# ENGINEERING SERVICES DEPARTMENT

## TANKER CAMLOCK SPECIFICATION SHEET

| | | | |
|---|---|---|---|
| **Project** | A26 Smelter: Emergency Cooling Water System | **Unit Tag No.** | WC21-07 CQ-040 |
| **Datasheet Document No.** | ENS-MES-SPE-0027 | **Revision** | 1.0 |
| **Description** | 40mm Threaded strainer is installed on line 40-21WCCP-002. | | |
| **Plant location** | NECSA Pelindaba Site: Elias Motsoaledi Street Ext. (Church Street West), R104 Pelindaba, Madibeng Municipality, 0240 | | |
| **P&IDs number** | NNDD-V-26-Y-PRPID-0006 | | |
| **Equipment location** | Downstream of PumpP2103 | | |
| **Safety Classification** | - | | |
| **Quality Classification** | - | | |

**DESIGN CONDITIONS**

| Male Camlock | UNITS | Description |
|---|---|---|
| **Material** | - | Galvanised Carbon Steel / Bronze |
| **Grade** | - | SA 216 (or an equivalent) |
| **Thread** | - | NPT ASME B1.20.1 |
| **Type** | - | Female Thread |
| **Class** | - | 150# |
| **Temperature** | °C | 0 to 90 |
| **Nominal bore (Thread side)** | mm | 40 |
| **Seal and gasket** | - | PTFE |

| | Name | Signature & Date |
|---|---|---|
| **Compiled by** | M Nteo (Mechanical Engineer) | |
| **Checked** | M Msane (Mechanical Engineer) | |
| **Approved** | S Mngoma (Chief Mechanical Engineer) | |
| Distribution | 1. ES Records 2. Docman 3. Mr D Ngwenya | |

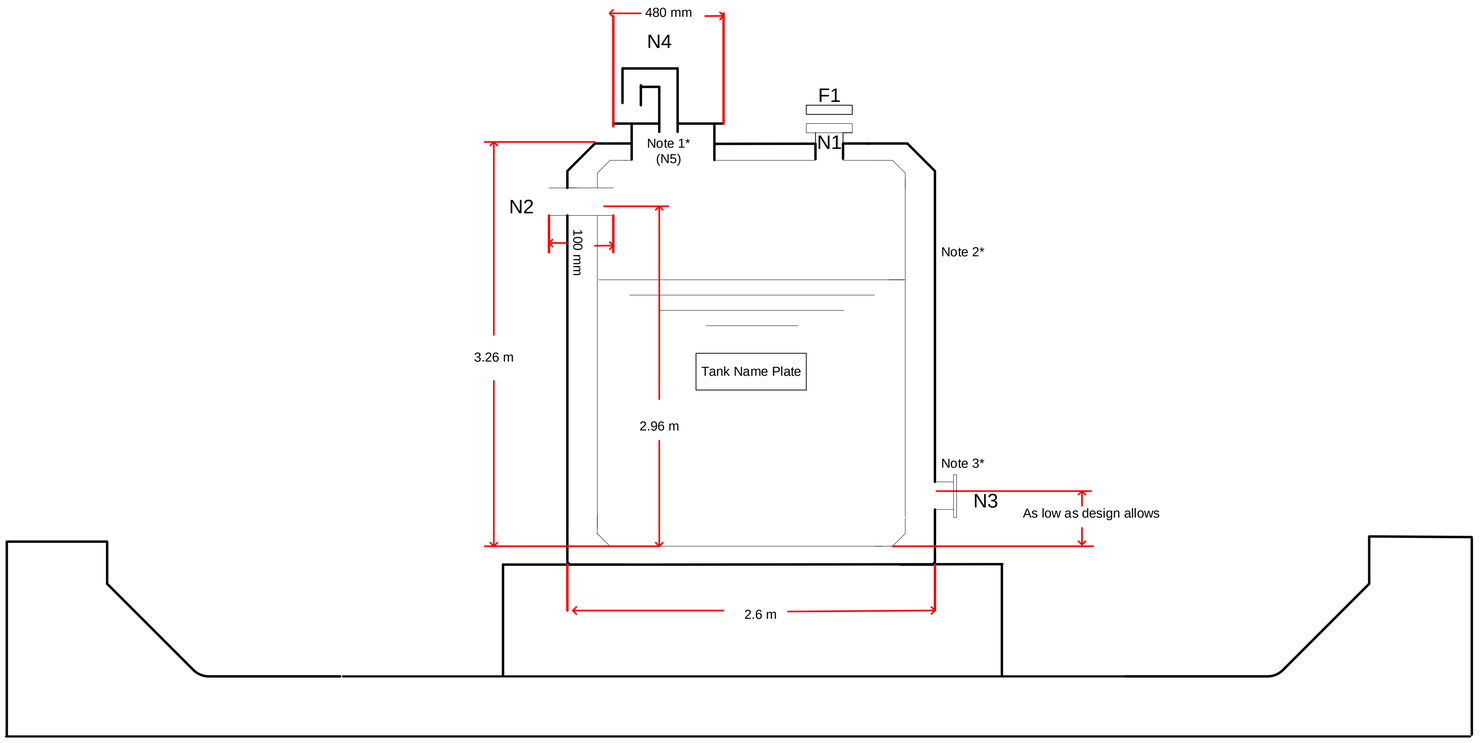
# ENGINEERING SERVICES DEPARTMENT

## MALE DRY BREAK COUPLING SPECIFICATION SHEET

| | | | |
|---|---|---|---|
| **Project** | A26 Smelter: Emergency Cooling Water System | **Unit Tag No.** | N/A |
| **Datasheet Document No.** | ENS-MES-SPE-0043 | **Revision** | 1,0 |
| | | **Page No.** | 1 of 1 |
| **Description** | Male dry-break coupling. | | |
| **Plant location** | NECSA Pelindaba Site: Elias Motsoaledi Street Ext. (Church Street West), R104 Pelindaba, Madibeng Municipality, 0240 | | |
| **Safety Classification** | - | | |
| **Quality Classification** | - | | |

| **(2) Hose Female Couplings** | **UNITS** | **Description** |
|---|---|---|
| **End Couplings** | **mm** | Male dry brake coupler, Female threaded, 50mm, NPT, B 1.20.1 |
| **End Coupling standard** | **-** | NATO STANAG 3756 |
| **Material** | **-** | Brass |
| **Pressure Rating** | **-** | Class 150 |
| **Temperature Range** | **°C** | 15 to 70 |
| **Flat Seal Material** | **-** | EPDM |
| **Seal O-ring** | **-** | FPM/FKM |
| **Reference** | **-** | Proposed Supplier: Mann Tek |
| **Quantity** | **-** | 1 |

| | **Name** | **Signature & Date** |
|---|---|---|
| **Compiled by** | M Nteo (Mechanical Engineer) | |
| **Checked** | M Msane (Mechanical Engineer) | |
| **Approved** | S Mngoma (Chief Mechanical Engineer) | |
| Distribution | 1. ES Records 2. Docman 3. Mr D Ngwenya | |




| | |
|---|---|
| **DESCRIPTION** | Tank T2101 is used for collection and temporary storage of the emergency cooling water coming from the connected furnaces in the event of emergency. |
| **LOCATION** | A26 Smelter, Outside Building, Necsa, Pelindaba |
| **SAFETY CLASSIFICATION** | SC-3(C) and SC-3(N) [1] |
| **QUALITY CLASSIFICATION** | QC-3(C) and QC-3(N) [1] |

| **FLUID PROPERTIES** | | | |
|---|---|---|---|
| FLUID | Heated water from furnace (Might contain uranium contaminates) | | |
| FLUID STATE | Liquid | SOLIDS CONTENT | N/A |
| MASS FLOW RATE IN (L/m) | **50 [1]** | | |
| DENSITY (kg/m$^3$) | 1000 at 90 °C [2] | | |
| VISCOSITY (Pa.s) | N/A | | |
| THERMAL CONDUCTIVITY (W/m.K) | N/A | | |
| SPECIFIC HEAT CAPACITY (kJ/kgK) | N/A | | |
| **CORROSIVE DUE TO** | Hot water | | |

| | | | |
|---|---|---|---|
| **MASS EMPTY (kg)** | Supplier to advise | **CORROSION ALLOWANCE (mm)** | 0 (Supplier to advise) |
| **CAPACITY OF VESSEL (L)** | 15000 | **VOLUME OF FLUID (L)** | 15000 (Maximum @ 2.96 m) |

| **PRESSURE (kPa (g))** | | **TEMPERATURE (ºC)** | |
|---|---|---|---|
| DESIGN | (atmospheric x 1.5) = 130.5 | DESIGN | 135 °C |
| OPERATING | (atmospheric) = 87 | OPERATING | 90 °C (maximum) |
| MINIMUM | 0 | MINIMUM | 0 °C |
| TEST | N/A | TEST | N/A |

| | | | | | |
|---|---|---|---|---|---|
| **TYPE OF PRESSURE TEST** | PNEUMATIC | N/A | HYDROSTATIC | N/A |

| | |
|---|---|
| **DESIGN CODE** | SANS 9001 and SANS 10329 |
| **SPECIFICATION** | N/A |
| **LAGGING** | No |

| **AGITATOR REQUIREMENTS** | | **COOLING/HEATING REQUIREMENTS** | |
|---|---|---|---|
| AGITATOR REQUIRED | No | COOLING/HEATING REQUIRED | No |
| AGITATOR SPECIFICATIONS / DATASHEET NO. | N/A | COOLING/HEATING SPECIFICATIONS / DATASHEET NO. | N/A |
| **MATERIAL OF CONSTRUCTION** | | Galvanized Carbon Steel (if non galvanized apply coating) | |

**NOTES AND REFERENCES**

**NOTES:**
a) Tank T2101 is Similar to a standard 15,000 L Jojo tank. Adjusted inlet water height @ 2.96m to have 300mm free board as per [1].

**REFERENCES:**
[1] NLM-DP-00003 (Rev 2.0): System Design Description - Emergency Cooling Water System.
[2] NLM-REP-22/042: Smelter Emergency Cooling Water Holding -up Tank Sizing

| **MATERIAL** | | | |
|---|---|---|---|
| SHELL | FLANGES | HEADS | TANK PIPE NOZZLES |
| SA 1008 / SA 1011 | CS, ASTM A105, ASME B16.5, STD FIN, GALV | 2.96 m | 40 and 50 mm (SCH 40) |
| SUPPORTS | GASKETS | BOLTING | OTHER |
| Tank base | Lockable lid (supplier to advice) 1 & 8" thick, self-centering ring, Neoprene, ASME B16.21 for Flange F1 | Machine BoltS, ASTM A307 GR B bolts, GALV w/ASTM A563 GR A heavy hex nuts, GALV | |

**NOZZLE SCHEDULE**

| MARK | NB | RATING AND FACING | DESCRIPTION |
|---|---|---|---|
| **N1** | 40 | Slip on flange (ASME B16.5 Class 150 # RF) | A 40mm flange welded on tank nozzle. Then fit F1 flange onto nozzle. |
| **F1** | 40 | Threaded flange (ASME B16.5 Class150# RF) | A 40mm threaded flange is bolted on tank flange. Then NECSA to fit Level indicator. |
| **N2** | 50 | Inlet nozzle. (100 mm extension) | Allow incoming 40mm pipe to pass through into tank. |
| **N3** | 40 | Slip on flange ( ASME B16.5 Class 150# RF) | A 40mm flange welded on tank nozzle. Then threaded flange piping. |
| **N4** | 40 | Venting pipe (material same as tank) | Supplier to advice on NB (Purpose is to vent the tank) |
| **N5** | 480 | Lockable Lid | As per SANS 10329 par 4.7.2 |

**OTHER**

| MARK | DESCRIPTION |
|---|---|
| Note 1 | Lockable lid of 480 mm NB with internal access ladder as per SANS 10329 par 4.7.2 |
| Note 2 | Internal and external coating as per SANS 10329 par 4.3.5 (Supplier to advise) |
| Note 3 | Welding of Nozzles and Flanges as per SANS 10329 par 4.3.4 |
| General note | Tank nozzles welded on shell (Supplier to advise) |
| Name Plate | Indicate Name plate with company name, operating and design parameters, materials of construction. Nozzle schedule |
| SOC | Standard Operating Conditions |
| TBD | To Be Determined |

| **NON DESTRUCTIVE TESTING (NDT)** | | **FABRICATION** | |
|---|---|---|---|
| DYE-PENETRANT | Yes (All Welds) | CHEMICAL CLEANING | N/A |
| LEAK TEST (SANS 10329, par 5.2) | YES | HEAT TREATMENT | N/A |
| MAGNETIC PARTICLE TESTING | N/A | HELIUM LEAK TESTING | N/A |
| ULTRA-SONIC | N/A | ALLOWABLE LEAK RATE | N/A |
| HARDNESS TESTING | N/A | SURFACE FINISH INTERNAL | Yes |
| X-RAY | N/A | MATERIAL CERTIFICATES | Yes |
| QUALITY CONTROL BLOCK | N/A | VESSEL TO BE DRIED | N/A |

| **APPROVAL** | | | | |
|---|---|---|---|---|
| | **DISCIPLINE** | **NAME** | **SIGNATURE** | **DATE** |
| Prepared | Mechanical Engineer | Makgetha Nteo | | |
| Reviewed | Mechanical Engineer | Manqoba Msane | | |
| Reviewed | Chief C&I. Engineer | Grant Manuel | | |
| Approved | Chief Mech. Engineer | Sibongeleni Mngoma | | |
| Checked | Technical Lead | Matome Ramotlou | | |

| **REVISION HISTORY** | | | |
|---|---|---|---|
| **Revision** | **Description** | **By** | **Date** |
| 1.0 | First Issued | Makgetha N | 26-02-25 |



Emergency Cooling Water System Project

Emergency Tank T2101 Datasheet

DESTROY ALL PREVIOUS PRINTS

1.0 Revision

OPEN

Document No. ENS-MES-SPE-0023

PIPELINE MATERIAL MENU

**CARBON STEEL VALVES & SPECIALITY ITEMS**

**Typical Application: Low to High Temperature Process Water**

*Piping Material Specification Line Class WCCP* *January 2025*

**Initiator: Makgetha Nteo**
**Document Number: MES-PIPE-SPE-0022**
**Revision: 1.0**

# WCCP
# Piping Material Specification 12CG0T01 Class125, Galvanized Carbon Steel, Threaded, 0.000"C.A.
# Category D
# Core: Process Water

| | | | |
|---|---|---|---|
| SERVICE: | Utility (Process Water), Category D | MATERIAL: | Galvanized Carbon Steel |
| RATING CLASS: | 125, ASME B16.1- 1998 | DESIGN CODE: | ASME B31.3-2004 |
| TEMPERATURE LIMIT: | 20F to 200F (Note 09) | STRESS RELIEF: | Per ASME B31.3 |
| NOMINAL CORROSION ALLOWANCE: | 0.000 in. | EXAMINATION: | Per ASME B31.3 |

**PRESSURE – TEMPERATURE RATINGS**

| | | | |
|---|---|---|---|
| TEMP F | 20 to 100 | 150 | 200 |
| TEMP C | -7 to 38 | 66 | 93 |

For NPS 1/2 through NPS 12 (Limited to ASME B31.3 Category D Fluid Service pressure limit)

| | | | |
|---|---|---|---|
| psig | 150 | 150 | 150 |
| kPag | 1035 | 1035 | 1035 |

For NPS 14 through NPS 24 (Limited by Cast Iron Flanged Valve; ASME B16.1, Table 1, Class B)

| | | | |
|---|---|---|---|
| psig | 150 | 150 | 135 |
| kPag | 1035 | 1035 | 930 |

| ITEM | NOTES | NPS | SCH/RAT | ENDS | DESCRIPTION | USER CODE |
|---|---|---|---|---|---|---|
| PIPE | 01 | | | | | |
| | | 1/2 - 2 | XS | | CS, ASTM A53-A, Type F, T&C, GALV ($E_j$=0.60) | |
| | 60 | 3 - 24 | STD | | CS, ERW, ASTM A53-B, Type E, ($E_j$=0.85) | |
| NIPPLES | | | | | | |
| Branch | | 1/2 - 2 | STD | THRD | CS, ASTM A53-A, Type F, GALV ($E_j$=0.60) | |
| Swage (CONC) | | 1/2 - 2 | STD | THRD | CS, ASTM A234-WPB, MSS SP-95, GALV | |
| Swage (ECC) | | 1/2 - 2 | STD | THRD | CS, ASTM A234-WPB, MSS SP-95, GALV | |
| FITTINGS | 02 | | | | | |
| Thredolet | | 1/2 - 2 | Class 3000 | Weld | CS, ASTM A105, MSS SP-97, GALV | |
| THRD Latrolet | | 1/2 - 2 | Class 3000 | Weld | CS, ASTM A105, GALV | |
| THRD Elbolet | | 1/2 - 2 | Class 3000 | Weld | CS, ASTM A105, GALV | |
| 90 ELL | | 1/2 - 2 | Class 300 | THRD | GALV malleable iron, ASTM A197, ASME B16.3 | |
| 45 ELL | | 1/2 - 2 | Class 300 | THRD | GALV malleable iron, ASTM A197, ASME B16.3 | |
| Tee | | 1/2 - 2 | Class 300 | THRD | GALV malleable iron, ASTM A197, ASME B16.3 | |
| Tee (RED) | | 1/2 - 2 | Class 300 | THRD | GALV malleable iron, ASTM A197, ASME B16.3 | |
| Plug | | 1/2 - 2 | | THRD | CS, ASTM A105, round head, ASME B16.11, GALV | |
| Coupling | | 1/2 - 2 | Class 300 | THRD | GALV malleable iron, ASTM A197, ASME B16.3 | |
| Coupling (RED) | | 1/2 - 2 | Class 300 | THRD | GALV malleable iron, ASTM A197, ASME B16.3 | |
| Cap | | 1/2 - 2 | Class 300 | THRD | GALV malleable iron, ASTM A197, ASME B16.3 | |
| Union (GJ) | | 1/2 - 2 | Class 300 | THRD | GALV malleable iron, ASTM A197, integral brass seats, ASME B16.39 | |
| Reducer (CONC) | 60 | 2-1/2 - 24 | | Weld | CS, ASTM A234-WPB-W, ASME B16.9 | |
| Reducer (ECC) | 60 | 2-1/2 - 24 | | Weld | CS, ASTM A234-WPB-W, ASME B16.9 | |
| Weldolet | 05, 60 | 3 - 20 | | Weld | CS, ASTM A105, MSS SP-97 | |
| 90 LR ELL | 60 | 3 - 24 | | Weld | CS, ASTM A234-WPB-W, ASME B16.9 | |
| 45 LR ELL | 60 | 3 - 24 | | Weld | CS, ASTM A234-WPB-W, ASME B16.9 | |
| Tee | 60 | 3 - 24 | | Weld | CS, ASTM A234-WPB-W, ASME B16.9 | |
| Cap | 60 | 3 – 24 | | Weld | CS, ASTM A234-WPB-S, ASME B16.9 | |
| VALVES | | | | | | |
| Gate | | 1/2 - 2 | Class 200 | THRD | Bronze body w/ bronze trim | GA02BT000 |
| Gate | | 3 - 24 | Class 125 | FF | CI body w/ bronze trim | GA12DC500 |
| Globe | | 1/2 - 2 | Class 200 | THRD | Bronze body w/ bronze trim | GL02BT000 |
| Globe | | 3 - 14 | Class 125 | FF | CI body w/ bronze trim | GL12DC500 |
| Swing Check | 62 | 1/2 - 2 | Class 200 | THRD | Bronze body w/ bronze trim | CS02BT000 |
| Wafer Dual PLT Check | 07, 09, 63 | 3 - 24 | Class 125 | | CI body w/ bronze disc, Buna-N ST | CD12DC700 |
| Ball | | 1/2 - 2 | WOG 400 | THRD | Bronze body w/ PTFE ST | BA04BT000 |
| Wafer Butterfly | 07, 09, 25 | 3 – 10 | Class 125 | | CI body w/ aluminum bronze disc, Buna-N ST | BF12DC700 |
| Wafer Butterfly | 07, 09, 25 | 12 – 24 | Class 125 | | CI body w/ aluminum bronze disc, Buna-N ST, GO | BF12DC701 |
| FLANGES | 02 | | | | | |
| Threaded | | 1/2 - 2 | Class 150 | RF | CS, ASTM A105, ASME B16.5, STD FIN, GALV | |
| Threaded | 12 | 1/2 - 2 | Class 300 | RF | CS, ASTM A105, ASME B16.5, STD FIN, GALV | |
| Blind | | 1/2 - 24 | Class 150 | FF | CS, ASTM A105, ASME B16.5, STD FIN, GALV | |

| ITEM | NOTES | NPS | SCH/RAT | ENDS | DESCRIPTION | USER CODE |
|---|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| FLANGES | 02 | | | | |
| Weld Neck | 13, 25, 60 | 3 - 24 | Class 150 | FF | CS, ASTM A105, ASME B16.5, STD FIN |
| Weld Neck | 12, 13, 60 | 3 - 24 | Class 300 | RF | CS, ASTM A105, ASME B16.5, STD FIN |
| Slip-On | 60 | 3 - 24 | Class 150 | FF | CS, ASTM A105, ASME B16.5, STD FIN |
| Slip-On | 12, 60 | 3 - 24 | Class 300 | RF | CS, ASTM A105, ASME B16.5, STD FIN |
| Pair WN Orifice | 60 | 2 - 24 | Class 300 | RF | CS, ASTM A105 w/ THRD taps, ASME B16.36, STD FIN |
| GASKETS | 14 | | | | |
| | | 1/2 - 2 | Class 125 | | 1/16" thick, self-centering ring, Neoprene, ASME B16.21 |
| | | 3 - 24 | Class 125 | | 1/8" thick, self-centering ring, Neoprene, ASME B16.21 |
| BOLTING | | | | | |
| Machine Bolts | | | | | ASTM A307 GR B bolts, GALV w/ASTM A563 GR A heavy hex nuts, GALV |

90° BRANCH CONNECTION

Legend and Chart

| BRANCH SIZE \ HEADER SIZE | 24 | 20 | 18 | 16 | 14 | 12 | 10 | 8 | 6 | 4 | 3 | 2 | 1-1/2 | 1 | 3/4 | 1/2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 24 | T | | | | | | | | | | | | | | | |
| 20 | P | T | | | | | | | | | | | | | | |
| 18 | P | P | T | | | | | | | | | | | | | |
| 16 | P | P | P | T | | | | | | | | | | | | |
| 14 | P | P | P | P | T | | | | | | | | | | | |
| 12 | P | P | P | P | P | T | | | | | | | | | | |
| 10 | P | P | P | P | P | P | T | | | | | | | | | |
| 8 | P | P | P | P | P | P | P | T | | | | | | | | |
| 6 | P | P | P | P | P | P | P | P | T | | | | | | | |
| 4 | W | W | W | W | W | W | W | W | W | T | | | | | | |
| 3 | W | W | W | W | W | W | W | W | W | W | T | | | | | |
| 2 | S | S | S | S | S | S | S | S | S | S | S | T | | | | |
| 1-1/2 | S | S | S | S | S | S | S | S | S | S | S | E | T | | | |
| 1 | S | S | S | S | S | S | S | S | S | S | S | E | E | T | | |
| ¾ | S | S | S | S | S | S | S | S | S | S | S | E | E | E | T | |
| ½ | S | S | S | S | S | S | S | S | S | S | S | E | E | E | E | T |

E Reducing Tee
P Branch Weld w/Reinforcing Pad (Pad thickness equals run pipe thickness. Pad width equals 1/2 branch OD.) (Note 81)
S Thredolet
T Tee
W Weldolet (Note 05)

NOTES:

01 If a pipe schedule is shown under "SCH/RAT," it shall be adequate for the full flange rating. If "CALC" is shown, the pressure limit may be lower than full flange rating.
02 All butt-welded component thicknesses shall match the pipe thickness.
05 Integrally reinforced branch connections outside the sizes shown in the branch connection table are permitted. If applicable, weld thickness of integrally reinforced branch connections shall be checked to determine if PWHT is required.
07 These valves have no flanges but are installed between line flanges with extra-length bolts.
09 Pressure and temperature rating can be limited by certain components permitted by this Practice. Manufacturer's recommended pressure-temperature restrictions shall be consulted.
12 These flanges shall be used only to match Class 300 flange connections at control valves and special equipment.
13 Weld-neck flanges shall be used against butt-weld fittings. Otherwise, slip-on flanges shall be used.
14 Full-face gaskets shall be used at flat-faced flanges.
25 Weld-neck flanges shall be used if mating against resilient-seated butterfly valves.
60 Piping shall be hot-dip galvanized after fabrication. Shop fabrication shall be maximized and all spools shall be hot-dip galvanized after fabrication. Valves and inside of field welds shall not be galvanized.
62 These check valves shall be installed in a horizontal position with cover up or in a vertical position with upward flow.
63 These check valves shall be installed in a horizontal position with hinge pin vertical or in a vertical position with upward flow.
81 Integrally reinforced branch connections, tees, and reducing tees are permitted as an acceptable alternative branch connection.

REFERENCES:

Process Industry Practices (PIP)

PIP PNF0200 - *Vents, Drains, and Instrument Connection Details*
PIP PNSMV033 - *Bronze and Iron Gate Valve Descriptions*
PIP PNSMV034 - *Bronze and Iron Globe Valve Descriptions*
PIP PNSMV035 - *Bronze and Iron Check Valve Descriptions*
PIP PNSMV036 - *Bronze and Iron Ball Valve Descriptions*
PIP PNSMV037 - *Bronze and Iron Butterfly Valve Descriptions*

## ENGINEERING SERVICES DEPARTMENT

## HOSE AND DRY BREAK COUPLING SPECIFICATION SHEET

necsa We're in your world
South African Nuclear Energy Corporation SOC Limited

| | | | |
|---|---|---|---|
| **Project** | A26 Smelter: Emergency Cooling Water System | **Unit Tag No.** | N/A |
| **Datasheet Document No.** | ENS-MES-SPE-0042 | **Revision** | 1,0 |
| | | **Page No.** | 1 of 1 |
| **Description** | 50 mm hose fitted with female dry-break couplings on both ends. | | |
| **Plant location** | NECSA Pelindaba Site: Elias Motsoaledi Street Ext. (Church Street West), R104 Pelindaba, Madibeng Municipality, 0240 | | |
| **Safety Classification** | - | | |
| **Quality Classification** | - | | |

| (1) Hose | UNITS | Description |
|---|---|---|
| **Core material (Inside Lining)** | - | PTFE |
| **Outer Covering** | - | Rubber |
| **Outer Wire Material** | - | Stainless Steel |
| **Length** | m | 7 m |
| **Nominal bore** | mm | 50 |
| **Maximum Pressure** | bar | 10 bar |
| **Temperature Range** | ◦C | 15 to 70 |
| **Hose End Fittings** | mm | Male threaded, 50mm , NPT, B 1.20.1, Stainless Steel |
| **End Couplers** | - | See Section (2) Hose Female Couplings |
| **Compliance** | - | Chemical resistant code or an equivalent |
| **Reference** | - | Proposed supplier. CFX 2690 - Chemical composite hose 1000 KPA, outer wire stainless steel. Produced by truco |
| **Quantity** | - | 1 |

| (2) Hose Female Couplings | UNITS | Description |
|---|---|---|
| **End Couplings** | mm | Female dry brake coupler, Female threaded, 50mm, NPT, B 1.20.1 |
| **End Coupling standard** | - | NATO STANAG 3756 |
| **Material** | - | Stainless steel |
| **Pressure Rating** | - | Class 150 |
| **Temperature Range** | ◦C | 15 to 70 |
| **Flat Seal Material** | - | EPDM |
| **Seal O-ring** | - | FPM/FKM |
| **Handles** | - | Single handle |
| **Reference** | - | Proposed Supplier: Mann Tek |
| **Quantity** | - | 2 |

| | Name | Signature & Date |
|---|---|---|
| **Compiled by** | M Nteo (Mechanical Engineer) | |
| **Checked** | M Msane (Mechanical Engineer) | |
| **Approved** | S Mngoma (Chief Mechanical Engineer) | |
| Distribution | 1. ES Records 2. Docman 3. Mr D Ngwenya | |

| ENGINEERING SERVICES DEPARTMENT | | | |
|---|---|---|---|
| **Self-Priming Emergency Cooling Water Pump P2103 Specification Sheet** | | | |
| **Project** | Smelter A26: Emergency cooling water system | **Unit Tag Number** | P2103 |
| **Datasheet Document No.** | ENS-MES-SPE-0033 | **Revision** | 1.0 |
| **Description** | Water from tank T2101 and/or bund Y2102 is transferred to mobile tanker using pump P2103. | | |
| **Plant Location** | NECSA, Pelindaba, North-West Province. | | |
| **Equipment Location** | Smelter A26 plant - Emergency cooling water system - inside tank bund Y2012. | | |
| **Safety Classification** | Non-classified (N) & SC-3 (C) [a] | | |
| **Quality Classification** | Non-classified (N) & QC-3 (C) [b] | | |

| **Process Data** | | **Drive: Motor** | |
|---|---|---|---|
| **Fluid** | Water | **Starting** | 3 Phase, Induction motor |
| **Composition (wt/wt &)** | - | **Voltage, V** | 220 - 240 (Municipal delivery) |
| **Density Max, kg/m3** | - | **Frequency, Hz** | 50 |
| **Density at Opr. Temp., kg/m3** | 997 | **Pump power, kW** | Greater than 2.01 |
| **Dynamic Viscosity at Opr. Kg/ms** | 0,000891 | **Motor Speed, RPM** | Supplier to advise |
| **Corrosion / Erosion** | - | **Mounting** | Foot Mounted |
| **Operating Temp, °C** | 25 | **Amb. Temp. °C** | 0 to25 |
| **Ambient Temp, °C** | 0 to 25 | **Protection Class** | IP-65 |
| **Solid Content , %** | Removed by strainer | **Installation** | Outdoor |
| **Normal Mass Flow Rate, kg/h** | - | **Flame Proof** | - |
| **Normal Volumetric Flow Rate, m3/hr** | 18 | **Starting** | - |
| **Normal Volumetric Flow Rate, m3/s** | 0,005 | **Motor Frame Size** | - |
| **NPSH available, m** | -8,37 | **Area Classification** | - |
| **Suction Pressure, bar (g)** | -1,55 | **Motor Make** | WEG or Equivalent |
| **Diff. Pressure, bar(g)** | 2,413 | | |
| **Discharge pressure, bar(g)** | 0,863 | | |
| **Total Dynamic Head, TDH (m)** | 24,7 | | |
| **Pump efficiency** | 60% or greater | | |
| **Total pipe length suction, m** | 3,2 | | |
| **Total pipe length discharge, m** | 11,61 | | |

| **Engineering data** | | **Material of Construction** | |
|---|---|---|---|
| **Pump type** | Self-Priming Centrifugal Pump | **Casing** | SA 216 WCB (Carbon Steel) or Equivalent |
| **Suction Orientation** | Horizontal | **Shaft** | SA 675 55 (Carbon Steel) or Equivalent |
| **Discharge Orientation** | Vertical | **Impeller** | SA 216 WCB (Carbon Steel) or Equivalent |
| **Installation** | Outdoor | **Coupling** | Supplier to advise |
| **Suction / Discharge pipe Size, mm** | 40 | **Sleeve** | Slip on sleeve |
| **Drive / Pump, RPM** | Supplier to advise | **Base Frame** | SA 36 or Equivalent |
| **Coupling Type (Suction & Discharge)** | Flange (B16.5), Raised Face | **Accessories** | Supplier to advise |
| **Pump Mounting** | Horizontal | **Foundation Bolts** | Supplier to advise |
| **Flange Rating** | Class 150 | **Coupling Guard** | Supplier to advise |
| **Design Efficiency, %** | - | **All Wetted Parts** | - |
| **Sealing Type** | Supplier to advise | **Seal Face Combination** | Supplier to advise |
| **Impeller Type** | Supplier to advise | **Seal Flushing Plan** | Supplier to advise |
| **Impeller Dia** | Supplier to advise | **Mechanical Seal Make** | Supplier to advise |
| **Casing Type** | Supplier to advise | **Flange Material** | CS, ASTM A105, ASME B16.5, STD FIN, GALV |
| **Pump Design Standard** | Supplier to advise | | |
| | | | |

| ENGINEERING SERVICES DEPARTMENT | | | |
|---|---|---|---|
| **Self-Priming Emergency Cooling Water Pump P2103 Specification Sheet** | | | |
| **Project** | Smelter A26: Emergency cooling water system | **Unit Tag Number** | P2103 |
| **Datasheet Document No.** | ENS-MES-SPE-0033 | **Revision** | 1.0 |

**REFERENCE DRAWINGS AND DOCUMENTS**

[1] NNDD-V-26-Y-PRPID-0006 (Rev 5.0) : Emergency Cooling Water System P&ID

[2] NLM-DP-00003 (Rev 2.0): System Design Description - Emergency Cooling Water System

[3] ENS-MES-REP-0019 (Rev 1.0): Calculation of the self-priming centrifugal pump duty point for the A26 Smelter Emergency Cooling Water System

**NOTES AND ABBREVIATIONS**

[a] SC - Safety Class

[b] QC - Quality Class

[d] Supplier to advise on special requirements for installation of pump

| Function | Name | Signature & Date |
|---|---|---|
| **Prepared** | M Nteo (Mechanical Engineer) | |
| **Reviewed** | M Msane (Mechanical Engineer) | |
| **Reviewed** | G Manuel (Chief C&I Engineer) | |
| **Reviewed** | W van Berg (Chief Electrical Engineer) | |
| **Approved** | S. Mngoma (Chief Mechanical Engineer) | |
| **Checked** | M Ramotlou (Technical Lead) | |
| Distribution | 1. ES Records 2. Docman 3. D. Ngwenya | |

# ENGINEERING SERVICES DEPARTMENT

## TANKER CAMLOCK SPECIFICATION SHEET

| | | | |
|---|---|---|---|
| **Project** | A26 Smelter: Emergency Cooling Water System | **Unit Tag No.** | WC21-02 CZ-040 |
| **Datasheet Document No.** | ENS-MES-SPE-0024 | **Revision** | 1.0 |

| | |
|---|---|
| **Description** | 40mm Threaded float valve is installed on line 40-21WCCP-001. |
| **Plant location** | NECSA Pelindaba Site: Elias Motsoaledi Street Ext. (Church Street West), R104 Pelindaba, Madibeng Municipality, 0240 |
| **P&IDs number** | NNDD-V-26-Y-PRPID-0006 |
| **Equipment location** | On inlet pipe in tank T2101 |
| **Safety Classification** | - |
| **Quality Classification** | - |

**DESIGN CONDITIONS**

| Male Camlock | UNITS | Description |
|---|---|---|
| **Material** | - | Bronze body |
| **Float ball** | - | Copper float OD 10" |
| **Thread** | - | NPT ASME B1.20.1 |
| **Type** | - | Male Thread |
| **Class** | - | 150# |
| **Temperature** | °C | 0 to 90 |
| **Nominal bore (Thread side)** | mm | 40 |
| **Gasket and O-ring** | - | NBR |

| | Name | Signature & Date |
|---|---|---|
| **Compiled by** | M Nteo (Mechanical Engineer) | |
| **Checked** | M Msane (Mechanical Engineer) | |
| **Approved** | S Mngoma (Chief Mechanical Engineer) | |
| Distribution | 1. ES Records 2. Docman 3. Mr D Ngwenya | |