



NATIONAL PETROCHEMICAL COMPANY  
STANDARDS

ENGINEERING STANDARD  
FOR  
NOISE CONTROL

NPCS-ES-RE-01

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1 GENERAL

1.1 Centrifugal pumps shall be supplied in accordance with the following:

API 610 "Centrifugal Pumps for General Refinery Service", Seventh Edition, February 1989.

1.2 This standard is supplemented by the data sheets for each individual item on which the operating conditions and special requirements are listed. Wherever the data sheets conflict with the provisions of this standard, the data sheets shall govern. In the event that there are any exception to standard, data sheets, codes, standards, etc., these shall be clearly listed in the vendor's bid.

1.3 Compliance by the manufacturer with the provisions of this standard does not relieve him of his responsibility of furnishing equipment and accessories of proper design mechanically suited to meet the specified service conditions.

1.4 Unproven, prototype or "first-off" equipment is not acceptable; only proven equipment may be used. Proven equipment is defined as equipment that has been in continuous operation elsewhere for a minimum of two years without major breakdowns on similar duties, and under similar conditions. In this context, "similar" does not mean absolutely identical. However, casings of given sizes and pressure ratings must have been operated at powers and speeds of the same order of magnitude on the application under consideration. Vendor is to provide an experience list with the bid. (See section 2.8 paragraph 5.1.n).

2 MODIFICATION TO API 610

The following paragraphs specifying the modifications follow the API 610 numbers and each paragraph denotes an addition, substitution or deletion.

(Substitution)

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

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(Deletion)

The API Standard clause is deleted without any replacement.

(Addition)

A new clause with a new number is added.

(Modification)

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

SECTION 1 - GENERAL

3  
1.1

SCOPE

(Substitution)

This standard covers the minimum requirements for centrifugal pumps used for general refinery service, including chemical plants, gas plants, petrochemical plants, etc. This standard is also applicable to hydraulic power recovery turbines.

1.2

ALTERNATIVE DESIGN

1.2.1

(Addition)

Metric fasteners and flanges constitute alternative design features and must be cited as an exception in the proposal.

1.2.2

(Addition)

Where reference is made in this standard to AISI or ASTM materials, alternative equivalent materials are acceptable. Chemical composition and properties shall be checked to ensure suitability for the intended service. All materials will be subject of review by the purchaser. Where pressure vessels as defined by the ASME Code are included, they shall be designed and manufactured in accordance with Sections VIII and IX.

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1.3 CONFLICTING REQUIREMENTS

1.3.1 (Substitution)

In case of conflict between the various documents, their order of precedence is as follows:

- a) Purchase order.
- b) Requisition.
- c) Data sheets.
- d) Project specification(s).
- e) This standard.
- f) Referenced industry standards.

1.3.2 (Addition)

All conflicting requirements shall be referred to the purchaser in writing. The purchaser will issue confirming documentation if needed for clarification.

1.4 DEFINITION OF TERMS

1.4.28 (Substitution)

Net positive suction head available (NPSHA) is determined by the purchaser for the pumping system at rated flow and is the total suction head in meters of liquid absolute referred to the bottom of the baseplate for horizontal pumps or mounting plate for double casing vertical pumps-minus the vapour pressure of the liquid at pumping temperature in meters absolute. Vertical open pit pumps shall be referred to the eye of the impeller and vertical in-line pumps shall be referred to the suction flange centerline.

1.4.39 (Addition)

"Unit Responsibility" refers to the vendor responsible for coordinating the technical aspects of the equipment and all auxiliary systems included in the scope of the "order". This includes expediting, and assurance that all applicable specifications referenced on the data sheets or requisition are supplied to, and complied with, by any sub-vendor. It also includes guarantee of performance of the complete package furnished. Unless specified otherwise in the purchase order, the manufacturer shall have unit responsibility.

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In the event of problems being experienced with the complete operating unit when installed, it is the prime vendor's responsibility to identify the source of the problem and only if and when he can establish that the source is not within his control will he cease to be responsible for the resolution of that problem.

1.4.40 (Addition1)

Agreement shall be obtained in writing from the company before work may be sub-contracted. Vendor shall inspect, coordinate and resolve any problems related to his sub-vendor.

1.4.41 (Addition)

"Licenses" shall refer to equipment manufactured under license and all such equipment shall carry the licensor's written guarantee.

1.5.3 (Deletion)

This clause shall be deleted.

4 SECTION 2 - BASIC DESIGN

2.1 GENERAL

2.1.1 (Substitution)

Any pump with constant speed driver, requiring a maximum impeller diameter to meet the rated pumping conditions is not acceptable. (The impeller shall be such that at least a 5% increase in head at the rated capacity can be obtained by installing a larger diameter impeller of the same pattern). Installed impeller diameters as well as maximum and minimum impeller sizes compatible with the pump casing shall be shown on the data sheets.

2.1.6 (Modification)

All horizontal pump with two or more stages and all horizontal double suction pumps shall have the impellers mounted between bearing.  
Single stage pumps with an impeller 500 mm diameter or more running at speeds over 1500 rpm shall be mounted between bearings.  
Close coupled pumps with the impeller mounted on an extension of the motor shaft are not acceptable.



2.1.9

(Substitution1)

Vendor shall list on the data sheet the net positive suction head (NPSH) at the appropriate reference elevation (see 1.4.28 above) which would be required if the pump were operated on (16°C) water at the specified capacity and rated speed. Temperature or hydrocarbon correction factors shall not be used in calculating NPSH requirements.

2.1.10

(Modification)

The viscous correction factors used for pump selection must be submitted with the proposal.

2.1.11

(Modification)

Pumps shall have capacity curves continuously rising to shut-off.  
Pumps in parallel operation shall have equal head rise to shut-off. Impellers with back vanes are not permitted without specific agreement with purchaser.

2.1.12

(Modification)

The rated point shall not be more than 115% of the flow at best efficiency point.

2.1.13

(Modification)

The maximum permissible sound level shall not exceed 85 dBA measured at 1 m from pump+driver surface for the recommended range of operation.  
The equipment furnished by the vendor shall conform with project noise specification.

2.1.17

(Modification)

Liquid cooling shall be offered for the following pumping temperatures:

Bearing : above 150°C

Pedestal : above 260°C

2.1.29

(Modification)

Pump drivers and accessories shall be designed for outdoor, unprotected installation.

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