

DIVISION: 07 00 00 – THERMAL AND MOISTURE PROTECTION

Section: 07 40 00 – Roofing and Siding Panels

REPORT HOLDER:

CENTRIA, A Nucor Company
1550 Coraopolis Heights Road, Suite 500
Moon Township, PA, 15108
800-759-7474
www.CENTRIA.com

REPORT SUBJECT:

**Formawall Dimension Series
Insulated Metal Panels**

- Standard (Flat)
- DS58
- DS59
- DS60

1.0 SCOPE OF EVALUATION

1.1 This Research Report addresses compliance with the following Codes:

- 2021 International Building Code® (IBC)
- 2018 International Building Code® (IBC)

Code sections referenced apply to 2021 IBC with [2018] sections in brackets where different.

1.2 Formawall panels have been evaluated for the following properties (see Table 1):

- Structural (Wind Resistance)
- Fire Performance
- Weather Resistance

1.3 Formawall panels have been evaluated for the following uses (see Table 1):

- Exterior wall cladding on non-fire-resistance-rated wall assemblies.
- Type V construction
- Type I, II, III or IV construction when installed in accordance with the conditions specified in Section 6.4.

2.0 STATEMENT OF COMPLIANCE

Formawall insulated panels comply with the Codes listed in Section 1.1, for the properties stated in Section 1.2 and uses stated in Section 1.3, when installed as described in this report, including the Conditions of Use stated in Section 6.0.

3.0 DESCRIPTION

3.1 General: The Formawall Insulated Wall Panel is a composite metal sandwich panel consisting of a poured-in-place polyisocyanurate (PIR) foam plastic insulation core between galvanized steel facings. When installed in accordance with the manufacturer's instructions and this report, Formawall panels form a weather-resistant exterior wall envelope in accordance with IBC Section 1402.2.

The panels are available in thicknesses of 2, 2.5, and 3 inches and widths of 10 to 40 inches for a flat exterior face. Profiled panels (DS59 and DS60) are available in 12-inch width only. See Figure 1 for panel series and profiles.

3.2 Panel Core: The Formawall Insulated Composite panel core is a continuously poured in place polyisocyanurate foam plastic with a minimum density of 2.7 pcf.

3.3 Exterior Panel Facings are formed from G90 galvanized coated steel with a minimum 22GA thickness. Panel facings are available in embossed or smooth textures with flat or striated profiles.

3.4 Interior Liner is G90 galvanized coated painted steel with a minimum 26GA thickness.

4.0 PERFORMANCE CHARACTERISTICS

4.1 Structural (Wind Resistance): Maximum allowable positive and negative transverse wind loads based on panel stiffness, strength and fastener clip capacity are presented in Table 2.



4.2 Fire Performance:

4.2.1 The foam plastic core and all panel finishes have a flame spread index not exceeding 25 and smoke developed index not exceeding 450, in accordance with ASTM E84.

4.2.2 Formawall assemblies constructed in accordance with Intertek Design Number CSG-CWP 30-03R1 meet the conditions of acceptance of NFPA 285.

4.2.3 Formawall panels were tested in accordance with NFPA 268 and met the conditions of acceptance in IBC Section 2603.5

4.3 Weather Resistance: Formawall Panels, when installed in accordance with this report, provide a weather-resistive exterior wall envelope when tested in accordance with ASTM E331 and IBC Section 1402.2.

5.0 INSTALLATION

5.1 General:

Formawall panels must be installed in accordance with the manufacturer's published installation instructions, the applicable Code, and this Research Report. A copy of the manufacturer's instructions must be available on the jobsite during installation.

5.2 Application:

Formawall panels may be installed in either a vertical or horizontal orientation. Panel attachment clips are located along interior edges of panels and secure panels to steel framing with 1/4-inch zinc coated self-tapping screws.

5.3 Sealant: Formawall panels are sealed along edges by factory-applied Non-Curing butyl gasket bead located within the double tongue and groove connection. The exposed panel ends are sealed with 3/4 in. x 7/8-in. EPDM foam or neoprene gasket within the joint. See Intertek Design Listing CSG-CWP-30-03R1 for approved gaskets.

5.4 Flashing and trim must be installed in accordance with Section 1404.4 of the IBC including, but not limited to, panel ends, openings and corners. The flashing and trim are attached to the panels or steel framing with 1/4-inch self-tapping, self-drilling screws.

6.0 CONDITIONS OF USE

6.1 Installation must comply with this Research Report, the manufacturer's published installation instructions, and the applicable Code. In the event of a conflict, this report governs.

6.2 Design loads determined from nominal wind speeds (V_{asd}) in accordance with IBC Section 1609.3.1 shall be used to calculate the panel bending moment, shear force, and panel anchor reaction loads and shall not exceed the corresponding maximum allowable design values given in Table 2. Panel deflection at design load shall be calculated using the panel stiffness properties in Table 2 and shall not exceed $L/180$ where (L) is the panel span.

6.3 Formawall Dimension Series panels must be separated from the building interior with an approved thermal barrier in accordance with IBC Section 2603.4.

Exceptions - Thermal barrier is not required under the following conditions:

- 1.** FM labeled panels meeting conditions of FM 4880 with the following limitations:
 - Dimension Series (Standard) and DS58 only (DS59 and DS60 not included).
 - Maximum reveal of 2 inches for Dimension Series (Standard).
 - Maximum reveal of 2.25 inches for DS58.
 - 2.** One story building equipped throughout with an automatic sprinkler system complying with IBC Section 903.3.1.1.
- 6.4 Types I, II, III or IV Construction:** Formawall Dimension Series (Standard) and DS58 panels may be installed on buildings of Type I, II, III or IV construction under the following conditions:
- 6.4.1** Buildings of any height with the wall assembly constructed in accordance with Intertek Design Number CSG-CWP 30-03R1 and an approved Thermal Barrier where required in accordance with Section 6.3.
- 6.5** Formawall Dimension Series panels are manufactured under a quality control program with inspections by Intertek Testing Services NA, Inc.





7.0 SUPPORTING EVIDENCE

7.1 Data in accordance with the ICC-ES Acceptance Criteria AC04 approved June 2019 editorially revised December 2020.

7.2 Reports of tests in accordance with ASTM E84, NFPA 285 and NFPA 268.

7.3 FM Approval including FM 4880.

7.4 Reports of tests in accordance ASTM E331 and IBC Section 1402.2.

7.5 Intertek Listing Report "CENTRIA - Formawall PIR Core", on the [Intertek Directory of Building Products](https://bpdirectory.intertek.com).

8.0 IDENTIFICATION

The Formawall Dimension Series panels are identified with the manufacturer's name (Centria), address and telephone number, the product name, the Intertek Mark as shown below, and the Code Compliance Research Report number (CCRR-0276).



9.0 OTHER CODES

This section is not applicable.

10.0 CODE COMPLIANCE RESEARCH REPORT USE

10.1 Approval of building products and/or materials can only be granted by a building official having legal authority in the specific jurisdiction where approval is sought.

10.2 Code Compliance Research Reports shall not be used in any manner that implies an endorsement of the product by Intertek.

10.3 Reference to the <https://bpdirectory.intertek.com> is recommended to ascertain the current version and status of this report.

This Code Compliance Research Report ("Report") is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this Report. Only the Client is authorized to permit copying or distribution of this Report and then only in its entirety, and the Client shall not use the Report in a misleading manner. Client further agrees and understands that reliance upon the Report is limited to the representations made therein. The Report is not an endorsement or recommendation for use of the subject and/or product described herein. This Report is not the Intertek Listing Report covering the subject product and utilized for Intertek Certification and this Report does not represent authorization for the use of any Intertek certification marks. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek.



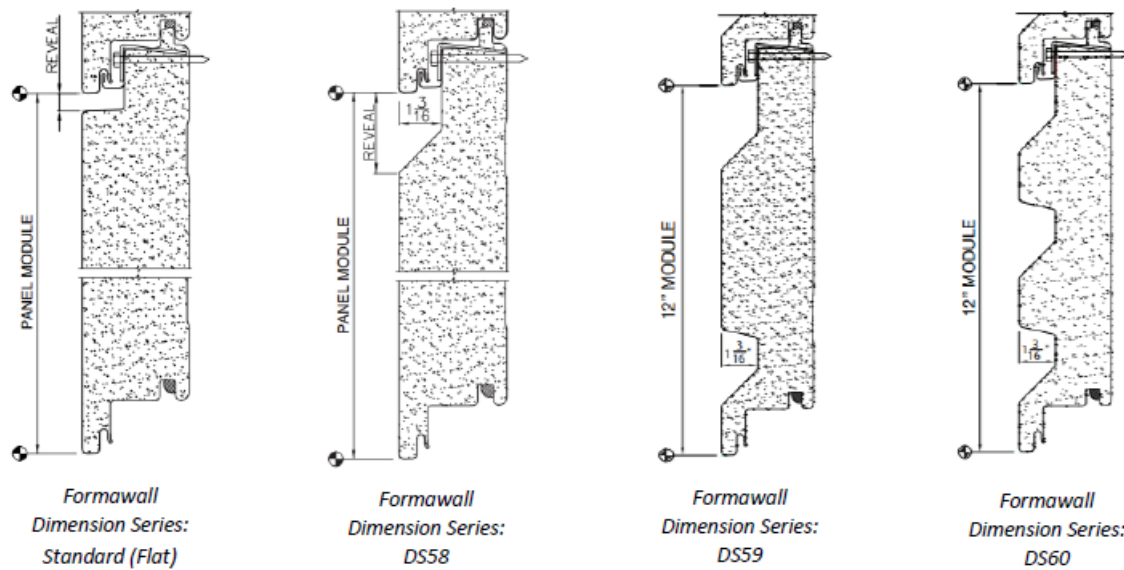


Figure 1 – Formawall Series/Profiles

TABLE 1 - PROPERTIES EVALUATED

PROPERTY	2021 IBC SECTION	2018 IBC SECTION
Structural (Wind Resistance)	1609	1609
Weather Resistance	1402.2	1402.2
Surface Burning	2603.3 and 2603.5	2603.3 and 2603.5
Use on exterior walls of Types I, II, III and IV construction	2603.5	2603.5
Thermal Barrier requirements	2603.4 and 2603.9	2603.4 and 2603.9

**TABLES 2 – 9: Allowable Design Values**

1. Allowable design loads were calculated using Allowable Strength Design (ASD) for the following limit states: panel bending strength (failure of face or liner skin), panel core shear strength (failure of foam core), disengagement (at panel end connections or intermediate connections), and specified deflection limit as required (no greater than $L/180$).
2. Safety factor for panel shear strength is 3.0
3. Safety factors for bending moment and panel connections in accordance with AISI S100.
4. Values for panel shear and bending strength are unit values per 12"-unit width of panel.
5. Core shear stiffness values (AG) are effective values derived from full-profile panel test and shall not be taken as a core material property. They are limited to use in calculating the deflection for the specific panel configuration to which they are assigned.
6. Allowable design values for panels with modules not shown here may be obtained by linear interpolation, bounded by values for panels of the same thickness, face/liner gauge, and reveal.
7. Allowable design values address panel properties only. Fastener values for anchorage to supporting structure must be determined separately based on panel, span, and fastening substrate.

Table 2 – Formawall Dimension Series (Standard and DS58)
40" Module Panel - 22 Gauge Face/26 Gauge Liner

Reveal (in)	Panel Thickness (in)	Panel Stiffness		Moment (ft-lb/ft)	Shear (lb/ft)	End Clip Reaction (lb)	Intermediate Clip Reaction (lb)
		EI (lb-in ² /ft)	AG (lb/ft)				
6	2	1.35E+06	1.51E+04	1,960	390	360	1,100
	2.5	2.16E+06	1.69E+04	2,250	300	350	1,040
	3-T	3.17E+06	1.99E+04	3,570	400	340	970
5	2	1.39E+06	1.53E+04	1,990	400	360	1,100
	2.5	2.21E+06	1.72E+04	2,280	310	370	1,060
	3-T	3.23E+06	2.02E+04	3,600	400	350	1,020
4	2	1.42E+06	1.56E+04	2,030	400	360	1,090
	2.5	2.25E+06	1.74E+04	2,310	310	390	1,080
	3-T	3.29E+06	2.04E+04	3,640	410	360	1,070
3	2	1.45E+06	1.58E+04	2,060	410	360	1,090
	2.5	2.30E+06	1.76E+04	2,340	310	410	1,100
	3-T	3.34E+06	2.06E+04	3,680	410	370	1,110
2	2	1.48E+06	1.61E+04	2,090	420	360	1,080
	2.5	2.34E+06	1.78E+04	2,370	320	430	1,130
	3-T	3.40E+06	2.08E+04	3,720	420	380	1,160
1	2	1.52E+06	1.63E+04	2,130	420	360	1,070
	2.5	2.39E+06	1.81E+04	2,400	320	460	1,150
	3-T	3.45E+06	2.10E+04	3,760	420	390	1,210
0.5 or less	2	1.53E+06	1.64E+04	2,140	430	370	1,070
	2.5	2.41E+06	1.82E+04	2,410	320	470	1,160
	3-T	3.48E+06	2.11E+04	3,770	420	390	1,230



Table 3 – Formawall Dimension Series (Standard and DS58)
40" Module Panel - 22 Gauge Face/22 Gauge Liner

Reveal (in)	Panel Thickness (in)	Panel Stiffness		Moment (ft-lb/ft)	Shear (lb/ft)	End Clip Reaction (lb)	Intermediate Clip Reaction (lb)
		EI (lb-in ² /ft)	AG (lb/ft)				
6	2	1.79E+06	1.58E+04	3,490	360	380	970
	2.5	2.88E+06	1.76E+04	4,270	380	360	1,010
	3-T	4.22E+06	2.08E+04	5,050	400	350	1,060
5	2	1.84E+06	1.60E+04	3,540	370	390	990
	2.5	2.93E+06	1.79E+04	3,780	380	380	1,050
	3-T	4.30E+06	2.10E+04	5,110	400	360	1,100
4	2	1.88E+06	1.63E+04	3,600	380	390	1,020
	2.5	2.99E+06	1.81E+04	3,830	390	400	1,080
	3-T	4.37E+06	2.13E+04	5,160	410	370	1,140
3	2	1.92E+06	1.65E+04	3,660	380	400	1,050
	2.5	3.05E+06	1.83E+04	4,440	390	420	1,120
	3-T	4.44E+06	2.15E+04	5,210	410	380	1,190
2	2	1.97E+06	1.68E+04	3,720	390	410	1,080
	2.5	3.11E+06	1.86E+04	3,930	400	440	1,160
	3-T	4.52E+06	2.17E+04	5,270	410	390	1,240
1	2	2.01E+06	1.71E+04	3,780	400	410	1,110
	2.5	3.17E+06	1.88E+04	3,980	400	460	1,200
	3-T	4.59E+06	2.19E+04	5,320	420	400	1,300
0.5 or less	2	2.03E+06	1.72E+04	3,810	400	420	1,120
	2.5	3.20E+06	1.89E+04	4,580	410	470	1,230
	3-T	4.63E+06	2.20E+04	5,350	420	400	1,320



Table 4 – Formawall Dimension Series (Standard and DS58)
14" Module Panel - 22 Gauge Face/26 Gauge Liner

Reveal (in)	Panel Thickness (in)	Panel Stiffness		Moment (ft-lb/ft)	Shear (lb/ft)	End Clip Reaction (lb)	Intermediate Clip Reaction (lb)
		EI (lb-in ² /ft)	AG (lb/ft)				
6	2	9.90E+05	1.22E+04	1,600	320	280	650
	2.5	1.67E+06	1.45E+04	1,920	260	350	810
	3-T	2.55E+06	1.76E+04	3,140	350	440	1,010
5	2	1.08E+06	1.30E+04	1,690	330	290	680
	2.5	1.80E+06	1.51E+04	2,010	270	360	830
	3-T	2.71E+06	1.82E+04	3,250	360	430	1,020
4	2	1.18E+06	1.37E+04	1,780	350	310	710
	2.5	1.92E+06	1.57E+04	2,090	280	360	850
	3-T	2.87E+06	1.88E+04	3,360	380	430	1,020
3	2	1.27E+06	1.44E+04	1,880	370	320	740
	2.5	2.05E+06	1.64E+04	2,180	290	370	870
	3-T	3.03E+06	1.94E+04	3,470	390	420	1,020
2	2	1.36E+06	1.51E+04	1,970	390	340	770
	2.5	2.18E+06	1.70E+04	2,260	300	380	890
	3-T	3.19E+06	2.00E+04	3,580	400	420	1,020
1	2	1.45E+06	1.58E+04	2,060	410	360	810
	2.5	2.30E+06	1.76E+04	2,350	320	390	910
	3-T	3.35E+06	2.06E+04	3,680	410	420	1,020
0.5 or less	2	1.50E+06	1.62E+04	2,110	420	370	830
	2.5	2.37E+06	1.80E+04	2,390	320	390	920
	3-T	3.43E+06	2.09E+04	3,740	420	410	1,030



Table 5 – Formawall Dimension Series (Standard and DS58)
14" Module Panel - 22 Gauge Face/22 Gauge Liner

Reveal (in)	Panel Thickness (in)	Panel Stiffness		Moment (ft-lb/ft)	Shear (lb/ft)	End Clip Reaction (lb)	Intermediate Clip Reaction (lb)
		EI (lb-in ² /ft)	AG (lb/ft)				
6	2	1.31E+06	1.28E+04	2,830	290	210	860
	2.5	2.22E+06	1.51E+04	3,530	320	280	930
	3-T	3.39E+06	1.83E+04	4,450	350	350	1,000
5	2	1.44E+06	1.36E+04	3,000	310	210	890
	2.5	2.39E+06	1.57E+04	3,220	340	270	950
	3-T	3.60E+06	1.90E+04	4,600	360	340	1,020
4	2	1.56E+06	1.43E+04	3,170	330	210	920
	2.5	2.56E+06	1.64E+04	3,360	350	260	980
	3-T	3.82E+06	1.96E+04	4,760	370	330	1,030
3	2	1.68E+06	1.51E+04	3,330	350	210	940
	2.5	2.72E+06	1.70E+04	4,000	370	260	1,000
	3-T	4.03E+06	2.02E+04	4,910	390	310	1,050
2	2	1.81E+06	1.58E+04	3,500	370	210	970
	2.5	2.89E+06	1.77E+04	3,630	380	250	1,020
	3-T	4.24E+06	2.09E+04	5,070	400	300	1,070
1	2	1.93E+06	1.66E+04	3,670	380	210	1,000
	2.5	3.06E+06	1.84E+04	3,760	390	250	1,050
	3-T	4.46E+06	2.15E+04	5,220	410	290	1,090
0.5 or less	2	1.99E+06	1.70E+04	3,750	390	210	1,020
	2.5	3.14E+06	1.87E+04	4,390	400	240	1,060
	3-T	4.56E+06	2.18E+04	5,300	420	290	1,100



Table 6 – Formawall Dimension Series (Standard and DS58)
10" Module Panel - 22 Gauge Face/26 Gauge Liner

Reveal (in)	Panel Thickness (in)	Panel Stiffness		Moment (ft-lb/ft)	Shear (lb/ft)	End Clip Reaction (lb)	Intermediate Clip Reaction (lb)
		EI (lb-in ² /ft)	AG (lb/ft)				
2	2	1.29E+06	1.45E+04	1,900	380	310	900
	2.5	2.08E+06	1.65E+04	2,190	290	330	970
	3-T	3.06E+06	1.95E+04	3,490	390	350	1,060
1	2	1.42E+06	1.56E+04	2,030	400	310	900
	2.5	2.25E+06	1.74E+04	2,310	310	330	970
	3-T	3.29E+06	2.04E+04	3,640	410	350	1,060
0.5 or less	2	1.48E+06	1.61E+04	2,090	420	310	900
	2.5	2.34E+06	1.78E+04	2,370	320	330	970
	3-T	3.40E+06	2.08E+04	3,720	420	350	1,060

Table 7 – Formawall Dimension Series (Standard and DS58)
10" Module Panel - 22 Gauge Face/22 Gauge Liner

Reveal (in)	Panel Thickness (in)	Panel Stiffness		Moment (ft-lb/ft)	Shear (lb/ft)	End Clip Reaction (lb)	Intermediate Clip Reaction (lb)
		EI (lb-in ² /ft)	AG (lb/ft)				
2	2	1.71E+06	1.52E+04	3,370	350	400	1,040
	2.5	2.76E+06	1.72E+04	4,030	370	550	1,040
	3-T	4.07E+06	2.04E+04	4,940	390	710	1,040
1	2	1.88E+06	1.63E+04	3,600	380	400	1,040
	2.5	2.99E+06	1.81E+04	3,710	390	550	1,040
	3-T	4.37E+06	2.13E+04	5,160	410	710	1,040
0.5 or less	2	1.97E+06	1.68E+04	3,720	390	400	1,040
	2.5	3.11E+06	1.86E+04	4,350	400	550	1,040
	3-T	4.52E+06	2.17E+04	5,270	410	710	1,040



**Table 8 - Formawall DS60 Allowable Design Values
12" Module Panel - 22 Gauge Face/26 Gauge Liner**

Reveal (in)	Panel Thickness (in)	Panel Stiffness		Moment (ft-lb/ft)	Shear (lb/ft)	End Clip Reaction (lb)	Intermediate Clip Reaction (lb)
		EI (lb-in ² /ft)	AG (lb/ft)				
Std.	2	1.30E+06	3.26E+04	2,990	460	350	940
	2.5	2.12E+06	3.03E+04	3,620	630	390	1,100
	3-T	3.21E+06	1.99E+04	5,050	1,030	430	1,250

**Table 9 - Formawall DS60 Allowable Design Values
12" Module Panel - 22 Gauge Face/22 Gauge Liner**

Reveal (in)	Panel Thickness (in)	Panel Stiffness		Moment (ft-lb/ft)	Shear (lb/ft)	End Clip Reaction (lb)	Intermediate Clip Reaction (lb)
		EI (lb-in ² /ft)	AG (lb/ft)				
Std.	2	1.66E+06	2.58E+04	4,730	580	280	1,080
	2.5	2.80E+06	2.67E+04	5,910	640	310	1,180
	3-T	4.31E+06	2.27E+04	7,230	810	360	1,280