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**SAMCHEOK LNG TERMINAL**  
 (삼척기지 LNG RELOADING 시스템 구축 기술검토 및 설계 용역)

**FLANGES SPECIFICATION**

SCALE	JOB NO.	PHASE	DOCUMENT NO.	REV.
NONE			P3-1-1-P-M12-53-517	0



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## 1. GENERAL

### 1.1 Scope

Flanges shall be purchased in accordance with this specification and SPECIFICATION REQUIREMENTS FOR BULK MATERIAL.

Related pipe classes : all classes except for WOWA3, WOWA4 W1W1

### 1.2 Applicable Codes and Standards

All following Codes and Standards of the latest edition shall be applied, unless otherwise specified.

#### AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

ASME Section II	Material Specifications", Part A – Ferrous Materials
<u>ASME</u> B31.3	Process Piping
<u>ASME</u> B16.1	Cast Iron Pipe Flanges and Flanged Fittings
<u>ASME</u> B16.5	Pipe Flanges and Flanged Fittings
<u>ASME</u> B16.25	Buttwelding End
<u>ASME</u> B16.42	Ductile Iron Pipe Flanges and Flanged Fittings
<u>ASME</u> B16.47	Large Diameter Steel Flanges (NPS 26 through NPS 60)
<u>ASME</u> B18.2.1	Square, Hex Bolts and Screws
<u>ASME</u> B18.2.2	Square and Hex Nuts
<u>ASME</u> B46.1	Surface Texture

#### AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A105	Forgings, Carbon Steel for Piping Components
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ASTM A182	Forged or Rolled Alloy-Steel Pipe Flanges, Forged Fittings, and Valves and Parts for high-Temperature Service
ASTM A370	Specification for Mechanical Testing of Steel Product
ASTM B6	Zinc (Slab Zinc)
ASTM D2200	Pictorial Surface Preparation Standards for Painting Steel Surfaces

MANUFACTURERS STANDARDIZATION SOCIETY OF THE VALVE AND FITTINGS INDUSTRY (MSS)

MSS-SP-44 Steel Pipe Line Flanges

AMERICAN WATER WORKS ASSOCIATION (AWWA)

AWWA-C207 Steel Pipe Flanges for Waterworks service - Sizes 4" through 144"

## 2. MATERIALS

### 2.1 General

1) Items shall be furnished in accordance with the material specification specified in the order, including the specific grade, type, or alloy designation.

2) Items specified to ASME material specifications are intended for application under the jurisdiction of ASME B31.3.

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3) Components specified as galvanized shall be galvanized inside and outside by the hot dip process. The zinc used for coating shall be any grade of zinc conforming to ASTM B6.

## 2.2 STAINLESS STEEL

No substitution is permitted without the written prior agreement of the Purchaser .

Under no circumstance will 'L' grade pipe be accepted in place of straight grade unless the material is dual certified at source.

## 3. DESIGN

3.1 Items shall be furnished in accordance with the wall thickness or schedule, pressure rating and size specified in the order .

3.2 If the seller obtains the written approval of the Purchaser, items having schedules or wall thickness exceeding those specified in the order may be used. If substitutions are approved, taper boring requirements shall be as specified by the Purchaser .

3.3 Threaded ends shall have NPT threads conforming to [ASME](#) B1.20.1.

3.4 Buttweld end preparation shall be in accordance with [ASME](#) B16.25.

3.5 Unless specified otherwise in the order, flanges shall conform to the following standard :

1) Cast iron : [ASME](#) B16.1

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2) Steel and nonferrous thru NPS 24 : [ASME](#) B16.5

NPS 26 & up to NPS 60 : [ASME](#) B16.47 SERIES "A" (MSS-SP-44)

NPS 66 up to NPS 72 : [AWWA-C207](#)

3.6 Where 125 AARH is specified for flange surface finish, the range for acceptance shall be 125 AARH to 250 AARH (micro inches) with surface finish roughness conforming to [ASME](#) B46.1.

#### 4. RECORD

4.1 If items are made and marked in accordance with an acceptable standard, such as ASTM or [ASME](#), no records shall be required, except as amended by Paragraphs 4.2. through 4.3.

4.2 Material test reports shall be submitted and retained for the following :

1) All impact tested materials shall include the results of the impact tests for cryogenic service (1R1J-9R1J classes) materials.

2) When special or supplementary requirements are imposed on the material specification.

4.3 Certificates of Compliance are permitted in lieu of Material Test Reports for the following cases :

1) For material acquired from stock for which Material Test Reports are not obtainable, if accepted in writing by the Purchaser.

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2) When the markings on flanges are missing provided certification of the unmarked material is acceptable to the Purchaser's inspector; to the governing standard, specification, or code; and provided evidence can be furnished demonstrating to the inspector's satisfaction that the certification is accurate.

## 5. MARKING AND IDENTIFICATION

5.1 All items shall be marked in accordance with the standards to which they are manufactured and any additional requirements of the order.

5.2 Stamping on all austenitic steels and impact tested materials shall be with "low-stress" steel stamps having round or "U" shaped cross sections or with "Interrupted-dot" die stamps.

5.3 Marking with paint or ink on all austenitic steels shall be with a water insoluble material that contains no harmful substance; e.g., metallic pigments, sulfur, or chlorides, which would harmfully affect austenitic steels at ambient or documented history of use which demonstrate that the marking materials for use on austenitic steels meet the requirements specified herein.

## 6. CORROSION ACCEPTANCE CRITERIA

The amount of permitted surface rust shall be determined in accordance with the grades specified in ASTM D2200. The acceptance or rejection of pipe or piping components based on these grades, at the destination specified in the order, shall be as follows:

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- Grade A & B           – ACCEPTABLE
- Grade C               – ACCEPTABLE (If not covering more than 25% of surface area)
- Grade D               – NOT ACCEPTABLE

## 7. ADDITIONAL REQUIREMENTS FOR CRYOGENIC SERVICE (PIPE CLASSES: 1R1J-9R1J)

### 7.1 Resilience tests

Acceptance criteria for resilience tests shall be allowable average value (3 tests) over **600 kJ/m<sup>2</sup> (6 daJ/cm<sup>2</sup>)** with no individual value under **400 kJ/m<sup>2</sup> (4daJ/cm<sup>2</sup>)**(KCV at -196°C-Transversal Impact Test) according to ASTM A370. The specimens for impact test shall be taken from two flanges of each lot. A lot of flanges mean the same size and same wall thickness from any one heat of steel. Additionally, base metal shall be impact tested at minus(-)196°C in accordance with Para.323.3.5(b) of ASME B31.3 (ie, lateral expansion not less than 0.38 mm).