



Bayu Undan Technical Delivery Terms

Material Description: Spring Supports	
Doc No: TDT 16	Rev: 0
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1 SCOPE

This document supersedes the "Procurement Specification for Spring Hangers H8-GEN-00-020-S01-2042 Rev 0" and outlines the general technical requirements for the supply of Spring Supports and attachments for Santos Bayu-Undan Facilities.

Datasheets will accompany this document identifying each application and this document applies to both variable effort and constant effort Spring Supports.

Spring Support components shall be manufactured under the general requirements of the following codes and standards:

MSS-SP-58	Pipe Hanger and Support -Materials, Design and Manufacture
BS 3974.1	Specification for pipe supports. Part 1: Pipe hangers, slider and roller type supports
ASME B31.3	Process Piping
AWS D1.1/ AS 1554.1	American Welding Society-Structural Welding Code/ Welding of Steel Structures
AS 3894	Site Testing of Protective Coatings
ASTM A125	Standard Specification for Spring Steel, Helical, Heat-treated

The following specifications prescribe items of related work:

H8-GEN-00-026-S01-2000	Pipe Support Design
DOC/ENG/SPE/0010	Project Coating Specification for New Offshore and Onshore structures
ALL/CMP/SPE/007	Technical Delivery Terms for Bolting Components- Structural Applications
DOC/CMP/PRO/002	Supplier Quality Requirements

2 EXCEPTIONS AND ADDITIONAL REQUIREMENTS

- This Technical Delivery Terms (TDT) document shall take precedence over any other spring support design and procurement documents for the Bayu Undan facilities.
- Spring Support Data Sheets shall be provided by the Purchaser. The Datasheets shall indicate the design details required for the selection, manufacture and supply of the Spring Assemblies for each tag location.
- No changes to size or type of spring unit shall be made by the vendor without the written authority of the Purchaser.
- The fabrication tolerances shall not exceed those listed below:
 - For dimensions up to and including 600 mm $\pm 1.5\text{mm}$
 - For dimensions over 600mm $\pm 3.0\text{mm}$
 - Tolerances for hole centres $\pm 1.5\text{mm}$
- The tolerances for proprietary items shall be the manufacturer's standard tolerances.
- All sharp edges shall be rounded to have a minimum 2mm radius, as specified in the Project Coating Specification for New Offshore & Onshore Structures Santos reference number -DOC/ENG/SPE/010
- Spring Support casing top sections shall be of bolted construction and the use of crimped fittings is not permitted.
- In reference to the fasteners associated with spring supports, the preferred material is Carbon Steel with Cadmium plating as specified in the Technical Delivery Terms for Bolting Components- Structural Applications- TDT 07 - Santos reference ALL/CMP/SPE/007. The use of 316 SS fasteners is permitted for the Spring Support casing top sections only and shall be approved by Santos in writing prior to them being used. Where SS fasteners are used, insulating gaskets shall be installed. The insulating gaskets shall be made of HDPE material and thick enough for the applied bolt load.
- Spring Support casing construction is to be 100% seal welded (internal & external). Full penetration weld detail can be considered seal for seal welding provided weld penetration can be inspected.
- All Spring Supports shall be supplied as complete assemblies.
- All welding shall conform to AS 1554.1 Category SP or AWS D1.1.
- All Spring Supports shall be supplied in the Pre-set and Gagged condition as indicated in the material requisition.
- Any potential for water accumulation on the top plate/flange bolts and internal shall be prevented. The top flange shall be flush with the spring unit assembly to avoid water accumulation.
- All Spring Supports shall be supplied with hydrostatic Test stops.

- All completed Spring Support assemblies shall be identified by a unique Tag Number as detailed in the material requisition.
- Suitable drain points shall be added to the spring supports casings to avoid water accumulation and subsequent corrosion. Mouse holes shall be located or oriented away from the hold down bolts.

3 MATERIALS

- Materials of construction for Spring Casings and components are as follows:

Component	Material
Casings	Carbon Steel to AS 3678 Gr. 250 or equiv.
Springs	Spring Steel to AS 1447 or equiv.
Drop Rods	Carbon Steel to AS 3679 Gr. 250 or equiv.
Threaded Components	Carbon Steel to AS 1110 Class 8.8
Clamps (CS Pipes)	Carbon Steel to AS 3679 Gr. 250 or equiv. with Insulating lining e.g. Vibro 700 lining
Clamps (SS and DSS Pipes)	Stainless Steel to ASTM A240 Grade 316 with Insulating lining e.g. Vibro 700 lining

- Chains for hydrostatic test Stops and screws on scale/tag plates shall be 316 Stainless Steel.
- All clamps for Carbon Steel and Stainless Steel piping SHALL BE the insulated type, lined with a Santos approved insulating lining.
- Clamps for Carbon Steel pipes shall be suitable for a temperature range from minus 46°C to 325 °C.
- Clamps for Stainless Steel pipes shall be suitable for a temperature range from minus 100°C to 200 °C.

4 COATINGS

Spring Support Components shall be coated in accordance with the Project Coating Specification for New Offshore and Onshore Structures DOC/ENG/SPE/0010 as follows unless stated otherwise

- Spring Support casings shall be coated in accordance with System 22-5A (Coat 3 to be white).
- Pipe Support Clamps for SS & CS piping shall be Cadmium plated with Xylan 1424 (green).
- Helical Coil Springs shall be powder coated using an approved Low Density Polyethylene Coating e.g. Cotene™ 4640 AMA @ 400 – 500 µm DFT.
- Threaded components and adjustment devices including Bolt & Nuts, Turnbuckles, Eye nuts, Rods, shall be Cadmium plated with Xylan 1424 (green).

Coatings shall be tested as per the Project Coating Specification for New Offshore and Onshore Structures- DOC/ENG/SPE/0010 and specified in the Inspection Test Plan. Any coating defects identified shall be repaired in accordance with the Project Coating Specification for New Offshore and Onshore Structures- for the specified system.

5 NON DESTRUCTIVE EXAMINATION

- Pipe Support components shall be subject to 100% Visual Examination of all welds.
- The vendor shall identify all load bearing welds for each spring assembly.
- All load bearing welds shall be subject to a proof load test to 1.35 x the Maximum Working Load of the spring support. Proof load test certificates approved by an accredited testing authority shall be supplied for each load bearing weld.
- Where proof loading is not feasible, the supplier shall ensure that load bearing welds are subject to 100% UT and 100% MPI.
- Full NDE traceability is required for all load bearing welds.

6 SPRING COIL TESTING

Helical Compression Spring coils shall meet the physical requirements as specified in the standard specification for Steel Springs, Helical, Heat-Treated: ASTM A125.

These requirements shall include;

- Solid height
- Free- height
- Loaded height
- Permanent Set

All certification shall be supplied as per section 7.

7 CERTIFICATION

Load Test certificates shall be provided for all Spring Units and shall form part of the Manufacturer's Data Dossier. The levels of certification and traceability requirements referenced in the following sub-sections are the industry standard EN 10204 for certification and as follows for traceability:

- Level A - Traceable to certificate or record of unique event
- Level B - Traceable to product grade or identical group of events
- Level C - Traceable to product type or type of event

All materials shall be supplied with EN 10204 specific test Certificates as follow:

Item	Certification and Testing	Traceability
All load bearing components	EN10204-3.1	Level B
Welding consumables	EN10204-3.1	Level B
Other non-load bearing components	EN10204-2.1	Level B
Bolting	EN10204-3.1	Level B

All Certificates shall be originals or certified copies. The certificates shall be in the English language or in other languages if they are accompanied by an endorsed and dated English translation of the contents. The manufacturer shall implement a material tracking system to ensure the correct materials are used. The manufacturer shall implement a materials traceability system to ensure certificates are fully traceable to their base material.

8 PACKING, SUPPLY AND DOCUMENTATION

Supplier quality requirement are to be in accordance with DOC/CMP/PRO/002. The Manufacturer shall provide documentation, which shall be available prior to shipment. Packing information details as specified during the procurement stage shall be met. In general, packing shall comply with the Santos Export Packing and Marking Specification -H8-GEN-00-030-S01-0103.

Crating and packages shall be suitable for opening and resealing without difficulty or damage. Preservation shall be such that if the packaging is disturbed, then negligible degradation is permitted for a minimum period of 12 months from dispatch from the vendor's works. Crating and packages shall be marked with clear handling, storage and warning instructions to protect against damage to the preservation applied.

Material used for packaging, packing, wrapping, sealers, moisture resistant barriers and corrosion preventatives shall be recognized brands and grades and shall conform to the best world standards. Every care should be taken to minimize physical damage and alteration during shipment. Suppliers shall ensure that standard packaging meets recognized international standards for the requirement for the applicable specification. Proposed non-standard packaging shall be reviewed by Santos and approved prior to assembly of packaging. There shall be no defects, imperfections or omissions which would tend to impair the protection afforded by the package as the whole.