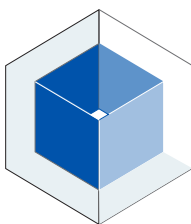




ARCOPLAST

Technical document

Walls Ceilings Linings



Disclaimer : All information is presented with the best of intentions. New data may arise or standards change, please be aware we can only offer what we know at the time. We never make the claim we have completed every possible test available, the information we offer is based on the testing and data we have conducted and collected to date.

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Arcoplast panels

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Arcoplast sealants & finishing compounds

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Arcoplast comparison test

Comparison tests

Barrier performance	Acryloyl 12.5mm	GFRP 9.5mm	GFRMC 9.5mm
Air Pressure Decay Test On Accessories Relating to MEP	Pass	Pass	Pass
Air Pressure Decay Test ASME N510 Nuclear Air Treatment Systems	Pass	Pass	Pass
Air Pressure Decay Test On Expansion Joint & Electrical Face Plates	Pass	Pass	Pass
Air Pressure Decay Test On Screw Penetrations	Pass	Pass	Pass
Air Pressure Decay Test Small Chamber BSL-3, BSL-4	Pass	Pass	Pass
Supplemental Helium Leak Testing	Pass	Pass	Pass
Window Panel Pressure Decay Test Report	Pass	Pass	Pass

Coloration fastness	Acryloyl 12.5mm	GFRP 9.5mm	GFRMC 9.5mm
Coloration Test on Formaldehyde Gas Decontamination Procedure	Pass	Pass	Pass
Coloration Test on Hydrogen Peroxide Vapor Decontamination Procedure	Pass	Pass	Pass
Coloration Test on Chlorine Dioxide Decontamination Procedure	Pass	Pass	Pass
UV Exposure Cycles Test	Pass	Pass	Pass
Arcoplast surface and sealant chemical compatibility tests ISO 2812-4	Pass	Pass	Pass
Arcoplast surface and sealant chemical compatibility tests ASTM D 1308-02	Pass	Pass	Pass
Arcoplast cleanability & stain resistance ISFA 2-01	Pass	Pass	Pass

Compliance	Acryloyl 12.5mm	GFRP 9.5mm	GFRMC 9.5mm
USDA, FDA, NIH, CDC, NIAID, CANADA AGRICULTURE Compliant	✓	✓	✓
Product Guide Specification Written According To (CSI) 3-Part Format	✓	✓	✓
City of New York Department of Buildings	MEA 64-96-M	MEA 414-04-M	-
Determination of Extractives Residue according to US FDA 21 CFR 177.2600	✓	✓	-
Living Building Challenge 3.1 Red List	✓	-	-

Arcoplast comparison test

Comparison tests

Fire & smoke properties	Acryloyl 12.5mm	GFRP 9.5mm	GFRMC 9.5mm
Air Pressure Decay Test ASME N510 Nuclear Air Treatment Systems	Pass	Pass	Pass
Air Pressure Decay Test On Accessories Relating to MEP	Pass	Pass	Pass
Air Pressure Decay Test Small Chamber BSL-3, BSL-4	Pass	Pass	Pass
Air Pressure Decay Test On Expansion Joint & Electrical Face Plates	Pass	Pass	Pass
Air Pressure Decay Test On Screw Penetrations	Pass	Pass	Pass
ASTM E-84 Test On Surface Burning Characteristics (Must be on full composite construction - USA)	10FS-0SD	20FS - 200SD	25FS-300SD
Classification of reaction to fire performance in accordance with EN 13501-1 - Europe, Asia	B-s1-d0	B-s1-d0	-
ISO 9705 Annex B full scale room fire test	Pass	Pass	-
Supplemental Helium Leak Testing	Pass	Pass	Pass
Toxicity Test - Measurement Of Acute Lethality Decomposition Products - UPITT Protocol	MEA 64-96-M (Solid colors)	MEA 414-04-M	-
UL 94 - 5VA - 500W Vertical burning test	Pass	Pass	-
UL S-102 Test on surface burning characteristics (must be on full composite construction - Canada)	10.8FS - 6.1SD	18.9FS - 63.4SD	-
Window Panel Pressure Decay Test Report	Pass	Pass	Pass

Mechanical properties	Acryloyl 12.5mm	GFRP 9.5mm	GFRMC 9.5mm
Arcoplast FEA Report on Structural Analysis - Seismic Loading Compliance	Pass	Pass	-
Joint Peel Strength Test - Interior Corner Assembly	92.78 lbf	55 lbf	-
Partition Load Bearing Test	✓	✓	-
Pull-out Strength Of Variable Fasteners - Ex. #6 x 25 mm Pan Phillips SDS	733 lbs	573 lbs	-
Seismic Shear Strength Test Panel - Spline Joint Assembly	380 lbf	396 lbf	210 lbf
Seismic Shear Strength Test Lateral Movement - Corner Section Assembly	791 lbf	330 lbf	-
Seismic Shear Strength Load Test (Peak Load) Solid Panel	629 lbf	556 lbf	-
Walk-On Ceiling System Load Test	✓	✓	-

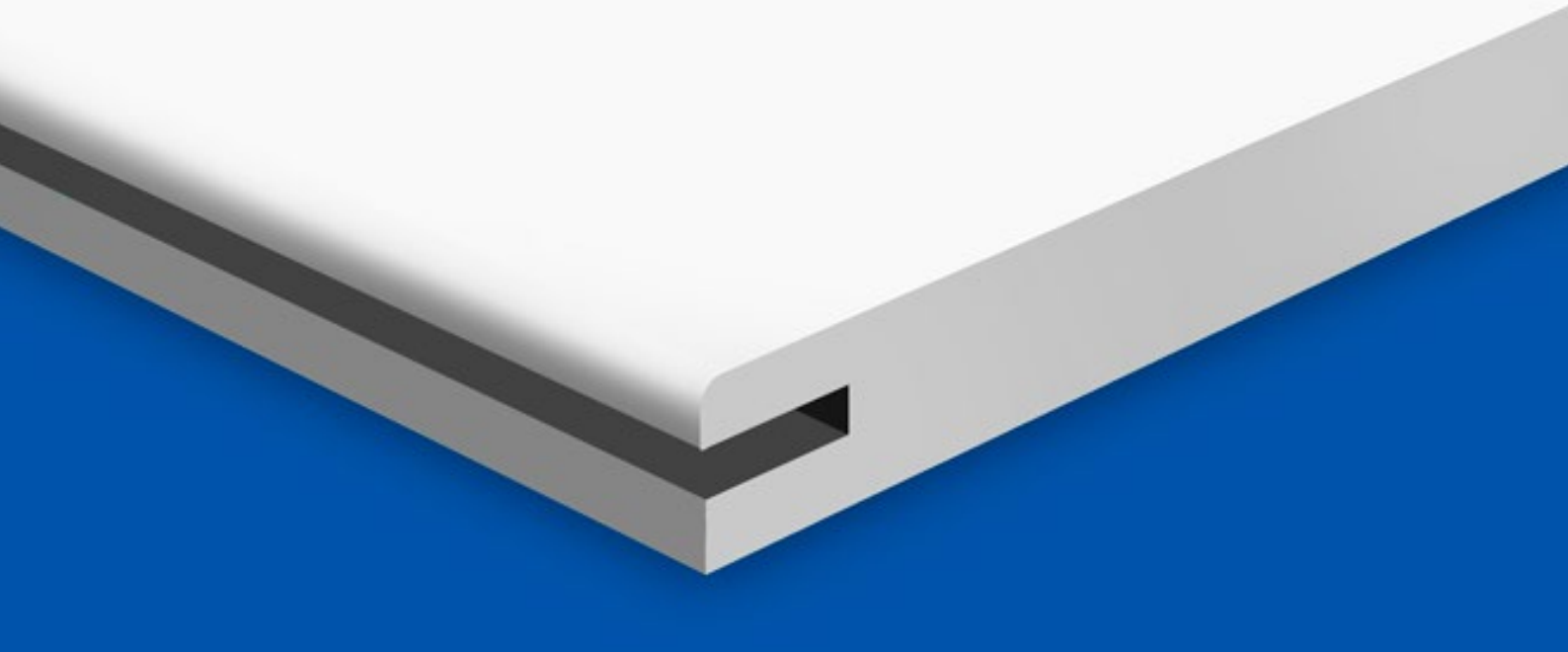
Arcoplast comparison test

Comparison tests

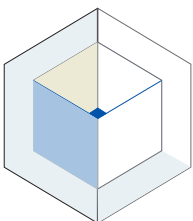
Physical Properties	Acryloyl 12.5mm	GFRP 9.5mm	GFRMC 9.5mm
Barcol Test Indentation Hardness Test ASTM D 2583	58	56.8	48.6
Coefficient of Linear Thermal Expansion ASTM D 696-03	22.43 x10 ⁻⁶ in/in°F	27.5 x10 ⁻⁶ in/in°F	63.22 x10 ⁻⁶ in/in°F
Compressive Strength Properties Test ASTM D 695-02a	12502 psi	15920 psi	5046 psi
Degree of Surface Disfigurement by Fungal/Algal Growth ASTM D3274	Pass	Pass	Pass
DTUL - Deflection Temperature Under Load ASTM D 648	200°F	185°F	-
Flexural Properties For Reinforced Plastics Test ASTM D 790-03	7504 psi	10318 psi	2012 psi
Impact Resistance Test - Mil 1073.2	11' x 2 lbs	18' x 2 lbs	1.5' x 2 lbs
Resistance to Bacteria ISO 846A-B-C	Pass	Pass	Pass
Resistance to Mold on the Surface Test ASTM D3273	Pass	Pass	Pass
R-Value ASTM D177 Thermal Conductivity	0.8	0.1	-
Sound Absorption Test ASTM C 423-09a / E 795-05	0.05	0.05	-
Sound Transmission Loss Test ASTM E 90-09 / E 413-10	59	57	-
Specular Gloss Test ASTM D 523	97.8	99.7	98.3
Surface Profile & Surface Finish Analysis ISO 10012-1	Pc750	Pc750	-
Tensile Properties Test ASTM D 638-03	3490 psi	10141 psi	4130 psi
Water Absorption ASTM D 570 (24 hrs)	0.01	0.01	2.33
Water permeance Test ASTM E 96-05	0.049l	-	0.015
Water Vapor Transmission Test ASTM E 96-05	0.04	0.01	0.0068

Acryloyl

Walls Ceilings Linings



Acryloyl



Imperial 1/2in

Metric 12.5mm

Engineered polymer wall paneling system
Antimicrobial / impervious to water, moisture and vapor
Certified up to PC3, PC4 | BSL-3 & BSL-4
Chemical toxin neutral
Surface : Pristine white high gloss/ matte

Acryloyl

introduction

ACRYLOYL IS AN EXCEPTIONAL PRODUCT. Manufactured to a consistent specification, is chemically neutral and has been awarded “The Living Building Challenge 3.1”. The Acryloyl paneling system integrates with all Arcoplast systems, offering design flexibility of exceptional range.

Tested, certified, compliant and having a working history of excellence in the field for many industries, notably high containment up to levels PC4, BSL-4. Acryloyl is proving to be the answer for many old problems. Installation does not require elaborate preparations and having a history of longevity and no rejuvenating maintenance programs, economically Acryloyl is considered a very good cost return on investment.

Specifications	page
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Fire & Smoke	p 16 -17
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Acryloyl

Barrier performance

AIR PRESSURE DECAY : The use of A-1010 Bio-Seal finishing compound has equally impermeable results in an air, gas or water vapor tight assembly. A-1010 Bio-Seal creates a smooth, seamless seal between panels that does not crack or deteriorate over time.

CLEANING : Acryloyl will withstand up to and greater than 30 years of vigorous decontamination and wash-downs. It will not delaminate, dent, fade, or peel, it does not need to be re-finished.

IMPACT : The Acryloyl system is designed to outlast the life of the facility. Acryloyl is a robust impact, corrosion and chemical resistant paneling system suited for walls and ceilings for a wide range of industrial and scientific applications.

MOISTURE and WATER : Acryloyl panels are impervious to microorganisms and are not attacked by insects or vermin. Acryloyl panels are impermeable, and are unaffected by moisture and humidity.

BARRIER TESTS CONDUCTED USING 12.5MM ACRYLOYL

Results	Test	Description
Pass	ASME N510	Air pressure decay nuclear air treatment systems test
Pass	ASME N510	Air pressure decay test on accessories relating to MEP
Pass	ASME N510	Air pressure decay test on expansion joint & electrical face plates
Pass	ASME N510	Air pressure decay test on screw penetrations
Pass	ASME N510	Air pressure decay test small chamber BSL-3, BSL-4
Pass	Test	Supplemental helium leak testing
Pass	Report	Window panel pressure decay test report

Acryloyl

Certification & training

PART 3 – EXECUTION

3.1 TRAINING AND CERTIFICATION

A. Only manufacturer trained and certified speciality applicators shall be considered for the construction of High Containment Environments as well as BSL-3, BSL-3Ag, and BSL-4 facilities.

1. Minimum Applicator requirements :

a. Minimum 2 years' experience in construction of High Containment facilities.

b. Familiar with construction guidelines pertaining to Bio-Safety in Microbiological and Biomedical Laboratories established by NIH (National Institute of Health).

c. Accredited by manufacturer on application of Acryloyl engineered polymer panels for high containment establishments.

d. US Department of Labor Occupational Safety and Administration (OSHA).

1) OSHA Standard 29CFR1926 – Safety and Health Regulation for Construction.

3.2 EXAMINATION

A. Examine areas to receive composite wall and ceiling panels. Notify Architect of conditions that would adversely affect installation or subsequent use.

B. Ensure other work to be performed behind composite panels is complete before starting installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

Acryloyl

Color surface finish

ACRYLOYL CUSTOMIZED COLOR RANGE : Match any PMS color.

ACRYLOYL STANDARD COLOR : Pristine white.

ACRYLOYL STANDARD FINISH : Acrylic on both face and back surfaces.

COLORATION FASTNESS : Surface color retention and durability based on cleaning and decontamination.

ACRYLOYL SURFACE FINISH : Satin or high-gloss.

LIGHTING : Acryloyl's pristine high gloss, bright white finish has been shown to produce a light reflectivity of 99.7 % at an 85 degree source angle, resulting in evenly diffused light throughout the room. The laboratory can be designed with fewer lamp fixtures and a reduced number of ceiling penetrations.

Acryloyl panels retain a clean modern look. Our clients often comment years after the installation, how Acryloyl panels always look brand new.

COLOR SURFACE TESTS CONDUCTED USING 12.5MM ACRYLOYL

Result	Test	Description
Pass	ISFA 2-01	Arcoplast cleanability & stain resistance
Pass	ASTM D 1308-02	Arcoplast surface and sealant chemical compatibility
Pass	ISO 2812-4	Arcoplast surface and sealant chemical compatibility
Pass	Coloration	Chlorine dioxide decontamination procedure
Pass	Coloration	Formaldehyde gas decontamination procedure
Pass	Coloration	Hydrogen peroxide vapor decontamination procedure
Pass	UV test	Exposure cycles

Acryloyl

Compliance

Arcoplast Acryloyl engineered polymer panels combine several barrier functions. Acryloyl panels when sealed and finished using A-1010 Bio-Seal are chemically welded together forming a single primary barrier membrane. Acryloyl panels are impervious to moisture and humidity, they do not oxidise or corrode and are unaffected by galvanic action, there is no flaking or delamination.

Arcoplast is used in mission critical environments and PC3, PC4, BSL-3, BSL-3Ag and BSL-4 facilities. Our products excel on air pressure decay tests, keeping interior and exterior personnel safe from harmful pathogens.

Arcoplast meets and exceeds USDA, CDC, FDA, cGMP, NIH BMBL 5th Edition, USP 797-800, GLSP compliant and specific guidelines for maximum containment facilities.

COMPLIANCE TESTS CONDUCTED USING 12.5MM ACRYLOYL

Result	Test	Description
Pass	MEA 64-96-M	City of New York Department of Buildings
Pass	US FDA 21 CFR 177.2600	Determination of Extractives Residue according to US FDA
Pass	LBC 3.1	Living Building Challenge 3.1 
Pass	CSI 3-Part Format	Product Guide Specification Written According To CSI 3
Pass	Compliant test	USDA, CDC, FDA, NIH, NIAID, CANADA AGRICULTURE Compliant

Acryloyl

Dimensions

Sheet sizes are made to your requirement within the parameters of the following thicknesses, widths and lengths.

IMPERIAL : ACRYLOYL SHEET SIZES

Thickness	Width	Length	Weight
1/4in	4 feet	3 - 16 feet	2 Lbs/Sq. Ft
3/8in	4 feet	3 - 16 feet	3.5 Lbs/Sq. Ft
1/2in	4 feet	3 - 16 feet	4.4 lbs./ Sq. Ft
3/4in	4 feet	3 - 16 feet	6.3 lbs./ Sq. Ft
Tolerance	+/- 1/16in width	+/- 1/2in length	

IMPERIAL : PROFILE & JOINT SYSTEM

END CUT PROFILE	1/4in	3/8in	1/2in	3/4in
Grooved		Yes	Yes	Yes
Square cut	Yes	Yes	Yes	Yes

SIDE CUT PROFILE	1/4in	3/8in	1/2in	3/4in
Eased side edge		Yes	Yes	Yes
Grooved		Yes	Yes	Yes
Square cut	Yes	Yes	Yes	Yes

JOINT SYSTEM	1/4in	3/8in	1/2in	3/4in
Batten cover	Yes	Yes	Yes	Yes
Cam lock				Yes
Flush seam	Yes	Yes	Yes	Yes
Welded seam	Yes	Yes	Yes	Yes

Acryloyl

Dimensions

Sheet sizes are made to your requirement within the parameters of the following thicknesses, widths and lengths.

METRIC : ACRYLOYL SHEET SIZES

Thickness	Width	Length	Weight
6mm	1200mm	900mm - 4875mm	9.7 Kg/M2
9.5mm	1200mm	900mm - 4875mm	17.09 Kg/M2
12.5mm	1200mm	900mm - 4875mm	21.48 Kg/M2
19mm	1200mm	900mm - 4875mm	30.2 Kg/M2
Tolerance	+/- 1.5mm width	+/- 12.5mm length	

METRIC : PROFILE & JOINT SYSTEM

END CUT PROFILE	6mm	9.5mm	12.5mm	19mm
Grooved		Yes	Yes	Yes
Square cut	Yes	Yes	Yes	Yes

SIDE CUT PROFILE	6mm	9.5mm	12.5mm	19mm
Eased side edge		Yes	Yes	Yes
Grooved		Yes	Yes	Yes
Square cut	Yes	Yes	Yes	Yes

JOINT SYSTEM	6mm	9.5mm	12.5mm	19mm
Batten cover	Yes	Yes	Yes	Yes
Cam lock				Yes
Flush seam	Yes	Yes	Yes	Yes
Welded seam	Yes	Yes	Yes	Yes

Acryloyl

Fire & Smoke

In 2009 under the Plastic Chapter 26, the International Building Code (IBC) created a division which addresses fiberglass reinforced polymer composite materials. This enables architects, specifiers and building owners to clearly interpret and conform to a uniform building code.

Composite materials are not incombustible, however the combustibility level can be significantly reduced through the correct process of chemistry engineering.

The surface burning characteristics of building materials manufactured in the United States are tested per the American Standard Testing Method (ASTM).

In Canada it is determined by ASTM International and Underwriters Laboratories (UL). In Europe, composite materials are tested in accordance with European Norms /Standard (EN), and International Organization for Standardization (ISO).

Interior finishes are classified according to their flame spread and smoke spread development indexes.

FIRE & SMOKE TESTS CONDUCTED USING 12.5MM ACRYLOYL

Result	Test	Description
B-s1-d0	EN 13501-1 – Europe, Asia	Classification of reaction to fire performance, in accordance with – Europe, Asia
Pass	ISO 9705 Annex B	Full scale room fire test
MEA 64-96-M	UPITT Protocol Toxicity	Measurement of acute lethality decomposition products
10.8 FS – 6.1 SD	UL S-102 Test	On surface burning characteristics (Must be on full composite construction – Canada)
10 FS – 0 SD	ASTM E-84 Test	On surface burning characteristics (Must be on full composite construction – USA)
Pass	UL 94 – 5VA 500W	Vertical burning test

Manufacturers usually publish the class only. However, there should be a more scrupulous look into the numbers. Owners and architects should require the test results for the flame and smoke generation to better assess the suitability of the interior finishes.

Acryloyl

Fire & Smoke

A composite material labelled as a Class A (Flame Spread 0-25) may not have a large margin of improvement because it is already in a low category. But, the (Smoke Development 0-450) is extremely critical, and a composite material with a smoke development of 425 versus 50 can have catastrophic consequences in a high occupancy high rise building.

Another area of concern is the toxicity issue in composite building materials. The City of New York requires testing on materials for acute lethality. This is based on the test methodology specified in the Building Code for the City of New York and as published by the University of Pittsburgh, Department of Industrial Environmental Health Sciences (The UPITT Test - The University of Pittsburgh Test Protocol for Measurement of Acute Lethality of Thermal Decomposition Products from Specimens).

The simplicity of the Arcoplast Acryloyl engineered polymer panel design, combined with the straightforward, simple installation methodology, facilitates cladding over new and existing fire rated partitions. Whether the fire rated assembly is composed on one or multiple layers of fire rated gypsum board and steel clad wall liners or is attached to a masonry wall construction, Acryloyl paneling will provide a fully compliant primary barrier, with a pristine, seamless high gloss single membrane surface, rated up to PC3, PC4, BSL-3, BSL-4.

Acryloyl

Installation

Borrowed from the light gauge steel stud construction methodology, Acryloyl engineered polymer wall and ceiling panel systems in most cases, do not require elaborate pre-engineering preparations. Acryloyl panels when sealed and finished using A-1010 Bio-Seal seamlessly integrate with third party building fixtures such as, door and window frames, MEP's, flooring finishes etc...

Arcoplast panels are manufactured in modular panel board form and are designed to be cut, shaped and fastened on-site to reduce engineering and fabrication time. The efficiency of on-site assembly reduces the cost of project delays, typically arising from last minute changes.

Arcoplast has an extensive library of application drawings and installation details specifically pertaining to the construction of high containment facilities.

The installation manual is a step by step guide with detailed instructions, work templates, drawings and quality control work sheets.

Installation manual

Please go to the website : www.arcoplast.com

Products page Acryloyl | Specifications | Installation | Download

Acryloyl

Mechanical test report

MECHANICAL TESTS CONDUCTED USING 12.5MM ACRYLOYL

Result	Test	Description
92.78 lbf	Interior corner assembly	Joint peel strength
Pass	Partition load bearing	Partition load bearing
733 lbs	Ex. #6 x 25mm Pan Phillips SDS	Pull-out strength of variable fasteners
Pass	FEA report	Seismic loading compliance - FEA report on structural analysis report
791 lbf	Corner section assembly	Seismic shear strength test lateral movement – corner section assembly
629 lbf	Peak load	Seismic shear strength test load (peak load) solid panel
380 lbf	Spline joint assembly	Seismic shear strength test panel – spline joint assembly
Pass	System load	Direct attach / walk-on ceiling system load

Acryloyl

Physical

Acryloyl panels can perform as cavity-less free-standing partitions, which enable lab planners and architects to design suites for areas in which space and location is critical and for environments in which wall cavities are not suitable.

Acryloyl panels may be assembled in virtually any configuration, this simple uncomplicated system allows for cost-effective “box-within-a-box” construction. Walk-on ceilings, suspended ceilings, wall and ceiling liners, load bearing partitions, chase systems, beam covers and bulkheads. Arcoplast panels are easily installed into new or existing projects and are well suited for large production facilities with multilevel interiors, clean-rooms and high containment suits of the highest standard.

In some complex projects where cost is a consideration, GFRP and Acryloyl panels are used together for a multitude of reasons, often relating to added security, heavy traffic, areas that require a very robust primary barrier.

To join the two different types of panels, A-1010 Bio-Seal is used to chemically weld the panels together, forming a single membrane primary barrier. There is no discoloration or any other imperfections, the finished result is a clean modern seamless joint between the two different types of panel.

The weight of building materials plays an essential role in the architecture, design, and engineering of a building, and equally a significant factor in the cost effectiveness of a project. Design and weight limitations, building movement and demanding construction schedules must be carefully assessed. The cost to reinforce a building's foundation and structure to support the added weight of interior wall & ceiling systems can be exceedingly expensive.

Acryloyl

Physical

PHYSICAL TESTS CONDUCTED USING 12.5mm ACRYLOYL

Result	Test	Description
58	ASTM D 2583	Barcol indentation hardness
22.43×10^{-6} in/in°F	ASTM D 696-03	Coefficient of linear thermal expansion
12502 psi	ASTM D 695-02a	Compressive strength properties
Pass	ASTM D3274	Degree of surface disfigurement by fungal/algal growth
200°F	ASTM D 648	DTUL – Deflection temperature under load
7504 psi	ASTM D 790-03	Flexural properties for Reinforced plastics
11' x 2 lbs	Mil 1073.2	Impact resistance
Pass	ASTM D3273	Resistance to mold on the surface
Pass	ISO 846A-B-C	Resistance to bacteria
0.8	R-Value ASTM D177	Thermal conductivity
0.05	ASTM C 423-09a / E 795-05	Sound absorption
59	ASTM E 90-09 / E 413-10	Sound transmission loss
99.8	ASTM D 523	Specular gloss test
Pc750	ISO 10012-1	Surface profile & surface finish analysis
3490 psi	ASTM D 638-03	Tensile properties
0.01	ASTM D 570 (24 hrs)	Water absorption
0.04	ASTM E 96-05	Water vapor transmission

Acryloyl

Test reports

ACRYLOYL : COLOR FAST TEST REPORTS

ACRYLOYL : ASTM_D1308

Acryloyl : Surface sealant chemical compatibility. Oct.. 16,2017

ACRYLOYL : NC-ARC16910A-1

Acryloyl : Coloration test report. Sep 23, 2016

ACRYLOYL : FIRE & SMOKE TEST REPORTS

ACRYLOYL : SV18619 / 4788361213

Acryloyl : Surface Burning Characteristics of Engineered Polymer Panels. March 7, 2018

ACRYLOYL : G102596804SAT-001. ISO 9705:1993(E)

Acryloyl : Full scale room test for surface products June 13, 2016

ACRYLOYL : REPORT NO : 406133. EN 13501-1:2007+A1 / ISO 11925-2

Acryloyl : Reaction to fire performance Oct 22, 2009

ACRYLOYL : REPORT NO : 103015795SAT-003A. ASTM E84-16 / UL 723, UBC 8-1, NFPA 255

Acryloyl : Surface burning characteristics of building materials. Apr 24, 2017

ACRYLOYL : MECHANICAL TEST REPORTS

ACRYLOYL : LAB NO. 16P-3867

Acryloyl : Interior corner peel strength test. Aug 19, 2016

ACRYLOYL : LAB NO 16P-1259

Acryloyl : Pull out strength of variable fasteners. Mar 15, 2016

ACRYLOYL : LAB NO. 16P-4391

Acryloyl : Seismic shear strength load test solid panel. Oct.. 16, 2016

ACRYLOYL : LAB NO. 16P-3867

Acryloyl : Seismic shear strength test lateral movement. Aug 19, 2016

Acryloyl

Test reports

ACRYLOYL : PHYSICAL TEST REPORTS

ACRYLOYL : LAB NO. 16P-4391

Acryloyl : Impact Resistance (2lb Steel Ball Dropped Causing No Damage). OCT 14, 2016

ACRYLOYL : LAB NO. 16P-4391

Acryloyl : Coefficient of Linear Thermal Expansion METHOD: ASTM D696-08 (Temperature Range: -30oC to + 30oC). OCT 14, 2016

ACRYLOYL : ASTM D3274-09 (20017)

Acryloyl : Evaluation degree of surface disfiguration of paint films by fungal or algal growth, or soil and dirt accumulation. Apr. 4, 2018

ACRYLOYL : LAB 130820 / ISO 848

Acryloyl : Evaluation of the action of microorganisms- Resistance to fungi and bacteria test method ISO 845. Apr. 20, 2018

ACRYLOYL : LAB NO : 16P-4391/ ASTM D523-14

Acryloyl : Physical properties test specular gloss ASTM D523-14. Oct.. 14, 2016

ACRYLOYL : LAB NO. 16P-4391 / ASTM D570-98

Acryloyl : Water Absorption 24hr immersion Method : ASTM D570-98 (Reapproved 2010). Oct.. 14, 2016

ACRYLOYL : LAB NO. 16P-4391/ ASTM D2583-07 / ASTM D2583-07

Acryloyl : Standard test method for indentation hardness of rigid plastics by means of a barcol impressor. Oct.. 14, 2016

ACRYLOYL : LAB CODE 200291/ ASTM E90-09/E413-10?E1332-10A

Acryloyl : Sound transmission loss test. Oct.. 14, 2016

ACRYLOYL : LAB NO. 16P-4391 / ASTM D790-15

Acryloyl : Flexural strength test using Instron 5500R with Bluehill software. Oct.. 14, 2016

ACRYLOYL : LAB NO. 16P-4391 / ASTM D638-14

Acryloyl : Tensile strength test. Method: ASTM D638-14. Oct.. 14, 2016

ACRYLOYL : LAB NO. 16P-4391 /ASTM E 96 DESICCANT PROCEDURE

Acryloyl : Water Vapor Permeance. Oct.. 14, 2016

Acryloyl

Peer review summary

Braun Intertec	date : 20 June 2020
Document	3 pages
Project	B2004610

Wall & ceiling panels limited structural peer review

Location national biocontainment laboratory Upper Hutt New Zealand

Ceiling and wall panels, Section 066250

Common Fire Alarm Testing at the PC3 Level (March 2019)
reported by Merrick Co

Leak Testing specification, Section 019140

As an assembly, these particular tests indicate that maximum loads to the ceiling and wall panels varied between some 15kPa to 30kPa to failure, far in excess of the stated goal of resisting a negative pressure of -3kPa (-3000 Pascals, or 0.435 psi) ...

Principal Engineer
Richard R. McGuire, PE (USA)

Reviewed by:
Jason S. Hanlon, PE (USA) Principal Engineer

June 2, 2020

Project B2004610

Mr. Ghislain Beauregard, President
Arcoplast, Inc.
106 Crafton Drive
O'Fallon, MO 63366

Re: Arcoplast Wall and Ceiling Panels Limited Structural Peer Review
National Biocontainment Laboratory
Upper Hutt, New Zealand

Dear Mr. Beauregard:

At the request of Arcoplast, Inc., O'Fallon, MO., U.S.A., Braun Intertec Corporation has prepared this third party limited structural performance peer review of the installed Arcoplast wall and ceiling panels in the National Biocontainment Laboratory (NBL), located in Upper Hutt, New Zealand. This new laboratory structure is owned and operated by the Ministry for Primary Industries in New Zealand and was substantially completed in the spring 2019. The building has some 3,400 square meters (approx. 36,600 sq. ft.) of interior floor space and the Arcoplast wall and ceiling biocontainment panels are installed throughout the many laboratory spaces in this new facility.

Overview of our Structural Peer Review of Arcoplast Panels Documents

Our technical documents review was limited to the available construction documents related to the Arcoplast wall and ceiling panels installations, data sheets, and past testing performance reports provided to us. In reviewing these product related documents, it is our understanding that the panels' installation performance must resist without assembly failure, a negative pressure of up to 3000 Pascals. (0.435 psi). The following is a summary of documents reviewed by Braun Intertec:

- Project Specification Sections 019140 – Room Leak Testing, 066200 – GFRPC Wall Panels
- Report of Mechanical Test (November 2016), St. Louis Testing Laboratory
- Structural Framing Calculations (July 2018), Redco NZ Ltd.
- Inspection and Site Visit Reports, Photos, Shop Drawings (2018 – 2019), Redco NZ Ltd., The Fletcher Construction Company Ltd.
- Sheet A-522-REV.M, Interior Details – Arcoplast System (November 2015), CCM Architects
- Arcoplast *Acryloyl EP* Panels Brochure (June 2019), Arcoplast, Inc.
- Window Panel Pressure Decay Study Report (June 2014), Technical Safety Services, Inc.
- Various website reviews on biocontainment facilities design and testing standards

In our review of the ceiling and wall panels tests performed by St. Louis Testing Labs, the test specimens were installed as a typical composite Arcoplast EP panel to standard light gauge metal stud framing, very similar to the support framing we see in the NBL structure. The Arcoplast structural adhesive provides the chemical bonding between the 12.5 mm (1/2") and ceiling 9.5 mm (3/8") biocontainment panels and the light gauge steel framing. As an assembly, these particular tests indicate that maximum loads to the ceiling and wall panels varied between some 15kPa to 30kPa to failure, far in excess of the stated goal of resisting a negative pressure of -3kPa (3000 Pascals, or 0.435 psi).

The technical specifications for the Acryloyl Engineered Polymer ceiling and wall panels, Section 066250, specifies that the Arcoplast panels are the 'Basis of Design' product. The physical properties listed in this specification requirement appear to be met or exceeded by the Arcoplast panels that were installed in the facility. In the Commissioning section of this specification, there is also the reference to the Room Leak Testing specification, Section 019140. In paragraph 3.3 for the air fan pressurization testing, a negative air pressure of -500 Pascals through the duration of the smoke pencil testing is required. The testing space acceptance criteria for the various rooms then is specified to be maintaining a negative room pressure of -200 Pascals +/- 50 Pascals for a period of at least 20 minutes.

Finally, the Common Fire Alarm Testing at the PC3 Level (March 2019) reported by Merrick Co. included a negative air pressure test that reached approximately -1300 Pascals (0.19 psi) without apparent damage to the Arcoplast ceiling and wall panels, and this negative pressure test exceeds the standard -500 Pa criteria for these biocontainment spaces, and further exceeds the minimum performance parameters in the above noted specifications.

In conclusion, our third party peer review of the Arcoplast ceiling and wall panels installed at the National Biocontainment Laboratory in Upper Hutt, New Zealand, would suggest that these biocontainment ceiling and wall panels, when constructed in conformance to the manufacturer's standards and project specifications, should perform as intended, even up to as much as -3000 Pascals negative room air pressure for the test standard of 20 minutes. This value in our opinion, appears to exceed standard requirements when compared to the project specifications criteria and in researching similar lab testing criteria.

Thank you for the opportunity to provide you this peer review of the Arcoplast panels being used at the impressive National Biocontainment Laboratory in Upper Hutt, New Zealand.

General

In performing its services, Braun Intertec used that degree of care and skill ordinarily exercised under similar circumstances by reputable members of its profession currently practicing in our profession. No warranty, express or implied, is made.

The information, observations, and opinions stated in this report are based upon our review of documents provided to Braun Intertec by the manufacturer or prime contractor, and are based upon our professional engineering judgment and professional practice.

To have questions answered, please call Richard McGuire at 913.647.5006.

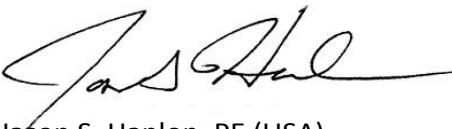
Sincerely,

BRAUN INTERTEC CORPORATION



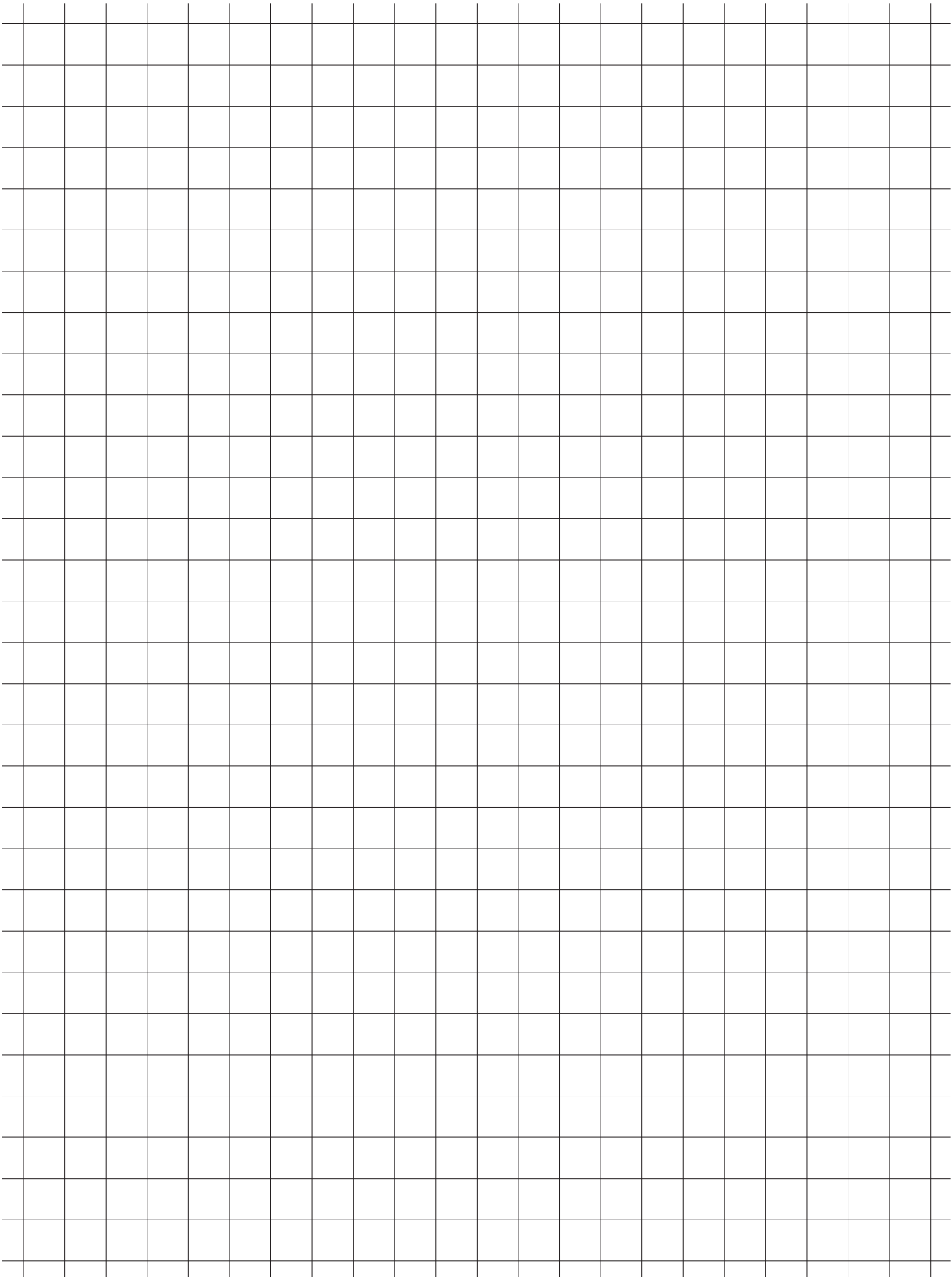
Richard R. McGuire, PE (USA)
Principal Engineer

Reviewed by:



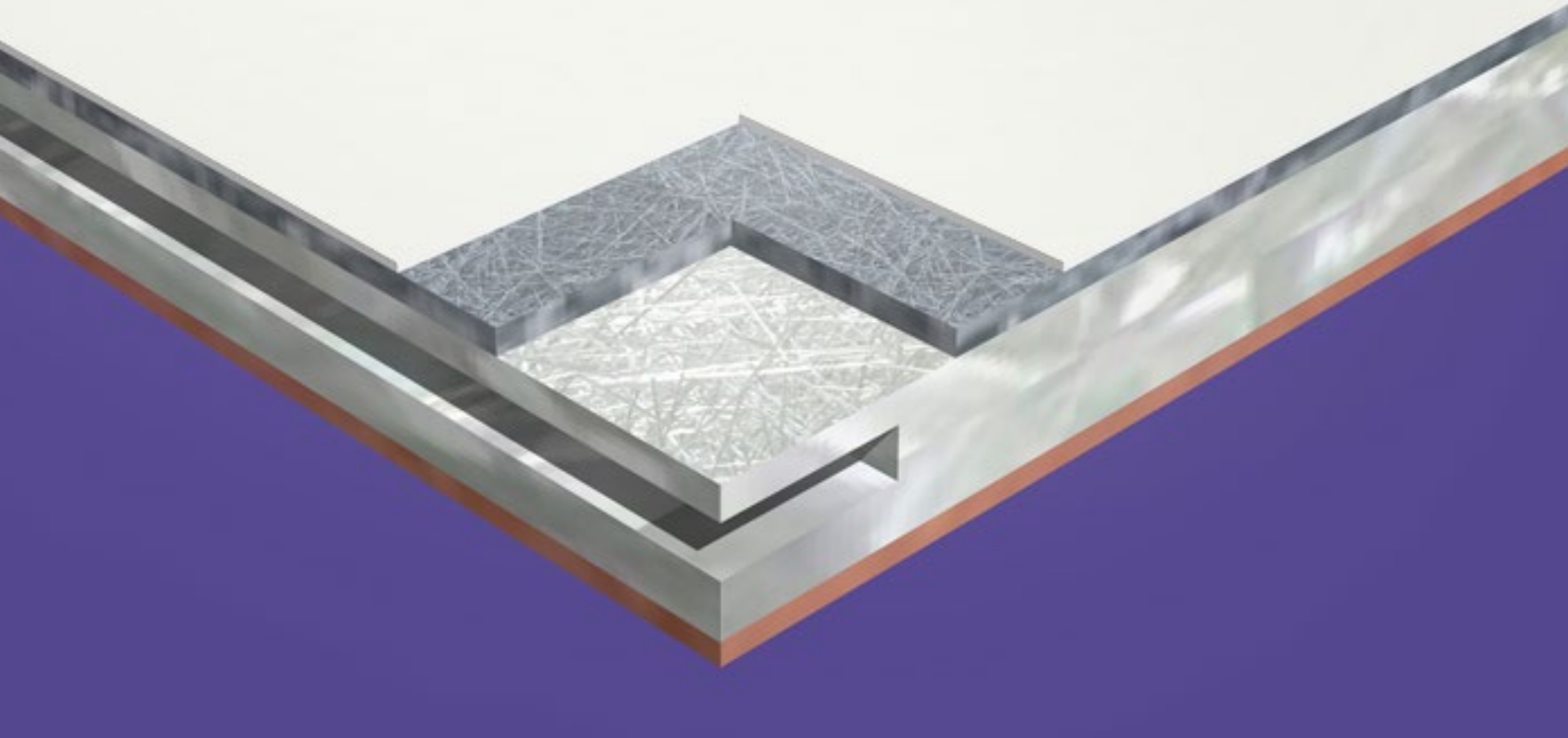
Jason S. Hanlon, PE (USA)
Principal Engineer

DRAWINGS

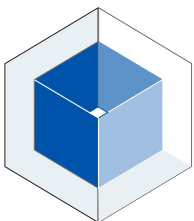


GFRMC

Walls Ceilings Linings



GFRMC



Imperial 3/8in

Metric 9.5mm

ASTM E 84 : Fire and Smoke Classification – Class A

Available in large panel dimension

Designed for cladding over existing walls and ceiling substrates

Designed to accommodate heavily burdened roof structures

Nationally and internationally code compliant

GFRMC

introduction

Arcoplast GFRMC is a non-woven composite core substrate reinforced with fiberglass resin with a high gloss gel coat finish that provides a smooth, hard, & non-porous finish for easy cleanability.

GFRMC wall and ceiling panel system's are suitable for a diverse range of applications from clean-rooms, controlled environments and regulated industries & sciences up to level PC3, BSL-3.

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Physical	p 40 –41
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GFRMC

Barrier performance

AIR PRESSURE DECAY : A-1010 Bio-Seal two in one sealant finishing compound when used to bond GFRMC panels together, forms an impermeable water vapor, gas and air tight joint. A-1010 Bio-Seal chemically welds the GFRMC panels together forming a single membrane. The seamless smooth joints of the connecting panels do not crack or deteriorate over time.

CLEANING : GFRMC will withstand up to and greater than 30 years of vigorous decontaminations and wash-downs. It will not decay, fade, or peel, so it will not need to be painted or re-finished.

IMPACT : The GFRMC system is designed to outlast the life of the facility. GFRMC is a robust, corrosion and chemical resistant, light weight panel system.

GFRMC : Having the least amount of vapor transmission of all Arcoplast products making it suitable for diverse environmental conditions, such as commercial kitchens and high humidity production areas.

BARRIER TESTS CONDUCTED USING : GFRMC 3/8inch | 9.5mm

Result	Test	Description
Pass	ASME N510	Air pressure decay test on accessories relating to MEP
Pass	ASME N510	Air pressure decay test small chamber
Pass	ASME N510	Air pressure decay test on electrical and monitoring face plates
Pass	ASME N510	Air pressure decay test Arcoplast cGMP window housing
Pass	ASME N510	Air pressure decay test on screw penetrations

GFRMC

Certification & training

PART 3 – EXECUTION

3.1 TRAINING AND CERTIFICATION

A. Only manufacturer trained and certified speciality applicators shall be considered for the construction of High Containment Environments such as PC3, BSL-3, BSL-3Ag facilities.

1. Minimum Applicator requirements :

a. Minimum 2 years' experience in construction of High Containment facilities.

b. Familiar with construction guidelines pertaining to Bio-Safety in Microbiological and Biomedical Laboratories established by NIH (National Institute of Health).

c. Accredited by manufacturer on application of GFRMC fiberglass composite panels for high containment establishments.

d. US Department of Labor Occupational Safety and Administration (OSHA).
1/ OSHA Standard 29CFR1926 – Safety and Health Regulation for Construction.

3.2 EXAMINATION

A. Examine areas to receive composite wall and ceiling panels. Notify Architect of conditions that would adversely affect installation or subsequent use.

B. Ensure other work to be performed behind composite panels is complete before starting installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

GFRMC

Color surface finish

GFRMC COLOR : Standard color, pristine white

GFRMC CUSTOMISED COLOR RANGE : Match PMS colors

GFRMC COLORATION FASTNESS : Surface color retention and durability based on cleaning and decontamination processes

GFRMC SURFACE FINISH : Smooth

GFRMC SURFACE PROFILE : High gloss polished surface

COLORATION FASTNESS TESTS CONDUCTED USING : GFRMC 3/8inch | 9.5mm

Result	Test	Description
Pass	ISFA 2-01	Arcoplast cleanability & stain resistance
Pass	ASTM D 1308-02	Arcoplast surface and sealant chemical compatibility
Pass	ISO 2812-4	Arcoplast surface and sealant chemical compatibility
Pass	Coloration	Chlorine dioxide decontamination procedure
Pass	Coloration	Formaldehyde gas decontamination procedure
Pass	Coloration	Hydrogen peroxide vapor decontamination procedure
Pass	UV test	Exposure cycles

GFRMC

Compliance

Arcoplast GFRMC fiberglass polymer composite panels combine together several barrier functions. GFRMC is light weight, available in large ceiling and wall panel sizes, GFRMC has a Gel Coat surface that does not corrode, oxidise or delaminate and requires no on going maintenance programs.

Arcoplast is used in mission critical environments up to PC3, BSL-3, BSL-3Ag facilities.

Our products excel on air pressure decay tests, keeping interior and exterior personnel safe from harmful pathogens.

Arcoplast meets and exceeds USDA, FDA, CDC, cGMP, NIH BMBL 5th Edition, USP 797-800, GLSP compliant and specific guidelines for maximum containment facilities.

COMPLIANCE TESTS CONDUCTED USING : GFRMC 3/8inch | 9.5mm

Result	Test	Description
Pass	CSI 3-Part Format	Product guide Specification written according To CSI 3
Pass	Compliant test	USDA, FDA, CDC, NIH, USP 797-800, Canada Agriculture compliant

GFRMC

Dimensions

GFRMC sheet sizes are made to your requirement within the parameters of the following thicknesses, widths and lengths.

IMPERIAL : GFRMC SHEET SIZES

Thickness	Width	Length	Weight	R/K Rating
13/64in	48in - 108in	Up to 40ft	1.09 lbs./ Sq. Ft	-
3/8in	48in - 108in	Up to 40ft	1.4 lbs./ Sq. Ft	-

GFRMC IMPERIAL PROFILE & JOINT SYSTEM

END CUT PROFILE	13/64in	3/8in
Grooved		Yes
Eased side edge		
Square cut	Yes	Yes

SIDE EDGE PROFILE	13/64in	3/8in
Eased side edge		
Grooved		Yes
Square cut	Yes	Yes

JOINT SYSTEM	13/64in	3/8in
Batten cover	Yes	
Flush seam	Yes	Yes
Mechanical spline		Yes

GFRMC

Dimensions

GFRMC sheet sizes are made to your requirement within the parameters of the following thicknesses, widths and lengths.

METRIC : GFRMC SHEET SIZES

Thickness	Width	Length	Weight	R/K Rating
5mm	1.2 - 2.74 meter	1.2 - 12.2 meter	5.3kg/m ²	-
9.5mm	11.2 - 2.74 meter	1.2 - 12.2 meter	6.1 kg/m ²	-

GFRMC METRIC PROFILE & JOINT SYSTEM

END CUT PROFILE	5mm	9.5mm
Grooved		Yes
Eased side edge		
Square cut	Yes	Yes

SIDE EDGE PROFILE	5mm	9.5mm
Eased side edge		
Grooved		Yes
Square cut	Yes	Yes

JOINT SYSTEM	5mm	9.5mm
Batten cover	Yes	
Flush seam	Yes	Yes
Mechanical spline		Yes

GFRMC

Fire & Smoke

FIRE & SMOKE TESTS CONDUCTED USING : GFRMC 3/8inch | 9.5mm

Result	Test	Description
Class A-20 FS-SD-300	ASTM E-84	Surface burning characteristics of building materials

Installation

Handling / Storage: Handle panels with care and limit panel sagging to prevent warping and gel coat fissures. Keep contents dry. Store indoors in a well-ventilated area on flat wooden skids.

Panel Protector – Remove protective film prior to edge detailing.

Caution : Do not stack nor store any goods on the GFRMC panels and prevent foot traffic on stored panels.

Crating / Transportation: Standard width panels of 4'0" and up to 16'-0" in length are crated and shipped on wooden crates. Dimensionally large panels of up to 9'-0" in width and up to 40'-0" in length are bundled and shipped on flatbed trailers.

Arcoplast has an extensive library of shop drawings and installation details specifically pertaining to the construction of high containment facilities.

The installation manual is a step by step guide with detailed instructions, work templates, shop drawings and quality control work sheets.

Installation manual

Please go to the website : www.acoplast.com

Products page GFRMC | Specifications | Installation | Download

GFRMC

Mechanical

SURFACE PROPERTIES TESTS CONDUCTED USING : GFRMC 3/8inch | 9.5mm

Result	Test	Description
210 lbf	Spline joint assembly	Seismic shear strength test panel

GFRMC

Physical

Arcoplast Composite Fiberglass Liner Panel – GFRMC 5mm & 9.5mm

Applications : Wall and ceiling systems requiring an ultra-lightweight, dimensionally large sanitary composite liner panel for cladding existing decayed surfaces. GFRMC is also well suited for lining new walls and ceilings that require minimum exposed panel joints.

Composition : Reinforcement – Chopped fiberglass strand.

Product : Arcoplast GFRMC 5mm & 9.5mm are constructed using a non-woven composite core substrate, reinforced with fiberglass resin impregnated fabric. GFRMC's gel coat surface is a smooth, hard, non-porous finish, offering easy cleanability and has a finish that is virtually maintenance free.

Resin : Fire Rated Polyester resin system.

Substrate : Polypropylene high strength core matrix.

Surface Finish : High gloss Fire Rated gel coat creating a smooth, impermeable surface profile with excellent chemical and corrosion resistance.

GFRMC

Physical

PHYSICAL TESTS CONDUCTED USING : GFRMC 3/8inch | 9.5mm

Result	Test	Description
48.6	ASTM D2583.7	Barcol test indentation hardness
1156.0	ASTM D695-15	Compressive strength
63.22 x10 ⁻⁶ in/in°F	ASTM D696-08	Coefficient of liner thermal expansion
2012.2	ASTM D790-15	Flexural strength
0.268	ASTM D695-15	Modulus compressive
192900.8	ASTM D790-15	Modulus flexural
24263.5	ASTM 638-14	Modulus tensile
4130	ASTM 638-14	Tensile strength

SURFACE PROPERTIES TESTS CONDUCTED USING : GFRMC 3/8inch | 9.5mm

Result	Test	Description
Pass	ASTM D 3274	Degree of surface disfigurement by fungal growth
Pass	ISO 8464 B C	Resistance to bacteria
Pass	ASTM D 3273	Resistance to mold on surface
98.3	ASTM D 523	Specular gloss test
30.9	ASTM D 570 (24HRS)	Water absorption
0.015	ASTM E 96	Water permeance
0.0068	ASTM E 96 05	Water Vapor transmission

GFRMC

Test reports

GFRMC : COMPLIANCE REPORTS

GFRMC : CSI 3-PART FORMAT

GFRMC : Construction Specification Institute. June 13, 2020

GFRMC : FIRE & SMOKE TEST REPORTS

GFRMC : ASTM-E84

GFRMC : Smoke development and Flame spread report 5mm. March 25, 2020

GFRMC : ASTM-E84

GFRMC : Smoke development and Flame spread report 9.5mm. March 25, 2020

GFRMC : MECHANICAL TEST REPORTS

GFRMC : 20P-2156

GFRMC : 5mm Lap shear strength test on concrete with A2020 adhesive no tape. May 21, 2020

GFRMC : 20P-2156

GFRMC : 5mm Shear strength test on metal plate with tape and A2020 adhesive. May 21, 2020

GFRMC : 20P-2156

GFRMC : 5mm Tensile strength test on metal plate with A2020 and tape. May 21, 2020

GFRMC : 20P-2156

GFRMC : 5mm Tensile strength test on metal plate with A2020 and no tape. May 21, 2020

GFRMC : 20P-2156

GFRMC : 9.5mm Lap shear strength test on concrete with A2020 adhesive no tape. May 21, 2020

GFRMC : 20P-2156

GFRMC : 9.5mm Seismic shear strength test with spline and A2020 adhesive. May 21, 2020

GFRMC : 20P-2156

GFRMC : 9.5mm Shear strength test on metal plate with tape and A2020 adhesive. May 21, 2020

GFRMC

Test reports

GFRMC : 20P-2156

GFRMC : 9.5mm Tensile strength test on metal plate with A2020. May 21, 2020

GFRMC : 20P-2156

GFRMC : 9.5mm Tensile strength test with spline and A2020. May 21, 2020

GFRMC : PHYSICAL TEST REPORTS

GFRMC : MIL 1073.2

GFRMC : Impact resistance test with 2lbs. ball drop method. May 21, 2020

GFRMC : ASTM D2583-13A

Standard test method for indentation hardness of rigid plastics by mean of barcol impresser. May 21, 2020

GFRMC : ASTM D696-08

Coefficient of linear thermal expansion test. May 21, 2020

GFRMC : ASTM D523-14

Standard test method of specular gloss. May 21, 2020

GFRMC : ASTM D570-98

GFRMC : 5mm Water absorption, 24-hour immersion. June 10, 2020

GFRMC : ASTM E96

GFRMC : 5mm Water vapor transmission and permeance test. June 10, 2020

GFRMC : ASTM D695-15

GFRMC : 5mm Compressive strength properties test. May 21, 2020

GFRMC : ASTM D790-17

GFRMC : 5mm Flexural strength test. May 21, 2020

GFRMC : ASTM D638-14

GFRMC : 5mm Tensile strength test. May 21, 2020

GFRMC

Test reports

GFRMC : PHYSICAL TEST REPORTS

GFRMC : ASTM D570-98

GFRMC : 9.5mm Water absorption, 24-hour immersion. June 10, 2020

GFRMC : ASTM E96

GFRMC : 9.5mm Water vapor transmission and permeance test. June 10, 2020

GFRMC : ASTM D695-15

GFRMC : 9.5mm Compressive strength properties test. May 21, 2020

GFRMC : ASTM D790-15

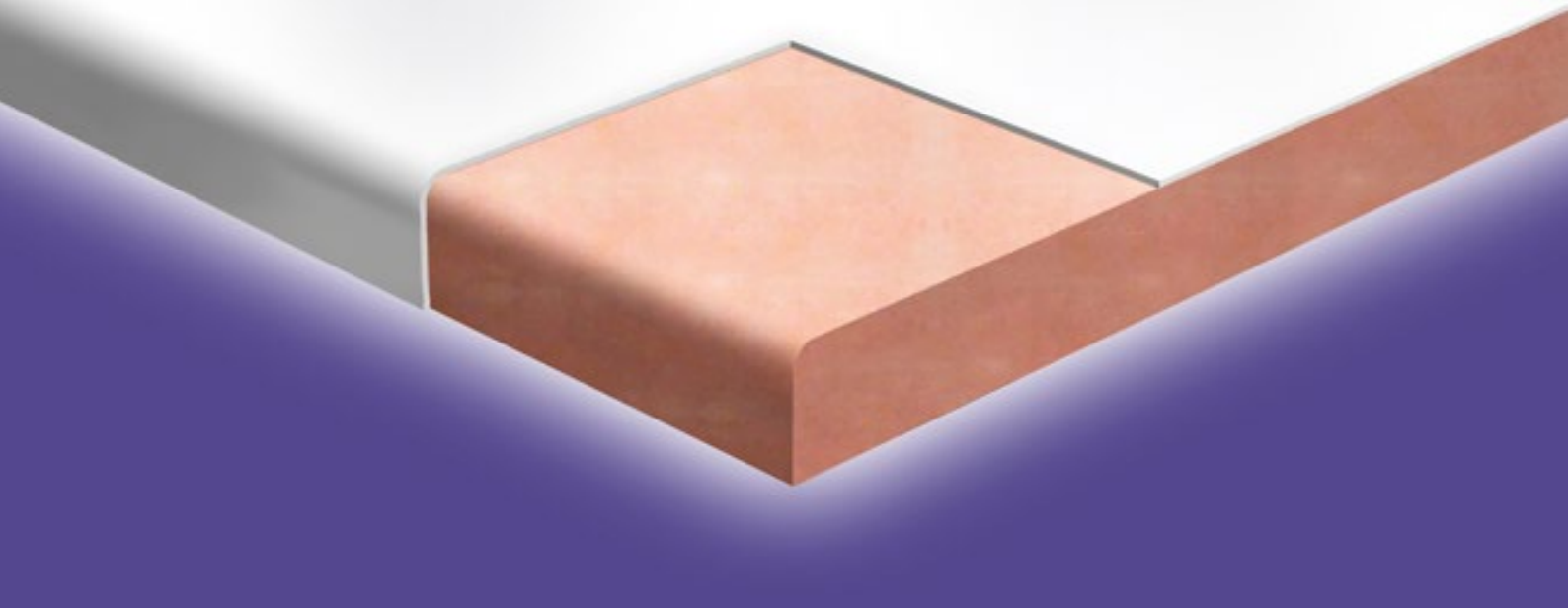
GFRMC : 9.5mm Flexural strength test. May 21, 2020

GFRMC : ASTM D638-14

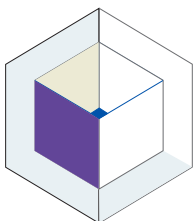
GFRMC : 9.5mm Tensile strength test. May 21, 2020

GFRP

Walls Ceilings Linings



GFRP



Imperial 3/8in

Metric 9.5mm

Gel coated fiberglass reinforced polymer wall panel system

Antimicrobial / impervious to water, moisture and vapor

Certified up to PC3, PC4 | BSL-3 & BSL-4

Designed for highly specialized facilities

Surface : Pristine white high gloss

GFRP

introduction

GFRP IS THE MOST ROBUST ARCOPLAST PRODUCT. Designed for highly specialized facilities with strict requirements for environment control. Made of reinforced glass fiber with a Gel Coat surface, GFRP panels are manufactured to comply to the highest level of containment rated PC3, PC4, BSL-3, BSL-4. GFRP has surpassed expectations for applied operational and functional criteria such as longevity, maintenance and reliability.

GFRP panels are configured for load and non-load bearing applications as well as direct attached ceilings and re-cladding existing surfaces. All Arcoplast products meet and exceed USDA, Canada Agriculture, FDA, NIH, BMBL, AS/NZS and USP 797-800. GFRP is compliant with specific guidelines for high containment facilities.

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Color surface finish	p 49
Compliance	p 50
Color range	P 51
Dimensions	p 52 –53
Fire & smoke	p 54 –55
Installation	p 56
Mechanical test report	p 57 –59
Physical	p 60 –61
Test reports	p 62 –65

GFRP

Barrier performance

AIR PRESSURE DECAY : GFRP panels when chemically welded together using A-1010 Bio-Seal, are formed into a single impermeable membrane. The smooth, seamless joints are water vapor, gas and air tight, and do not crack or deteriorate over time

CLEANING : GFRP will withstand up to and greater than 30 years of vigorous decontaminations and wash-downs. It will not decay, dent, fade, or peel, so it will not need to be painted or re-finished.

IMPACT : The GFRP system is designed to outlast the life of the facility. GFRP is a robust, impact, corrosion, and chemical resistant panel system.

MOISTURE and WATER : GFRP is impervious to microorganisms and is not effected by insects or vermin. The front and back surfaces are impermeable and unaffected by moisture or humidity.

BARRIER TESTS CONDUCTED USING : GFRP 9.5MM

Results	Test	Description
Pass	ASME N510	Air pressure decay nuclear air treatment systems test
Pass	ASME N510	Air pressure decay test on accessories relating to MEP test
Pass	ASME N510	Air pressure decay test on expansion joint & electrical face plates
Pass	ASME N510	Air pressure decay test on screw penetrations test
Pass	ASME N510	Air pressure decay test small chamber BSL-3, BSL-4 test
Pass	Test	Supplemental helium leak testing
Pass	Report	Window panel pressure decay test report

* ASME Standard N510 – Testing of nuclear air treatment systems (1995)

GFRP

Color surface finish

GFRP COLOR : Standard color, pristine white

GFRP CUSTOMIZED COLOR RANGE : Full range of PMS colors

GFRP COLORATION FASTNESS : Surface color retention & durability based on cleaning & decontamination

CUSTOM FORMING : Custom molded for curved applications

GFRP FINISH : Front surface finish : Fire rated gel coated resin acrylic

GFRP SURFACE FINISH : Smooth, non porous

GFRP SURFACE PROFILE : High gloss polished surface

Lighting : GFRP has a pristine high gloss, bright white finish, that produces a light reflectivity of 99.7 % at an 85 degree source angle, providing the laboratory with evenly diffused light designed with fewer lamp fixtures, thus reducing the amount of penetrations to the ceiling surface.

GFRP COLOR SURFACE TESTS CONDUCTED USING : GFRP 9.5MM

Result	Test	Description
Pass	ISFA 2-01	Arcoplast cleanability & stain resistance
Pass	ASTM D 1308-02	Arcoplast surface and sealant chemical compatibility
pass	ISO 2812-4	Arcoplast surface and sealant chemical compatibility
Pass	Coloration	Chlorine dioxide decontamination procedure
Pass	Coloration	Formaldehyde gas decontamination procedure
Pass	Coloration	Hydrogen peroxide vapor decontamination procedure
Pass	UV test	Exposure cycles

GFRP

Compliance

Arcoplast GFRP fiberglass polymer composite panels integrate both shielding and barrier functions into the primary barrier. GFRP does not flake, delaminate, is unaffected by water or galvanic action and GFRP does not corrode or oxidise and requires no rejuvenating maintenance programs.

Arcoplast is used in mission critical environments such as BSL-3, BSL-3Ag and BSL-4 facilities. Arcoplast products excel on air pressure decay tests, keeping interior and exterior personnel safe from harmful pathogens.

Arcoplast meets and exceeds USDA, FDA, CDC, cGMP, NIH BMBL 5th Edition, USP 797-800, GLSP compliant and specific guidelines for maximum containment facilities.

GFRP COMPLIANCE TESTS CONDUCTED USING : GFRP 9.5MM

Result	Test	Description
MEA 414-04-M	UPITT Protocol toxicity test	City of New York department of buildings
Pass	US FDA 21 CFR 177.2600	Determination of extractives residue according to US FDA
Pass	CSI 3-Part format	Product guide specification written according to CSI 3
Pass	Compliant test	USDA, FDA, CDC, NIH, NIAID, Canada Agriculture compliant

GFRP

GFRP Color range

Standard color : Pristine white.

Arcoplast gel coated fibreglass panels can be matched to most pan tone colors, please consult with Arcoplast for further information.

GFRP is highly durable, and retains its pristine high gloss appearance. The GFRP Gel Coat surface has a clean brilliant white glossy finish, offering a modern aesthetic to any room or working environment. After years of being decontaminated, scrubbed, vigorously washed and having endured years of activity... Our clients often comment on how GFRP always looks “brand new”.

GFRP COLOR RANGE TESTS CONDUCTED USING : GFRP 9.5MM

Color	Pristine white
Custom color	Full range of PMS colors

GFRP RANGE OF FINISHES

Custom forming	Custom molded for curved applications
Panel surface	Front surface finish : Fire rated gel coated resin acrylic
Surface finish	Smooth non porous
Surface profile	Polished high gloss surface

GFRP

Dimensions

GFRP sheet sizes are made to your requirement within the parameters of the following thicknesses, widths and lengths.

IMPERIAL SIZES

Thickness	Width	Length	Weight
13/64in	4 feet	3 - 12 feet	2.0lbs./ Sq. Ft
3/8in	4 feet	3 - 12 feet	3.6lbs./ Sq. Ft
1/2in	4 feet	3 - 12 feet	4.6lbs./ Sq. Ft
3/4in	4 feet	3 - 12 feet	8lbs./ Sq. Ft

Tolerance	-	+/-1/8 Inch length
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IMPERIAL : PROFILE & JOINT SYSTEM

END CUT PROFILE	13/64in	3/8in	1/2in	3/4in
Grooved		Yes	Yes	Yes
Eased side edge				Yes
Square cut	Yes	Yes	Yes	

SIDE CUT PROFILE	13/64in	3/8in	1/2in	3/4in
Eased side edge	Yes	Yes	Yes	Yes
Grooved		Yes	Yes	Yes
Square cut				Yes

JOINT SYSTEM	13/64in	3/8in	1/2in	3/4in
Batten cover	Yes			
Flush seam	Yes	Yes	Yes	Yes
Mechanical seam		Yes	Yes	Yes

GFRP

Dimensions

GFRP sheet sizes are made to your requirement within the parameters of the following thicknesses, widths and lengths.

METRIC SIZES

Thickness	Width	Length	Weight
5mm	1200mm	900mm - 3700mm	9.76 Kg/m ²
9.5mm	1200mm	900mm - 3700mm	17.5Kg m ²
12.5mm	1200mm	900mm - 3700mm	22.5Kg m ²
19mm	1200mm	900mm - 3700mm	39.1Kg m ²
Tolerance	-	+/- 3 mm length	

METRIC : PROFILE & JOINT SYSTEM

END CUT PROFILE	5mm	9.5mm	12.5mm	19mm
Grooved		Yes	Yes	Yes
Eased side edge				Yes
Square cut	Yes	Yes	Yes	

SIDE CUT PROFILE	5mm	9.5mm	12.5mm	19mm
Eased side edge	Yes	Yes	Yes	Yes
Grooved		Yes	Yes	Yes
Square cut				Yes

JOINT SYSTEM	5mm	9.5mm	12.5mm	19mm
Batten cover	Yes			
Flush seam	Yes	Yes	Yes	Yes
Mechanical seam		Yes	Yes	Yes

GFRP

GFRP Fire & smoke

In the year 2009 under the Plastic Chapter 26, the International Building Code (IBC) created a division which addresses fiberglass reinforced polymer composite materials. This enables architects, specifiers and building owners to clearly interpret and conform to a uniform building code.

Composite materials are not incombustible, however the combustibility level can be significantly reduced through the correct process of chemistry engineering.

The surface burning characteristics of building materials manufactured in the United States are tested per the American Standard Testing Method (ASTM).

In Canada it is determined by ASTM International and Underwriters Laboratories (UL). In Europe, composite materials are tested in accordance with European Norms /Standard (EN), and International Organization for Standardization (ISO).

Interior finishes are classified according to their flame spread and smoke spread development indexes.

Manufacturers usually publish the class only. However there should be a more scrupulous look into the numbers. Owners and architects should require the test results for the flame and smoke generation to better assess the suitability of the interior finishes.

A composite material labeled as a Class A (Flame Spread 0-25) may not have a large margin of improvement because it is already in a low category. But the (Smoke Development 0-450) is extremely critical, and a composite material with a smoke development of 425 versus 50 can have catastrophic consequences in a high occupancy high rise building.

Another area of concern is the toxicity issue in composite building materials. The City of New York requires testing on materials for acute lethality. This is based on the test methodology specified in the Building Code for the City of New York and as published by the University of Pittsburgh, Department of Industrial Environmental Health Sciences (The UPITT Test – The University of Pittsburgh Test Protocol for Measurement of Acute Lethality of Thermal Decomposition Products from Specimens).

GFRP

GFRP Fire & smoke

The test has a pass/fail criteria. It must not be more toxic than wood, which produces a 50 percent lethality rate at a total mass of 19.7 grams. Upon the receipt of successful test results, the City of New York will grant a Materials & Equipment Acceptance (MEA) number for the designated product.

[Note: International Building Code Chapter 8 Section 8901.1.1. on interior finishes. Exception: Materials having a thickness less than 0.036 inch (0.9mm) applied directly to the surface of walls or ceilings.]

The IBC does not factor in primers and paint applications or high-performance coatings as an integral part of a wall or ceiling system, whether constructed using a light gauge steel stud and drywall composition or masonry wall. Historically, manufacturers have only been required to test the primer and paint product and coatings without the substrate. It is therefore highly uncertain as to the classification of a given system unless the whole assembly is tested.

Arcoplast fiberglass reinforced composite panels also comply with the IBC Chapter 8 Section 801.1.3 referring to interior finishes below the design flood elevation to be flood-damage-resistant materials.

GFRP RANGE OF FINISHES TESTS CONDUCTED USING : GFRP 9.5MM

Result	Test	Description
B-s1-d0	EN 13501-1 Europe, Asia	Classification of reaction to fire performance, in accordance with – Europe, Asia
Pass	ISWO 9705 Annex B	Full scale room fire test
MEA 414-04-M	UPITT Protocol Toxicity	Measurement of acute lethality decomposition products
18.9 FS – 63.4SD	UL S 102 Test	On surface burning characteristics (Must be on full composite construction – Canada)
20FS – 200SD	ASTM E 84 Test	On surface burning characteristics (Must be on full composite construction – USA)
Pass	UL 94 – 5VA 500W	Vertical burning test

GFRP

Installation

Borrowed from the light gauge steel stud construction method, Arcoplast fiberglass reinforced composite wall and ceiling systems most often do not require elaborate pre-engineering preparations. GFRP when sealed and finished using A-1010 Bio-Seal, seamlessly integrates with third party building fixtures such as, door and window frames, MEP's, flooring finishes etc.

Arcoplast panels are manufactured in modular panel board form and are designed to be cut, shaped and fastened on-site to reduce engineering and fabrication time. The efficiency of on-site assembly reduces the cost of project delays typically arising from last minute changes.

Arcoplast has an extensive library of application drawings and installation details specifically relating to the construction of high containment facilities.

The installation manual is a step by step guide with detailed instructions, work templates, drawings and quality control work sheets.

Installation manual

Please go to the website : www.acoplast.com

Products page GFRP | Specifications | Installation | Download

GFRP

Mechanical

Mechanical and Physical Properties. The mechanical and physical properties of building materials should be carefully considered when planning the construction of high containment facilities. Flexural and compressive strength, surface hardness, gloss property, coefficient of expansion and contraction, impact resistance and water vapor transmission are crucial factors in the material selection process.

Disappointment and failures are, in many cases, associated with a poor performance of materials or systems design. Consider this example: A wall to footprint ratio is approximately 1.72 feet times the floor surface. With a 5,000 square foot footprint, the laboratory space will yield approximately 8,600 square feet of partition surface.

Arcoplast Panel System : 7 lbs. x 8600 sq. ft. = 60,200 lbs.

Masonry Block : 45 lbs. x 8,600 sq. ft. = 387,000 lbs.

Poured in Place Concrete : 100 lbs. x 8,600 sq. ft. = 860,000 lbs.

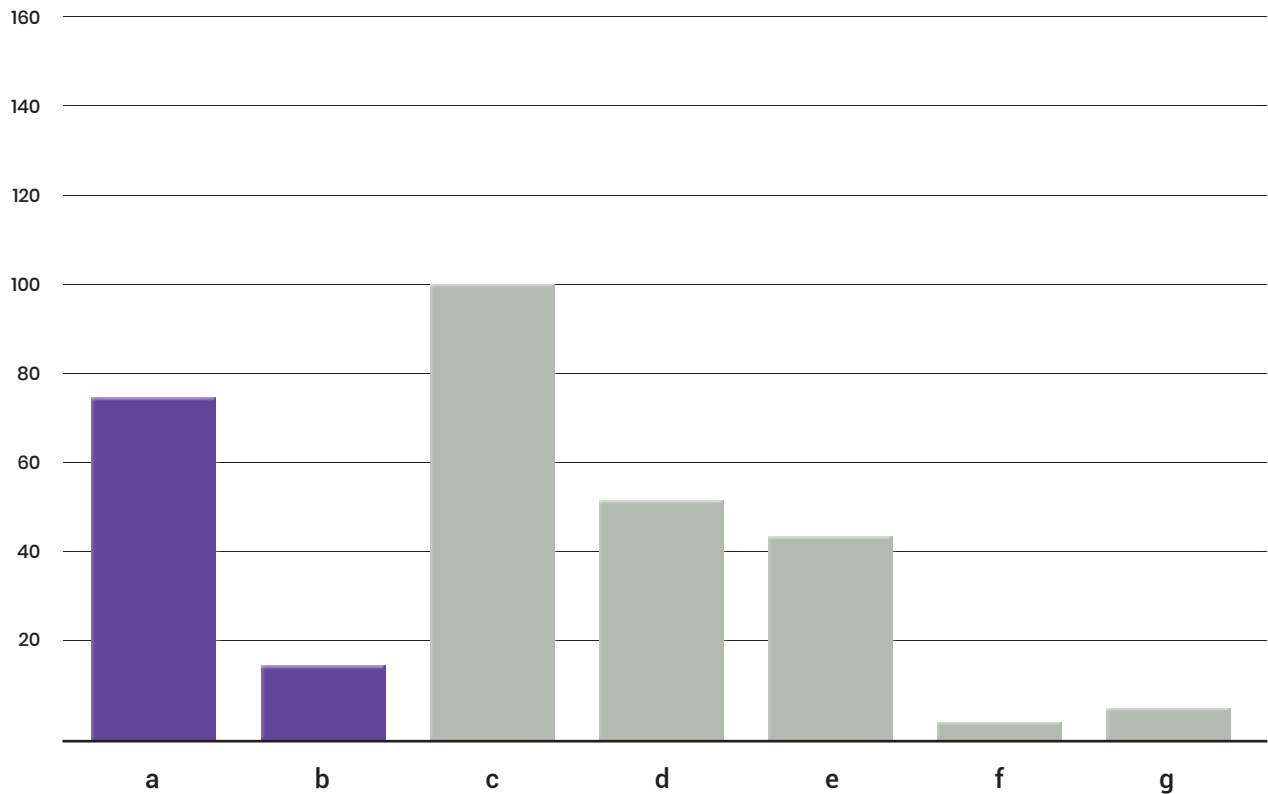
At 7 pounds per square foot, Arcoplast panel systems would clearly cause the least stress on the building. The structural and environmental integrity is achieved through light gauge steel stud framing and Arcoplast modular panel system that work in harmony with the building movement, and constant air cycle movement generated by the air handling systems.

MECHANICAL TESTS CONDUCTED USING 9.5 MM GFRP

Result	Test	Description
55 lbf	Interior corner assembly	Joint peel strength test
Pass	Partition load bearing	Partition load bearing test
573 lbs	Ex. #6 x 25mm Pan Phillips SDS	Pull-out strength of variable fasteners test
Pass	FEA report	Seismic loading compliance - FEA report on structural analysis report
330 lbf	Instron 5500R	Seismic shear strength test lateral movement – corner section assembly
556 lbf	Instron 5500R	Seismic shear strength test load (peak load) solid panel test
396 lbf	Instron 5500R	Seismic shear strength test panel – spline joint assembly test
Pass	System load	Walk-on ceiling system load test

GFRP

Mechanical



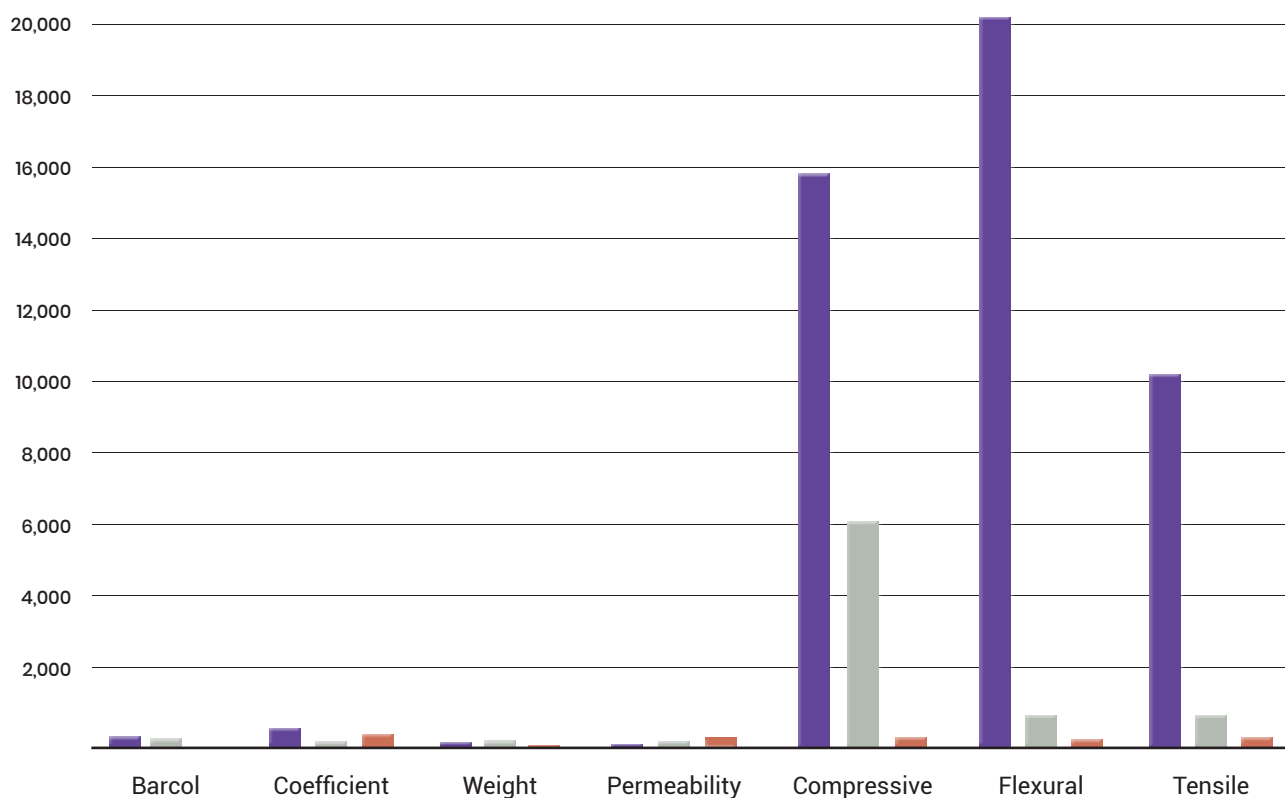
	High containment facility estimated material weights	Arcoplast ■
a	Cast in place 8" concrete wall with Arcoplast liner	76 P/sf
b	Arcoplast with steel stud	16 P/sf

	High containment facility estimated material Weights	Concrete ■
c	Cast in place 12" concrete wall w/HPC coating	100 P/sf
d	12" thick glazed CMU	51 P/sf
e	12" thick CMU w/HPC coating	42 P/sf
f	2" 18 Gauge insulated stainless steel panel	4 P/sf
g	Steel stud/ two layers 1/2 Ea side w/HPC coating	9 P/sf

These figures are based on average construction calculations

GFRP

Mechanical & physical properties comparison



Test	GFRP	Concrete	Gypsum
Barcol Hardness	56.8	50	0
Coefficient of thermal expansion	27.5 x10 ⁻⁶ /in/in°F	5.5 x10 ⁻⁶ /in/in°F	9.3 x10 ⁻⁶ /in/in°F
* Weight (psf)	3.6 psf	4.5 psf	1.4 psf
Permeability	0.01	6	31

Compressive Strength (psi)	15,920 psi	6,000 psi	350 psi
Flexural Strength (psi)	21,101 psi	700 psi	60 psi
Tensile Strength (psi)	10,141 psi	700 psi	80 psi

* Concrete weight is based on GFRP panel thickness of : 9.5mm | 3/8in

GFRP

Physical

Acryloyl panels may be assembled in virtually any configuration, this simple uncomplicated system allows for cost-effective “box-within-a-box” construction. Walk-on ceilings, suspended ceilings, wall and ceiling liners, load bearing partitions, chase systems, beam covers and bulkheads. GFRP panels are easily installed into new or existing projects and are well suited for high traffic production facilities with demanding work loads in the clean-room and high containment industries.

PHYSICAL TESTS CONDUCTED USING 9.5 MM GFRP

Result	Test	Description
0.05	ASTM C 423-09a / E 795-05	Sound absorption Test
57	ASTM E 90-09 / E 413-10	Sound transmission loss test
99.7	ASTM D 523	Specular gloss test
Pc750	ISO 10012-1	Surface profile & surface finish analysis test
10141 psi	ASTM D 638-03	Tensile properties test
0.01	ASTM D 570 (24 hrs.)	Water absorption test
0.01	ASTM E 96-05	Water vapor transmission test

GFRP

Physical

The weight of building materials plays an essential role in the architecture, design, and engineering of a building, and equally a significant factor in the cost effectiveness of a project. Design and weight limitations, building movement and demanding construction schedules must be carefully assessed. The cost to reinforce a building's foundation and structure to support the added weight of interior wall and ceiling systems can be exceedingly expensive.

PHYSICAL TESTS CONDUCTED USING 9.5 MM GFRP

Result	Test	Description
56.8	ASTM D 2583	Barcol indentation hardness test
27.5×10^{-6} in/in°F	ASTM D 696-03	Coefficient of linear thermal expansion test
15920 psi	ASTM D 695-02a	Compressive strength properties test
Pass	ASTM D3274	Degree of surface disfigurement by fungal/algal growth test
185°F	ASTM D 648	DTUL – Deflection temperature under load test
10318 psi	ASTM D 790-03	Flexural properties for Reinforced plastics test
18' x 2 lbs	Mil 1073.2	Impact resistance test
Pass	ASTM D3273	Resistance to mold on the surface test
10318 psi	ISO 846A-B-C	Resistance to bacteria test
0.1	R-Value ASTM D177	Thermal conductivity test

GFRP

GFRP : BARRIER PROPERTIES TEST REPORTS

GFRP : ASME N510

GFRP : Air pressure decay nuclear air treatment systems test. Jun 29, 2006

GFRP : ASME N510

GFRP : Air pressure decay test on accessories relating to MEP. Aug 14, 2006

GFRP : ASME N510

GFRP : Air pressure decay test on screw penetrations. Mar 3, 2007

GFRP : ASME N510

GFRP : Air pressure decay test small chamber BSL-3, BSL-4. Jun 29, 2006

GFRP : PHAC LEVEL 4 CONTAINMENT

GFRP : Air pressure decay test on expansion joint & electrical face plates. Nov 9, 2010

GFRP : ARCOPLAST TESTING

GFRP : Supplemental helium leak testing. Aug 14, 2006

GFRP : COLORATION PROPERTIES TEST REPORTS

GFRP : ASTM D1308-02

GFRP : Chemical resistance testing on GFRP surface and sealant 72-hour test. Jan 3, 2014

GFRP : ISO 2812-4

GFRP : Chemical resistance testing on GFRP surface and sealant failure rate. Feb 14, 2014

GFRP : ARC062065A-01

GFRP : Coloration test chlorine dioxide decontamination procedure. Mar 8, 2007

GFRP : ARC062065A-01

GFRP : Coloration test formaldehyde gas decontamination procedure. Mar 3, 2007

GFRP : ARC062065A-01

GFRP : Coloration test hydrogen peroxide vapor decontamination procedure. Mar 3, 2007

GFRP : MEA

GFRP : City of New York Department of Buildings. Mar 7, 2005

GFRP : CSI 3-PART FORMAT

GFRP : Construction Specification Institute. Dec 21, 2014

GFRP

GFRP : COMPLIANCY REPORTS

GFRP : MEA
GFRP : City of New York Department of Buildings. Mar 7, 2005

GFRP : CSI 3-PART FORMAT
GFRP : Construction Specification Institute. Dec 21, 2014

GFRP : FIRE & SMOKE TEST REPORTS

GFRP : ISO 9705
GFRP : Annex B full scale room fire test. Oct 28, 2014

GFRP : EN 13501-1
GFRP : Classification of reaction to fire performance, in accordance with – Europe, Asia. Feb 18, 2011

GFRP : UL S-102
GFRP : Test on surface burning characteristics (Must be on full composite construction – Canada)
Feb 18, 2011

GFRP : ASTM E-84
GFRP : Test on surface burning characteristics (Must be on full composite construction – USA). May 5, 2020

GFRP : GFRP : ISO 9705
GFRP : Investigation combustion products of Arcoplast cement core sandwich panel in accordance with article 4, section 27-335.1(2) and article 5, section 27-348E. March 31, 2005

GFRP : MECHANICAL TEST REPORTS

GFRP : REPORT 1106-867
GFRP : Pull-out strength of variable fasteners – ex. #6 x 25 mm Pan Phillips SDS. Nov 29, 2006

GFRP

GFRP : PHYSICAL TEST REPORTS

GFRP : ASTM D 696-03

GFRP : Coefficient of linear thermal expansion. Mar 17, 2011

GFRP : ISO 846

GFRP : Resistance to bacteria test. Aug 29, 2013

GFRP : ASTM D 3273

GFRP : Resistance to mold on the surface test. Aug 28, 2013

GFRP : ASTM C 423 - 09A / E 795 - 05 REPORT NO : NGC 4012079

GFRP : Sound absorption Arcoplast" Closed Edge Insulated Ceiling Tile Type E-400 Mount Aug 10, 2012

GFRP : ASTM C423-09A / E795-05

GFRP : Sound absorption test GFRP 9.5mm panel. Aug 10, 2012

GFRP : ASTM E 90-09/ E413-10/EI332-10A REPORT NO : NGC 2012071

GFRP : Sound transmission 9.5mm on 5/8 drywall side 1 and 5/8 drywall side 2 on 3-5/8 in. steel stud with 3-1/2 in. fiberglass insulation. Aug 10, 2012

GFRP : ASTM E 90 - 09 / E 413 -10 REPORT NO : NGC 2012041

GFRP : Sound transmission loss test GFRP : 9.5mm panel side 1 and no face side 2 on 3-5/8 in. steel stud. Aug 10, 2012

GFRP : ASTM E 90 - 09 / E 413 -10 REPORT NO : NGC 2012042

GFRP : Sound transmission 9.5mm panel side 1 and GFRP 9.5 side 2 on 3-5/8 in. steel stud with 3 in. mineral wool insulation. Aug 10, 2012

GFRP : ASTM E 90 - 09 / E 413 - 10 REPORT NO : NGC 2012043

GFRP : Sound transmission 9.5mm side 1 and 1/2in. drywall side 2 on 3-5/8 in. steel stud with 3 in. mineral wool insulation. Aug 10, 2012

GFRP : ASTM E 90-09 / E 413-10/EI332-10A REPORT NO : NGC 2012072

GFRP : Sound transmission 9.5mm side 1 and 1/2in. drywall side 2 on 3-5/8 in. steel stud with 3 in. mineral wool insulation. Aug 10, 2012

GFRP : ASTM E 90-09/ E 413 -10 REPORT NO : NGC-2012040

GFRP : Sound transmission wall Partition Assembly Consisting of Side 1 - No Face Materials Source

Side of Partition Side 2 - Single Layer of Arcoplast" Closed Edge Insulated Ceiling Tile 3-5/8 Inch Steel Studs, 16 Inches o.c. Aug 10, 2012

GFRP

GFRP : PHYSICAL TEST REPORTS

GFRP : ASTM D 523

GFRP : Specular gloss test. Mar 17, 2011

GFRP : ASTM D 2583

GFRP : Test barcol indentation hardness. Mar 17, 2011

GFRP : ASTM D 695-02A

GFRP : Test compression properties, Arcoplast 9.5 mm solid glass/resin core panel. March 17, 2011

GFRP : ASTM D 695-02A

GFRP : Test compressive strength properties. Mar 17, 2011

GFRP : ASTM D 790-03

GFRP : Test flexural properties, Arcoplast 9.5 mm solid glass/resin core panel. March 17, 2011

GFRP : MIL 1073.2

GFRP : Test impact resistance. Mar 17, 2011

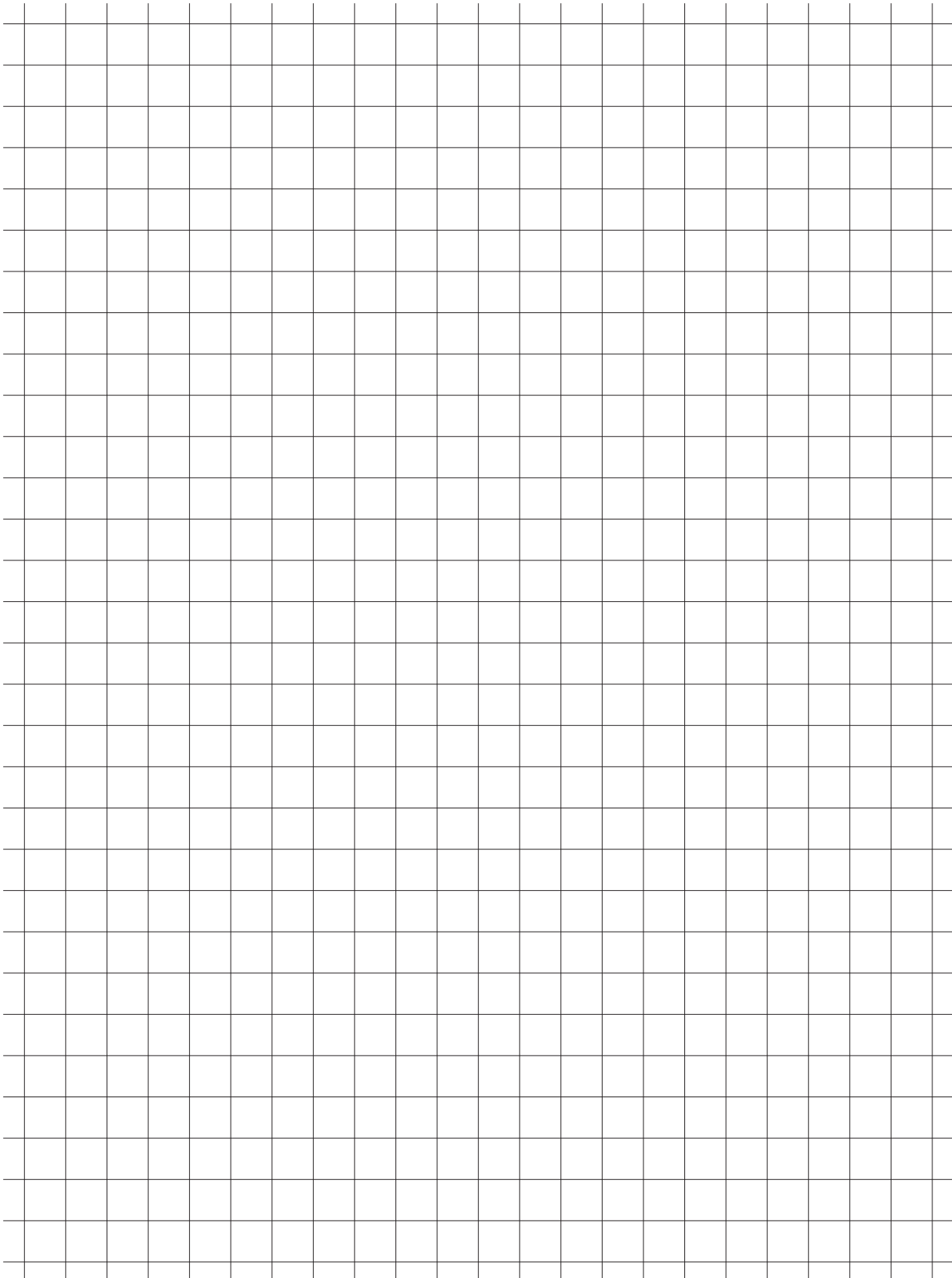
GFRP : ASTM D 638-03

GFRP : Test tensile properties. Mar 17, 2011

GFRP : ASTM E 96-05

GFRP : Water vapor transmission test. Mar 17, 2011

DRAWINGS



GFRP Specialized

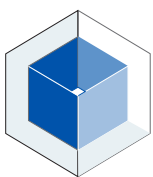
Walls Ceilings Linings



GFRP Specialized

Imperial 1/2in

Metric 12.5mm



Customized fabrication for specific controlled environments

Designed & manufactured for healthcare and research facilities

Engineered to architectural specification

Gel coated fibreglass composite technologies

Four specialized panels : Lead, i-Panel, High Security, Ultra

GFRP Specialized panels

introduction

Manufactured for specific application of industrial and scientific requirement where no deviation from strict criteria is expectable.

These specialized paneling systems are designed to form a comprehensive wall to ceiling primary barrier membrane.

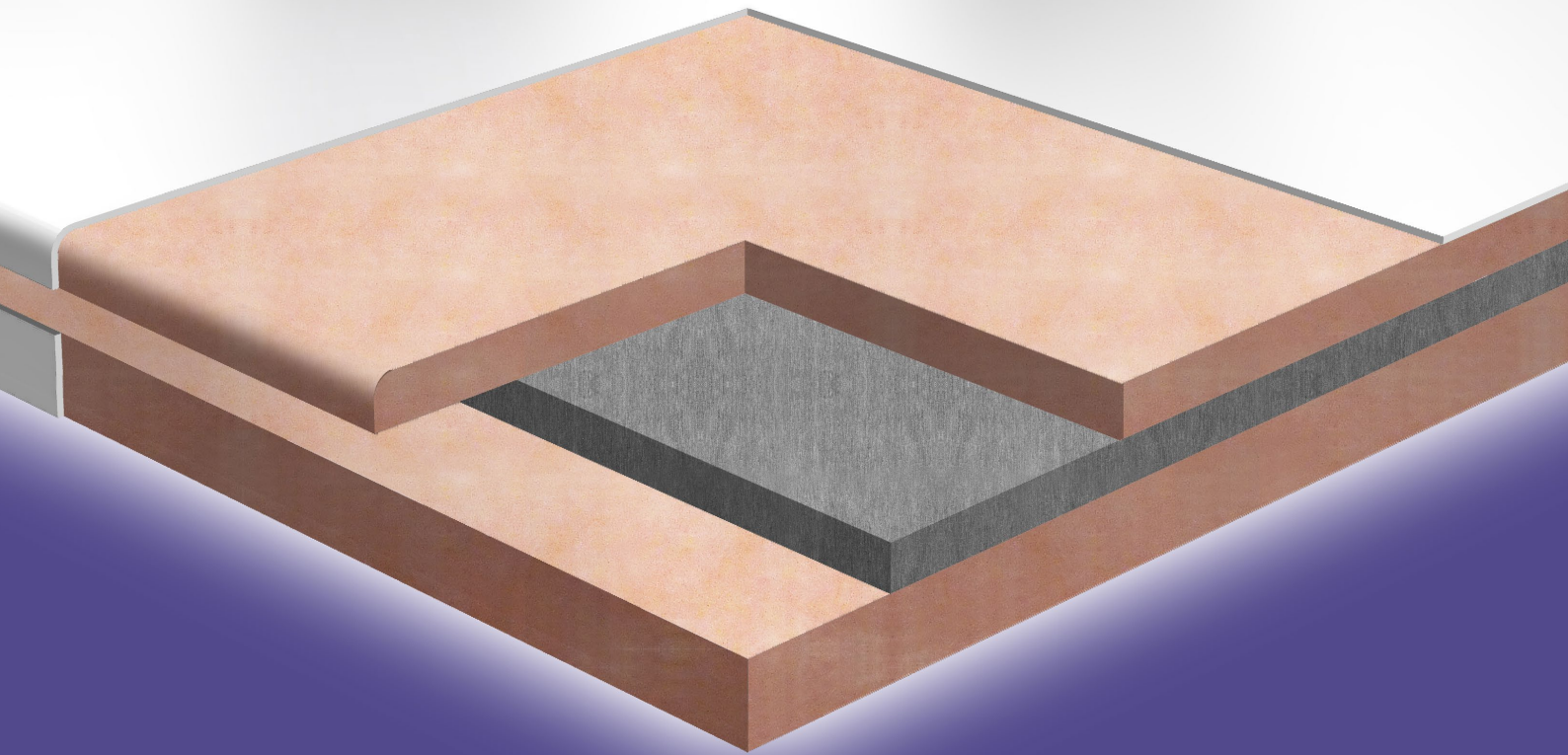
GFRP Specialized paneling systems have all the features of the GFRP panels, except these specialized panel systems have been modified for specific applications such as : Hospital R/F, RAD, X-Ray or C-Arm departments, vivariums accommodating large animals, industrial/ government buildings and places where security is a critical requirement...

Specifications	page
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GFRP lead walls & ceilings panels	p 70 -75
i-Panel GFRP insulated ceiling panels	p 76 -79
GFRP security walls & ceilings panels	p 80 -83
GFRP ultra walls & ceilings panels	p 84 -89
Mechanical Spline	p 90 -91

GFRP Lead

Walls Ceilings Linings



GFRP Lead



Imperial 1/2in

Metric 12.5mm

Encased lead shielded panels, impose no risk of lead expose

Encased lead laminate available in various thicknesses, suited to user requirement

Designed for new and modernizing existing facilities

Lead shielded panels are engineered to meet specific radiation specifications

Manufactured for radiation protection in health & animal care imaging facilities

GFRP Specialized lead shield panels

PANELING SURFACE : The same gel coat surface is used for all GFRP panels, including GFRP Lead shield

GFRP COLOR : Standard color, pristine white

GFRP CUSTOMIZED COLOR RANGE : Full range of PMS colors

GFRP COLORATION FASTNESS : Surface color retention & durability based on cleaning & decontamination

CUSTOM FORMING : Custom molded for curved applications

GFRP FINISH : Front surface finish is made of a fire rated gel coated resin acrylic

GFRP SURFACE FINISH : Smooth gloss

GFRP SURFACE PROFILE : Polished surface

Lighting : GFRP panels have a Light reflectivity of 99.7 % at an 85 degree source angle

All GFRP panel surfaces have excellent evenly diffused light properties, resulting in fewer lamp fixtures and fewer ceiling penetrations.

GFRP SPECIALIZED COLOR SURFACE TESTS CONDUCTED USING 9.5 MM GFRP

Result	Test	Description
Pass	ISFA 2-01	Arcoplast cleanability & stain resistance
Pass	ASTM D 1308-02	Arcoplast surface and sealant chemical compatibility
pass	ISO 2812-4	Arcoplast surface and sealant chemical compatibility
Pass	Coloration	Chlorine dioxide decontamination procedure
Pass	Coloration	Formaldehyde gas decontamination procedure
Pass	Coloration	Hydrogen peroxide vapor decontamination procedure
Pass	UV test	Exposure cycles

GFRP Lead panels

Cutting profile

PROFILE	LEAD	LEAD
END CUT PROFILE	½ in	12.5mm
Grooved	Yes	Yes
Eased side edge		
Square cut	Yes	Yes

SIDE EDGE PROFILE	½ in	12.5mm
Eased side edge	Yes	Yes
Grooved	Yes	Yes
Square cut		

JOINT SYSTEM	½ in	12.5mm
Batten cover	Yes	Yes
Flush seam	Yes	Yes
Mechanical spline	Yes	Yes

GFRP Lead panels

Dimensions

Lead shield panels

Sheet sizes are made to your requirement with the parameters of the following thicknesses, widths and lengths. If you require a thicker gauge of lead shielding, please contact Arcoplast.

Thickness	R/K Rating	Weight	Length	Width
½ inch	-	7.1lbs./ Sq. Ft	Up to 12ft	48in
12.5mm	-	35.32Kg. / Sq. m	Up to 3650mm	1200mm

GFRP Lead panels

Arcoplast lead lined paneling

Radiation shielding embedded in the Arcoplast (GFRP) gel coated fiberglass reinforced polymer panels are particularly well suited for Healthcare, Animal Care and Medical Industries. Applications for Imaging facilities, X Ray, CT Scan and PET Scan can be designed and constructed, with ease and security, with minimum exposure to lead.

Arcoplast GFRP wall and ceiling liner panels, and dividing partitions, eliminate lead hazards with fully integrated lead shield plates, ensuring a safe working environment for humans and animals in high containment facilities and research laboratories.

Arcoplast manufacturing processes easily incorporates lead shielding plates of variable thickness and dimensions to suit user requirements. The final product is a fully fused and homogenous panel make-up, encapsulating the lead sheets that cannot leech out and contaminate the laboratory space.

The Arcoplast lead shielded panel's extreme performance is due to the unique construction process. The Arcoplast panel is not a laminated construction, the construction of the panel consists of a wetting out glass fiber and resin systems, in multiple applications, to meet specific thickness, physical and mechanical strength. During this assembly process, the specified lead sheets are incorporated in the panel make-up, and the entire panel in the exotherm process, fuses the glass fiber mats, fire rated resin and the lead sheeting.

The entire crafted process results in a very smooth, non-porous, high gloss gel coat surface, with a solid glass and resin matrix, fully encapsulated lead shield panel that is permanently sealed and will provide the security and protection for the occupants and environments for the entire duration of the laboratory.

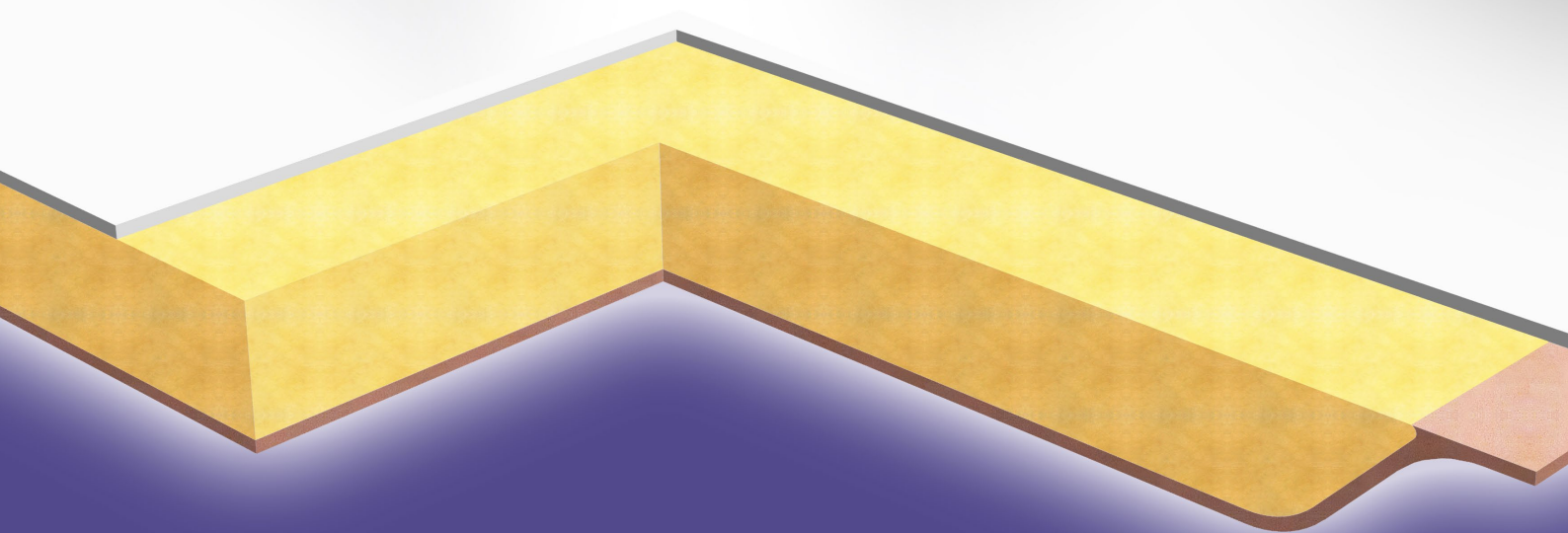
Through the engineering advances in composite manufacturing, the lead shielded panels can now be handled safely, and the on-site installation methodology greatly simplify the constructability of high containment laboratories with specific radiation requirements, providing a lifetime, high performance wall and ceiling systems.

NOTES

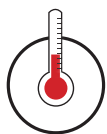
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i-Panel

Suspended ceiling panels



i-Panel



Imperial 5/8in

Metric 15.9mm

Available in various R / K ratings

Closed edge encapsulated high density insulation

Does not crack, peel, fade or deteriorate over time

Gel coated, high gloss, non-porous surface

Rigid suspended ceiling panel system

i-Panel : GFRP insulated ceiling panels

PANELING SURFACE : The same gel coat surface is used for all GFRP panels, including i-Panel

i-PANEL COLOR : Standard color, pristine white

i-PANEL CUSTOMIZED COLOR RANGE : Full range of PMS colors

i-PANEL COLOR FASTNESS : Surface color retention & durability based on cleaning & decontamination

i-PANEL FINISH : Front surface finish is made of a fire rated gel coated resin acrylic

i-PANEL SURFACE FINISH : Smooth gloss

i-PANEL SURFACE PROFILE : Polished surface

Lighting : GFRP panels have a Light reflectivity of 99.7 % at an 85 degree source angle

All GFRP panel surfaces have excellent evenly diffused light properties, resulting in fewer lamp fixtures and fewer ceiling penetrations.

i-PANEL's are designed to be installed into the TR35 suspended ceiling grid system

i-PANEL COLOR SURFACE TESTS CONDUCTED USING 9.5 MM GFRP

Result	Test	Description
Pass	ISFA 2-01	Arcoplast cleanability & stain resistance
Pass	ASTM D 1308-02	Arcoplast surface and sealant chemical compatibility
Pass	ISO 2812-4	Arcoplast surface and sealant chemical compatibility
Pass	Coloration	Chlorine dioxide decontamination procedure
Pass	Coloration	Formaldehyde gas decontamination procedure
Pass	Coloration	Hydrogen peroxide vapor decontamination procedure
Pass	UV test	Exposure cycles

i- Panel GFRP insulated ceiling panels

Dimensions

Sheet sizes are made to your requirement with the parameters of the following thicknesses, widths and lengths.

i-Panel ceiling panels | Imperial

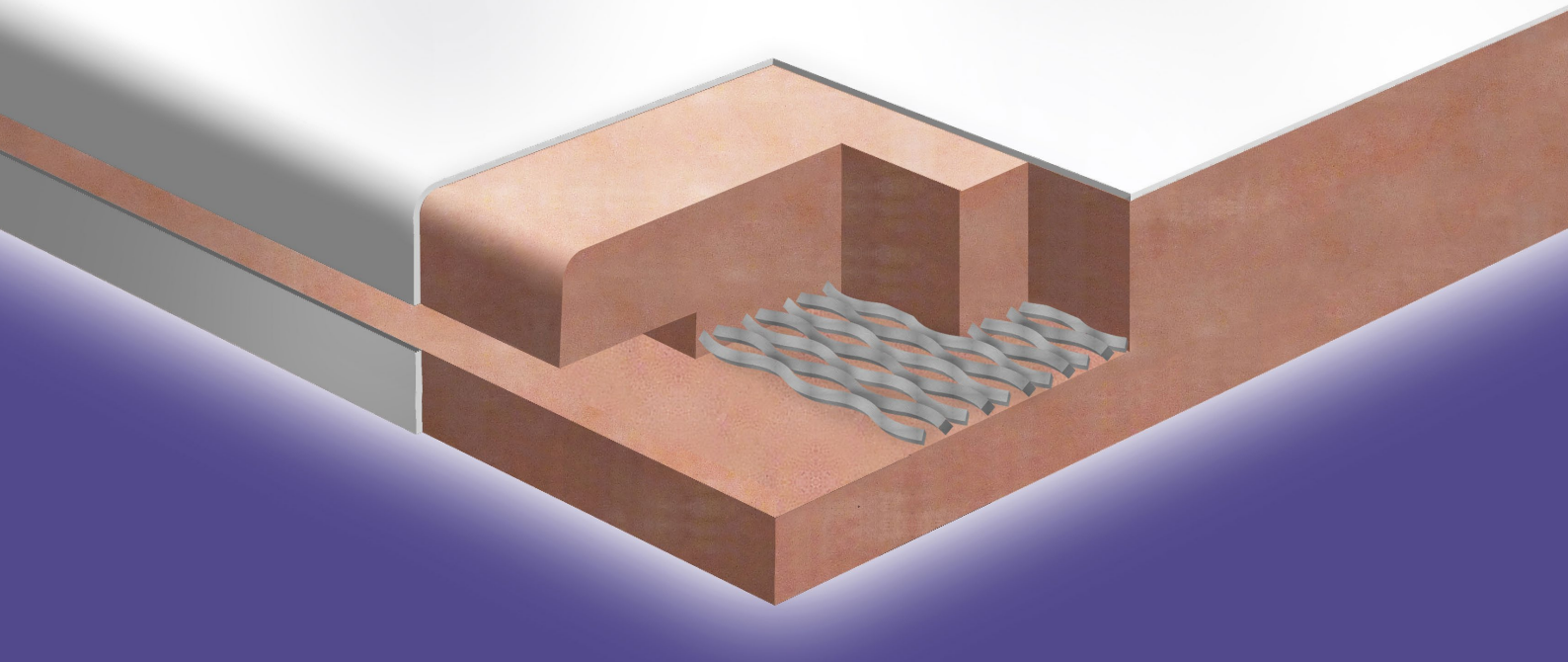
Thickness	R -Value	Weight	Length x Width		
5/8 inch	R 2.368	1.15lbs./ Sq. Ft	23 3/4 in x 23 3/4 in	23 3/4 in x 47 3/4 in	47 3/4 in x 47 3/4 in
1 1/8 inch	R 4.523	1.25lbs./ Sq. Ft	23 3/4 in x 23 3/4 in	23 3/4 in x 47 3/4 in	47 3/4 in x 47 3/4 in
1 5/8 inch	R 6.648	1.35lbs./ Sq. Ft	23 3/4 in x 23 3/4 in	23 3/4 in x 47 3/4 in	47 3/4 in x 47 3/4 in
2 1/8 inch	R 8.344	1.45lbs./ Sq. Ft	23 3/4 in x 23 3/4 in	23 3/4 in x 47 3/4 in	47 3/4 in x 47 3/4 in

i-Panel ceiling panels | Metric

Thickness	R -Value	Weight	Length x Width		
15.9mm	R 2.368	5.61Kg m ²	600mm x 600mm	600mm x 1200mm	1200mm x 1200mm
28.6mm	R 4.523	6.09Kg m ²	600mm x 600mm	600mm x 1200mm	1200mm x 1200mm
41.3mm	R 6.648	6.58Kg m ²	600mm x 600mm	600mm x 1200mm	1200mm x 1200mm
53.9mm	R 8.344	7.07Kg m ²	600mm x 600mm	600mm x 1200mm	1200mm x 1200mm

GFRP Security

Walls Ceilings Linings



GFRP Security



Imperial 3/4in

Metric 19mm

Available in various thickness to meet user requirement

Constructed for high level security controlled environments

Custom manufactured to specification

Impressive weight to strength ratio

Various perforation geometries and dimensions are available

GFRP Specialized security panels

PANELING SURFACE : The same gel coat surface is used for all GFRP panels, including GFRP Security

GFRP COLOR : Standard color, pristine white

GFRP CUSTOMIZED COLOR RANGE : Full range of PMS colors

GFRP COLORATION FASTNESS : Surface color retention & durability based on cleaning & decontamination

GFRP FINISH : Front surface finish is made of a fire rated gel coated resin acrylic

GFRP SURFACE FINISH : Smooth gloss

GFRP SURFACE PROFILE : Polished surface

LIGHTING : GFRP Security panels have a pristine high gloss, bright white finish, that produces a light reflectivity of 99.7% at an 85 degree source angle, providing the laboratory with evenly diffused light designed with fewer lamp fixtures, while reducing the amount of penetrations to the ceiling surface.

GFRP SPECIALIZED COLOR SURFACE TESTS CONDUCTED USING 9.5 MM GFRP

Result	Test	Description
Pass	ISFA 2-01	Arcoplast cleanability & stain resistance
Pass	ASTM D 1308-02	Arcoplast surface and sealant chemical compatibility
Pass	ISO 2812-4	Arcoplast surface and sealant chemical compatibility
Pass	Coloration	Chlorine dioxide decontamination procedure
Pass	Coloration	Formaldehyde gas decontamination procedure
Pass	Coloration	Hydrogen peroxide vapor decontamination procedure
Pass	UV test	Exposure cycles

GFRP Security panels

Cutting profile

PROFILE	STEEL CORE	STEEL CORE
END CUT PROFILE	$\frac{3}{4}$ in	19mm
Grooved	Yes	Yes
Eased side edge		
Square cut	Yes	Yes

SIDE EDGE PROFILE	$\frac{3}{4}$ in	19mm
Eased side edge	Yes	Yes
Grooved	Yes	Yes
Square cut		

JOINT SYSTEM	$\frac{3}{4}$ in	19mm
Batten cover	Yes	Yes
Flush seam	Yes	Yes
Mechanical spline	Yes	Yes

GFRP Security panels

Dimensions

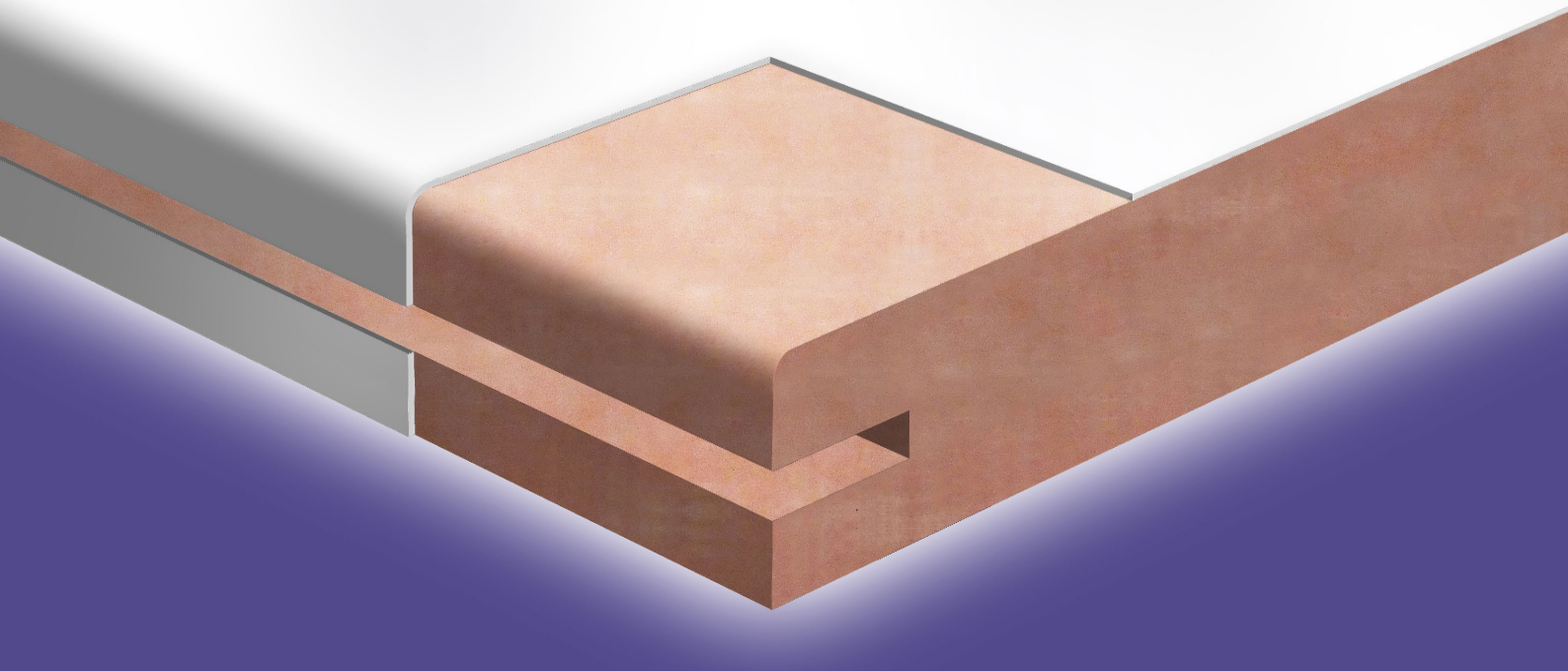
Security panels

Sheet sizes are made to your requirement with the parameters of the following thicknesses, widths and lengths. For more information please contact Arcoplast.

Thickness	R/K Rating	Weight	Length	Width
¾ inch	-	7.8lbs./ Sq. Ft	Up to 12ft	48in
19mm	-	38.3Kg. / Sq. m	Up to 3650mm	1200mm

GFRP Ultra

Walls Ceilings Linings



GFRP Ultra

Imperial 3/4in

Metric 19mm



Designed for large animal holding rooms

Extremely robust, non delaminated panel system

Impact resistance up to 2,000 psf at point of contact

Manufactured to endure stringent cleaning regimes & high pressure washdowns

Standard building construction practices, utilizing minimum components

GFRP Specialized Ultra panels

PANELING SURFACE : The same gel coat surface is used for all GFRP panels, including GFRP Ultra

GFRP COLOR : Standard color pristine white

GFRP CUSTOMISED COLOR RANGE : Full range of PMS colors

GFRP COLORATION FASTNESS : Surface color retention & durability based on cleaning & decontamination

CUSTOM FORMING : Custom molded for curved applications

GFRP FINISH : Front surface finish is made of a fire rated gel coated resin acrylic

GFRP SURFACE FINISH : Smooth gloss

GFRP SURFACE PROFILE : Polished surface

LIGHTING : GFRP Security panels have a pristine high gloss, bright white finish, that produces a light reflectivity of 99.7% at an 85 degree source angle, providing the laboratory with evenly diffused light designed with fewer lamp fixtures, while reducing the amount of penetrations to the ceiling surface.

GFRP SPECIALIZED COLOR SURFACE TESTS CONDUCTED USING 9.5 MM GFRP

Result	Test	Description
Pass	ISFA 2-01	Arcoplast cleanability & stain resistance
Pass	ASTM D 1308-02	Arcoplast surface and sealant chemical compatibility
pass	ISO 2812-4	Arcoplast surface and sealant chemical compatibility
Pass	Coloration	Chlorine dioxide decontamination procedure
Pass	Coloration	Formaldehyde gas decontamination procedure
Pass	Coloration	Hydrogen peroxide vapor decontamination procedure
Pass	UV test	Exposure cycles

GFRP Ultra panels

Cutting profile

PROFILE	ULTRA HEAVY DUTY	ULTRA HEAVY DUTY
END CUT PROFILE	$\frac{3}{4}$ in	19mm
Grooved	Yes	Yes
Eased side edge		
Square cut	Yes	Yes

SIDE EDGE PROFILE	$\frac{3}{4}$ in	19mm
Eased side edge	Yes	Yes
Grooved	Yes	Yes
Square cut		

JOINT SYSTEM	$\frac{3}{4}$ in	19mm
Batten cover	Yes	Yes
Flush seam	Yes	Yes
Mechanical spline	Yes	Yes

GFRP Ultra panels

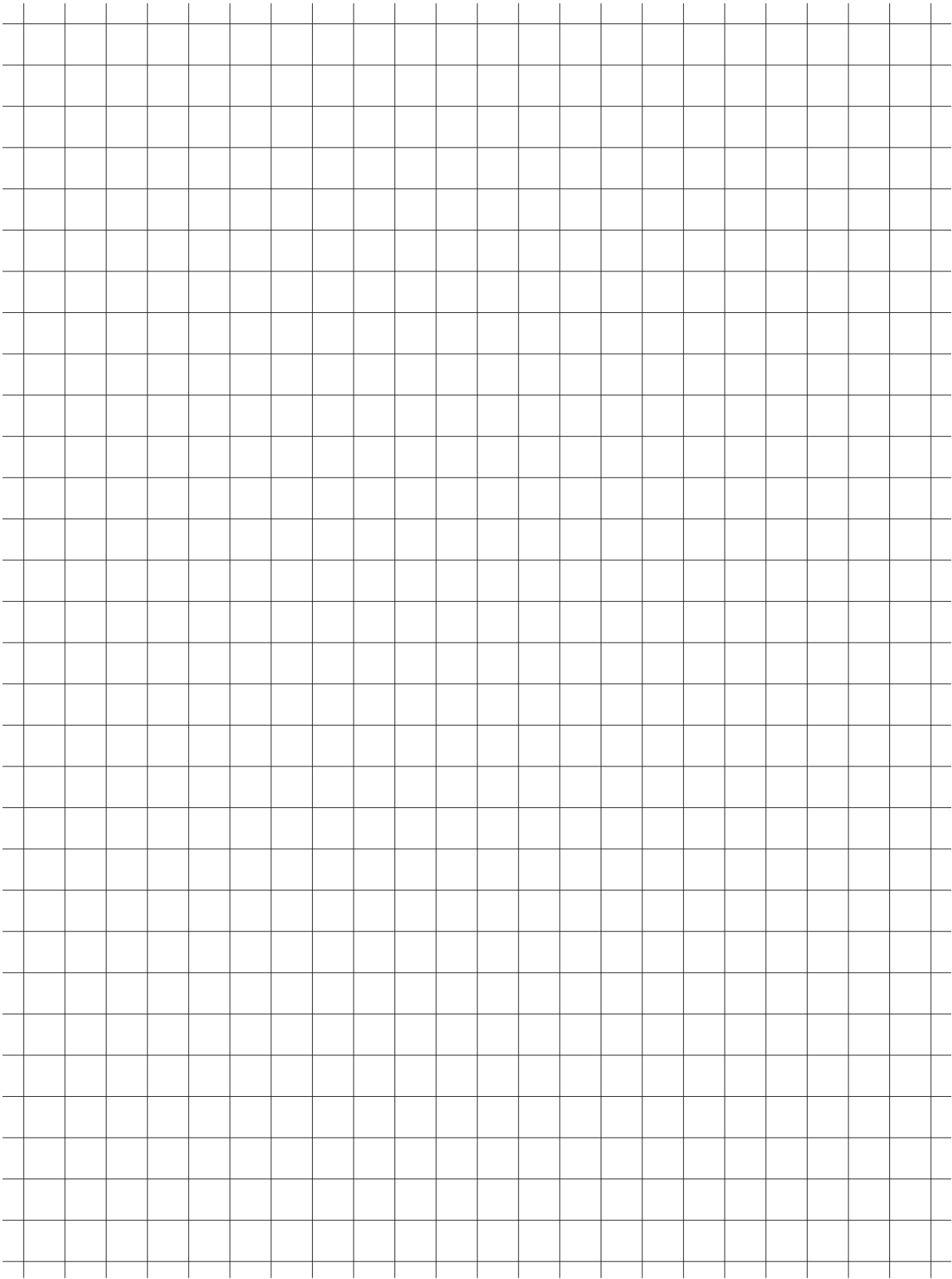
Dimensions

Ultra heavy duty panels

Sheet sizes are made to your requirement with the parameters of the following thicknesses, widths and lengths. Please contact us for more information.

Thickness	R/K Rating	Weight	Length	Width
¾ inch	-	6.7lbs./ Sq. Ft	Up to 12ft	48in
19mm	-	32.5Kg. / Sq. m	Up to 3650mm	1200mm

DRAWINGS

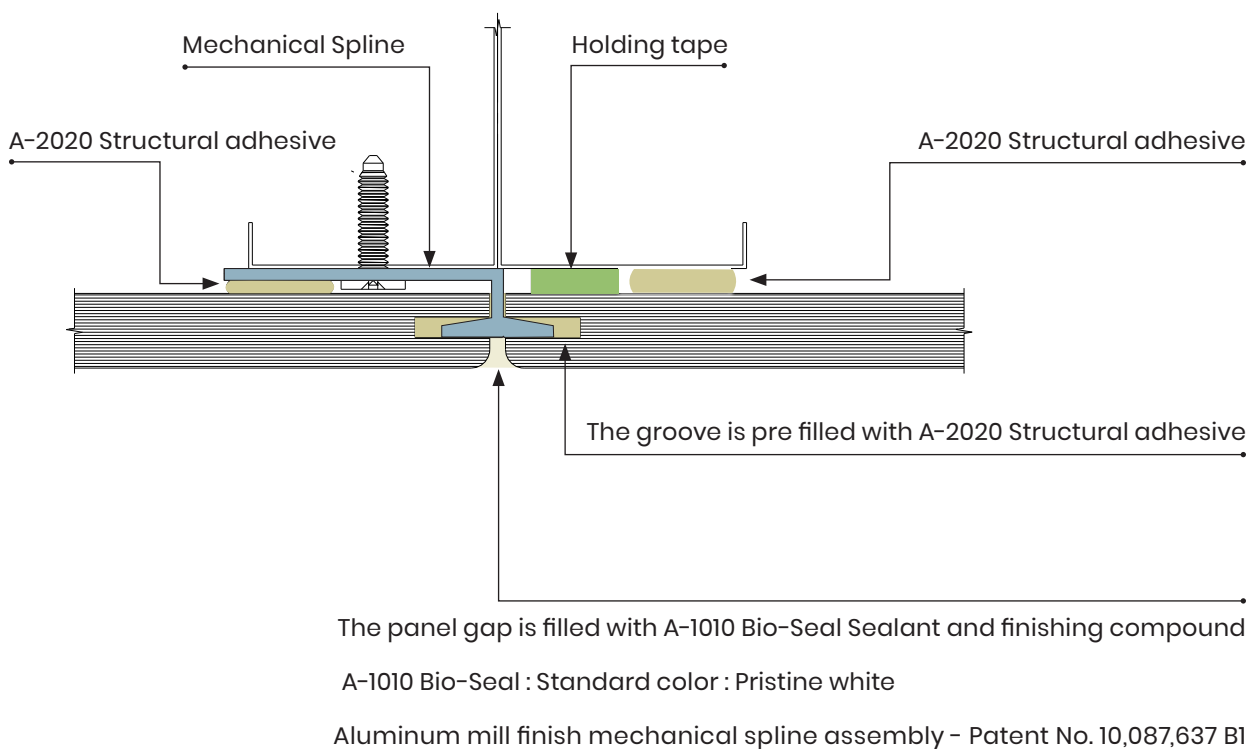


Mechanical Splines

Mechanical Spline

Arcoplast wall and ceiling liner joint and spline attachment assembly meets seismic requirements of NZS 4219 (2009) and ICC-ES AC 156 (US).

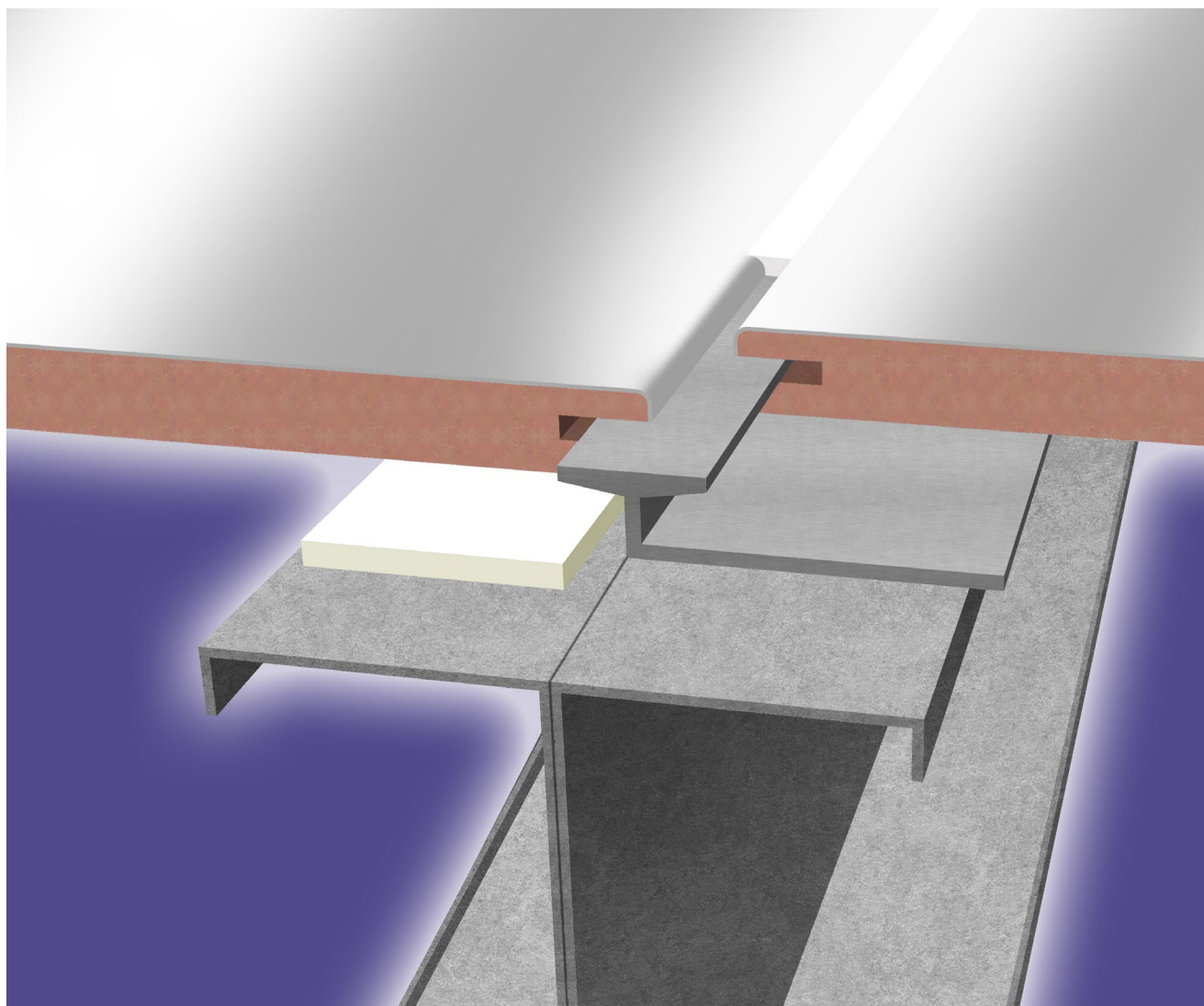
Mechanical working Joint Strength lbs/in 457.2



The innovative engineering design of the Arcoplast spline joining system allows the adhesive to flow through the staggered diagonal grooves creating a "zipper configuration" preventing the legs of the spline from laterally slipping out of the panel kerf, therefore significantly increasing the seismic shear strength.

Furthermore, the staggered groove design enables the adhesive to expand to the bottom and top lip of the panel kerf enabling a "stitching effect" resulting in a solid panel joint core matrix.

Mechanical Spline



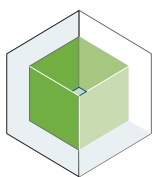
Mechanical splines are the backbone of the assembly process and key to overcoming the issues of lining a wall over existing materials without breaching the barrier surface.

The Arcoplast mechanical spline system works with the full range of Arcoplast Panel Systems.

ARCOPLAST A-1010 Bio-Seal

Two in one : sealant finishing compound
specifications

A-1010 Bio-Seal



Sealant & Finishing compound

A two-component equal mix high strength aliphatic urethane adhesive

Bonds seals in a single application, non sagging

Environmentally chemically neutral, odor free

Pick proof, non porous or yellowing finish

Seismic Shear strength panel to panel 791 psi

A-1010 Bio-Seal : Sealant and finishing compound

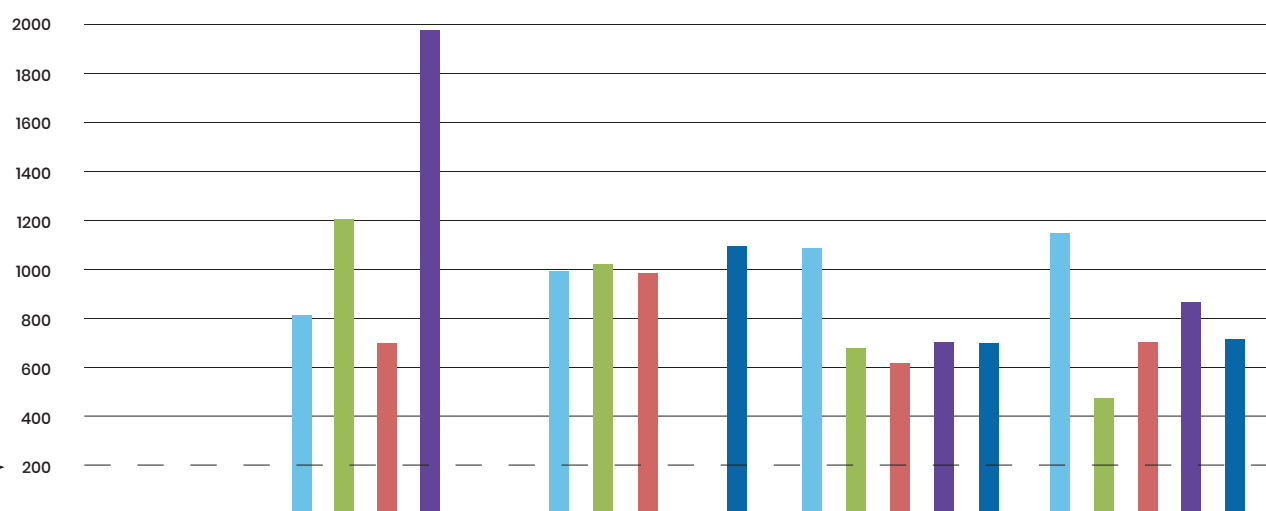
A-1010 Bio-Seal

A two component, equal mix, high strength aliphatic urethane structural adhesive that bonds and seals in one application. The A-1010 Bio-Seal sealant is specifically designed for composite panel joints, panel to panel coving and featheredge detailing. It is also ideally suited for sealing around mechanical, electrical devices and plumbing services eliminating unsightly caulking lines, and difficult tooling lines that can harbor contamination.

A-1010 Bio-Seal delivers a permanent high gloss, non-porous, non-yellowing finish. It is odor free and environmentally neutral. This extraordinary product creates the perfect seal necessary for a safe working environment in Pharmaceutical production, Food and Beverage manufacture, Healthcare, Animal care and Bio Security laboratories rated up to PC3, PC4, BSL-3 and BSL-4.

The series of Lap Shear tests were conducted using Arcoplast A-1010 Structural Adhesive as a bonding agent between a combination of materials.

psi Lap Shear tests : A-1010 Bio-Seal capacity to adhere to various materials



	Acryloyl panel	GFRP panel	Galvanized steel	Stainless Steel
Epoxy	837 psi	995.9 psi	1080.5 psi	1164.2 psi
MMA	1202.3 psi	1077.1 psi	681.1 psi	477.3 psi
Urethane	721.1 psi	919.9 psi	624.7 psi	686.8 psi
Acryloyl panel	1975.1 psi	-	721.6 psi	849.2 psi
GFRP panel	-	1102.8 psi	713.8 psi	728.4 psi

200 psi : Is consider in the industry as an acceptable working strength for wall panel adhesion.

A-1010 Bio-Seal : Sealant and finishing compound

Tooling

Tooling is recommended immediately after application to ensure uniformed contact on both sides of the joint area. Always use a smooth continuous pressure to obtain clean lines.

Tip : Practice before you begin.

Sealant cartridge

Two cartridges joined together : Cartridge A 200ml, Cartridge B 200 ml. Bio-Seal is automatically mixed to the correct ratio of 1:1 when using the recommended dispensing system with a static mixer.

Arcoplast – Surface preparation

Prior to application, remove all foreign matter and contaminants, such as surface dirt, dust, oil and loose particles from all interface materials and components. Clean the surface using a clean cloth dampened with isopropyl alcohol.

Application – Bio-Seal A-1010

Critical to the performance are the correct environmental room conditions : Temperature and humidity range are critical.

Setting time

Application and tooling for a 1/4 inch / (6 mm) diameter bead has an approximate working time of 45 minutes at 70°F / 21.1 °C

Moisture sensitive

If cartridge is not fully dispensed, keep the current static mixer dispense tip on until next application and then replace with new needle.

For industrial and commercial use only

Must be applied by trained skilled personnel. Not for consumer use.



Result	Test	Description
Pass	21 CFR 177.2600	Determination of extractive residue. US FDA test
0.21%	ASTM D570	Moisture absorption
199%	ASTM D882	% Elongation
2100 psi	ASTM D882	Tensile strength
66	Test	Shore D hardness
199	ASTM D882	Standard method of tensile properties of thin plastics
1531 psi	ASTM 882	Young's modulus (elastic)

Disclaimer : Bio-Seal is not a structural product, & is not designed to address any structural issues a building may have or there part of.

A-1010 Bio-Seal : Sealant and finishing compound

Safety Data Sheet	Please go to the website before using any Arcoplast product & download the SDS sheets
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Application : caulking guns 400ml	Battery powered gun Cox 83002 Manual gun Mixpac DM-400 Pneumatic gun Mixpac DP-400-85-01
Application mix ratio	A & B by volume 1:1 total volume 400 ml
Application working humidity range	40% maintained and below
Application working temperature range	60 – 80 °F 15.56 – 26.67 °C
Application working time frame	45 minutes
Cure time touch dry	12 hours
Cured time 100% set	72 hours 3 x days
Clean up	Isopropyl alcohol
Flash point	200°F 93°C
Storage life time	6 months from date of shipment stored at 50 – 80°F 10 – 27°C

Dual cartridges part A & B	Translucent paste (part A)	White paste (part B)
Density 77 °F / 21 °C	9.64 – 10.04 lbs/gal 115-1203 kgs/m ³	9.9 – 10.2 lbs/gal 1186 – 1222 kgs/m ³
Viscosity 77 °F / 21 °C	45,000 – 160,000	130,000 – 230,000

Colors x 2	Pristine high gloss white / Clear high gloss
Environmentally neutral	No solvents, no hood system, no effect on the ozone
Finish – High gloss	Feathers well producing a clean line
Low shrinkage	Not cured by solvent evaporation, therefore has minimal shrinkage
Non-sag	Application to vertical surfaces is not an issue
Non porous	Does not encourage bacterial growth. Impervious to moisture
Non-yellowing	Colorfast – does not obscure detection of debris or unsanitary conditions
Odour free	During and after curing
Toxic free	No known carcinogens, mutagens, teratogens, heavy metals, or other toxic substances

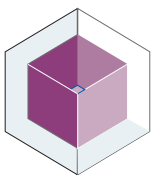
Compliant | Determination of Extractive Residue in Accordance with US FDA 21 CFR 177.2600

ARCOPLAST A-2020

Structural adhesive
specifications



A-2020



Structural Methacrylate Adhesive

A two-component methacrylate adhesive

Exceptional strength, 5 times greater than conventional urethane

Cure time of 4 hours

Lap Shear strength panel to panel 2000 psi

No fasteners required, no breaching of the containment barrier

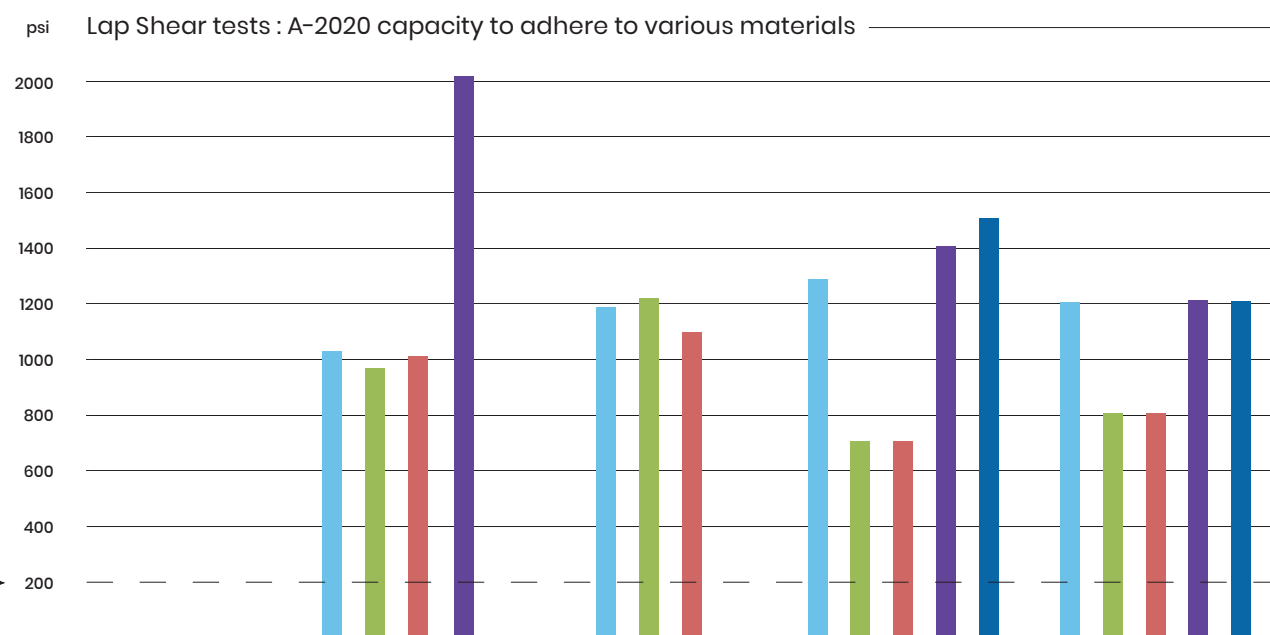
A-2020 Methacrylate Structural Adhesive

introduction

The Arcoplast A-2020 Structural Adhesive is a two-part, equal mix methacrylate adhesive, formulated specifically for bonding composite acrylic and fiberglass wall and ceiling panels.

The bonding strength of the A-2020 on average, is 5 times greater than conventional one-component urethane moisture cure adhesives, therefore eliminating the need for mechanical fasteners, a feature well appreciated in the construction of high containment facilities.

This series of Lap Shear tests were conducted using Arcoplast A-2020 Structural Adhesive as a bonding agent between a combination of materials.



	Acryloyl panel	GFRP panel	Galvanized steel	Stainless Steel
Epoxy	1087.8 psi	1195 psi	1303.5 psi	1220 psi
MMA	976 psi	1307.3 psi	759.5 psi	864.3 psi
Urethane	1050 psi	1126.4 psi	768.3 psi	844.2 psi
A-2020 (Acryloyl panel)	2088.1 psi	-	1440.2 psi	1256 psi
A-2020 (GFRP panel)	-	-	1526.9 psi	1214.6 psi

200 psi : Is consider in the industry as an acceptable working strength for wall panel adhesion.

A-2020 Methacrylate Structural Adhesive

Application

Begin by choosing the appropriate VHB tape.

For the 1.5mm VHB tape run a 9.5 mm continuous bead of A-2020

For the 3 mm VHB tape run a 12.5 mm continuous bead of A-2020

Run all A-2020 adhesive beads parallel to the tape.

Tip : Work in a well ventilated space.

A-2020 Structural Adhesive cartridge

Two cartridges joined together : Cartridge A 200ml, Cartridge B 200 ml. A-2020 is automatically mixed to the correct ratio of 1:1 when using the recommended dispensing system with a static mixer.

Arcoplast – Surface preparation

Prior to application, remove all foreign matter and contaminants, such as surface dirt, dust, oil and loose particles from all interface materials and components. Clean the surface using a clean cloth dampened with isopropyl alcohol mixed with 50% water.

Structural adhesive A-2020 Application

Critical to the performance are the correct environmental room conditions : Temperature below 60° F will increase cure and fixture time.



Setting time

Application for a 1/2 inch / (12.5 mm) diameter bead has an approximate working time of 45 minutes at 70°F / 21.1 °C

Dispensing and handling

If cartridge is not fully dispensed, keep the current static mixer dispense tip on until next application and then replace with new needle.

For industrial and commercial use only

Must be applied by trained skilled personnel. Not for consumer use.

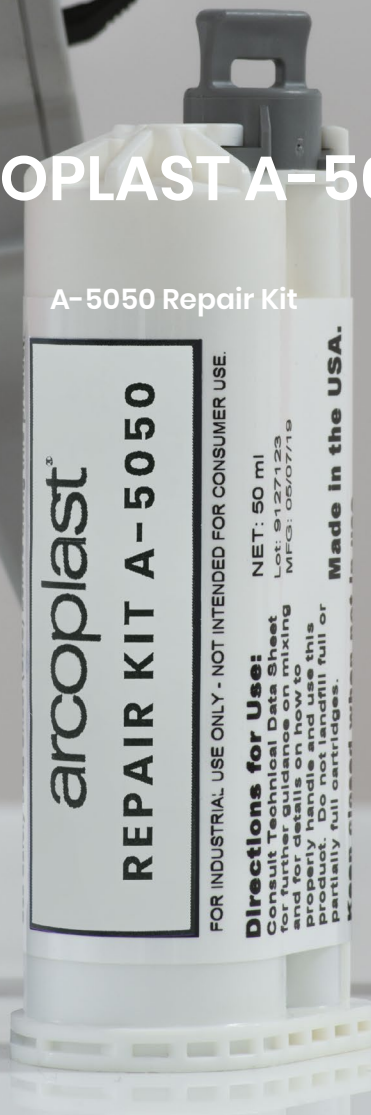
Disclaimer : A-2020 is not designed to address any structural issues of the building or there part of

A-2020 Methacrylate Structural Adhesive

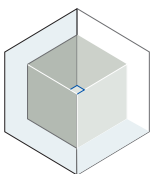
Safety Data Sheet	Please go to the website before using any Arcoplast product & download the SDS sheets	
Application : caulking guns 400ml	Battery powered gun	Cox 83002
	Manual gun	Mixpac DM-400
	Pneumatic gun	Mixpac DP-400-85-01
Application mix ratio	A to B by volume 1:1	total volume 400 ml
Application working humidity range	40% maintained and below	
Application working temperature range	60 - 80 °F	15.56 - 26.67 °C
Application working time frame	30 - 50 minutes 75°F	24°C
Fixture time	100 to 150 minutes 75°F	24°C
Cured time 100% set	4 hours	
Clean up	Isopropyl alcohol	
Flash point	51°F	11°C
Storage life time	12 months from date of shipment stored at 50 - 70°F 10 - 21°C	
Temperatures	Translucent paste (part A)	Amber paste (part B)
Density 77 °F / 21 °C	8.2 lbs/gal 3.71 kgs/m ³	8.0 lbs/gal 3.6 kgs/m ³
Viscosity 77 °F / 21 °C	100,000 - 150,000	100,000 - 150,000
Color x l	Amber	
VOC's 1000gram	39 grams of VOC / Litre of material	
Gloss finish	Consistent viscosity	
Low shrinkage	Not cured by solvent evaporation, therefore has minimal shrinkage	
Non-sag	Application to vertical surfaces is not an issue	
Non porous	Does not encourage bacterial growth. Impervious to moisture	
Gap filling capability	0.25 inches	6mm
Odour	Slight odor during curing process	
Classification	Low VOC construction adhesive	

ARCOPLAST A-5050

A-5050 Repair Kit



A-5050



Repair kit

Acryloyl surface repair and restoration compound

Does not support bacterial growth

Odor chemically neutral when cured

Restoration to original finish and surface quality

Tensile strength ASTM D-638 2000-3000 psi

A-5050 Repair Kit

introduction

A-5050 is a two-component blended methacrylate compound developed specifically for filling Acryloyl Engineered Polymer panel surface scratches, cracks, deep gouges and various panel perforations including core inserts, facilitating a full panel surface restoration.

The A-5050 methacrylate compound is formulated to quickly harden and is easily sanded down to the original panel thickness and then polished to restore the Acryloyl panel's original high gloss surface resulting in a seamless surface finish. The A-5050 product is UV stable, has similar ingredients to the Acryloyl panels, giving the finished product similar hardness and gloss when polished properly.

The A-5050 10:1 mix ratio cartridge fits most hand operated dispenser guns with a 10:1 mix plunger. These dispenser tools are easy to use and cost effective, eliminating excess waste material, measuring and mixing equipment, messy and time-consuming cleanups.

The A-5050 restoration compound is packed in a single 50ml – 10:1 mix ratio cartridge and neatly packaged in a plastic bag with two Quadro mixing nozzle 10:1 mix ratio tips.

A-5050 Repair Kit

Specifications

Safety Data Sheet	Please go to the website before using any Arcoplast product & download the SDS sheets
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CHARACTERISTICS

Room temperature cure	Properties
Working Time	20 to 30 minutes (at 75°F/ 24°C)
Fixture Time	40 to 60 minutes (at 75°F/ 24°C)
Can be Sanded In	60 minutes
Operating Temp	65°F to 85°F (18°C to 30°C)
Gap Filling	0.250 inches
Mixed Density	0.5 lbs/gal (.96 g/cc)
Flash Point	51°F (11°C) – See SDS for more safety information

CHEMICAL RESISTANCE

Excellent Resistance to the following	Susceptible to the following
Hydrocarbons	Polar Solvents
Acids and Bases	Super Strong Acids and Bases

A-5050 Repair Kit

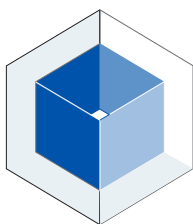
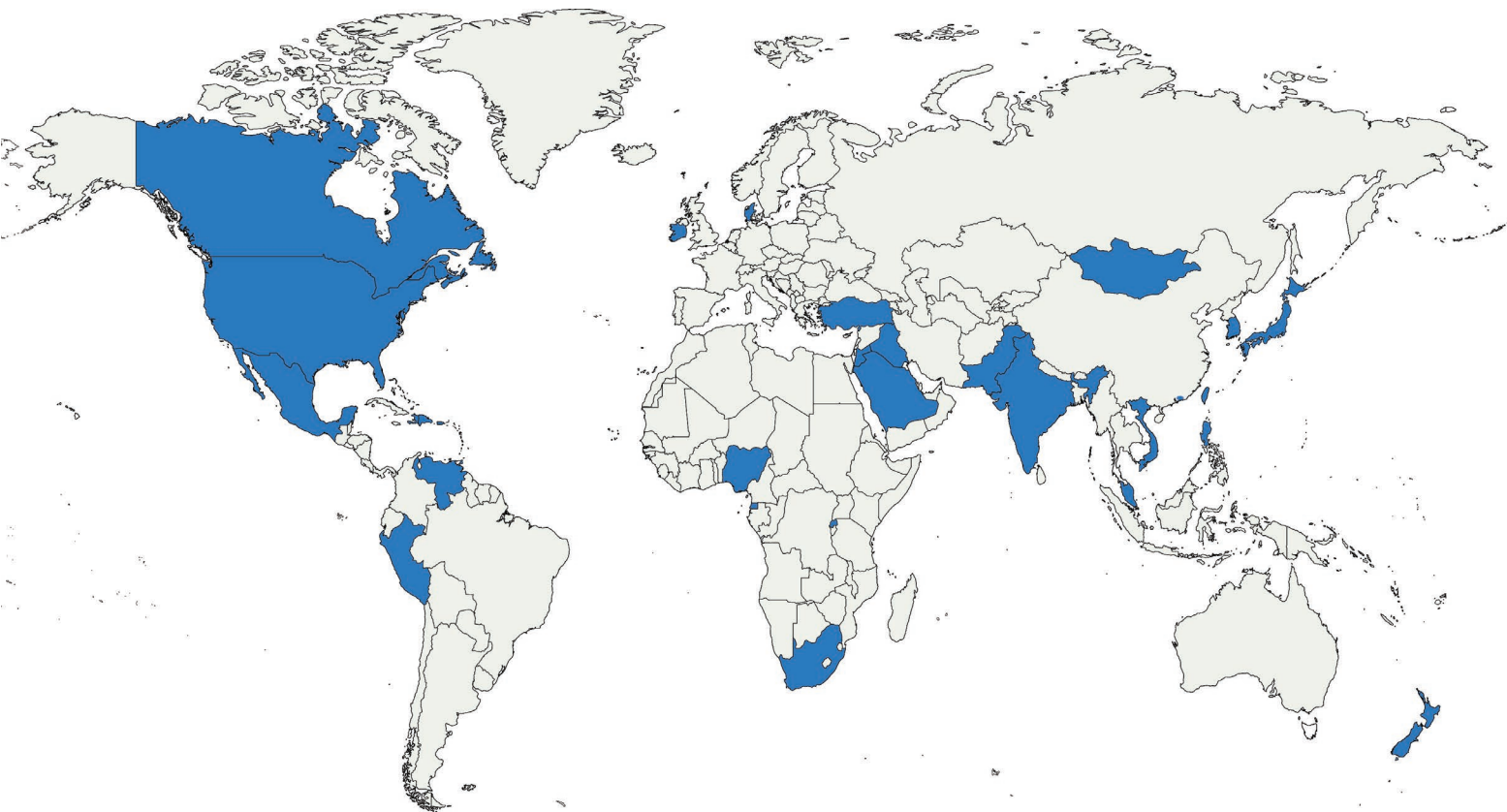
Specifications

PHYSICAL PROPERTIES

UNCURED	RESIN	ACTIVATOR
Viscosity (cps)	50,000 – 70,000	8,000 – 15,000
Color	White	Clear
Density (lbs/gal)	9.3	7.5
Mix Ratio (wt or vol) 1.0	10	
Mixer Recommendation	Cartridge (50 ml)	MBQX 05-24T – Square 24 element Pink/Grey Mix Tips (10:1)

MECHANICAL PROPERTIES

Tensile Strength (ASTM D63B)	Substrate	Results	Failure Type
Strength, psi	Engineered Polymers	2,000 – 3,000	Cohesive
Strength, psi	Gel Coat Surface	2,000 – 3,000	Substrate
Strength, psi	Steel/Stainless Steel	1,000	Cohesive
Strength, psi	Aluminum	1,000	Cohesive



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