The Bio-Safety House

Table of contents

1. Introduction

Rough Brothers' Bio-Safety Containment Greenhouse has received extensive testing for use in clinical, diagnostic, teaching, research and production environments, consistent with containment guidelines established by the Center for Disease Control and specifications utilized by the USDA for certification. As a result of this testing, Rough Brothers has designed a Bio-Safety Containment Greenhouse that meets CDC and USDA standards for Level 2 and Level 3 greenhouse containment.

2. Features

2.1. Structural Overview

Rough Brothers' structural glazing system for high containment greenhouses is designed to facilitate the seating and sealing of glass within the structure to prevent leakage of air and water, and to keep potentially dangerous elements from escaping.

2.2. Custom, Precision-Machined Materials

The fastening component of the structural glazing system includes tubular carrier beams that are interconnected in a grid configuration. All materials are precision machined to exacting dimensions to ensure the tightest tolerances and complete sealing required of a bio-safety containment structure.

2.3. System Structure

The greenhouse is comprised of a three-component structure:

1. Super Structure - incorporates aluminum "I" beam to support the second structure, the Glazing System.
2. Glazing System - incorporates aluminum extrusions, gaskets and glass. Glass consists of 9/16-inch clear laminated panels, 0.060-inch polyvinyl buryl (PVB) laminated between two 1/4-inch plates.
3. Doors - are tested to meet bio-safety containment standards. The doors are constructed with an interior heavy-duty tubular design laminated between two sheets of 1/8-inch aluminum sheets to form a flush panel door. Electromagnetic locks and inflatable perimeter seals are provided for an airtight closure.

3. Uses & Application

The Bio-Safety Containment Greenhouse is designed to meet the needs of secure research environments and growing production assessment.

- Research & Education

4. Benefits

- Protects workers, products and the environment from exposure to microbiological agents.
- Performance-tested to insure the proper balance of in-flow and ex-flow of air to restrict the exposure of air infiltration agents.
- Engineered with interlocking three-point pressure gasket seals for easy removal and replacement of glazing components to maintain bio-safety structural integrity.

5. Performance Testing Criteria and Results

5.1. Static Pressure Air Infiltration (ASTM E283)

Air infiltration tests at 6.24 psf with air leakage < 0.01 cfm/ft2 of fixed area.

5.2. Static Pressure Water Resistance (ASTM E331):

Water penetration tests with a water application rate of 5 gal/hr/ft2 at a pressure differential of 10.0 psf with no water leakage.

5.3. Dynamic Pressure Water Resistance (AAMA 501.1-94)

Water penetration tests with a water application rate of 5 gal/hr/ft2 and dynamic air stream equivalent to static pressure of 10.0 psf with no water leakage.