

FND PROFILE ON PHARMACEUTICAL PLANTS

Scope of Services Provides

FND offers a comprehensive range of engineering consultation services in a wide spectrum of electrical & mechanical fields. We serve clients in the commercial, institutional, educational, residential, industrial, hospitality, retail, and cultural market segments. We are one of the largest private sector engineering consultants in Pakistan and regularly undertake projects in many parts of the country. We analyze the specific problems of our clients and suggest optimal state-of-the-art solutions.

FND offers services at all stages of a project, from feasibility studies to project planning to realization and commissioning. In 2010, we completed more than 1200 projects for a diverse roster of satisfied clients: industrialists, commercial firms, building owners and developers, architects, civil engineers, contractors, facility managers and public agencies. These projects range from small tenant improvements, to large new offices and schools, to major industrial and treatment facilities.

CGMP Design of HVAC, Electrical & Mechanical Systems for:

- Oral Solid Manufacturing & Packaging
- Oral Liquid Manufacturing & Packaging
- Sterile Manufacturing
- Warehouse
- Cephalosporin Manufacturing
- CNS Products Manufacturing
- DI & WFI Plants

1. Johnson & Johnson Pakistan (Pvt.) Ltd., Karachi

The partners of FND were responsible for the complete design of the mechanical & electrical systems for the new plant, consisting of the following.

- HVAC System
- Compressed Air System
- Steam Distribution System
- Water Supply System
- Drainage System
- Fire Protection System
- Medium and Low Voltage Power Distribution
- Interior and Exterior Lighting
- Communication Systems
- Fire Alarm
- Switchgear & Earthing
- PFI Plant
- Standby Generator

The work was completed & commissioned in 1985.

2. Roche Pakistan Ltd., Karachi- Mechanical System

Complete mechanical works for the new factory at Korangi was designed and supervised by Fahim I. Siddiqui, consisting of the following:

- HVAC System
- Water Supply System
- Drainage System
- Fire Protection System
- Steam Plant & Distribution System



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- Compressed Air System
- Oil Storage & Distribution System
- Synthesis Laboratory

The plant was completed & commissioned in 1986.

3. **Merck Sharp & Dohme of Pakistan Ltd., Karachi-Electrical System**

- Medium and Low Voltage Power Distribution
- Interior and Exterior Lighting
- Communication Systems
- Fire Alarm
- Switchgear & Earthing
- PFI Plant
- Standby Generator

The work was completed & commissioned in 1983 by Mr. Roland deSouza.

4. **Project No: 295** **Cynamid Pakistan Ltd., Karachi-Complete Mechanical System**

Complete mechanical system for the new plant consisting of the following.

- HVAC System
- Compressed Air System
- Steam Distribution System
- Water Supply System
- Drainage System
- Fire Protection System

The work was completed & commissioned in 1990.

5. **Project No: 317** **Roche Pakistan Ltd., Karachi-Microbiology Lab**

The work was completed & commissioned in 1989.

6. **Project No: 344** **Pfizer Laboratories, Karachi**

Complete upgrading of electrical & mechanical systems consisting of the following:

- HVAC System for Sterile Areas (Class 100 & Class 10,000 areas)
- HVAC System for Admin. & Cafeteria
- Steam Plant & Distribution System
- Compressed Air System
- Water Supply & Drainage System
- Fire Protection System
- D.I. System
- WFI System
- Substation
- Interior and Exterior Lighting
- Communication Systems
- Fire Alarm
- Switchgear & Earthing



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- PFI Plant
- Standby Generator

The work was completed & commissioned in 1993.

7. Project No: 505
Roche Pakistan Ltd., Karachi-Granulation Area

Separation & Additional AHU for Granulation Area

The work was completed & commissioned in 1994.

8. Project No: 590
Roche Pakistan Ltd., Karachi-Granulation Oven

Design & construction of two Granulation Ovens with heating system to dry granules at 80°C. Construction.

The work was completed & commissioned in 1995.

9. Project No: 621
Upjohn Pakistan Plant, Rawalpindi

Complete electrical & mechanical design for the new pharma plant consisting of the following works:

- HVAC System for Dry Manufacturing Areas
- HVAC System for Liquid Manufacturing
- CNS Room HVAC System
- XP Area HVAC System
- Steam System
- Compressed Air System
- DI Water System
- Soft & Non-Soft Water System
- Drainage System
- Substation
- PABX
- Security/ Fire Alarm System
- Interior & Exterior Lighting

The work was completed & commissioned in 1996.

10. Project No: 654
Abbott Laboratories, Karachi

HVAC System Upgrade for Dry Manufacturing Area to Maintain Low Relative Humidity.

The work was completed & commissioned in 1995.

11. Project No: 673
Roche Pakistan Ltd., Karachi-Ointment Plant

Electrical & Mechanical services for Ointment Plant.

The work was completed & commissioned in 1996.



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12. Project No: 729
Pfizer Laboratories, Karachi-MEP Upgrading

Electrical & Mechanical services for complete upgrading of Dry Manufacturing & Packaging Area.

The work was completed & commissioned in 1998.

13. Project No: 795
Pharmacia Upjohn Pakistan Plant, Rawalpindi

Extension of Dry Manufacturing Area with Low relative Humidity (25% RH) application.

The work was completed & commissioned in 1999.

14. Project No: 796
Roche Pakistan Ltd., Karachi-Rocephin Packaging

MEP services for Rocephin Packaging Area.

The work was completed & commissioned in 1998.

15. Project No: 802
Novartis, Jamshoro

New Electrical / Mechanical services plant, with new substation and generators, boiler and chiller plant.

The work was completed & commissioned in 1998.



16. Project No: 805
Roche Pakistan Ltd., Karachi-Pharma Extension

MEP works for Extension of Dry Manufacturing Area & Packaging Area.

The work was completed & commissioned in 2001.

17. Project No: 838
Roche Pakistan Ltd., Karachi-Conversion of Existing Area into New Zone Concept

Conversion of existing HVAC System into "New Zone" concept, to improve cross- contamination control.

The work was completed & commissioned in 2002.

18. Project No: 858
Parke Davis & Company Ltd., Karachi

Upgradation & expansion of substation at SITE plant.

The work was completed & commissioned in 2002.

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19. Project No: 866
Glaxo Smith Kline Pakistan Ltd., Karachi

MEP works for New Corporate Offices.

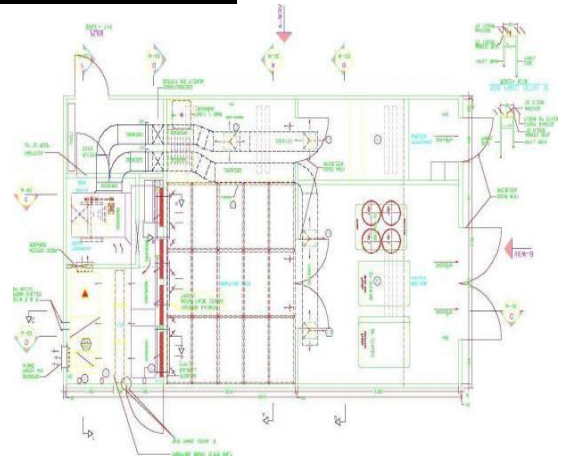
The work was completed & commissioned in 2002.



20. Project No: 872
Parke Davis & Company Ltd., Karachi- Plant Consolidation Project

MEP services for shifting of Pfizer, West Wharf manufacturing facilities into Parke Davis SITE plant.

The work was completed & commissioned in 2003.



Project No: 879
Roche Pakistan Ltd., Karachi-Sampling Booth, Karachi

Detailed design & construction drawings for fabrication of Sampling Booth locally. Booth uses state of the art laminar flow & filtration technology.

The work was completed & commissioned in 2003.

21. Project No: 884
Roche Pakistan Ltd., Karachi-Replacement of Reciprocating Chiller

Design of MEP services for replacement of electric operated chillers using Freon refrigerant to gas operated absorption chillers as Roche policy disallows use of Freon due to ozone depletion and global warming. The electric operated chillers were designed by FND in 1987, when this policy was not made.

The work was completed & commissioned in 2003.

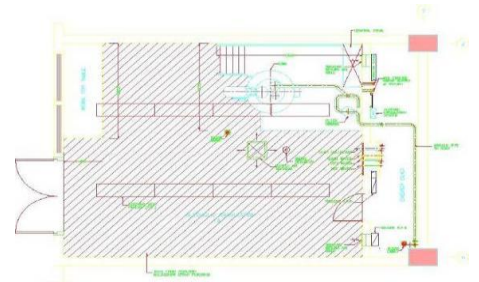


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22. Project No: 887
Roche Pakistan Ltd., Karachi-Moritz Drying Oven,
Karachi

Design of MEP services for installation of Mortiz Oven.

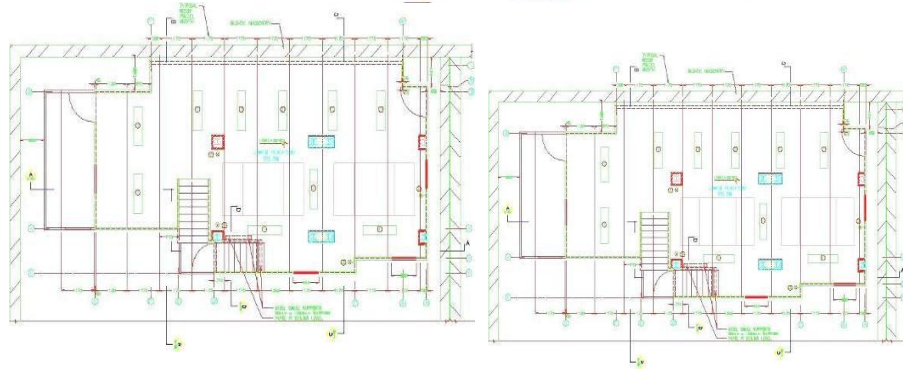
The work was completed & commissioned in 2003.



23. Project No: 898
Procter & Gamble, Karachi

Design and construction of Amalgamator Room using polyurethane pre-insulated sandwich panels. Design and construction completed & commissioned in 3 months

The work was completed & commissioned in 2002.



24. Project No: 906
Roche Pakistan Ltd., Karachi-Replacement of AHU

Replacement of AHU's & conversion of the areas to new zone concept, including addition of a dehumidifier for low humidity dry product areas

The work was completed & commissioned in 2004.

25. Project No: 908
Parke Davis & Company Ltd., Karachi-Access Control & CCTV

Automatic Access Control System & CCTV for SITE.

The work was completed & commissioned in 2002.

26. Project No: 926
Pfizer Laboratories, Karachi

Design of MEP services for corporate offices at their West Wharf site.

The work was completed & commissioned in 2004.

27. Project No.929
Roche Pakistan Ltd., Karachi-Fire Alarm System

Fire Alarm System.

The work was completed & commissioned in 2004.

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28. Project No: 934
Parke Davis & Company Ltd., Karachi-Sewerage System

Design of Sewerage System for entire complex & connection to a new sewerage treatment plant.

The work was completed & commissioned in 2004.

29. Project No.935
Parke Davis & Company Ltd., Karachi-Compressed Air System & Utilities Piping Rationalization

Relocation of Rotary Compressor from West Wharf site to SITE, refurbishment of compressed air distribution system, and design of a complete utilities piping services support system.

The work was completed & commissioned in 2006.

30. Project No.936
Parke Davis & Company Ltd., Karachi-Steam System

Relocation of Steam Boiler from West Wharf site to SITE, refurbishment of steam distribution system, and condensate return system.

The work was completed & commissioned in 2004.

31. Project No: 937
Parke Davis & Company Ltd., Karachi-Water Distribution System

Design of central city water storage, filtration, chlorination & distribution system for the entire pharma complex.

The work was completed & commissioned in 2006.

32. Project No.938
Parke Davis & Company Ltd., Karachi-Chilled Water System

Design of a central chilled water plant and rationalization of existing chilled water distribution system to feed existing AHU's as well as new installation.

Under Construction

33. Project No.939
Parke Davis & Company Ltd., Karachi-Fire Protection System

Design of a new fire protection system consisting of electric & diesel engine driven fire pumps, fire water storage, yard hydrant piping, hose reels, external hydrants and automatic sprinklers.

The work was completed & commissioned in 2009.



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34. Project No.956
Roche Pakistan Ltd., Karachi-MEP Services in Granulation Room

Replacement of flat bed dryers with a fluid bed dryer and complete refurbishment of the air-handling system, and utilities piping.

The work was completed & commissioned in 2005.

35. Project No.962
Glaxo Smith Kline Pakistan Ltd., Karachi-Evaluation of Aqueous Coating De-humidification System

Evaluation of existing low RH system serving coating pan, for suitability for conversion to aqueous coating.

Evaluation report completed & commissioned in 2004.

36. Project No.974
Glaxo Smith Kline Pakistan Ltd., Karachi-Low RH Design for HSSL Filling Area

25% RH design for HSSL Filling Area.

The work was completed & commissioned in 2005.

37. Project No.976
Gelcaps Pakistan Ltd., Karachi-A/C System for Capsule Making Machine

Conditioned air-supply to hard gelatin capsule making machine, consisting of low RH low temperature air, HEPA filtered to required cleanliness.

The work was completed & commissioned in 2006.

38. Project No.985
Roche Pakistan Ltd., Karachi-Walk-in-Cold Storage

Walk in cold storage of size 15' X 13' X 12' (h), designed for 2°C.

The work was completed & commissioned in 2005.

Project No.991
Sanofi Aventis, Karachi-Liquid Manufacturing Area HVAC, Plumbing & Fire System

Design of HVAC & Mechanical services for liquid manufacturing plant, including shifting of equipment from Wah factory to Karachi factory.

The work was completed & commissioned in 2009.



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39. Project No.995
Roche Pakistan Ltd., Karachi-Replacement of Diesel Generator Set

1X 650-kVA-diesel generator with sound suppressed canopy, and auto-synchronization & load sharing with existing generators.

The work was completed & commissioned in 2007.

40. Project No.999
Parke Davis & Company Ltd., Karachi-XANAX Manufacture

Design of HVAC & Mechanical services for manufacturing of highly potent CNS drug, Xanax, including shifting of equipment from Pharmacia-Upjohn factory at Islamabad to Karachi factory.

The work was completed & commissioned in 2008.

41. Project No.1014
Roche Pakistan Ltd., Karachi-Isolators for Primary Packaging Line

Design of air-conditioning system for the Isolators on existing primary packaging lines to meet manufacturing standards to avoid cross contamination & to protect the operators from contamination.

The work was completed & commissioned in 2007.

42. Project No.1029
Gelcaps Pakistan Ltd., Karachi-Two New Hard Gelatin Capsule Manufacturing Machines

Addition of 200TR direct fired absorption chiller with existing chilled water system

The work was completed & commissioned in 2007.

43. Project No.1030
Parke Davis & Company Ltd., Karachi

Upgradation of standby power generation system.

The work was completed & commissioned in 2007.

44. Project No.1036
Roche Pakistan Ltd., Karachi-Ventilation System

Upgradation of ventilation system for male & female locker rooms.

The work was completed & commissioned in 2007.

45. Project No.1038
Parke Davis & Company Ltd., Karachi-Chilled and Condenser Water System

Upgradation of chilled and condenser water system.

Under Construction.



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46. Project No.1044
Roche Pakistan Ltd., Karachi-Walk-in Cold Storage

Design of refrigeration unit for walk-in cold storage.

The work was completed & commissioned in 2008.

47. Project No.1063
Procter & Gamble, Karachi

MEP Design Works.

The work was completed & commissioned in 2010.

48. Project No.1111
Roche Pakistan Ltd., Karachi

Installation of 2nd Boiler in Boiler Room at Roche Factory.

The work was completed & commissioned in 2008.

49. Project No.1115
Roche Pakistan Ltd., Karachi

Separation of Primary and Secondary Packaging Lines for Implementation of New Zone Concept and New Blister Packaging Machines.

The work was completed & commissioned in 2008.

50. Project No.1152
Parke Davis & Company Ltd., Karachi-Amenity cum Office Building

Parke Davis is now constructing a new amenity cum office block. FND has designed all MEP services.

Under construction

51. Project No.1160
Roche Pakistan Ltd., Karachi-Warehouse

Air-conditioning of warehouse of about 2500 sq.ft. The required room temperature is 24 C. with 24 hr/day and 365 a year air conditioning. Day operation is by central chiller plant, whereas for night time operation, separate 25 TR chiller has been installed.

The work was completed & commissioned in 2010.