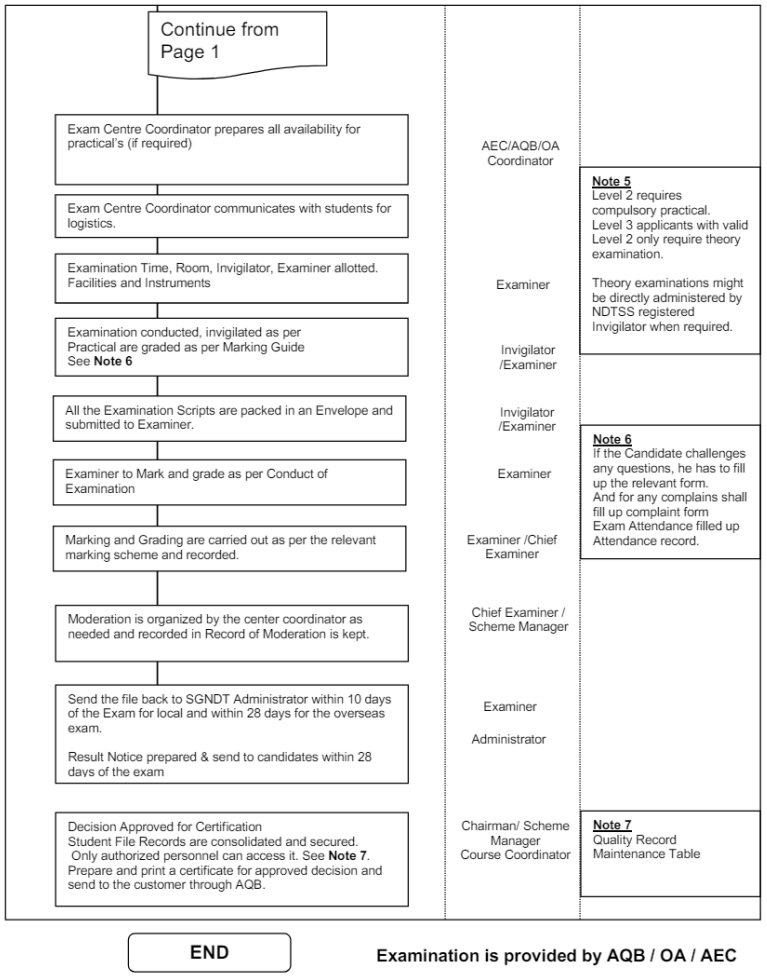


NDTSS Flow Chart



- https://ndtss.org.sg/wp-content/uploads/2023/05/NDTSS-Flow-Chart-WI-002-Rev-2.pdf

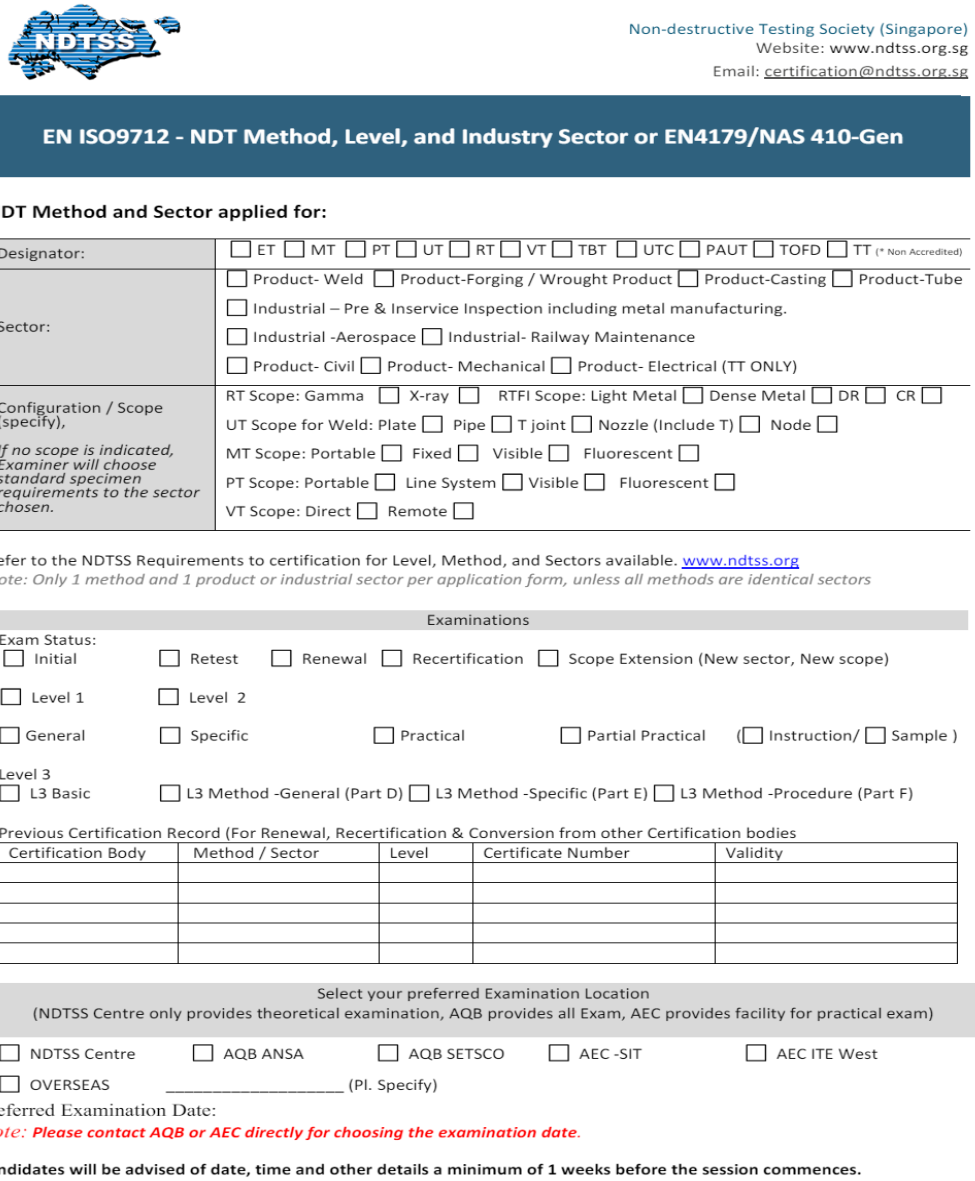
NDTSS Flow Chart



- https://ndtss.org.sg/wp-content/uploads/2023/05/NDTSS-Flow-Chart-WI-002-Rev-2.pdf

Type of Application

- Cert by Exam, One form per method to be used (004, Rev 5)



Non-destructive Testing Society (Singapore)
Website: www.ndtss.org.sg
Email: certification@ndtss.org.sg

EN ISO9712 - NDT Method, Level, and Industry Sector or EN4179/NAS 410-Gen

NDT Method and Sector applied for:

Designator:	☐ ET ☐ MT ☐ PT ☐ UT ☐ RT ☐ VT ☐ TBT ☐ UTC ☐ PAUT ☐ TOFD ☐ TT (* Non Accredited)
Sector:	☐ Product- Weld ☐ Product-Forging / Wrought Product ☐ Product-Casting ☐ Product-Tube ☐ Industrial – Pre & Inservice Inspection including metal manufacturing. ☐ Industrial -Aerospace ☐ Industrial- Railway Maintenance ☐ Product- Civil ☐ Product- Mechanical ☐ Product- Electrical (TT ONLY)
Configuration / Scope (specify), *If no scope is indicated, Examiner will choose standard specimen requirements to the sector chosen.*	RT Scope: Gamma ☐ X-ray ☐ RTFI Scope: Light Metal ☐ Dense Metal ☐ DR ☐ CR ☐ UT Scope for Weld: Plate ☐ Pipe ☐ T joint ☐ Nozzle (Include T) ☐ Node ☐ MT Scope: Portable ☐ Fixed ☐ Visible ☐ Fluorescent ☐ PT Scope: Portable ☐ Line System ☐ Visible ☐ Fluorescent ☐ VT Scope: Direct ☐ Remote ☐

Refer to the NDTSS Requirements to certification for Level, Method, and Sectors available. www.ndtss.org
Note: Only 1 method and 1 product or industrial sector per application form, unless all methods are identical sectors

Examinations

Exam Status:
☐ Initial ☐ Retest ☐ Renewal ☐ Recertification ☐ Scope Extension (New sector, New scope)

☐ Level 1 ☐ Level 2

☐ General ☐ Specific ☐ Practical ☐ Partial Practical (☐ Instruction/ ☐ Sample)

Level 3
☐ L3 Basic ☐ L3 Method -General (Part D) ☐ L3 Method -Specific (Part E) ☐ L3 Method -Procedure (Part F)

Previous Certification Record (For Renewal, Recertification & Conversion from other Certification bodies

Certification Body	Method / Sector	Level	Certificate Number	Validity

Select your preferred Examination Location
(NDTSS Centre only provides theoretical examination, AQB provides all Exam, AEC provides facility for practical exam)

☐ NDTSS Centre ☐ AQB ANSA ☐ AQB SETSCO ☐ AEC -SIT ☐ AEC ITE West
☐ OVERSEAS _____ (Pl. Specify)

Preferred Examination Date:
Note: ***Please contact AQB or AEC directly for choosing the examination date.***

Candidates will be advised of date, time and other details a minimum of 1 weeks before the session commences.

Verification of Application

Non-destructive Testing Society (Singapore)
Website: www.ndtss.org.sg
Email: certification@ndtss.org.sg

Invoicing/Receipt Details

Invoice to be made to ☐ Applicant ☐ Company ☐ Other (Please Provide Details) _____

The Application, when fully completed should be **Printed** and **Signed** where required.
This form along with supporting attachments should be forwarded to the Exam Center
I have submitted all the required documents in order, and I confirm the information provided are true and I understand if any documents proven forged, I would be barred from any NDTSS examinations for 2 years for violating code of ethics

Signature of Applicant: _____ Date: _____

ADMINISTRATION USE BY NDTSS /AQB ONLY

Payment Completed (Yes / No / NA)	
Examination Exemption Details	
Practical Exemption Granted (State Reason) YES / NO / NA	
Method General / Part D (State Reason) YES / NO / NA	
Method Specific / Part E (State Reason) YES / NO / NA	
Practical – Instruction writing / Part F Procedure Granted (State Reason) YES / NO / NA	
Basic Part A, Part C Granted (ASNT / ISO Level 3 Cert Holder)	Yes / No / NA
Basic Part B Granted (Current SGNDT Cert Holder)	Yes / No / NA
Training Exemption Details	
50 % Training Hours Granted (State Reasons)	YES / NO

ACCEPTANCE OF APPLICATION	
Application form	Acceptable / Not Acceptable
Eye Fitness Form	Acceptable / Not Acceptable
Experience form (Pre or Post)	Acceptable / Not Acceptable
Training Record	Acceptable / Not Acceptable
Special Condition (if any) Additional Time for Examination	
APPROVED FOR EXAM – NDTSS / AQB	*NAME:* *SIGNATURE:* *DATE*

Incomplete Application will not be accepted.

Type of Application

- Renewal by Points, Recertification by Points
- Form 004A, Rev 2 – One form per multiple methods, Appendix A(One per method)

Remarks (In case of not approved)	

10.2 Renewal Approval (AQB/EXAM CENTRE) –

Criteria for Verification	Result	Remark
Application form	Comply / Not Complied	
Experience	Comply / Not Complied	
Vision Requirement	Comply / Not Complied	
Structural Credit System	Comply / Not Complied	
Recommendation (In case not complied)		

EXAMINER: _____ (Name) SIGNATURE: _____

FILE REFERENCE: _____

Chop of AQB/ EXAM CENTER

Appendix A: STRUCTURED CREDIT SYSTEM SUMMARY OF POINTS

Name: **Method:** **Sector:** **Level:**

Previous Certificate Number:

S. No	Description	Year to Date Points (Filled by applicant)	Total Points	Accepted by AQB *(Filled by examiner)*
	Points Max per Year			
A1	Performing NDT Activity, 2 points per day- 25 Max			(Max 95)
A2	Completion of theoretical training in the method (1point per day) -5 Max			(Max 15)
A3	Completion of practical training in the method (2point per day)10 Max			(Max 25)
A4	Delivery of practical or theoretical training in NDT in the method considered (1 point per day) 15 Max Level 2 & Level 3 only			(Max 75)
A5	Participation in research activities in NDT field or for engineering of NDT (1 point per week) 15 Max per year			(Max 60)
6	Participation to a technical seminar/paper in the field of the method or technique 1 per day (2 Max)			(Max 10)
7	Presenting a technical seminar/ paper in the field of the method or technique 1 per presentation (3 Max)			(Max 15)
8	Current individual membership in NDT or NDT related society 1 per membership, (2 Max)			(Max 5)
9	Technical oversight and Mentoring of NDT personnel / Trainee in the relevant method 2 per mentee (10 Max)			(Max 30- L2 / 40-L3)
10	Participation or convenorship in standardization and technical committees. 1 per committee (3 Max for L2, 4 Max for L3)			(Max 15- L2 / 20-L3)
11	Performing a technical NDT role within a certification body 2 per activity (Max 10)			(Max 30- L2 / 40-L3)
	Total Points			

Application for Recertification –Mutual Recognition

- **USE form 004C, Rev 3 (One form per method)**

1. Conversion from Certification (ISO 9712:2012) to NDTSS Certification w.e.f. 02.03.2022 would require

- Full Practical Examination for Level 2
- Part B, Part E & Full Practical Examination for Level 3

Certificate Validity will be 5 years from the date of issue

2. For All other Conversion,

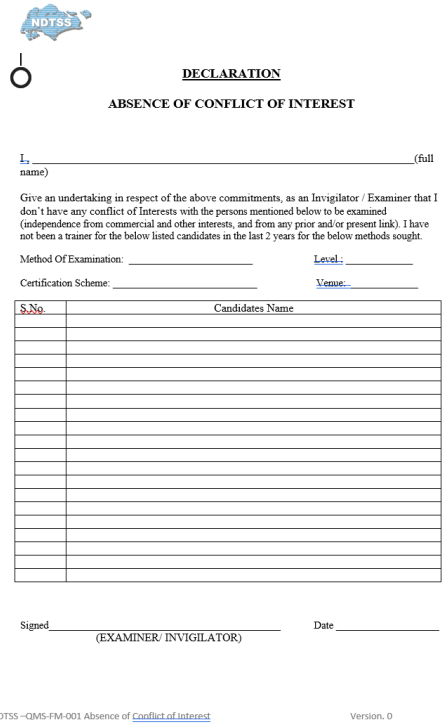
Certificate should be issued to ISO 9712:2021 & should be issued from a Certification body recognized under IAF MRA for ISO/IEC 17024 & ICNDT / EFNDT MRA Listed Certified body in Schedule 2 with examination held at acceptable center as defined in scheme manual

Certificate Validity will match with the previous issued certification body

NDTSS Recognizes Schedule 2 MRA of ICNDT

Impartiality, Integrity, Confidentiality

- All staffs should sign the impartiality & confidentiality declaration form (QMS-FM-002 rev 0)
- Examiner and Invigilator should submit the form to NDTSS
- Both shall receive appointment letter from NDTSS before start to function
- No conflict with candidate QMS-FM-001 rev 0
- (No common employer, 2 years being a trainer)
- Code of conduct signed by Candidate with application form



DECLARATION

ABSENCE OF CONFLICT OF INTEREST

I, _____(full name)

Give an undertaking in respect of the above commitments, as an Invigilator / Examiner that I don't have any conflict of Interests with the persons mentioned below to be examined (independence from commercial and other interests, and from any prior and/or present link). I have not been a trainer for the below listed candidates in the last 2 years for the below methods sought.

Method Of Examination: _____ Level: _____

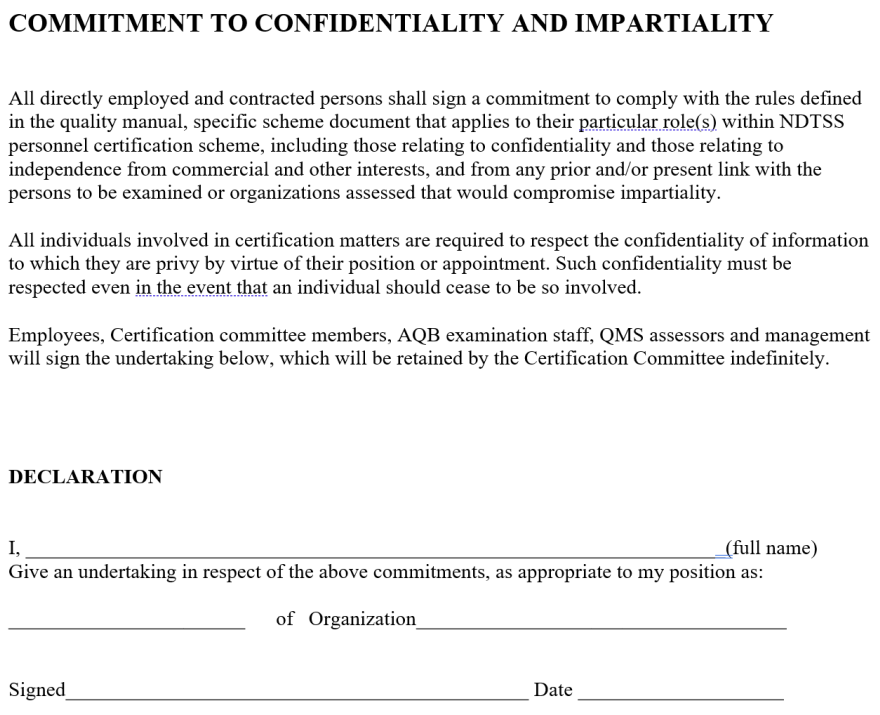
Certification Scheme: _____ Venue: _____

S.No.	Candidates Name

Signed_____ Date _____

(EXAMINER/ INVIGILATOR)

NDTSS –QMS-FM-001 Absence of Conflict of Interest Version. 0



COMMITMENT TO CONFIDENTIALITY AND IMPARTIALITY

All directly employed and contracted persons shall sign a commitment to comply with the rules defined in the quality manual, specific scheme document that applies to their particular role(s) within NDTSS personnel certification scheme, including those relating to confidentiality and those relating to independence from commercial and other interests, and from any prior and/or present link with the persons to be examined or organizations assessed that would compromise impartiality.

All individuals involved in certification matters are required to respect the confidentiality of information to which they are privy by virtue of their position or appointment. Such confidentiality must be respected even in the event that an individual should cease to be so involved.

Employees, Certification committee members, AQB examination staff, QMS assessors and management will sign the undertaking below, which will be retained by the Certification Committee indefinitely.

DECLARATION

I, _____(full name)

Give an undertaking in respect of the above commitments, as appropriate to my position as:

_____ of Organization_____

Signed_____ Date _____

Student Record file

- Filled application form (original)- OP_FM_004
- Eye fitness certificate (copy)- OP_FM_003 Rev 2
- Precertification experience (for initial/retest)- OP_FM_006_Rev0
- Post certification experience (for renewal / recert)-OP_FM_006A-Rev1
  (This form is issued to all candidate with the certificate & 004A)
- Education certificate
- Training completion certificate (stating days / hours)
- Code of Ethics
- Result Notification from AQB
- Photograph - Digital

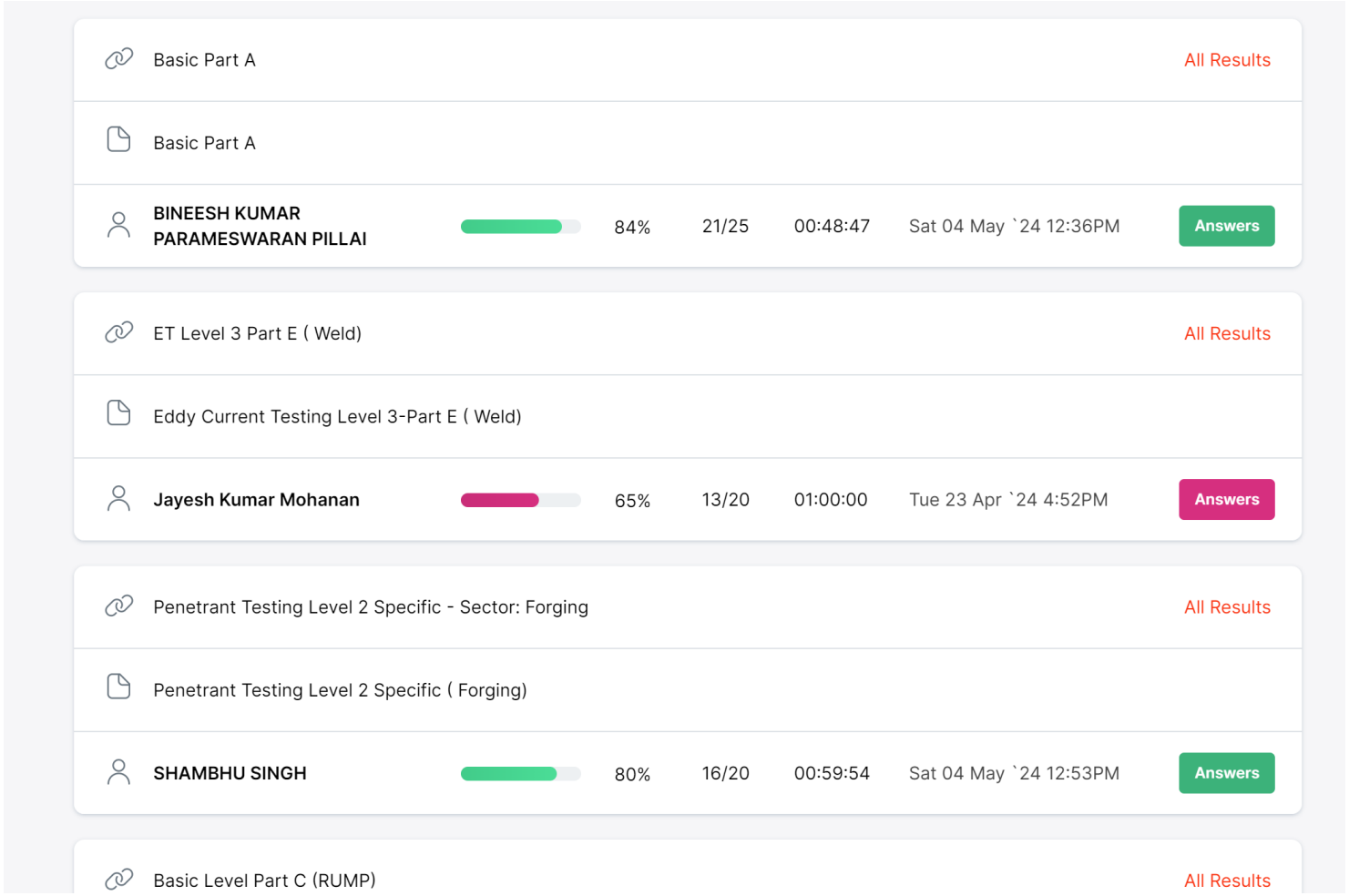
Security of Examination

Chapter 2

Procedure for security

- Exam papers will be issued to AQB by email to authorized person
- AQB shall save it in their local drive (only assessed by authorized examiner) and delete this email, A transmittal is provided from NDTSS
- It is AQB responsibility to ensure paper is available prior to exam for the exam authorized
- AQB shall reissue to AEC (maximum of 2 set per paper) and should issue on each set by transmittal as required.
- Exam specimens at center shall be locked always and kept by examiner.
- Exam specimens in transition for cleaning shall be secured and done under the supervision of authorized invigilator.
- NDTSS is in transition to E-exam from the database, hence papers wont be generated in unlimited manner

ONLINE EXAMINATION



Procedure for Security – Refer QMP-008 rev 2

- For this procedure, the following materials are considered as ‘” Examination Materials”
- 1- Question papers received from NDTSS
- 2- Draft Question Bank Prepared by the Examiners
- 3- Computers Holding the Examination Data
- 4- Examination Scripts of the Candidates
- 5- Result Records
- 6- Specimen usage records
- 7- Master Results of Specimen
- 8- Review of Question Papers
- 9- Review of Course Content

Scheme Manual Update

Chapter 3

Scheme Manual Rev 9

NON-DESTRUCTIVE TESTING SOCIETY (SINGAPORE)
9 Jurong Townhall Road #02-21, SINGAPORE-609431
Website: www.ndtss.org.sg Email: membership@ndtss.org.sg

Quality Assurance Documents

Scheme Manual – SGNDT Certification

Requirements for Qualification & Certification of NDT Personnel

Prepared By:	Dickson Tan **Chairman-Certification**	Date: 30.01.2022
Reviewed By:	**Sajeesh Kumar Babu** **President NDTSS**	Date: 30.01.2022
Approved By:	Sajeesh Kumar BABU **President NDTSS / Head CB**	Date: 30.01.2022

Issued to	**Implementation Date: From 1st July 2022**	

Revision Summary

9	Updated Scheme manual in accordance with ISO 9712:2021	30.01.2022
8	Updated Typographical Errors & Page setting	10.04.2021
7	Replace board to committee throughout the document & clause 5.2.2	28.02.2021
6	Updated RT Experience Requirements, Clause 3.7 Pg. 18	20.03.2020
5	Corrected Typo errors & updated scope table	20.03.2017
4	Clause 1.2, 8.0 including 8.1 to 8.4 is revised to detail reduction, suspension & withdrawal	19.02.2017
3	Updated all relevant methods & clause 1.2	12.02.2017
2	Updated document clause 1.1, 1.2,1.6, 3.8,5.1 & NDTSS code of ethics	15.12.2016
1	Totally Revised including AINDT Scheme document	15.07.2016
0	Initial Issue	15.03.2012
Rev.	***Description***	***Date***

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1.3 SCOPE

This document describes the NDTSS process for the qualification and certification of personnel who perform industrial non-destructive tests.

Specific details of the certification available at each level in the various NDT methods and industry/product sectors are contained within this document.

1.4 REFERENCES

1.4.1 Standards

- ISO/IEC17024:2012- General requirements for bodies operating certification systems of persons
- CEN ISO/TR 25107: Non-destructive testing – Guidelines for NDT training syllabuses (ISO/TR 25107)
- CEN ISO/TR 25108: Non-destructive testing – Guidelines for NDT personnel training organisations (ISO/TR 25108)
- ISO 9712-2021: Non-destructive testing - Qualification and certification of personnel

1.5 TERMS AND DEFINITIONS

For the purposes of this document, the following terms and definitions apply.

1.5.1 Authorised qualification body

Body, independent of the employer, authorized by the certification body to prepare and administer examinations

1.5.2 Basic examination

Written examination, at Level 3, which demonstrates the candidate's knowledge of the materials science and process technology and types of discontinuities, the specific qualification and certification system, and the basic principles of NDT methods as required for Level 2.

1.5.3 Candidate

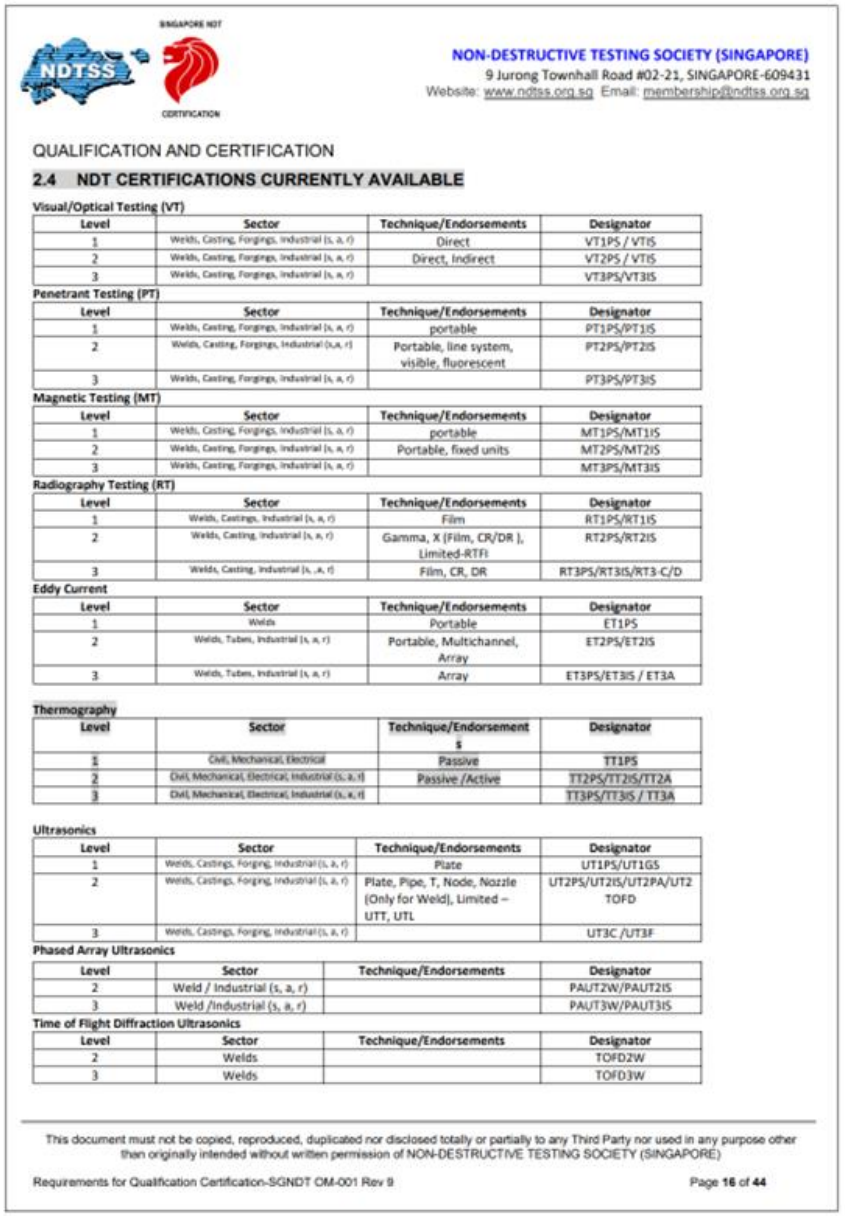
Applicant who has fulfilled specified prerequisites and has been admitted to the certification process.

1.5.4 Certificate

Document in the form of a letter issued by a certification body under the provisions of this document, indicating that the named person has fulfilled the certification requirements.

This document must not be copied, reproduced, duplicated nor disclosed totally or partially to any Third Party nor used in any purpose other than originally intended without written permission of NON-DESTRUCTIVE TESTING SOCIETY (SINGAPORE)

Cert Scheme Availability



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QUALIFICATION AND CERTIFICATION

2.4 NDT CERTIFICATIONS CURRENTLY AVAILABLE

Visual/Optical Testing (VT)

Level	Sector	Technique/Endorsements	Designator
1	Welds, Casting, Forgings, Industrial (s, a, r)	Direct	VT1PS / VTIS
2	Welds, Casting, Forgings, Industrial (s, a, r)	Direct, Indirect	VT2PS / VTIS
3	Welds, Casting, Forgings, Industrial (s, a, r)		VT3PS/VT3IS

Penetrant Testing (PT)

Level	Sector	Technique/Endorsements	Designator
1	Welds, Casting, Forgings, Industrial (s, a, r)	portable	PT1PS/PT1IS
2	Welds, Casting, Forgings, Industrial (s,a, r)	Portable, line system, visible, fluorescent	PT2PS/PT2IS
3	Welds, Casting, Forgings, Industrial (s, a, r)		PT3PS/PT3IS

Magnetic Testing (MT)

Level	Sector	Technique/Endorsements	Designator
1	Welds, Casting, Forgings, Industrial (s, a, r)	portable	MT1PS/MT1IS
2	Welds, Casting, Forgings, Industrial (s, a, r)	Portable, fixed units	MT2PS/MT2IS
3	Welds, Casting, Forgings, Industrial (s, a, r)		MT3PS/MT3IS

Radiography Testing (RT)

Level	Sector	Technique/Endorsements	Designator
1	Welds, Castings, Industrial (s, a, r)	Film	RT1PS/RT1IS
2	Welds, Casting, Industrial (s, a, r)	Gamma, X (Film, CR/DR), Limited-RTFI	RT2PS/RT2IS
3	Welds, Casting, Industrial (s, ,a, r)	Film, CR, DR	RT3PS/RT3IS/RT3-C/D

Eddy Current

Level	Sector	Technique/Endorsements	Designator
1	Welds	Portable	ET1PS
2	Welds, Tubes, Industrial (s, a, r)	Portable, Multichannel, Array	ET2PS/ET2IS
3	Welds, Tubes, Industrial (s, a, r)	Array	ET3PS/ET3IS / ET3A

Thermography

Level	Sector	Technique/Endorsements	Designator
1	Civil, Mechanical, Electrical	Passive	TT1PS
2	Civil, Mechanical, Electrical, Industrial (s, a, r)	Passive /Active	TT2PS/TT2IS/TT2A
3	Civil, Mechanical, Electrical, Industrial (s, a, r)		TT3PS/TT3IS / TT3A

Ultrasonics

Level	Sector	Technique/Endorsements	Designator
1	Welds, Castings, Forging, Industrial (s, a, r)	Plate	UT1PS/UT1GS
2	Welds, Castings, Forging, Industrial (s, a, r)	Plate, Pipe, T, Node, Nozzle (Only for Weld), Limited – UTT, UTL	UT2PS/UT2IS/UT2PA/UT2 TOFD
3	Welds, Castings, Forging, Industrial (s, a, r)		UT3C /UT3F

Phased Array Ultrasonics

Level	Sector	Technique/Endorsements	Designator
2	Weld / Industrial (s, a, r)		PAUT2W/PAUT2IS
3	Weld /Industrial (s, a, r)		PAUT3W/PAUT3IS

Time of Flight Diffraction Ultrasonics

Level	Sector	Technique/Endorsements	Designator
2	Welds		TOFD2W
3	Welds		TOFD3W

SS ISO 9712 NDT - QUALIFICATION AND CERTIFICATION OF NDT PERSONNEL

SCOPE OF THE STANDARD


Acoustic emission testing

The certification covers proficiency in one or more of the following methods:

- acoustic emission testing;
- eddy current testing;
- infrared thermographic testing;
- leak testing (hydraulic pressure tests excluded);
- magnetic testing;
- penetrant testing;
- radiographic testing;


Eddy current testing


Leaking testing


Infrared thermographic testing


Radiographic testing


Magnetic testing

SS ISO 9712 NDT - QUALIFICATION AND CERTIFICATION OF NDT PERSONNEL

KEY CHANGES TO SS ISO 9712:2022

— clarified responsibilities for the certification body, the authorized qualification body, the examination centre and the employer;

— added and revised definitions;

— defined responsibilities for examiners and referees;

— revised requirements for the duration of training and industrial experience;

— modified requirements for visual acuity testing;

— revised requirements for examinations;

— included an option for the use of a psychometric process at the discretion of the certification body;

— revised requirements for the certification documents;

— revised requirements for the conditions of certification;

— added requirements for candidates for the renewal of certificates;

— revised structured credit system for Level 3 recertification;

— included a new Annex F for techniques;

included a new Annex G for psychometric principles;

— other minor technical and editorial changes.

Terms & Definition

- 3.8
- certification process
- activities by which a certification body (3.6) determines that a person fulfils certification requirements (3.9), including application, assessment, decision on certification, renewal (3.36), recertification (3.34) and use of certificates (3.5) and logos/marks
- 3.9
- certification requirements
- set of specified requirements, including requirements of the scheme to be fulfilled in order to establish or maintain certification

Terms & Definition

3.45

supervision

act of directing the application of NDT performed by other NDT personnel (3.26), which includes the control of actions involved in the preparation of the test, performance of the test and reporting of the results

qualified supervision (Not Anymore)

supervision of candidates gaining experience by NDT personnel certified in the same method under supervision or by non-certified personnel who, in the opinion of the certification body, possess the knowledge, skill, training, and experience required to properly perform such supervision

Responsibilities - Examiner

Examiners shall:

— be authorized by the certification body to conduct, supervise and grade examinations;

— be certified to Level 3 in the NDT method in the product and/or industrial sector for which they are authorized.

5.8.2 An examiner shall not be permitted to examine any candidate:

— that they have trained for the examination for a period of two years from the date of the conclusion of the training;

— who is working (permanently or temporarily) in the same facility as the examiner unless the certification body has established a documented confidentiality and impartiality management procedure for such a situation.

Training

7.2.1 The candidate shall provide documentary evidence, acceptable to the certification body, that he or she has satisfactorily completed NDT training as shown in Table 2 in the method and level for which the certification is sought.

For all levels, theoretical training may be delivered in a face-to-face instructor-led format, distance learning format, a self-paced format, or a combination of these formats. Practical training shall be delivered by a face-to-face instructor-led format only. **The training for initial certification shall remain valid for a maximum period of ten years from the date of completion.**

For Level 3, in addition to the minimum training requirements given in Table 2, the preparation for qualification can be completed in different ways dependent on the scientific and technical background of the candidate, including attendance at other training courses, conferences or seminars, studying books, periodicals and other specialized printed or electronic materials.

When a distance learning option is utilized, systems shall be established to ensure the entire training syllabus is completed.

Training

Table 2 — Minimum training requirements

NDT method		Level 1 h	Level 2 h	Level 3 h
AT		40	64	48
ET		40	48	48
LT	B — Pressure method	24	32	32
	C — Tracer gas method	24	40	40
MT		16	24	32
PT		16	24	24
ST		16	24	20
TT		40	80	40
RT		40	80	40
UT		40	80	40
VT		16	24	24

NOTE For RT, training hours do not include radiation safety training.

Obsolete

Table 2 — Minimum training requirements

NDT method	Level 1 days[a]	Level 2 days[a]	Level 3 days[a]
AT	5	8	5
ET	5	6	6
LT	5	9	6
MT	3	2	4
PT	3	2	3
RT[b]	5	10	5
ST	2	3	2
TT	5	6	5
UT	8	10	5
VT	3	2	3

[a] One day duration is at least seven hours, which can be achieved on a single day or by accumulating hours.

[b] For RT, training days does not include radiation safety training.

NOTE 1 In the case of specific techniques, see Annex F.

for candidates who have graduated in a relevant subject from technical college or university or have completed at least two years of relevant engineering or science study at college or university (or equivalent formal education), the total required training duration may be reduced by up to 50 %; the certification body shall specify relevant subjects and their qualification.

Experience

2.10 MINIMUM NDT TRAINING & EXPERIENCE – ISO 9712:2021

NDT Method	Level 1		Level 2		Level 3	
	Training (days)	Total Experience (days)	Training (days)	Total Experience (days) Direct Access	Training (days)	Total Experience (days) (Higher Education/Grammar School)
Eddy Current Testing (ET)	5	45	6	180	6	270/450
Magnetic Testing (MT)	3	15	2	60	4	180/240
Penetrant Testing (PT)	3	15	2	60	3	180/240
Radiographic Testing (RT-F)	5	45	10	180	5	270/450
Computerised/Digital Radiography (RT-D/RT-CT)	5	+15	5	+45	5	+70/150
Ultrasonic Testing (UT)	8	45	10	180	5	270/450
Phased Array (PAUT)	5	+15	5	+45	5	+70/150
TOFD	5	+15	5	+45	5	+70/150
Visual Testing (VT)	3	15	2	60	3	180/240
Thermographic Testing (TT)	5	45	6	180	5	270/450

One day duration is at least seven hours, which can be achieved on a single day or by accumulating hours. The maximum allowable hours in any one day is 12 hours. Experience in days is achieved by dividing the total accumulated hours by 7.
Candidate for Level 3 (direct access) who doesn't have valid ISO 9712 Level 2 should have double the experience and approved only for higher education.
If the experience record is issued in months, 20 workdays per month will be recognized.

Table 3 — Minimum industrial experience

Obsolete

NDT method	Experience months[a]		
	Level 1	Level 2	Level 3
AT, ET, LT, RT, TT, UT	3	9	18
MT, PT, ST, VT	1	3	12

[a] Work experience is based on a nominal 40 h/week or the legal week of work. When an individual works in excess of 40 h/week, he may be credited with experience based on the total hours, but he shall be required to produce evidence of this experience.

Table 3 — Minimum industrial experience

NDT method	Experience in days[a]					
	Level 1	Level 2		Level 3		
		with Level 1	direct access	higher education, with Level 2	with Level 2	direct access with higher education
AT, ET, LT, RT, TT, UT	45	135	180	270	450	540
MT, PT, ST, VT	15	45	60	180	240	360

[a] One day duration is at least seven hours, which can be achieved on a single day or by accumulating hours. The maximum allowable hours in any one day is 12 hours. Experience in days is achieved by dividing the total accumulated hours by 7.

Reduction in Experience

A certified Level 1, 2 or 3 adding an additional method may be permitted a reduction of required experience of 25 % for that additional method.

A certified Level 1, 2 or 3 individual changing sector, adding another sector or technique for the same NDT method **shall be required to gain additional experience of at least 25 % of the experience required** in Table 3; and this shall never be less than 15 days in duration.

Up to 50 % of the industrial experience time may be achieved by a structured experience program (SEP). **One day of attendance at the SEP may be equivalent to a maximum of five days industrial experience**.

NDTSS – Trainee Certificate (Level 1/2)

NON-DESTRUCTIVE TESTING SOCIETY (SINGAPORE)
9, Jurong Town Hall Road, #02-21, Singapore – 609431
Tel: +65-6257 0370 / Email: treasurer@ndtss.org.sg / www.ndtss.org.sg

File No: A0171- TR01

This is to that certify the individual named below has successfully appeared for a Level 2 examination in

Eddy Current Testing (Weld sector)

on 16th September 2022

He has successfully passed all sections of the mandated examinations and will be awarded the ISO 9712 certification on fulfilment of the minimum experience requirements.

SURYA RAVICHANDRAN

NDT Trainee – **ET (Weld)**

Valid until 15 September 2024.

On behalf of the Non-Destructive Testing Society (Singapore)

_____

Dickson Tan

Administering Vision Test

- 7.4.4 Personnel administering vision tests
- Near vision acuity testing, colour vision and/or grey scale perception verification(s) **shall be administered by a licensed physician, nurse, ophthalmologist or optometrist**; or by another trained professional who is approved and documented by a Level 3 personnel acting on behalf of the employer.

Examinations Overview

- The process used for the development and selection of examination questions shall be specified in a procedure prepared by the certification body. It shall ensure the questions are appropriate for the relevant syllabus for the method/technique/sector, and for the level of certification.
- The process shall be designed to ensure the comparability of results of examinations using methods such as peer group review, input from subject matter experts, statistical comparisons, and, where the size of the examination cohort allows, psychometric principles may be used as specified in Annex G.
- The certification body shall establish a documented appropriate methodology and procedures to ensure fairness, validity, reliability, and general performance of examinations to maintain an acceptable pass grade of 70 % for all examinations.

Examination Elements

For Level 1 the examination shall consist of the following examination elements:

— general examination element;

— specific examination element;

— practical examination element.

For Level 2 the examination shall consist of the following examination elements:

— general examination element;

— specific examination element;

— practical examination element;

— NDT instruction writing element.

Examination Time

The certification body shall specify and publish the maximum amount of time allowed for the candidate to complete each examination element, which shall be based upon the following.

For Level 1 and Level 2, the total time for the examination elements shall be based on two minutes per multiple choice examination question for general examination element and three minutes per multiple choice examination question for specific examination element.

For questions requiring narrative answers, Level 3 item F, NDT instruction writing element, and for the practical examination element, the time allowed shall be determined by the certification body.

For Level 3, the total time for the examination elements shall be based on three minutes per multiple choice examination question in items B and E and two minutes for items A, C and D.

Grading of practical Exam

Table 4 — Subjects and weighting factors for grading — Practical examination element

Item	Subject	Weighting factor	
		Level 1	Level 2
		%	%
1	Knowledge of NDT equipment and NDT media.	20	10
2	Application of NDT method	35	26
3	The detection of indications or discontinuities and reporting	45	64
Total		100	100
Table D.1 gives guidance on additional details on each item, to be taken into account, as applicable by the examiner.			

Grading of practical Exam

D.1 Grading of Level 1 and Level 2 practical examination element —percentile weighting

Table D.1 — Percentile weighting for practical examination element for Levels 1 and 2

Subject	% maximum (Level 1)	% maximum (Level 2)
Item 1 — Knowledge of the NDT equipment and/or NDT media:		
a) system and/or media knowledge and control;	10	5
b) validity of verifications and/or media.	10	5
Total	**20**	**10**
Item 2 — Application of the NDT method:		
a) preparation of the specimen (i.e. surface condition), including visual examination;	5	2
b) for Level 2, the selection of the NDT technique and determination of operating conditions;	n/a	10
c) setting up of the NDT apparatus and performance of the test;	25	12
d) post test procedures (i.e. demagnetization, cleaning, preservation).	5	2
Total	**35**	**26**
Item 3 — Detection of discontinuities and reporting:		
a) detection of mandatory reportable indications;	20	18
b) characterization of indications (if applicable with respect to the test method: type, position, orientation, apparent dimensions, etc.);	15	18
c) Level 2 evaluation against code, standard, specification or procedure criteria;	n/a	18
d) production of the test report.	10	10
Total	**45**	**64**
Total items 1, 2 and 3	**100**	**100**

Written Instruction

- NDT instruction writing (Level 2 candidates)

	% maximum
a) foreword (scope, reference documents)	5
b) personnel	5
c) equipment/media to be used	5
d) product (description or drawing, including area of interest and purpose of the test)	10
e) test conditions, including preparation for testing	10
f) detailed instructions for application of the test, including settings	40
g) recording and classifying of the test results	20
h) reporting the results	5
TOTAL	100

Re examination

A candidate who fails one or more elements of an examination (i.e. general, specific, practical etc.) **may retake the failed examination no more than twice**:

a) after a minimum time of one month (which may be reduced if further training acceptable to the certification body has been satisfactorily completed);

b) no later than two years after the initial examination.

A candidate failing two re-examinations on one or more elements shall complete further training, acceptable to the certification body, and be required to retake all examination elements.

Supplementary Examination

Supplementary examinations

8.6.1 A certified Level 1 or Level 2 individual changing sectors or adding another sector for the same NDT method shall be required to take sector specific and practical examination elements for the new sector.

Level 2 shall also be required to write the NDT instruction for the new sector.

Scope Extension

The certification body shall specify requirements for scope extension for situations where an individual seeks extension of their scope of certification for an existing certification (i.e. additional product sector).

At the discretion of the certification body:

a) the additional scope may be added to the existing certification and the original period of validity maintained; or

b) a new certificate with a new period of validity may be issued for the extension to scope only.

Certifications Issued by Other Cert Body

- 9.4.1 A certification body may consider certification issued by another certification body. If so, the certification body shall do so in accordance with a documented process. Where the certification body takes into account work performed by another body, it shall have appropriate reports, data and records to demonstrate that the results are equivalent and conform to the requirements established by the certification scheme.
- 9.4.2 This process shall consider the granting of credit for valid certification including a review of education, training, experience, vision and examination requirements of the originating certification body. The review may allow the certification body to recognize the general theory part of a method examination. The review may also allow the certification body to recognize the specific and/or practical examination elements but only when the method/technique, industry/product sector are appropriate.
- 9.4.3 Where the prior certification is accepted without any additional examination, **the expiry of the new certification shall not extend beyond that of the prior certification nor shall extend the scope of certification.**

Renewal

a) documentary evidence of a satisfactory near vision acuity examination taken within the preceding 12 months; and

b) documentary evidence of a satisfactory colour vision and/or grey scale perception examination taken within the preceding 60 months; and

c) verifiable documentary evidence of continued satisfactory work activity without significant interruption in the method and sector for which certificate renewal is sought; and either

d) successful completion of a practical examination element in accordance with 11.2.2 except that it shall consist of a minimum of 50 % of the examination specimens required by 11.2.2; **or**

e) successfully meeting the requirements of the structured credit system as given in 10.2 and Annex C.

If the criterion c) for renewal is not met, the individual shall complete the practical examination elements required by 11.2.2.

Structured Credit System

Where a candidate elects to use the structured credit system, they shall provide evidence to the certification body to demonstrate achievement of **a minimum of 100 points** in the 5 year renewal period based on the requirements of Table C.1.

For candidates seeking renewal of Level 2 or 3 certificates, a minimum of 50 of the 100 points is required for any combination of activities listed in part A of Table C.1.

Where a candidate is seeking renewal for more than one certificate, points granted for a specific activity can be applied to the total points required for each certificate for those activities not specific to a particular method (e.g. “Current individual membership in NDT or NDT related society”). However, candidates shall meet the total number of points required **(i.e. 100 points) for each certificate for which renewal is being sought.**

The renewal application should be made to the certification body before the date of the expiration of the certification and **shall be no later than 12 months** after the date of expiration of the certificate.

Validity of Renewal

If the renewal application is received prior to or on the date of expiration of the certificate, the renewal date of the new certificate shall be the same as the date of expiration of the certificate (i.e. no interruption in certification). The date of expiration of the new certificate shall be no more than 5 years from the date of expiration of the original certificate.

If the renewal application is received after the date of expiration of the certificate, the renewal date of the new certificate shall be the date on which all requirements for renewal are met. In this case, there shall have been an interruption in the certification period. The date of expiration of the new certificate shall be no more than 5 years from the date of expiration of the original certificate.

Recertification

11.2.2 The individual shall successfully complete the practical examination element which demonstrates continued competence to carry out work within the scope specified on the certificate.

This shall include testing specimens (see Annex B) appropriate to the scope of recertification and in addition, for Level 2, the production of a written instruction suitable for the use of Level 1 personnel (see 8.2.4.1).

If the individual fails to achieve a grade of at least 70 % for each specimen tested (weighted according to the guidance in Table 4), and, for Level 2, for the instruction, two re-examinations of the recertification examination shall be allowed after at least 7 days and within 12 months of the first attempt at the recertification examination.

Level 3 Recertification

- For certificate holders seeking recertification of Level 3 certification:
- — a minimum of 50 and a maximum of 70 of the 100 points is required for any combination of activities listed in item A of Table C.1; and
- — a minimum of 30 and a maximum of 50 of the 100 points is required for any combination of activities listed in item B of Table C.1.

- 11.3.3 Where a certificate holder elects to take the written examination or does not meet the structured credit system requirements, they shall successfully complete an examination that includes:
- a) a minimum of 20 multiple-choice questions on the application of the test method in the sector(s) concerned which demonstrates an understanding of current NDT techniques, standards, codes or specifications, and applied technology; and
- b) a minimum of 10 multiple-choice questions on the requirements of the certification body’s certification scheme.

Structured Credit System – Part A

Table C.1 — Structured credit system for renewal Level 1, 2 and 3 and for Level 3 recertification [a]

		Level 1			Level 2			Level 3		
Item	Activity	Points granted per activity	Maximum number of points per year of activity	Maximum number of points over 5 years of activity	Points granted per activity	Maximum number of points per year of activity	Maximum number of points over 5 years of activity	Points granted per activity	Maximum number of points per year of activity	Maximum number of points over 5 years of activity
	Part A									
1	**Performance of NDT Activities [a]**	2 / day	25	95	2 / day	25	95	2 / day	25	95
2	**Completion of theoretical training in the method**	1 / day	5	15	1 / day	5	15	1 / day	5	15
3	**Completion of practical training in the method**	2 / day	10	25	2 / day	10	25	2 / day	10	25
4	**Delivery of practical or theoretical training in NDT in the method considered**	N/A	N/A	N/A	1 / day	15	75	1 / day	15	75
5	**Participation in research activities in NDT field or for engineering of NDT (see Annex E)**	1 / week	15	60	1 / week	15	60	1 / week	15	60
	Part B									

Structured Credit System – Part B

Table C.1 — Structured credit system for renewal Level 1, 2 and 3 and for Level 3 recertification [a]

Item	Activity	Level 1			Level 2			Level 3		
		Points granted per activity	Maximum number of points per year of activity	Maximum number of points over 5 years of activity	Points granted per activity	Maximum number of points per year of activity	Maximum number of points over 5 years of activity	Points granted per activity	Maximum number of points per year of activity	Maximum number of points over 5 years of activity
	Part B									
6	**Participation to a technical seminar/paper in the field of the method or technique**	1 / day	2	10	1 / day	2	10	1 / day	2	10
7	**Presenting a technical seminar/ paper in the field of the method or technique**	1 / presentation	3	15	1 / presentation	3	15	1 / presentation	3	15
8	**Current individual membership in NDT or NDT related society**	1 / membership	2	5	1 / membership	2	5	1 / membership	2	5
9	**Technical oversight and mentoring of NDT personnel/ trainee in the relevant method**	N/A	N/A	N/A	2 / mentee	10	30	2 / mentee	10	40
10	**Participation or convenorship in standardization and technical committees**	N/A	N/A	N/A	1 / committee	3	15	1 / committee	4	20
11	**Performing a technical NDT role within a certification body**	N/A	N/A	N/A	2 / activity	10	30	2 / activity	10	40

NOTE Where the term "year(s)" is noted in this table, this is specified as a certification year and not as a calendar year.

[a] See C.2 for specific details of this activity.

Product Sectors

- — **metallic materials:**
- a) castings (c) (ferrous and nonferrous materials);
- b) forgings (f) (all types of forgings: ferrous and non-ferrous materials);
- c) welds (w) (all types of welds, including soldering, for ferrous and non-ferrous materials);
- d) tubes and pipes (t) (seamless, welded, ferrous and non-ferrous materials, including flat products for the manufacturing of welded pipes);
- e) wrought products (wp) except forgings (i.e. plates, bar, rods);
- — **composite materials:**
- f) cement matrix composites (cc);
- g) reinforced plastics, such as fibre–reinforced polymers (frp);
- h) metal matrix composites (mmc);
- i) ceramic matrix composites (cmc).

Industrial Sectors

- Sectors combining a number of product sectors including all or some products or specified materials (i.e. ferrous and non-ferrous metals or non-metals like ceramics, plastics, and composites):
- a) manufacturing (m);
- b) pre- and in-service testing which includes manufacturing (s);
- c) railway maintenance (r);
- d) aerospace (a).

Practical Examination

- For a product sector related practical examination elements:
- Candidates shall be required to test a minimum of two specimens and for multiple product sectors, a minimum of one from each product sector.
- For an industrial sector related practical examination elements:
- **Candidates shall be required to test at least two specimens (SGNDT requirement is still 3 specimens)**, representative of products typically tested in the industrial sector.
- For RT candidates:
- Level 1 and Level 2 candidates shall radiograph at least two specimens. Level 2 candidates, already certified as Level 1, shall radiograph at least one specimen.
- In addition to taking radiographs, Level 2 candidates shall interpret a set of at least **10 film** images or 10 digital radiographic images. This set shall be considered as one specimen.

SS ISO 9712 NDT - QUALIFICATION AND CERTIFICATION OF NDT

PAUT / TOFT

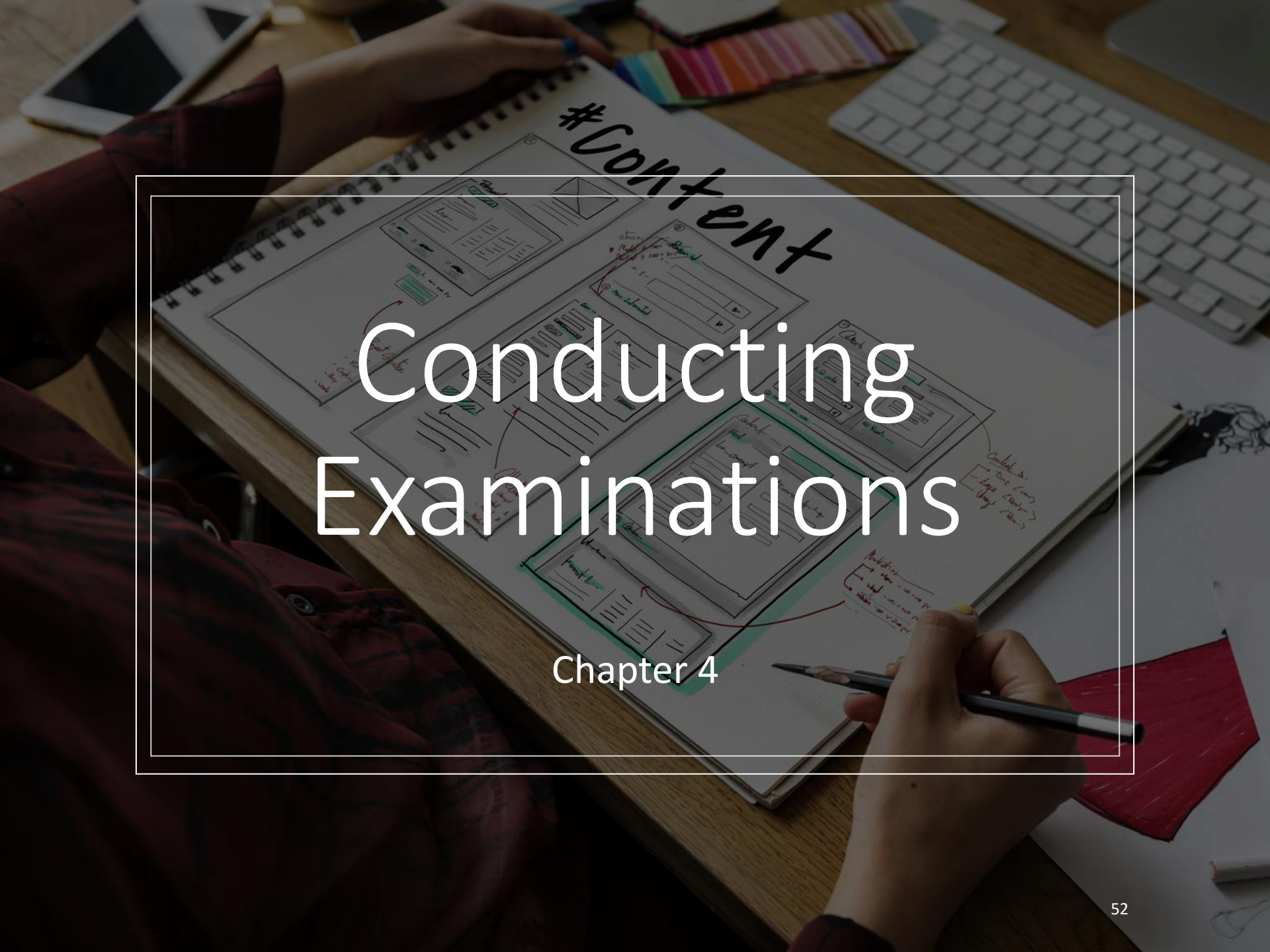
PAUT & TOFD TECHNIQUES ARE INCLUDED IN THE CURRENT STANDARD

ble F.3 — Ultrasonic testing (UT) techniques additional training requirements

Technique	Abbreviated term	Training requirements (days)		
		Level 1	Level 2	Level 3
UT (as per Table 2)		8	10	5
Time of flight	UT-TOFD	5	5	N/A
Phased array	UT- PA	5	5	N/A

Table F.4 — Ultrasonic testing (UT) techniques additional prerequisites

Technique	Level 1	Level 2	Level 3
UT – TOFD	UT 1	UT 2	N/A
UT – PA	UT 1	UT 2	N/A
NOTE The level stated in the table is the minimum acceptable level of certification. A Level 3 certificate holder satisfies this requirement.			



Conducting Examinations

Chapter 4

Procedure

Conducting_Examination-NDTSS-QMP009_Rev6.pdf

- Prior to Exam, An exam notification shall be send to Certification body to notify and get an approval from Certification Chair.
- Mentioning candidate, method, paper to be used, sample to be used, examiner or invigilator
- Upon confirmation from NDTSS
- AQB shall appoint the examiner using examiner appointment form (OP-FM-007 for Level 2, OP-FM-007A for Level 3)
- Read the Instruction WI-001
- Invigilator shall brief the candidate and get signed OP-FM-008
- Get signed the attendance
- Note down the time in the white board & start the process

Forms - Technical

<u>All practical forms should be NDTSS forms</u>

E.G Instruction writing, Report writing, Practical check list, Marking for Level 2, procedure marking

Invigilator should record the observation during examination in the Level 2 marking check list

Records

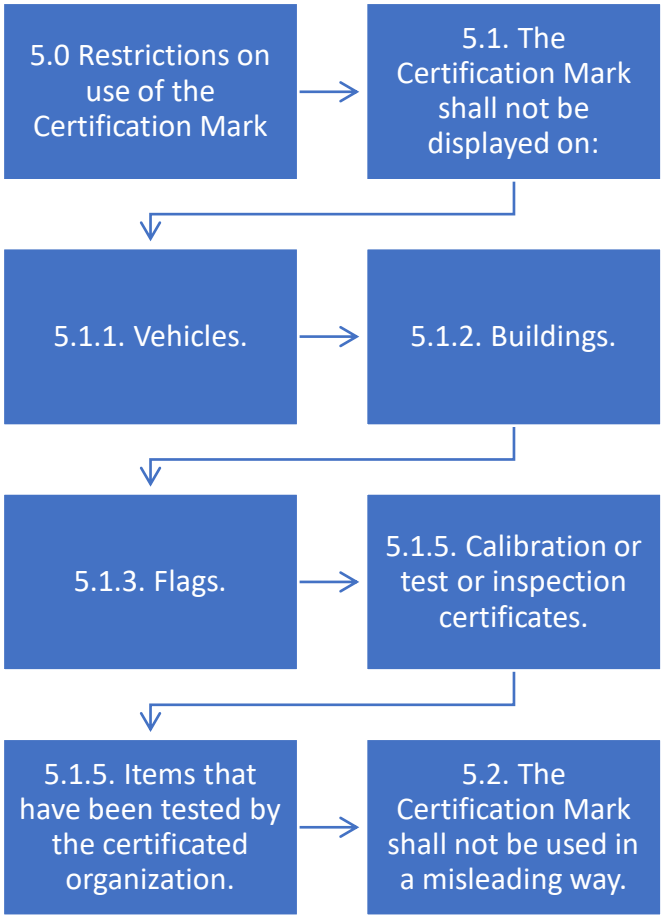
All Records shall be send to NDTSS from AQB

With the recommendation for certificate (summary)

Notification of exam results

NDTSS will generate decision & Issue the certificate and file all records in NDTSS records office in Jurong town Hall

Certification Mark



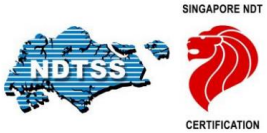


Figure 1

2. Definitions

2.1. SGNDT Certification Mark: That mark shown at figure 1 of which contain the letters "**SINGAPORE NDT CERTIFICATION**" in Arial. The official colors of the Lion Head symbol are red (Pantone 032), white and black, the official color of NDTSS Mark is Azzure Blue with white letters.

3. Certification Mark

3.1. The Certification mark may be used in the form shown at figure 1 provided the organization is authorized by NDTSS and:

3.1.1. the mark of the organization is also shown.

3.1.2. it is shown with no more prominence than the mark or title of the organization concerned.

3.1.3. figure 1 is printed in a single color or dual color as shown in figure 1 and detailed in clause 2.1, which suits the predominant color of the stationery.

3.1.4. Embossed, relief or stamped versions of the mark may not be used without prior written permission from NDTSS. Embossed self-inked stamp could be ordered and purchased from NDTSS for every certified individual for a fee of $80/- including local ordinary postage delivery.

Date : 05 May 2022

Page : 1 of 1

Accreditation Field : Personnel Certification

The accreditation covers the following scope(s):

- Qualification and certification of personnel engaged in non-destructive testing

S/N	NDT Method	Level	Sector
1.	Eddy Current Testing (ET)	1, 2, 3	Product/Industrial (ISO 9712: 2012 and ISO 9712: 2021)
2.	Magnetic Testing (MT)	1, 2, 3	
3.	Penetrant Testing (PT)	1, 2, 3	
4.	Ultrasonic Testing (UT)	1, 2, 3	
5.	Radiographic Testing (RT)	1, 2, 3	
6.	Phased Array Ultrasonic Testing (PAUT)	2, 3	
7.	Time of Flight Diffraction Testing (TOFD)	2, 3	
8.	Visual Testing (VT)	1, 2, 3	
9.	Tank Bottom Testing (TBT)	2	Product (ISO 20807: 2004)
10.	Ultrasonic Corrosion Mapping (UTC)	2	

Standard used for certification: ISO 9712:2012 Non-destructive testing – Qualification and certification of NDT personnel

ISO 9712:2021 Non-destructive testing – Qualification and certification of NDT personnel

ISO 20807:2004 Non-destructive testing -- Qualification of personnel for limited application of non-destructive testing

SINGAPORE NDT CERTIFICATION

Scope of Certification

4th Singapore International NDT Conference & Exhibition (SINCE 2022)

LAUNCH CEREMONY OF SS ISO 9712 & NDT STANDARDS

Dr Sajeesh Kumar BABU
President, NDTSS
Convenor, NMWG on ISO/TC 135 NDT

Ms CHOY Sauw Kook
Director General
Quality & Standards, Enterprise Singapore

Dr Norikazu OOKA
President
Asia Pacific Federation for Non-Destructive Testing

4th Singapore International NDT Conference & Exhibition (SINCE

TO PURCHASE THE STANDARDS

SS ISO 9712 & NDT STANDARDS IS LAUNCHED

OTHER SINGAPORE STANDARDS ON NDT

S/N	Reference	Title of standard
1	**SS ISO 9712:2022**	Non-destructive testing — Qualification and certification of NDT personnel
2	**SS ISO 18490:2022**	Non-destructive testing — Evaluation of vision acuity of NDT personnel
3	**SS ISO 20807:2022**	Non-destructive testing — Qualification of personnel for limited application of non-destructive testing
4	**TR ISO/TS 22809:2022**	Non-destructive testing — Discontinuities in specimens for use in qualification
5	**TR ISO/TS 25107:2022**	Non-destructive testing — NDT training syllabuses
6	**TR ISO/TS 25108: 2022**	Non-destructive testing — NDT personnel training organizations
7	**TR ISO/TS 11774:2022**	Non-destructive testing — Performance-based qualification

Thank you