



NATIONAL PETROCHEMICAL COMPANY
STANDARDS

MATERIAL STANDARD

FOR
ROTARY-TYPE POSITIVE DISPLACEMENT COMPRESSOR
FOR GENERAL REFINERY SERVICES
NPCS-MS-RE-11

REVISION : 0

DECEMBER 1992

THIS DOCUMENT IS THE PROPERTY OF NPC. IT IS CONFIDENTIAL AND ALL RIGHTS RESERVED, TO THE OWNER NEITHER THE WHOLE NOR ANY PART OF THIS DOCUMENT MAY BE DISCLOSED TO ANY THIRD PARTY, REPRODUCED, STORED IN ANY RETRIEVAL SYSTEM OR TRANSMITTED IN ANY FORM OR ANY MEANS WITHOUT THE PRIOR WRITTEN CONSENT OF NPC.



CONTENTS

1	<u>SECTION I - GENERAL</u>
1.1	SCOPE
1.2	CRITERIA FOR ACCEPTANCE
1.3	CONFLICTING REQUIREMENTS
1.4	DEFINITION OF TERM
2	<u>SECTION II - BASIC DESIGN</u>
2.1	GENERAL
2.2	PRESSURE CASING
2.3	CASING CONNECTION
2.6	SEALS
2.1	DYNAMICS
2.9	BEARING HOUSINGS
2.10	LUBE OIL AND SEAL OIL SYSTEM
3	<u>SECTION III. - ACCESSORIES</u>
3.3	MOUNTING PLATES
3.4	CONTROLS & INSTRUMENTATION,
3.5	PIPING & APPURTENANCES
4	<u>SECTION IV - INSPECTION AND TESTING</u>
4.3	TESTING
4.4	PREPARATION FOR SHIPMENT
5	<u>SECTION VI - VENDOR'S DATA</u>
6	<u>SECTION VII - GUARANTEE AND WARRANTY</u>

THIS DOCUMENT IS THE PROPERTY OF N.P.C. IT IS CONFIDENTIAL AND ALL RIGHTS RESERVED. TO THE OWNER NEITHER THE WHOLE NOR ANY PART OF THIS DOCUMENT MAY BE DISCLOSED TO ANY THIRD PARTY, REPRODUCED, STORED IN ANY RETRIEVAL SYSTEM OR TRANSMITTED IN ANY FORM OR ANY MEANS WITHOUT THE PRIOR WRITTEN CONSENT OF N.P.C.



1 SECTION I - GENERAL

1.1 SCOPE

1.1.1 This standard defines the minimum requirements for helical, spiral and straight lobe rotary compressors (used for vacuum, pressure or both, in all types of services), including their drivers and drive mechanisms, reducing gears, if any, lubrication/sealing systems, all controls, safety devices, instrumentation and other auxiliary equipment.

1.1.2 No deviations or exceptions from this standard shall be permitted without the written approval of purchaser. Intended deviations shall be listed by vendor on a separate sheet of paper at the time of bids and supported by reasons thereof, for consideration by purchaser at the time of bidding.

1.1.3 Compliance with this standard shall not relieve the vendor of the responsibility of furnishing equipment and accessories of proper design, materials and workmanship to meet the specified start-up and operating conditions.

1.1.4 Except as modified herein, the rotary compressors and their auxiliaries shall be designed, fabricated tested and supplied strictly in accordance with the API 619, Second Edition, May 1985 "Rotary Type Positive Displacement Compressors For General Refinery Services". All the requirements specified in the following paragraphs are additions, modifications or substitution (as noted in the parenthesis) to API 619 and appear in the alphabetical or numerical order as followed in the above standard.

(Substitution)

The API Standard clause is deleted and replaced by the new clause.

(Deletion)

The API Standard clause is deleted without any replacement.

(Addition)

A new clause with a new number is added.

THIS DOCUMENT IS THE PROPERTY OF NPCC. IT IS CONFIDENTIAL AND ALL RIGHTS RESERVED. TO THE OWNER NEITHER THE WHOLE NOR ANY PART OF THIS DOCUMENT MAY BE DISCLOSED TO ANY THIRD PARTY, REPRODUCED, STORED IN ANY RETRIEVAL SYSTEM OR TRANSMITTED IN ANY FORM OR BY ANY MEANS WITHOUT THE PRIOR WRITTEN CONSENT OF NPCC.



(Modification)

Part of the API Standard clause is modified, and/or a new description and/or condition is added to that clause.

1.2

CRITERIA FOR ACCEPTANCE (SUBSTITUTION)

1.2.1

The equipment offered shall meet the following manufacturing and service experience requirements as a minimum:

1. The model offered by the bidder shall be one from his existing regular production range. Model said **above** refers to the offered designated model number of that series at the quoted RPM including the casing design/rotors design and bearing assembly and maximum discharge pressure.
2. Mechanical as well as thermodynamic performance of the machine shall have been established at vendor's shop.
3. The compressors and also the drivers, gear units and other auxiliary equipment shall be identical or validly similar in power rating, speed, discharge pressure, suction capacity, process gas, mechanical design, materials and rotor dynamics as compared to at least 3 units produced by the vendor at the proposed manufacturing plant in the past ten years out of which at least 2 units must have been operating satisfactorily at plant site for at least 8000 hr individually.
4. Equipment manufactured under license, in addition to satisfying the above requirements shall also have the licensor's written guarantee.
5. Installation lists shall be prepared **in a** manner so as to show clearly that the above requirements are satisfied and the lists shall be submitted alongwith the bid.

1.3

CONFLICTING REQUIREMENTS (MODIFICATION)

This standard is supplemented by the specific requirements contained in the equipment data sheets and job specifications, if any. In the event of contradiction, the following order of precedence shall govern:

THIS DOCUMENT IS THE PROPERTY OF NPCC. IT IS CONFIDENTIAL AND ALL RIGHTS RESERVED. TO THE OWNER NEITHER THE WHOLE NOR ANY PART OF THIS DOCUMENT MAY BE DISCLOSED TO ANY THIRD PARTY, REPRODUCED, STORED IN ANY RETRIEVAL SYSTEM OR TRANSMITTED IN ANY FORM OR ANY MEANS WITHOUT THE PRIOR WRITTEN CONSENT OF NPCC.



a) Equipment Technical Data Sheets.

b) Job Specification.

c) This Standard.

1.1 DEFINITION OF TERMS (ADDITION)

"m³/hr" is an abbreviation for inlet cubic meters per hour determined at suction (cylinder inlet flange) conditions of pressure, temperature, compressibility and moisture.

"Nm³/hr" is an abbreviation for capacity in normal cubic meters per hour referred to 1.033 kg/cm²(a) pressure, 0°C temperature and 0% relative humidity.

2 SECTION II - BASIC DESIGN

2.1 GENERAL

2.1.2 (Modification)

Compressors and drivers (including gear units and couplings, if any) shall be designed to perform satisfactorily under specified start-up conditions, part load/full load operation, maximum differential pressure operation and relief valve setting pressure and upto the trip speed.

2.1.3 (Modification)

Air cooled machines are acceptable upto differential pressure of 5000 mm water column. All the compressor casings over this pressure shall be oil or water cooled.

2.1.4 (Modification)

Clearance areas and suggested maintenance areas shall be marked in the layout drawing *submitted* with the proposal. Also vendor shall list out components of compressor, driver and auxiliaries which will require regular maintenance including weights and dimensions of these components, method of disassembly and removal and maintenance facilities to be provided by purchaser.

THIS DOCUMENT IS THE PROPERTY OF N.P.C. IT IS CONFIDENTIAL AND ALL RIGHTS RESERVED. TO THE OWNER NEITHER THE WHOLE NOR ANY PART OF THIS DOCUMENT MAY BE DISCLOSED TO ANY THIRD PARTY, REPRODUCED, STORED IN ANY RETRIEVAL SYSTEM OR TRANSMITTED IN ANY FORM OR ANY MEANS WITHOUT THE PRIOR WRITTEN CONSENT OF N.P.C.