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Inspectors of Pressurised Equipment

Non-Metallics (Polymeric and composites)

Guidelines for application for certification

1. **Scope:**

SANS 10227 : 2007 – Code of practice for the evaluation of the technical competence of inspection authorities for the certification of vessels under pressure, requires that personnel responsible for inspection, testing and verification of non-destructive testing shall have sound technical knowledge and certification, which meets the minimum requirements of the South African Qualification and Certification Committee for Inspectors of Pressurised Equipment

This document provides guidelines and requirements for application for certification as an Inspector of Pressurised Equipment-Non -Metallics

2. **Objectives:**

The objective of this document is to ensure that a standard process is followed for application for certification of Inspectors of Pressurised Equipment-Non -metallics

3. **Responsibilities:**

It is the responsibility of:

- 3.1 the applicant to complete SAQCC-IPE-NM certification application forms.
- 3.2 the SAQCC-IPE administrator to provide the applicant with certification application forms and to forward the completed forms and supporting documents to the SAQCC-IPE committee for assessment and to inform applicants of assessment results.
- 3.3 the SAQCC-IPE committee to assess applications for IPE-NM certification, in accordance with this document.

4. **Requirements for certification:**

Every applicant for IPE-NM certification is required to complete the prescribe certification application form and furnish proof of qualifications, acceptable to SAQCC-IPE, which substantiate that the applicant:

- 4.1 has proven knowledge of welding and fabrication inspection non-metallics
- 4.2 has proven knowledge of the content of design and manufacturing codes commonly used in industry.
- 4.3 has proven knowledge of the Occupational Health and Safety Act, 1993 (Act 85 of 1993) and/or the Mineral Act. 1991 (Act 50 of 1991)
- 4.4 has met the minimum practical and classroom training requirements as detailed in this document. Satisfactory completion of each of the eighteen tasks on five different vessels required for practical training shall be verified by the certified IPE-NM responsible for the training of the applicant. The certified IPE-NM is required to sign and affix his IPE-NM certification number to each completed inspection task on the practical training record. In addition, each applicant is required to provide documentary proof of the completion of each of the individual inspection tasks. This proof can be in the form of inspection reports, visit reports, quality control plans or other relevant documentation acceptable to SAQCC-IPE. These documents must be verified by the certified IPE-NM involved in the training and must clearly indicate the involvement of the trainee. The minimum duration of training accepted by SAQCC-IPE is two years.
- 4.5 is capable and physically able to perform all activities involved in the duties of an IPE-NM and shall:
 - submit a record of visual acuity tested within the six months prior to the date of application or re-application. This must be submitted on the standard SAQCC-IPE vision record form and must be an original document signed and stamped by the optometrist. This vision test record shall certify that the applicant is able to read J1 (or N5) letters on the standard Jaeger or equivalent test chart at 300 mm and J7 (or N10) at 1000 mm, with at least one corrected eye or uncorrected eye and of at least 6/6 on a Snellen chart or orthorator, and
 - have clinically assessed normal fields of vision

5. General:

Application forms are available from:

The Administration Controller (Certification)
SAIW Certification
52 Western Boulevard, Off Main Reef Rd,
CITY WEST
2092

Telephone no: (011) 298-2100
e-mail: cert@saiw.co.za

Application forms may also be downloaded from the SAIW website at: www.saiw.co.za

- 5.1 The applicant shall return the application together with all supporting documentation to the Administrator. All supporting documentation must be original or verified copies. Verification should be done by a Commissioner of Oaths or equivalent authority.
- 5.2 Applicants may be requested to present themselves for a professional interview with the SAQCC-IPE committee and will be advised in writing should such an interview be required.
- 5.3 Applicants will be advised in writing as to whether their application has been successful or unsuccessful.
- 5.4 Unsuccessful applicants may appeal in writing on the certification decision of the SAQCC-IPE committee and request further information as to the reason(s) for rejection of their application.
- 5.5 Information relating to unsuccessful applications will not be divulged by the committee to any third party.

6. Certification:

- 6.1 Successful applicants will receive a copy of the Code of Ethics which must be signed and the signed copy returned to the Administrator. A uniquely numbered certificate will be issued to each successful applicant on the receipt of the signed copy of the Code of Ethics.
- 6.2 Certification is subject to periodic renewal periods of three years with re-certification after nine years.
- 6.3 All IPE certificates numbers issued will be recorded on the SAQCC-IPE National Register and will be published on the SAIW website, which is accessible by the public.

7. Attachments to this document:

- 7.1 Note on practical training requirements
- 7.2 Related inspection tasks for practical training
- 7.3 Minimum classroom training for recognition of qualifications

NB: Please note that applications will not be processed unless proof of payment is received. Proof of payment needs to be attached to the application.

Banking details: FNB Hyde Park Account number 505 236 54 470

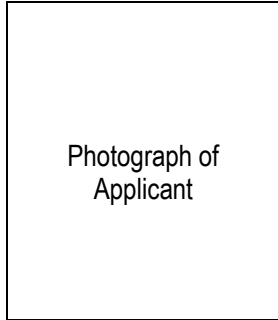
Branch code 255 805

Please use reference: Surname and Initials or student number

Please note that this is a **non-refundable fee**

SAQCC-IPE

South African Qualification and Certification Committee for Inspectors of Pressurised Equipment



Application for initial certification

Certification fee payable on submission of the application. R2 444.00 incl. VAT for each category

Please type or print all information in black ink and block letters.

1. Personal

- a. Surname:
First name/s:
Identity No. or Passport No: Date of Birth:

- b. Postal address for SAQCC-IPE correspondence:
.....
..... Postal code:
Residential address:
.....
..... Postal code:

- c. Company name and postal address:
.....
..... Postal code

- d. Company VAT No:

- d. Home telephone No:
Business telephone No:
Business facsimile No:
Cell No:
e-mail address:

3. Practical training details

Name and address of company	Position held	Dates employed				Name and title of management representative	Signature of representative*
		from		to			
		Month	Year	Month	Year		

If space is insufficient, please attach extra information on additional separate sheets.

* If not possible, state reasons why.

I hereby certify that the information I have included on this application is accurate. I give the SAQCC-IPE permission to verify this information. I understand that any false statement or omission may nullify this application.

Signature:

Date:

Qualifying practical training required

Complete the items on separate sheets of paper for each employer.

If you wish to expand on any activity or detail , this can be added on a separate sheet.

- a. Company name:
Dept/Division:
Supervisor/Human Resources Manager:
Telephone No:
Box/Street Number:
..... Postal Code
Province.....
Month Year Month Year
- b. Job title..... From To.....
- c. Complete the list below, to meet the requirements of Appendix II.

Report on practical training for SAQCC-IPE

Name:

Relevant training received						
	Vessel No.	Manufacturer	Code	Date	Client	Verification by certified IPE (Number and signature)
Inspectors task	Establish that the manufacturer / repairer is working to drawings verified by the AIA					
1	1.					
	2.					
	3.					
	4.					
	5.					
2	Verify that QCP is approved by manufacturer / repairer, client and AIA. Incorporate AIA requirements for witness, hold and surveillance points. Sign and complete the inspection stage requirements.					
	1.					
	2.					
	3.					
	4.					
	5.					
3	Correlate material certificates with materials and check conformity to specification					
	1.					
	2.					
	3.					
	4.					
	5.					

	Vessel No.	Manufacturer	Code	Date	Client	Verification by certified IPE (Number and signature)
4	Identify material and witness transfer identification					
	1.					
	2.					
	3.					
	4.					
	5.					
5	Visually examine material					
	1.					
	2.					
	3.					
	4.					
	5.					
6	<p>Verify that applicable approved welding procedures are being used and followed. Where procedures have not been previously approved by an AIA, the inspector witnesses the production welding procedure qualification tests, the mechanical testing of test pieces prepared from the coupons, evaluates the results and validates the applicable reports. Where witnessing of mechanical testing of welding procedure test pieces is not possible, practical training is required to be undertaken in a mechanical testing laboratory.</p>					
	1.					
	2.					
	3.					
	4.					
	5.					

	Vessel No.	Manufacturer	Code	Date	Client	Verification by certified IPE (Number and signature)
7	Verify that welders qualified to the appropriate code are being used. Where welders are required to undergo testing, witness the production of the test coupon, evaluate the results of the examination of the coupon and validate applicable reports.					
	1.					
	2.					
	3.					
	4.					
	5.					
8	Examine fit-up of different categories of weld seams. Verify results of dimensional checks. Examine weld preparations					
	1.					
	2.					
	3.					
	4.					
	5.					
9	Inspect second side of different categories of weld seam preparations after first side is completed					
	1.					
	2.					
	3.					
	4.					
	5.					
10	Evaluate radiographs and accept or reject components on such evaluation. Verify NDT personnel qualifications. Verify defects reported by NDT personnel as to their acceptability against the applicable code. Examine NDT procedures, techniques, sheets and/or reports for compliance as having been signed/authorised by recognised competent personnel. All other NDT tasks must be performed by the manufacturer's/repairer's or AIA specialised personnel					
	1.					
	2.					
	3.					
	4.					
	5.					

	Vessel No.	Manufacturer	Code	Date	Client	Verification by certified IPE (Number and signature)
11	Verify that any required production test plates are provided, witness mechanical testing and evaluate results (See Task 6)					
	1.					
	2.					
	3.					
	4.					
	5.					
12	Witness that pre and post weld heat treatments are performed in accordance with approved procedures, if this requirement is included in the QCP. Examine heat treatment records and verify compliance with procedures					
	1.					
	2.					
	3.					
	4.					
	5.					
13	Witness the pressure test and verify code requirements. Where necessary, record the amount of permanent set..					
	1.					
	2.					
	3.					
	4.					
	5.					
14	Visually examine the completed vessel or sectional replacement/modification area, as relevant, internally and externally.					
	1.					
	2.					
	3.					
	4.					
	5.					

	Vessel No.	Manufacturer	Code	Date	Client	Verification by certified IPE (Number and signature)
15	Witness dimensional checks made by the manufacturer or repairer, controlled against drawing requirements					
	1.					
	2.					
	3.					
	4.					
	5.					
16	Verify marking of nameplate details and attachment of plate to vessel					
	1.					
	2.					
	3.					
	4.					
	5.					
17	Verify collation of documentation for data book or sectional replacement report					
	1.					
	2.					
	3.					
	4.					
	5.					
18	Verify certification details and co-sign certification with the manufacturer or repairer					
	1.					
	2.					
	3.					
	4.					
	5.					

I hereby certify that the statements in this record of practical training are correct and factual and are in accordance with the requirements of SAQCC-IPE.. I give the SAQCC-IPE permission to verify this information. I understand that any false statement or omission may nullify this application.

d. Employer verification of practical training required.

Signature of management representative: Name of management representative:

Title of management representative:

Checklist for submission of application for certification as an Inspector of Pressurised Equipment-Non-metallics with SAQCC-IPE.

1. Is the application for certification, correctly completed either in black ink or type and verified by your employer(s)/certified IPE in respect of your practical training and experience and are all necessary signatures in place, as well as correct dates?
2. Are certified copies of all relevant qualifications/certificates being submitted as evidence of having the qualification requirements for registration with SAQCC-IPE?
3. Is the necessary supporting evidence enclosed?
4. Has an original vision test record confirming visual acuity tested in the six months prior to the date of application enclosed? Has it been completed on the SAQCC-IPE format? Has it been stamped by the optometrist?

N.B. Do not enclose original certificates. A Commissioner of Oaths, e.g. Police Station, can certify copies.

South African Qualification and Certification Committee

for

Inspectors of Pressurised Equipment-Non-metallics

Vision testing for Inspectors of Pressurised Equipment-Non-metallics

(This form to be handed to the medical examiner for completion)

Vision test record

For:
(Name of candidate)

Visual acuity

The requirements for visual acuity are:

- a. the ability to read J1 size letters of the standard Jaeger test chart at 300mm and J7 at 1 000mm, and
- b. at least 6/6 on a Snellen chart or orthorator with at least one eye, corrected or uncorrected.

N.B. Circle where applicable

Test	J1 @ 300 mm, J7 @ 1000 mm	Snellen 6/6
Left	Yes / No	Yes / No
Right	Yes / No	Yes / No

Field of vision

The requirements for field of vision are:

Test	Field	Remarks
Left	Normal / Not normal	
Right	Normal / Not normal	

Date of test:

Tested by:

(Medical Officer / Optometrist)
Signature and stamp

7.1 Practical training

Introduction

Examination of the codes and standards used in South Africa for the manufacture of pressure vessels, boilers and portable gas containers indicates that the functions of an inspection authority as defined in these documents are quite similar. These functions are described in the table overleaf.

Major users often require inspectors to become deeply involved in manufacture and testing of equipment than at the minimum level required by a particular code.

The inspection tasks described overleaf can be regarded as a collation of minimum code requirements and normally applicable requirements of users. Minimum practical training requirements for certification are established in relation to each of the inspector tasks.

Inspection Authorities that undertake training of Inspectors should record progress of trainees on the attached SAQCC-IPE document.

Training should be completed under the supervision of an SAQCC-IPE certified IPE-NM. Supervised work should be aimed at providing the trainee with exposure to different facets of each of the tasks.

The minimum acceptable duration of practical training is two years.

7.2

Related inspection tasks for practical training or experience requirements.

Inspection Authority function	Inspector's tasks	Remarks	Minimum practical training
1. Verification that the design of all parts of the vessel and repairs and modifications are in accordance with the requirements of the applicable approved code	Establish that the manufacturer / repairer is working to drawings verified by an inspection authority		Perform inspector tasks on 5 different designs.
2. Verification that an agreed quality plan is to be implemented. Incorporated of inspection authority requirements for witness, hold and surveillance points.	Where applicable, verify that the quality plan is approved by manufacturer or repairer, client and inspection authority. Incorporate inspection authority requirements for witness, hold and surveillance points. Sign and complete the inspection stage requirements of the inspection authority.	This is not a code requirement but a quality plan is a generally accepted requirement of all parties	Perform inspector tasks on 5 different designs.
3. Correlation of material certificates with materials of construction and checking conformity of material specification	Correlate material certificates with materials and check conformity to specification.		Correlation of certificates for 5 different materials.
4. Identification of material and witnessing of transfer identification	Identify material and witness transfer identification.		Identification and witnessing of transfer for 5 different materials.
5. Examination of material cut edges and heat affected zones.	Visually examine material		Examination of material for 5 vessels. See note 1.

Related inspection tasks for practical training

Inspection Authority function	Inspector's tasks	Remarks	Minimum practical training
6. Approval of welding procedures.	Verify that applicable approved welding procedures are being used and followed. Where procedures have not been previously approved by an inspection authority, the inspector witnesses the production procedure test plates, the mechanical testing of test pieces prepared from the plates, evaluates the results and validates applicable reports.	The inspection authority should have specifically designated persons to approve welding procedures for use in consultation.	Verification of 5 procedures. Witnessing of 5 different procedure tests and validating applicable reports.
7. Approval of welders and operators	Verify that welders are qualified to the appropriate code are being used. Where welders are required to undergo testing, the inspector witnessed production of the test plate, evaluates the results of the examination of the plate and validates applicable reports.		Acceptance of documentation for 5 welders. Witnessing and acceptance of 5 different test plates and validating applicable reports
8. Examination of fit-up of seams for welding including dimensional check, examination of weld preparations, tack welds, etc.	Examine fit-up of seams for welding. Verify results of dimensional checks. Examine weld preparations and tack welds.		Examination of 5 different vessels incorporating examination of all categories of joints. See Note 1.
9. Inspection of second side of weld preparation after first side is completed and root cleaned.	Inspect second side of weld preparations after first side is completed and root cleaned.		Examination of 5 different vessels incorporating examination of all categories of joints. See Note 1.

Related inspection tasks for practical training

Inspection Authority function	Inspector's tasks	Remarks	Minimum practical training
<p>10. Examine and accept non-destructive test reports. Verify compliance with agreed procedure and acceptability of any defects.</p> <p>Where necessary, the inspection authority may need to verify results by practical examination.</p>	<p>Evaluate radiographs and accept or reject components on such evaluation. Verify NDT personnel qualifications. Verify defects reported by NDT personnel as to their acceptability against a code. Examine NDT procedures, techniques, sheets and/or reports for compliance as having being signed / authorised by the recognised competent personnel. All other NDT tasks must be performed by the manufacturer's/ repairer's or inspection authority's specialised personnel.</p>	<p>The inspection authority should have access to specifically designated persons to approve all relevant NDT procedures.</p>	<p>Acceptance of complete sets of radiographs for five different vessels.</p>
<p>11. Witness and evaluate mechanical testing of production test welds.</p>	<p>Verify that any required production test plates are provided, witness mechanical testing and evaluate results.</p>		<p>Incorporated in 6.</p>
<p>12. Examine heat treatment records and verify compliance with procedure.</p>	<p>The inspector may witness that pre-and post heat treatments are performed in accordance with approved procedures if this requirement is included in the quality plan. Examine heat treatment records and verify compliance with procedures.</p>	<p>Witnessing heat treatment is not a code requirement.</p>	<p>Examination and verification of 5 separate heat treatments incorporating pre and post weld heat treatment using furnace and local heat treatment methods.</p>
<p>13. Witness the pressure test and where necessary, record the amount of permanent set.</p>	<p>Witness the pressure test and verify code requirements. Where necessary, record the amount of permanent set.</p>		<p>Witnessing of test on 5 different vessels.</p>

Related inspection tasks for practical training

Inspection Authority function	Inspector's tasks	Remarks	Minimum practical training
14. Final visual examination	The inspector should visually examine the completed vessel of the repair / modification area, as relevant, internally and externally.	Where possible, this should be carried out before and after pressure test.	Examination of 5 different vessels. See Note 1.
15. Verify the dimensional tests made by the manufacturer or repairer.	Witness dimensional checks made by the manufacturer or repairer controlled against drawing requirements.	Where possible, this should be carried out before and after pressure test.	
16. Verification and marking of nameplate details and attachment of nameplate to vessel.	Verify marking of nameplate details and attachment of plate to vessel.		Verification and marking of 5 different vessels.
17. Collation of documentation	Verify collation of documentation for data book or repair report.	This is not a code requirement.	
18. Sign construction and test certificate or record of continuance.	Verify certification details and co-sign certification with the manufacturer or repairer.	The inspector must be registered to carry out his work.	Witness the signing of a certificate of construction and test or record of continuance.

Note 1

Where training is gained on repairs and modifications, the scope of work must be such that the replacements of different types of pressure parts are included. This provision is included to ensure that such inspectors gain adequate training of the complexities involved in new vessel construction.

Note 2

The requirement for practical training that it is to take place over a two-year period is to ensure that adequate experience is obtained in performing the 18 tasks. The requirement for training on five different vessels, boilers or repairs and modifications is a minimum requirement.

7.3

Minimum classroom training requirements for recognition of qualifications.

Subject matter	Applicable to inspection task	Minimum classroom training hours
<p>1. Legal statutory and safety knowledge pertaining to the OSAHCT 1993 and the Mineral and Energy Affairs 1956</p> <p>1.1. OSHACT</p> <p> 1.1.1 Vessels under pressure</p> <p> 1.1.2 Boilers</p> <p> 1.1.3 Portable gas containers</p> <p>1.2. Mineral and Energy Affairs 1956</p> <p> 1.2.1 Boilers</p> <p> 1.2.2 Pressure vessels</p> <p> 1.2.3 Portable gas containers</p>	<p>16,18</p>	<p>4 total</p>
<p>2. Materials knowledge</p> <p>2.1 Material types and manufacture</p> <ul style="list-style-type: none"> - Steels including stainless steels - Cast iron - Specifications - Non-ferrous alloys - Primary manufacturing methods <ul style="list-style-type: none"> - castings - forgings - rolled products - Specification 	<p>3,4</p>	<p>48 total</p> <p>(24)</p>

Minimum classroom training requirements for recognition of qualifications.

Subject matter		Applicable to inspection task	Minimum classroom training hours
2.2.	Heat treatment - annealing - normalising - quenched and tempered - solution heat treatment - ageing - furnace and site methods	12	(16)
2.3.	Mechanical testing - tensile - impact - bend - hardness (laboratory and site methods)	3,6,11	(8)
3.	Fabrication		112
3.1.	Engineering drawing - symbols - tolerances - dimensions - finishes - interpretation - control of changes, approvals, revisions	1,2,6,8,13	(8)
3.2.	Secondary forming - rolling - spinning - pressing - marking and cutting - templates	4	(8)

Minimum classroom training requirements for recognition of qualifications.

Subject matter		Applicable to inspection task	Minimum classroom training hours
3.3.	Welding <ul style="list-style-type: none"> - terminology - basic processes - joint preparation - distortion - consumables - weldability of materials - effects of preheat interpass and post weld heat treatment - weld defects, causes, and remedial actions - welding procedure specifications - procedure qualification records - essential and non-essential variables 	5,6,7,8,9,11	(80)
3.4.	Inspection <ul style="list-style-type: none"> - joint preparation - weld profiles - weld sizes 	5,8,9,14	(8)
3.5.	Measurement <ul style="list-style-type: none"> - tapes - templates - jigs and fixtures - instrument, gauges 	8,14,15	(8)

Minimum classroom training requirements for recognition of qualifications.

Subject matter	Applicable to inspection task	Minimum classroom training hours
4. Testing Knowledge		112 total
4.1. Non-destructive testing	10	
a) Common to all testing methods		
<ul style="list-style-type: none"> - personnel qualifications 		
<ul style="list-style-type: none"> - fundamentals 		
<ul style="list-style-type: none"> - equipment and calibrations 		
<ul style="list-style-type: none"> - test techniques and limitations 		
<ul style="list-style-type: none"> - advantages / disadvantages 		
<ul style="list-style-type: none"> - evaluation procedures 		
<ul style="list-style-type: none"> - acceptance criteria and adjudicating results 		
b) Specific		
<ul style="list-style-type: none"> - Radiographic testing (RT) content in (a) 		(40)
<ul style="list-style-type: none"> - film interpretation 		
<ul style="list-style-type: none"> - Ultrasonic testing (UT) content in (a) 		(32)
<ul style="list-style-type: none"> - defect sizing 		
<ul style="list-style-type: none"> - Magnetic particle testing (MT) content in (a) 		(16)
<ul style="list-style-type: none"> - Liquid penetrant testing (PT) content in (a) 		(16)

Minimum classroom training requirements for recognition of qualifications.

Subject matter	Applicable to inspection task	Minimum classroom training hours
<p>4.2. Pressure testing</p> <p>a) Hydraulic</p> <ul style="list-style-type: none"> - requirements for measurement - filling and emptying - effects of vacuum - safety - statutory and code requirements <p>b) Pneumatic</p> <ul style="list-style-type: none"> - allowable gases - gauges calibration and location - safety - statutory and code requirements - leak detection at lower pressures 	<p>13</p>	<p>8</p>
<p>5. Code groups and related standard requirements knowledge</p> <p>5.1. Structure of code</p> <ul style="list-style-type: none"> - related standards and specifications - welding and brazing qualifications - welding consumables - inspection and test related requirements - documentation <p>5.2. Other code groups</p>	<p>All</p>	<p>80 total</p> <p>56 hours on first code group. First code group must be ASME, BS or Merkblatter.</p> <p>24</p> <p>Other codes covered must include remainder of ASME, BS or AD Merkblatter and SABS codes.</p>