

FOREWORD

The selection of fiberglass reinforced plastic (FRP) duct for use in corrosive environments is increasing. FRP duct is frequently being selected for fume hood exhaust systems, for air pollution and odor control systems in facilities such as waste water treatment plants, and other corrosive environments.

FRP ducts are routinely designed and manufactured to meet a systems unique requirements. This represents a major advantage over thermoplastic (PVC), metallic, and coated metallic ductwork. FRP ducts are manufactured using specifically designed reinforcement systems, bonded together with thermosetting plastic resins. These resins are selected for their ability to resist specific chemicals known to be present in the corrosive environment in which the ductwork is to be installed.

Working with resin and FRP duct manufacturers, SMACNA contractors have researched the current and future potential use of FRP duct and its physical properties. This effort resulted in an authoritative manual that SMACNA contractors, architects, engineers, managers, and plant owners can rely upon for the proper selection, manufacture, and installation of specifically tailored FRP duct systems. To establish these manufacturing and construction standards, SMACNA contracted with Dr. Joseph M. Plecnik of the Civil Engineering Department at California State University, Long Beach, to develop and test duct design procedures for the manufacture and installation of round and rectangular duct systems. Dr. Plecnik investigated round duct systems ranging from 4 to 72 inches (100 to 1800 mm) in diameter and rectangular duct systems ranging from 12 to 96 inches (300 to 2400 mm) in width and depth, operating at a static pressure within a range from -30 to +30 in. wg (-7500 to +7500 Pa) and within a temperature range from ambient to 180°F (82°C).

By following the manufacturing, construction, and installation details specified in this manual, a contractor should be able to develop a duct system that dependably meets the stated requirements of the customer. As with all products, there are limits to the successful use of FRP duct systems. It is imperative that the customer provide an accurate definition of the corrosive environment in which the FRP duct system is to be installed. Proper selection of the thermoset resins and reinforcing material ensures that the customer receives a well designed duct system that meets his needs for the foreseeable future.

Throughout the manual and its appendices, we have included the engineering design criteria and safety factors selected to achieve a safe, and cost effective construction standard. This includes ample consideration of the manufacturing variables that occur in a product built to meet the individual requirements of each application.

SMACNA is indebted to representatives from thermoset resin and FRP duct manufacturers, and the SMACNA contractors who, as members of the FRP Task Force, volunteered their time and effort to the development of this manual. SMACNA appreciates their dedication and willingness to share their knowledge and experience in the design, fabrication, and installation of FRP duct systems.

SHEET METAL AND AIR CONDITIONING CONTRACTORS'
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