Fiberglass (or FRP) duct is thin walled pipe generally used for corrosive fume exhaust from process areas or equipment, but may also be used for fresh air supply or light-weight conveying of liquids or solids. Flame Guard fiberglass duct may be used above or below ground, with proper attention to mechanical design requirements.

FRP duct is available in a wide variety of corrosion resistant materials, shapes and thickness. All thermoset resins and most reinforcements can be used to fabricate duct, although flame retardant corrosion grade polyesters and vinyl esters using E-glass reinforcement predominate.

Non-routine applications may call for furan, phenolic, epoxy, or other high performance specialty thermosets for specific strength, corrosion, flame propagation and/or smoke development resistance. Furans and phenolic resin based FRP duct systems generally offer enhanced solvent resistance as compared to polyesters and vinyl esters, while epoxy can offer improved strength in particularly demanding applications such as aerospace, where weight reduction also becomes more of a factor.

Introduction

Flame Guard is the trade name for Composites USA line of industrial grade corrosion resistant fiberglass duct that is not specifically certified by agencies such as FM Global or Underwriters Laboratories as a smoke removal duct, suitable for indoor installation without sprinklers (see our Dual Guard 2000® if this is a requirement). Flame Guard duct is typically provided in fire retardant versions of vinyl ester resins, but may be provided using other materials of construction as well. Our most popular version of Flame Guard utilizes a fire retardant vinyl ester resin and fiberglass, rated as Class 1 fire retardant with a flame spread <25 as measured by ASTM E-84. The inherent smoke development for this product may be reduced by secondary application of intumescent paints and coating.

Advantages

There are many advantages to choosing Flame Guard®:

- Safety
- Flame and Smoke Resistance
- Corrosion Resistance
- Customization to fit your specific project

Custom Sizing

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Design

The design of FRP duct systems must take into account many different factors. Corrosion resistance, design pressure, vacuum, temperature, abrasive characteristics of the conveyed fluid or gas, flammability or smoke concerns, electrical conductivity or static dissipation are just a few of the characteristics of the desired system that must be considered and addressed with proper choice of materials of construction. Mechanical design evaluates the strength of the duct, the requirements for supports, thermal expansion compensation, burial loads, wind, snow and seismic considerations. Laminate analysis, and when required, finite element analysis is a part of the overall Composites USA design solution.

Custom Applications

Duct systems are usually supplied with a round cross section, but oval, square and rectangular duct is also available. Various industry guidelines exist for specifying proper duct construction, including SMACNA, ASTM D 3982, the U.S. Bureau of Commerce Voluntary Guidelines PS-15-69, and others. A typical specification for fiberglass duct is available on our web site. FRP duct is easily tailored for custom applications requiring higher or lower pressure handling capability than what is shown in the specifications, generally by adjusting wall thickness or local reinforcements. Please contact Composites USA for questions or guidance in this area. Many of our most popular fitting and damper styles may be viewed on our Fitting Style Sheets, but specialty fittings not shown can be supplied as well.

Dual Guard 2000

Composites USA works with all the resin systems mentioned above, and also manufactures Dual Guard 2000, a line of Factory Mutual (FM) Approved and Underwriters Laboratories (U.L. 181) Listed fiberglass duct and fittings. This FRP duct incorporates a proprietary copolymer thermoset resin, a Halar surfacing veil, and fiberglass reinforcement to meet stringent building code requirements (International Mechanical Code, or IMC, BOCA, SBCA and others) for low flame propagation (ASTM E-84 = 5) and low smoke generation (ASTM E-84 = 10) in corrosive fume and smoke exhaust applications, without having to sprinkler the duct, and without requiring secondary application of intumescent coatings typical of vinyl ester resin systems.

Why Composites USA?

Since 1982, Composites USA continues to execute on the requests of the world’s most discerning and demanding users. From intricate, complex parts to multi-million dollar design, fabrication, and construction projects, we invoke hundreds of years of combined experience and technological superiority in each and every initiative undertaken.

Contact Composites USA today for design assistance & recommendations for your process needs!
Other Composites USA products:
- Dual Laminate Equipment & Structures - Corrstop
- FM Approved / UL Listed FRP Duct - DualGuard
- Fiberglass Scrubbers & Skid Systems
- Fiberglass Tanks & Vessels
- Fiberglass Stacks

Services
- Consulting
- Design
- Manufacturing
- Construction
- Inspection/Testing

For more information visit our website at:
www.compositesusa.com

Composites USA
A Critical Process Systems Group Company

One Peninsula Drive
North East, MD 21901
Tel: (410) 287-2700
Fax: (410) 287-5222
Email: info@compositesusa.com

We also invite you to explore the countless invaluable resources offered by the CPS Group family of companies listed below:

Critical Process Systems Group  www.cpsgrp.com
BioPharm Engineered Systems   www.bpesys.com
Composites USA                www.compositesusa.com
CPS Process Solutions          www.cpsprocess.com
Diversified Fluid Solutions   www.dfsolution.com
ENGVT, LLC                    www.engvt.com
Fab-Tech Inc.                 www.fabtechinc.com
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