
	<p align="center">Doode Sanati Pars Company Carbon Black Hard Reactor Revamping</p>		
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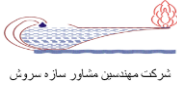

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  	Doodeh Sanati Pars Company Carbon Black Hard Reactor Revamping		 TARH O FARAYAND KIMIA Eng. CONSULTANT
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1. Purpose

1.1 Scope

This document provides the minimum requirements for the technical specifications of the *Air Blower* used in “Pars Carbon Black Plant” project.

1.2 Project description

The existing plant of Pars Carbon Black consist of four Soft reactors and also four Hard reactors in the production unit. Due to the fact that the old technology of this plant and lower the performance of the production unit, it is decided to renovate the technology and also revamping the capacity of hard carbon black unit to 20000 metric ton per year. Another necessary consideration is capability of production of N-200 series carbon blacks after revamping. According to the contract, basic design is carried out by TARH O FARAYAND KIMIA Co.

Project:	Basic Design of Pars Carbon Black Hard Reactor Revamping
Client:	Pars Carbon Black Co. (DSP).
Consultant:	Tarh o Farayand Kimia Co (TOFKA).
Vendor/Supplier:	Refers to firm or person who will supply and/or fabricate the equipment or material.
Will:	Is normally used in connection with the action by the “Company” rather than by a contractor, supplier or vendor.
May:	Is used where a provision is completely discretionary.
Should:	Is used where a provision is advisory only.
Shall:	Is used where a provision is mandatory.

1.3 Unit and Language



International system of units (SI) shall be use in accordance with NIOEC-SP-00-10, unless otherwise specified.

1.4 Site Location

SAVEH City, KAVEH Industrial Estate, Pars Carbon Black Co.

2. Applicable Code, Standard, Specification

- 2.1 Unless otherwise stated on the equipment data sheets the following codes and standards shall apply.

 <p>شرکت مهندسين مشاور سازد سروش</p>	<p align="center">Doode Sanati Pars Company Carbon Black Hard Reactor Revamping</p>		 <p>TARH O FARAYAND KIMIA Eng. CONSULTANT</p>
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API 672	Packaged, Integrally Geared Centrifugal Air Compressors for Petroleum, Chemical, and Gas Industry Services
API 617	Axial and Centrifugal Compressors and Expander-Compressor
ASME Section II	Ferrous Material Specifications
ASME Section V	Non-destructive Examination
ASME Section IX	Welding & Brazing Qualifications
ASTM A-388/A-388M	Standard Practice for Ultrasonic Examination of Heavy Steel Forgings
ISO 900 I: 2000	Quality Management Requirements Systems
ISO 9001:1994	Quality Systems Model for Quality Assurance in Design, Development, Production, installation and Servicing.

2.2 The following specifications shall be used in conjunction with this technical specification document:

DSP-FK-BE-ME-DCR-501	Mechanical Design Criteria
DSP-FK-BE-ME-DCR-502	Machinery Design Criteria
DSP-FK-BE-ME -SPC-513	Specification for Safeguarding of Machinery
DSP-FK-BE-EL-SPC-702	Specification for MV Switchgear
DSP-FK-BE-SF-SPC-904	Specification for Noise Control
DSP-FK-BE-IN-SPC-604	Specification for I&C of Package Unit
DSP-FK-BE-PR-RPT-303	Site technical survey

2.3 In the event of a conflict of technical requirements within the requisition documents, the order of precedence shall be:

- (a) Local Authority or Statutory Regulations
- (b) Requisition I Purchase Order
- (c) Exchanger Data Sheet
- (d) This specification

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- (e) Referenced Project Specifications
- (f) Referenced Design Codes and Standards

3. General Requirements

- 3.1 The equipment and parts can be manufactured according to internal manufacturer's standards, provided they comply with the unit reference standards.
- 3.2 The unit shall be suitable for outdoor operation.
- 3.3 Weatherproof construction is required. The blower package shall be installed outdoors without roof, exposed to a plant atmosphere, in an area subject to occasional sandstorms.
- 3.4 The unit shall be designed for continuous operation under the specified conditions.
- 3.5 The unit shall be provided with lugs, lifting rings or other equivalent devices to facilitate handling if the weight exceeds 30 kg.
- 3.6 Performance guarantees shall be in accordance with ASME Code performance test (ASME Power Test Code 10) or equivalent.
- 3.7 The head capacity curve shall rise continuously from rated point to surge. The blower, without the use of a bypass, shall be suitable for continuous operation at any point at least 10 percent above the surge capacity.
- 3.8 Blower performance curves shall be submitted for Client's approval.
- 3.9 Control at suction from rated capacity to surge at constant discharge pressure.
- 3.10 Max allowable noise is 85 dB(A) at 1 m distance. (enclosure and exhausting fan should be considered if required)
- 3.11 All any requirement that mentioned in data sheet document.



4. Design

4.1 General

- 4.1.1 No critical speed shall be within 20% above or below the operating speed.

4.2 Casing

- 4.2.1 The casing shall be suitable for the maximum possible discharge pressure.

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4.2.2 The stress values used in the design of pressure containing parts shall not exceed the values given for maximum allowable stress values in tension at the maximum operating temperature of the material used.

4.2.3 Inlet and outlet connections shall be flanged in accordance to ANSI B 16.5 RF flanges.

4.2.4 The direction of rotation of the impeller shall be clearly indelibly marked on the casing.

4.2.5 Provisions shall be made for blower, gear and driver with couplings and guards to be mounted on a common structural steel welded base plate sufficiently rigid to lift the entire package as a complete unit. Blower, gear and accessories shall be shipped with baseplate to the jobsite. The baseframe shall be provided with lifting lugs. It shall be extended as necessary to support the driver and blower.

4.3 Impeller

4.3.1 The impeller shall be equipped with a balancing ring to be used for field balancing.

4.3.2 Rotating parts shall be statically and dynamically balanced.

4.3.3 Balancing and vibrations limits shall be in accordance with acceptable international standards such as VDI 2056, VDI 2060, ISO 19816, ISO 14694 and other applicable codes.

4.4 Shaft and Bearing



4.4.1 Impeller and shaft shall be stiff enough to prevent contact between the rotor bodies and casing.

4.4.2 The shaft is forged and may be designed as stiff shaft.

4.4.3 Shaft shall rotate in self-aligning, precision type ball bearings, grease or oil packed, and selected for a minimum operational life of 40 000 hours when running continuously under the specified design conditions .

4.4.4 The bearings shall be mounted in easily accessible positions.

4.4.5 The unit shall operate smoothly throughout its entire speed range in reaching its operating speed. First critical speed shall be at least 20% above the specified operating speed. Tip speed of the impeller shall not exceed 30 m/s.



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4.5 Couplings and Guards

- 4.5.1 Couplings shall be furnished with the maximum practical service factor, considering speed and lubrication. Minimum service factor used shall be 1,75 based on maximum design torque input.
- 4.5.2 Guards shall completely enclose the couplings, preventing all access to the danger zone during equipment operation. However, it shall be readily removable for maintenance and inspection.
- 4.5.3 Couplings shall be spacer type .

4.6 Electrical Motor

- 4.6.1 All electrical components shall be suitable for the area classification and grouping specified by the Purchaser on the data sheets.
- 4.6.2 The driver shall be sized to meet the maximum operating conditions including all losses. It shall be in accordance with enclosed blower and electric motor data sheets.
- 4.6.3 Vendor shall identify the order with his Purchase Order Number and shall include the following minimum motor ordering information:
- Employer Equipment Tag Number
 - Power Output in Kilowatts (as noted in the Data Sheet)
 - Speed in RPM
 - Direction of Rotation (as viewed from Motor Drive End)
 - Enclosure (All TEFC, IP-54)
 - Voltage, Phase, Frequency
 - Shipping Destination
- 4.6.4 Electrical datasheet and wirings shall be submitted by vendor.
- 4.6.5 Vendor to advise the requirments to the motor soft starter.
- 4.6.6 For more details, please refer to electrical specifications.

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4.7 Lube Oil Systems



- 4.7.1 In general, the Vendor's standard lube oil system design is acceptable. The reservoir shall be in stainless steel and shall have a suitable level gauge glass covering the full level range. Reservoir may be integral with the base.
- 4.7.2 Reservoir or sump drain shall be 1/2 inch NPT minimum (plugged).

4.8 Accessories

- 4.8.1 Following additional accessories are required:
- throttling valve with I/P convertor
 - air filter regulator with air connection 1/4" NPT
 - discharge check valve
 - necessary instrumentation for normal and safe operation
- 4.8.2 Filter shall be considered to avoid sand dust in the ambient air due to strong winds.
- 4.8.3 A vibration monitoring system shall be provided for blower bearings, as a minimum.
- 4.8.4 Local control system should be considered.
- 4.8.5 Instrument air and cooling water supply and return connections should be considered.
- 4.8.6 Filter and silencer for air inlet shall be considered.
- 4.8.7 Pressure control system as per data sheet for air outlet shall be considered.
- 4.8.8 Silencer for blower vent shall be considered.
- 4.8.9 Special tools for operation and maintenance shall be supplied by vendor.

5. Inspection

- 5.1 The blower will be tested in accordance with API 617:
- a) impeller over speed test
 - b) performance test ASME Power Test Code Class

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5.2 Non-Ductructive test shall be performed according the NDT procedure DSP-FK-BE-ME-PRC-520.

5.3 Client at appoint his representative to inspect the unit and witness all tests. Clients representative shall have the right to reject unsatisfactory materials and workmanship.

5.4 Synchronous vibration amplitude and phase angle vs speed for deceleration shall be plotted before and after the 4-hour run. Both the filtered (one per revolution) and the unfiltered vibration magnitudes shall also be plotted. These data shall also be furnished in polar form. The speed range covered by these plots shall be 400 revolutions per minute to the specified driver trip speed.

5.5 The sound-level test shall be performed in accordance with CLIENT's requirements: DSP-FK-BE-SF-SPC-904, Specification for Noise Control.

6. Coating

6.1 After all tests are made, the inside and outside of the blower shall be cleaned, dried and blasted ready for coating.

6.2 Coating surfaces shall be painted with protective coating to withstand industrial atmosphere on site.

6.3 Stainless steel surfaces shall not be painted.



6.4 Specification for Shop & Field Painting, DSP-FK-BE-PI-SPC-426, shall be followed by vendor.

7. Shipment

7.1 All openings shall be sealed with substantial closures.

7.2 The unit shall be properly crated and packed to prevent transit damage which may arise from handling and weather conditions.

7.3 "Packing, Marking and Shipping Procedure, DSP-FK-BE-ME-PRC-512" shall be followed by vendor.

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8. Guarantee

8.1 All equipment covered by this Specification shall be suitable for the specified operating conditions and shall be designed and constructed for at least 3 years of uninterrupted continuous service life.

8.2 The Vendor shall be responsible for coordination and guarantee of the overall, performance of the blower, driver, gear and all auxiliaries.