

**To be read in conjunction with 240-101712128: “Standards for the Internal Corrosion Protection of Water Systems, Chemical Tanks and Vessels and Associated Piping with Linings”**

**Vessels/Items/Component/s**

**IX Vessels**

- Strong Acid & Weak Acid Cation Exchanger (SAC): 0.63/1633 - Cation Exchangers Engineering Flow Diagram (rev 12)
- Strong Base Anion Exchanger (SBA): 0.63/1636 - Strong Base Anion Exchangers Engineering Flow Diagram (rev 12)
- Weak Base Anion Exchanger (WBA): 0.63/1635 - Weak Base Anion Exchangers Engineering Flow Diagram (rev 11)
- Mixed Bed

**Other WTP Vessels**

- Hot water tank: 0.63/1739 - Hot Water Tank System Engineering Flow Diagram (rev 12)
- Brine Storage Tank: 0.63/1741 - Brine Dosing System Engineering Flow Diagram (rev 11)
- Measuring Tank: 0.63/1741 - Brine Dosing System Engineering Flow Diagram (rev 11)
- Degasser: 0.63/1634 - Degassers Engineering Flow Diagram (rev 11)

**Chemical Storage Vessels**

- Sulphuric Acid Re-use Tank: 0.63/1858 – Sulphuric Acid Reuse Tank Engineering Flow Diagram (rev 11)
- Caustic Acid Re-use Tank: Unknown

For existing **Carbon Steel Piping and Associated Pipe Fittings** it is considered that salvage of existing piping for new rubber lining is not practical/feasible due to removal of the existing lining within the confines of a pipe.

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<u>Vessel Description/ Name</u>	Strong Acid & Weak Acid Cation Exchanger: SAC & WAC	Strong Base Anion Exchanger: SBA	Weak Base Anion Exchanger (WBA)	Hot water tank	Brine storage tank	Brine measuring tank	Degasser vessel	Sulphuric Acid Re-use Tank	Caustic Re-use Tank
Material	Carbon Steel. Existing rubber lined.								
Access & Ventilation (size in mm)	2 x Manholes on side of vessel. OD = 500mm  Multiple pipe entries. OD = 50mm	2 x Manholes on side of vessel. OD = 500mm  Multiple pipe entries. OD = 50mm	2 x Manholes on top and side of vessel. OD = 500mm  Multiple pipe entries. OD = 50mm	1 x Manhole on top of vessel. OD = 500mm  Multiple pipe entries. OD = 50mm	Unknown	Unknown	2 x Manholes on top and side of vessel. OD = 500mm  2 pipe entries. OD = (250 - 500mm)	2 x Manholes on top and side of vessel. OD = 500mm  2 pipe entries. OD = (80 - 100mm)	2 x Manholes on top and side of vessel. OD = 500mm  2 pipe entries. OD = (80 - 100mm)
Medium	Sulphuric acid	NaOH	NaOH	Demin Water	Brine	Brine	De-Cationised water	Dilute Sulphuric Acid	Dilute Caustic Soda
pH	0.6 – 8.5	3.5 - 13	3.5 - 13	5 - 7	7	7 - 11	3 – 4.5	> 0.6	< 13
Concentration	1.5 - 3.2%	4%	4%	-	25% NaCl	25% NaCl with addition of NaOH	-	Approx 4 – 6%	Approx 4 – 6%
Na	15ppm	< 2%	< 2%	< 2ppb	Based on above	Based on above	< 200ppb		

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<u>Vessel Description/ Name</u>	Strong Acid & Weak Acid Cation Exchanger: SAC & WAC	Strong Base Anion Exchanger: SBA	Weak Base Anion Exchanger (WBA)	Hot water tank	Brine storage tank	Brine measuring tank	Degasser vessel	Sulphuric Acid Re-use Tank	Caustic Re-use Tank
Chloride	15ppm	5%	5%	< 2ppb	Based on above	Based on above	15ppm		
Design Pressure	600 kPa	600 kPa	600 kPa	600 kPa	Atmospheric	Atmospheric	Atmospheric	Atmospheric	Atmospheric
Design Temperature	Ambient - 40°C	Ambient - 40°C	Ambient - 40°C	Ambient - 85°C	Ambient - 40°C	Ambient - 40°C	Ambient - 40°C	Ambient - 40°C	Ambient - 40°C
Vessels Dimensions (Diameter, Height)	OD = 3.0 m Height = 6 m	OD = 1.5 m Height = 5 m	OD = 3.0 m Height = 4.4 m	OD = 2.2 m Height = 5 m	OD = 3.0 m Height = 2.5 m	OD = 2 m Height = 2 m	OD = 2.5 m Height = 6 m	OD = 2 m Height = 6.5 m	OD = 2 m Height = 6.5 m

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**Generic System**

Pre-cured Butyl Rubber Material, (Grade B, 40 to 70 IRHD) as per SANS 1198. The adhesion of the rubber lining to substrate shall be  $\geq 3.5$  N/mm.

**Surface Preparation**

Abrasive blast clean to Grade Sa 3 (ISO 8501-1).

For localised areas mechanical clean to Grade Sa 3 (ISO 8501-1).

In both cases the final surface profile shall be as specified by the primer Manufacturer.

**Lining Thickness**

The lining thickness shall be 6mm.

**Rubber Lining Options**

Rubber lining options shall be determined by inspection findings.

Option 1 – Rubber Lining Patch Repairs.

Option 2 – Complete Rubber Lining Replacement.

**Option 1. Rubber Lining Patch Repairs.**

The scope of work for option 1 will include the following:

1. If applicable to the vessel and as instructed by the System Engineer remove the tekapor/sinert base inside the vessel to allow proper inspection. Replacement of the tekapor/sinert base is part of the scope and this replacement will be done as specified in the scope of work document.
2. Conduct a detailed visual inspection and pin-hole detection testing (no more than 3 kilovolts per mm) on the existing rubber to check the condition of the rubber lining and identify the defects. Identify and mark-up the defects or the areas requiring the repairs. Eskom shall witness all aspects of the inspection and be responsible for the selection of repair areas or complete relining.
3. The laterals, nozzles and pipes inside the vessels also require removal in order to allow access inside the vessel.

4. The Contractor shall compile a rubber patch repair procedure and submit to Eskom for approval. As a minimum the repair procedure shall include the following:
  - Pin-hole detection testing on the existing rubber lining.
  - Cutting out, stripping and removal of the existing rubber in the marked up areas as per the above inspections.
5. Proceed with surface preparation of the substrate. For smaller areas to be patch repaired where abrasive cleaning is impractical the Rubber Liner or Contractor shall propose suitable cleaning method/s. The cleaning method/s shall be submitted to Eskom for review and approval before commencement of the work.
6. Power and hand tool cleaning is only applicable to localised patch repairs. Hand-tool cleaning for isolated/localised areas may be utilised provided the required standard of finish is achieved. For all internal applications final mechanical cleaning shall be by bristle blaster in order to create a surface profile.
7. Cleaning by means of hand or power-tools, i.e. wire brushes, chipping hammers, scrapers, grinders, sanders, needle descenders, bristle blasters etc. may only be used where accepted by the Eskom engineer and where the position and condition of the substrate metal is such that efficient cleaning and surface profile can be achieved.
8. Burnishing of the surface shall not be permitted.
9. In all cases, after wire brushing or grinding, all traces of loose material shall be removed from the surface by vacuum cleaning. Cleaned surfaces shall not be contaminated with oil, grease, rust or other deposits before primer application.
10. To assess the extent of possible pitting and corrosion of the underlying steel substrate it may be necessary to determine the need for possible mechanical repairs i.e. welding. Unfortunately, this inspection can only be carried out once the surfaces have been blast cleaned in preparation for lining. Based on the damage on the vessel it may be required to conduct mechanical repairs before rubber lining.
11. Care shall be taken during welding and surface preparation to protect the remaining rubber lining from any damage such as mechanical damage, welding/grinding sparks, and welding spatter.

12. Rubber lining shall only proceed once all mechanical repairs or activities on the vessels have been completed and released in terms of the applicable manufacturing/fabrication Quality Control Plan (QCP).
13. Once the above inspection and welding repairs are completed, conduct rubber lining patch repairs of the affected areas. In the event that the pre-cleaned substrate has been exposed for more than 8 hours or the cleanliness grade of the substrate has deteriorated then the substrate will require rework to reinstate the required grade of cleanliness in accordance with ISO 8501-1.

### **Option 2. Complete Rubber Lining Replacement**

The scope of work for option 2 will include the following:

1. If applicable to the vessel and as instructed by the System Engineer remove the tekapor/sinert base inside the vessel to allow proper inspection. Replacement of the tekapor/sinert base is part of the scope and this replacement will be done as specified in the scope of work document.
2. The laterals, nozzles and pipes inside the vessels also require removal in order to allow access inside the vessel.
3. The Rubber Liner or Contractor shall remove most of the existing rubber lining by initial removal techniques such as cutting out, stripping and flapper disc grinding.
4. Assess the extent of possible pitting and corrosion of the underlying steel substrate it may be necessary to determine the need for possible mechanical repairs i.e. welding.
5. Proceed with rubber lining operation once the above inspections and welding repairs have been completed. Rubber lining shall only proceed once all mechanical repairs or activities on the vessels have been completed and released in terms of the applicable manufacturing/fabrication Quality Control Plan (QCP).
6. Subsequent surface preparation shall be by means of abrasive blast cleaning method. Abrasive blast cleaning to grade Sa 3 in accordance with ISO 8501-1.

7. The Eskom standard 240-101712128 (Section 5 in particular), SANS 1201, SANS 1198 and BS 6374-5 shall apply for the manufacture, selection and installation of rubber lining. The rubber liner or contractor to take note of the selected type of rubber required in the table above. NOTE: Special Requirements as per SANS 1198, Table 4, Property Column (Special points (III), (V) and (VI)) shall apply.
8. All the laterals, nozzles and pipes shall be removed from the vessel, the old rubber stripped out and replaced with butyl rubber grade B with 40-70 IRHD.
9. Pre-cured Butyl rubber grade B with 40-70 IRHD is the specified material for this application. Pre-cured rubber lining sheet is typically inflexible (not pliable) relative to other rubbers. The Rubber Liner or Contractor shall propose the application method to ensure the correct bond and adhesion strength between the support geometry and rubber lining.
10. The rubber lining thickness of 6mm is specified. The Rubber Liner or Contractor shall confirm the specified thickness as satisfactory for the application.
11. The rubber lining Manufacturer, adhesive Manufacturer and Rubber Liner or Contractor shall select the relevant primer and or adhesive systems for the type of rubber lining (butyl rubber) material, substrate and service conditions to ensure compatibility. All the products to be used on the system shall be supplied by the same Manufacturer.

### **General Requirements**

1. Sharp edges shall be dressed to a radius of not less than 3 mm. All burrs and weld spatter shall be removed. Welds shall be free from imperfections (e.g. asperities, undercutting, blowholes, craters, and spatter).
2. All surfaces shall be completely dry and free from contaminants such as traces of oil, grease, etc., before surface preparation is carried out.
3. No abrasive blasting or lining applications shall take place when conditions are likely to affect these operations. Clauses 4.1.1.2 to 4.1.1.5 of BS 6374-5 shall apply.
4. Surface preparation by abrasive blasting shall be performed by means of blasting equipment capable of removing mill scale, rust and suitably preparing the substrate to the required cleanliness of Grade Sa 3.

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5. During rubber lining on site care shall be taken to ensure adequate protection of the surrounding areas and any parts of the ancillary equipment i.e. pumps, filters, valves seats, drains, inlet and outlet piping from abrasive blasting and spent grit particles.
6. Different grades and types of blasting media exist. It is important that the correct abrasive be used in combination with a specific coating system to achieve the specified surface profile. The required blast profile height should be carefully considered. The contractor shall select an appropriate abrasive type and mesh size to attain the specified surface profile.
7. Only inert mineral grit or steel grit abrasives shall be used. Steel grit shall be used in sensitive plant areas such as Water Treatment Plants in order to ensure no contamination of plant. Sand or silica based abrasives shall not be used. Abrasive material for blast cleaning shall be used in line with local environmental regulations.
8. The abrasive shall be used in accordance to the manufacturer's specifications and shall be clean, sound, hard particles free from foreign substances such as dirt, oil, grease, toxic substances, organic matter and water soluble salts. It is important that good quality abrasives are used in order to minimize the amount of waste grit and dust generated and contamination of the surfaces.
9. The use of re-cycled blasting media for the final blast is strictly prohibited.
10. All abrasive media shall be stored in an area that is completely dry, covered and protected from weather.
11. The profile height of the blasted surfaces should be within the range of the specified system. Refer to the manufacturers Product Data Sheets.
12. It is important that the blast profile does not exceed the specified DFT of the primer. Blast cleaning of severely corroded surfaces may result in high profiles i.e. > than 100 microns. In these cases, the primer shall be applied by brush/roller to ensure complete wet-out of the pitted/jagged surface. However, agreement should be reached between the Applicator and primer Manufacturer as to the most suitable profile range, with due consideration of the application method, for the specific primer.



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13. The requirement for surface preparation of all metallic surfaces for immersion condition or internal piping surface is strictly Grade Sa 3 (ISO 8501-1), in which case the surfaces shall be blast cleaned to white metal where all traces of rust, mill scale and other foreign matter are removed.
14. All compressed air for blasting activities shall be free from entrained moisture and oil. All traps shall be in a functional condition. The compressed air shall be tested at regular intervals using clean white clothes to assess cleanliness and dryness. This requirement shall be included in the QCP.
15. After surface preparation, all dust, grit blasting media or any other deleterious matter shall be removed from the surfaces by vacuuming. The process shall be repeated until the required level of dust and debris removal is achieved. It is imperative that all surface dirt and contaminants are completely removed before primer or the adhesion of the rubber shall be impaired.
16. Cleaned surfaces shall not be contaminated with oil, grease, rust or other deposits before primer application. Unnecessary traffic prior to painting shall be avoided.
17. On completion of grit blasting the surface shall be thoroughly vacuumed until no loose dust is evident. The level of cleanliness required shall be less than "dust quality rating" 2 when tested in accordance with ISO 8502-3. It is imperative that all surface dirt and contaminants are completely removed before lining or the adhesion of the lining shall be impaired. For piping the internals shall be blown with compressed air until the above requirement has been met.
18. In order to avoid recontamination and flash rusting of the surfaces, the primer shall be applied within 8 hours after final surface preparation of the steel surfaces. Under no circumstances shall the blast be permitted to stand overnight.
19. Prior to rubber lining installation the Contractor shall ensure that the metal surface is suitable for receiving the lining system. The onus is on the Rubber Liner or Contractor to ensure that the surfaces are ready for lining.
20. During rubber lining the rubber liner shall prepare (200mm X 300mm X 3mm) test panels at the same time and under the same conditions as the vessel, piping and spools. The prepared test panels shall be tested by Eskom for adhesion/peel testing as per the requirements of SANS 1201 section 9.4

21. The lining shall be bonded to the flange faces. The mating surface of the flange face to gasket shall be suitably dressed such that the face is acceptably flat to ensure sealing between the liner and the gasket. The application and flange arrangement shall be as per SANS 1201 Figure 7 a) or c) and the Eskom Engineer requirements.
22. Individual rubber sheets shall be tailored to fit the surface to be lined. The lining shall be bonded to the manhole flange faces. The mating surface of the flange face to gasket shall be suitably dressed such that the face is acceptably flat to ensure sealing between the liner and the gasket. The application and flange arrangement shall be as per SANS 1201 Figure 7 a) or c).
23. All joints of lined rubber shall be strapped as per BS 6374-5.
24. All surfaces shall be pinhole tested (only after completion of all handling, moving and equipment and scaffolding removal) to ensure the lining is pinhole free and if required additional repairs shall be performed and once cured then the repair areas shall be retested. The process to be repeated until a pinhole free lining is achieved.
25. The installed lining shall present a smooth appearance and be free of voids, blisters, pinholes, cracks, open seams, excessive squeeze out of adhesive at the joints (>10mm on either side), entrapped air or any other defects which will impair its use. Defective areas shall be cause for rejection of the lining.

**Pre-job Method Statement and Quality Documentation review and acceptance:**

The documents and submission of samples as described below shall be submitted to Eskom for review, acceptance or rejection. No work shall be performed until this requirement has been satisfactorily met.

1. The system manufacturer/rubber liner or contractor shall supply individual product data sheets and material safety datasheets (MSDS) for all products comprising the system i.e. rubber lining, adhesives, tack coats and solvents. For the rubber lining as a minimum the following shall be submitted:
  - A description of the generic type of rubber lining.
  - Physical and chemical properties as per table 4 in SANS 1198.
  - Recommended and non-recommended uses.

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- Service temperatures and chemical resistance limits. For the chemical resistance, special property (I), (III), (V) and (VI) as per SANS 1198 Clauses 4.2.2 (d), 4.2.3 (b) in conjunction with the environment and operating conditions in the table above in this specification sheet shall apply.
  - Maximum recommended service temperature which shall be a minimum of 30% greater than the maximum temperatures as is indicated in the table at the top of this specification sheet.
  - Surface preparation requirements.
2. Prior to the application of any parts of the lining system, the Product Data Sheet/s shall be signed by the manufacturer and rubber liner or contractor. The signed Product Data Sheet/s shall be deemed to be a binding reference document (as part of the QCP). It shall be specific to this project any further/other subsequent revisions of the Product Data Sheet/s shall be submitted to Eskom for reacceptance clearly stating the variations/deviations. No further use/application of the related product, for this project, is permitted until acceptance is granted by Eskom.
  3. The manufacturer shall supply the relevant batch certificate for each of the lining products used in the submitted test sample panels. All tests, parameters, and results shall be as per the requirements of SANS 1198 Table 4. These tests shall be conducted as per SANS 1198 by an ISO 9001 certified independent laboratory. These test results or certificates shall be submitted to Eskom after tender award and before commencement of work to verify mechanical and chemical properties in the product data sheets.
  4. After tender award and prior to project execution the Manufacturer shall submit test samples of the lining system as proposed in the tender submission. Two samples shall be required for reference purposes. The samples (substrates) shall be prepared as per the requirements of the Manufacturer's datasheet and in compliance with the requirements of this standard. The size of the test sample panels shall be (200mm X 300mm X 3mm). The lining shall be cured as would be in practical situations without any artificial assistance.

5. The Manufacturer shall supply the relevant batch certificate for each of the lining products used in the submitted test sample panels. Properties such as hardness shall be evaluated by Eskom to ensure compliance to the Manufacturer's product data sheet, The Manufacturer shall provide written commitment to this requirement at the tender stage. In addition to the panel samples above, representative (considering different batches), loose rubber sheeting 500mm X 500mm shall be submitted for tensile testing in order to ensure conformity to SANS 1198.
6. For the test sample panels properties such as hardness and adhesion (SANS 1201) will be tested by Eskom to ensure compliance to both the product data sheet and the above mentioned standard (SANS 1201), including all the normative references contained therein.
7. A detailed procedure/method statement shall be submitted to Eskom at the time of tender detailing all steps, procedures and activities of the lining application process. The steps to be considered includes:
  - The methods, steps, sequence and equipment required for ventilation and dust mitigation.
  - Grease decontamination and washing.
  - Soluble salt decontamination.
  - Methods for dust and debris removal, maintaining and ensuring cleanliness between primer and adhesive steps shall be described.
  - The Method Statement shall detail the precise sequence and breakdown of work areas/activities in order to apply the system with due consideration of dust contamination.
  - The Method Statement shall also consider the most efficient methods and sequencing to avoid unnecessary delays that may have an impact i.e. time required for removal of spent abrasive grit and dust/debris.
  - All inspection interventions during and after completion of rubber installation shall be considered and included.
  - The Method Statement shall describe all measures and details for establishing and maintaining the environmental conditions as required by this specification.

- The required ventilation for the prevention and/or management of volatile/combustible/explosive or toxic fumes and dust build-up. The number of extraction fans; mounting diameters, sizes and mounting methods of fans to manholes; power rating of fans; positioning of fans and direction of intended air flow shall be described and detailed. All inspection interventions during and after completion of rubber installation shall be considered and included.
  - Detailed information and engineering drawings of flange arrangement.
  - Curing.
  - All test and inspection interventions during and after completion of rubber installation shall be considered and included.
8. The detailed Method Statement shall be submitted to Eskom for review and acceptance/rejection prior to the commencement of any work. Eskom reserves the right to request further revision, clarification or additions in accordance with or as required by this specification sheet.
9. A detailed Quality Control Plan (QCP) shall be submitted and shall detail all inspections and tests with acceptance criteria during lining application. Inspections during lining application shall at least cover surface documentation review and approval, surface cleaning and blasting, environmental parameters, rubber thickness, hardness, adhesion, continuity and visual tests, submission and testing of rubber tests samples and lined panels. Tests for continuity shall be carried out using the high frequency spark test method;
- Before vulcanisation.
  - After vulcanisation.
  - Immediately prior to assembly.
10. The rubber Lining manufacturer and rubber liner or contractor shall specify the test voltage and the length of spark (no less than 2kV per mm). If the rubber manufacturer cannot comply then a detailed motivation describing the reasons why this requirement can't be met shall be submitted for review, acceptance or rejection.

11. Prior to commencement of rubber lining the Rubber Liner shall submit detailed repair procedures in accordance with BS 6374-5. Any defects such as mechanical damage, cuts, blisters, lack of adhesion and poor joints shall be marked up and repaired according to BS 6374-5 Clause 5.2.4.
12. The Rubber Lining Manufacturer and Rubber Liner or Contractor shall specify the test voltage and the length of spark (no less than 2kV per mm). If the rubber Manufacturer cannot comply then a detailed motivation describing the reasons why this requirement can't be met shall be submitted for review, acceptance or rejection.
13. The supply and cost of all testing, inspection and specialized testing equipment shall be the Contractor's responsibility. QC shall be performed by the Rubber Liner and the Quality Assurance inspection shall be conducted by Eskom. A series of witness and hold points shall be agreed such that Eskom may witness any of the above tests. Eskom may elect to carry out its own tests at these times.
14. List of deviations or exclusions from this specification. If there are none then there shall be a definitive written statement to such effect. This mentioned list of deviations or definitive written statement shall be used as part of the contract. In addition to this statement the contractor, rubber liner or manufacturer shall also provide a definitive statement of the submission of samples as prescribed above.

**Safety Requirements and Considerations:**

1. During the applications of all coatings/lining, care shall be taken to ensure adequate ventilation and lighting, to avoid/minimise health and safety risks.
2. A confined spaces (CSs) may be defined as an enclosed, restricted, or limited space in which, because of its construction, location or contents, or any work activity carried on therein, a hazardous substance may accumulate and/or an oxygen-deficient atmosphere may occur, and/or in which a dangerous liquid or dangerous concentration of gas, vapour, dust or fumes may be present. It includes any chamber, tunnel, pipe, pit, sewer, container, valve, pump, sump, chute, bunker, silo, gearbox, tank, receiver, drum or any similar construction, equipment, machinery or object.

3. Flammable Atmospheres: Gases, vapours and dusts can become trapped in CSs and create flammable or explosive atmospheres, and include combustibles e.g. Hydrogen, Acetylene, Rubber and thinning/cleaning solvents, etc.
4. Walking / Working Surfaces and Visibility: Poor lighting may add to hazards caused by an irregular, sloped, or constricted working surface.
5. Special care needs to be taken when working with all organic coatings/linings. Prior to the use of any coating material, the Material Safety Data Sheets shall be obtained from the relevant coating manufacturer. The contractor shall be familiar with the contents of these safety data sheets and ensure that the necessary safety precautions are taken in order to comply with local and national safety and health requirements such as the OHS Act.
6. Any solid waste materials or liquids stripped or generated during the coating operations shall be discarded in accordance with the requirements of the appropriate national and/or local authorities or the requirements of Eskom.
7. The contractor shall ensure compliance with all statutory regulations, municipal by-laws, etc. concerning pollution and the health and safety of personnel and/or members of the public who may be affected by the work. The contractor shall provide the personnel with the appropriate required PPE.
8. The contractor shall provide for all necessary safety precautions and risk assessments.
9. All materials shall be stored in designated areas in storage facilities that meet the storage requirements of the rubber liner manufacture. The contractor shall be responsible for the provision of appropriate storage/shipping containers as required. These containers shall include the appropriate refrigeration/conditioning systems for temperature control. This requirement shall be dependent on where the container will be located (indoors/outdoors), typical ambient temperature for the particular season of the year and the maximum storage temperature limits as per the manufacturers recommendations.

10. The contractor's Safety File for the area to be worked it shall address all the hazardous activities of abrasive blast cleaning and spray painting. The contractor shall verify that the personnel carrying out these activities are suitably qualified.
11. The contractor shall ensure that the abrasive materials used conform to all National Health and Safety Standards.

***Specifically with respect to CSs and based on the descriptions and definitions of safety risks as per the above points it is imperative that the contractor's/contractor's Method Statement shall describe in detail, the measures and mitigation steps for the risks and hazards as identified in this specification sheet.***

***It is compulsory that these safety risks/mitigation measures and any others as identified by the contractor/contractor be included in the Method Statement. Prior to the commencement of any work the Method Statement shall be submitted for review, acceptance/rejection by the respective Power Station Risk and Safety office/department.***

#### **Reference Documents**

Since the compilation of the Eskom Standards 240-101712128: Standard for the Internal Corrosion Protection of Plant, Equipment and Associated Piping with Coatings there have been changes in terms of the referenced documents i.e. some documents have been withdrawn, replaced or superseded. The following list of references shall apply in addition to the requirements of 240-101712128. The latest revision of the referenced standards shall apply.

Where conflict exists between any of these documents the more stringent requirement shall apply.

1. 240-101712128: Standard for the internal corrosion protection of water systems, Chemical Tanks and Vessels and Associated Piping with Coatings.
2. ISO 9001: Quality Management Systems - "is defined as the international standard that specifies requirements for a quality management system (QMS). Organizations use the standard to demonstrate the ability to consistently provide products and services that meet customer and regulatory requirements".



3. SANS 1198: The manufacture of rubber sheeting for rubber lining.
4. BS 6374-5: Lining of equipment with polymeric materials for the process industries.
5. SANS 1201: The application of rubber linings to pipes, pipe fittings and vessels.
6. SANS 10037: Rubber, vulcanized or thermoplastic - Determination of tensile stress-strain properties.
7. ASTM D5162: Standard Practice for Discontinuity (Holiday) Testing of Nonconductive Protective Coating on Metallic Substrates.
8. ASTM E376: Measuring coating DFT by magnetic field or eddy current electro-magnetic test Methods.
9. ASTM F21: Standard Test Method for Hydrophobic Surface Films by the Atomizer Test.
10. ISO 8501-1: Preparation of steel substrates before application of paints and related products – Visual assessment of surface cleanliness – Part 1: Rust grades and preparation grades of uncoated steel substrates and of steel substrates after overall removal of previous coatings.
11. ISO 8502-3: Preparation of steel substrates before application of paint and related products – Test for the assessment of surface cleanliness – Part 3: Assessment of dust on steel surfaces prepared for painting (pressure sensitive tape method).
12. ISO 8503-4: Preparation of steel substrates before application of paint and related products – Surface roughness characteristics of blast-cleaned steel substrates - Part 4: Method for the calibration of ISO surface profile comparators and for the determination of surface profile – Stylus instrument procedure. (May be used as an alternative to SANS 5772).
13. SANS 5772: Preparation of steel substrates before the application of paints and related products – Surface roughness characteristics of blast-cleaned steel surfaces – Profile of blast-cleaned surfaces determined by a micrometre profile gauge (Can be used as alternative to ISO 8503-4).
14. SIS 055900: Swedish Code of Practice - Pictorial surface preparation standard for painted steel surfaces. (Can be used as alternative to ISO 8501 – 1).