

ComCheck and Metal Building Systems

KEY TAKE AWAY:

- **1**. BASIC INTRODUCTION TO COMCHECK
- 2. UNDERSTANDING YOUR ROLE AND RESPONSIBILITY WITH A COMCHECK REVIEW.
- 3. DISCUSS HOW TO THE "OTHER ASSEMBLY" (TRADE-OFF METHOD) MAY BENEFIT YOU.

Agenda

- □ A QUICK INTRODUCTION INTO COMCHECK
- □ WHAT STATES REQUIRE OR ALLOW IT
- □ WHO IS RESPONSIBLE TO COMPETE IT
- DEMO SHOW HOW COMCHECK CAN EFFECT THE DESIGN AND THE COST OF THE BUILDING DESIGN
- OPEN FORUM

What is ComCheck?

"COMcheck is a program developed and maintained by the US Department of Energy to <u>demonstrate compliance with commercial and high-rise residential building energy codes</u>."

The COM*check* software product group makes it <u>easy for architects, builders,</u> <u>designers, and contractors to determine whether new commercial or high-rise</u> <u>residential buildings, additions, and alterations meet the requirements of the IECC and</u> <u>ASHRAE Standard 90.1</u>, as well as several state-specific codes. COM*check* also simplifies compliance for building officials, plan checkers, and inspectors by allowing them to quickly determine if a building project meets the code.

States that accept or require ComCheck

- Blue: Most states use or allow ComCheck
- Green: Maybe....County or Jurisdiction will decide.
- Uhite: Not used.



Who is responsible?

Who should be completing the ComCheck input? Well it depends - Who is paying the bill and what is their motivation?

□ The Architect or the engineer?

Motivation: Get it to pass, they don't pay the bill.

- Very little experience with Metal Buildings.
- The General Contactor / Design Build Contractor?
- Material Supplier's?
 - Building manufacturers?
 - Insulation suppliers?



What does the DOE say about how should complete COMcheck reviews?

From the DOE Website: "An overall issue with documentation is who is responsible to complete it. It is possible for one individual to provide the documentation if they have all of the required information, and this is fairly common for residential projects. It is more common in commercial construction for the individual specialties to provide documentation for their required sections: building envelope, lighting, mechanical, and SWH."

Should there be a disclaimer?

- Clearly define any assumptions. This ComCheck review is based on our products, and the base assumptions made. It is responsibility of the project architect or engineer to review this review, and the responsibility of the general contractor to assure that the specified materials are being installed as required.
- Bay recommends that the Com-check report is supplied by the architect or engineer for the project.
- Some Sign some don't sign the ComCheck review.



Where to find COMcheck https://www.energycodes.gov/comcheck

There are two version of COMcheck:

COMcheck Desktop can be downloaded and installed directly to your computer. Desktop can complete IECC compliance without being connected to the internet.

□ COMcheck-Web[™] is accessible directly from the website without having to download and install.

Regardless of which you use, make sure that you are working with the latest version.



	nergy Efficiency & Renewable Energy	EERE H	ome Programs & Offices C	onsumer Information	
Building	Energy Cod	es Program	Buildir Searc	ıg Energy Codes h Help ⊩	SEARCH
HOME N	IEWS EVENTS	ABOUT			
DOE » EERE » BTO »	BECP » Compliance » Softwa	re & Web Tools	Site Map	Printable Version	C SHARE
DEVELOPMENT Adoption	COMcheck				
COMPLIANCE	Commercial Co	mpliance Using COMcheck ¹	ίΜ.		_
Basics	The COMcheck softwa	re product group makes it easy for archite	cts, builders, designers, and contractors to de	etermine whether	

new commercial or high-rise residential buildings, additions, and alterations meet the requirements of the IECC and ASHRAE RESIDENTIAL FIELD Standard 90.1, as well as several state-specific codes. COMcheck also simplifies compliance for building officials, plan checkers, and inspectors by allowing them to quickly determine if a building project meets the code.

SOFTWARE & WEB COMcheck Desktop can be downloaded and installed directly to your desktop, while COMcheck-WebTM is accessible directly from the website TOOLS without having to download and install.

RESOURCE CENTER

STUDY

See if your state or county can use COMcheck to show compliance.

COMcheck[™] for Windows[®]

Runs on Windows 7/8/10 in either single, multi-user, or network environments. Note that the Mac version of COMcheck has been discontinued. Mac users are advised to use COMcheck-Web.

Download COMcheck

Download COMcheck Now!

Version 4.0.5 (Build Version: 4.0.5.3)

Version 4.0.5 includes support for the 2016 New York City Energy Conservation Code. It discontinues support for the 2014 New York Energy Conservation Construction Code.

Where to go for help with ComCheck

- https://www.energycodes.gov/resource-center
- https://www.lamtec.com/energy-code-navigator/
- □ Your metal building insulation supplier
- □ Your metal building supplier

Tools for COMcheck Know your assemblies U-Values

Understanding what the code requires is just the first step, the bigger step is understand what assemblies you can use to meet the requirements.

The following assemblies are non-proprietary, industry accepted values with published U-values.



FOAMULAR® 150 Extruded Polystyrene (XPS) Rigid Foam Insulation

Product Data Sheet

 Provides a weather resistant barrier (when joints are sealed) to enhance the building resistance to air and moisture penetration.

Technical Information

This product is combustible. A protective barrier or thermal barrier is required as specified in the appropriate building code. For additional information, consult MSDS or contact Owens Corning World Headquarters at I-800-GET-PINK[®].

All construction should be evaluated for the necessity to provide vapor retarders. See current ASHRAE Handbook of Fundamentals.

Property	Test Method ²	Value
Thermal Resistance', R-Value (180 day) minimum.		
hr•ft2•°F/Btu (RSI, °C•m2/W)		
@ 75°F (24°C) mean temperature	ASTM C518	
I* Thickness		5.0 (0.88)
1½* Thickness		7.5 (1.32
2" Thickness		10 (1.76)
2½* Thickness		12.5 (2.20
3" Thickness		15 (2.64)
@ 40°F (4.4°C) mean temperature		1101010-000
I* Thickness		5.4 (0.95)
11/2" Thickness		8.1 (1.43)
2" Thickness		10.8 (1.90
2½* Thickness		13.5 (2.38
3" Thickness		16.2 (2.85
Long Term Thermal Resistance, LTTR-Value1 minimum		
hr•ft2•°F/Btu (RSI, °C•m3/W)		
@ 75°F (24°C) mean temperature	CAN/ULC 5770-03	
I" Thickness		5.0 (0.88)
1½* Thickness		7.8 (1.37)
2" Thickness		10.6 (1.87
21/3" Thickness		13.4 (2.36
3" Thickness		16.2 (2.85
Compressive Strength*, minimum psi (kPa)	ASTM DI621	15 (103)
Flexural Strength ⁴ , minimum psi (kPa)	ASTM C203	60 (414)
Water Absorption ⁶ , maximum % by volume	ASTM C272	0.10

		Ba Standard In		ulation stems Assemblies	5	
ROOF ASSE	MBLIES (Standi	ng Seam)	[[]		90.1-2007 & 2010(except as noted)	90.1-2013(except as noted)
DESCRIPTION	MATERIAL	INSTALLATION	8" Purlins	10" Purlins	U-FACTOR	U-FACTOR
Single Laver MBI	R-10	Over the purlin	Yes	Yes	0.097	0.115
Single Laver MBI	R-11	Over the purlin	Yes	Yes	0.092	0.107
Single Laver MBI	R-13	Over the purlin	Yes	Yes	0.083	0.101
Single Laver MBI	R-16	Over the purlin	Yes	Yes	0.072	0.096
Single Laver MBI	R-19	Over the purlin	Yes	Yes	0.065	0.082
Double Laver MBI	R-13+R-13	Sag 'N Bag	Yes	Yes	0.055	0.075
Double Layer MBI	R-13+R-19	Sag 'N Bag	Yes	Yes	0.049	0.068
Liner System	R-11+R-19	Between & over purlins	Yes	No	0.035	0.037
Liner System	R-11+R-25	Between & over purlins	Yes	Yes	0.031	0.031
Liner System	R-11+R-30	Between & over purlins	Yes	Yes	0.029	0.029
Liner System	R-11+R- 11+R-25	Between & over purlins	No	Yes	0.026	0.026
Long Tab Banded / FC System	R-19+R-11	values are taken from Stando ASHRAE 2010 require Banded between & over purlins	ard 90.1-2010 Ap s a minimum R-3 Yes	pendix A, Table A2.3 (i .5 thermal spacer block No	Metal Building Roofs). k 0.037*	Same
Long Tab Banded / FC System	R-25+R-11	Banded between & over purlins	Yes	Yes	0.035**	Same
Long Tab Banded / FC System	R-25+R-19	Banded between & over purlins	Yes	Yes	0.029* (10" Purlin)	Same
The values are taken from Lamb	ec's ARCHITECT Analysis Modeling	S GUIDE: Filled Cavity System was conducted by Engrana LI Machine Installed	ns for Metal Buik LC. ASHRAE 201	lings. "Testing was cor 0 requires a minimum	ducted in accordance with ASTM C R-3.5 thermal spacer block	C1363, **Finite Element
100or300						
ELAMINATOR Series 100	R-10+R-10	Machine Installed			0.059	Same



Standard Insulation Assemblies

ROOF ASSEME	BLIES (Standi	ng Seam)			90.1-2007 & 2010(except as noted)	90.1-2013(except as noted)
ESCRIPTION MATERIAL INSTALLATION			8" Purlins	10" Purlins	U-FACTOR	U-FACTOR
Single Layer MBI	R-10	Over the purlin	Yes	Yes	0.097	0.115
Single Layer MBI	R-11	Over the purlin	Yes	Yes	0.092	0.107
Single Layer MBI	R-13	Over the purlin	Yes	Yes	0.083	0.101
Single Layer MBI	R-16	Over the purlin	Yes	Yes	0.072	0.096
Single Layer MBI	R-19	Over the purlin	Yes	Yes	0.065	0.082
Double Layer MBI	R-13+R-13	Sag 'N Bag	Yes	Yes	0.055	0.075
Double Layer MBI	R-13+R-19	Sag 'N Bag	Yes	Yes	0.049	0.068
Liner System	R-11+R-19	Between & over purlins	Yes	No	0.035	<mark>0.037</mark>
Liner System	R-11+R-25	Between & over purlins	Yes	Yes	0.031	0.031
Liner System	R-11+R-30	Between & over purlins	Yes	Yes	0.029	0.029
Liner System	R-11+R-	Between & over purlins	No	Yes	0.026	0.026
	11+R-25					
	The tabulated	values are taken from Standa ASHRAE 2010 require	ard 90.1-2010 Ap s a minimum R-3	pendix A, Table A2.3 (I 3.5 thermal spacer block	Metal Building Roofs). k	
Long Tab Banded / FC	R-19+R-11	Banded between &	Yes	No	0.037*	Same
System		over purlins				
Long Tab Banded / FC	R-25+R-11	Banded between &	Yes	Yes	0.035**	Same
System		over purlins	ļļ			
Long Tab Banded / FC	R-25+R-19	Banded between &	Yes	Yes	0.029* (10" Purlin)	Same
System	<u> </u>	over purlins	<u> </u>		<u> </u>	
The values are taken from Lamtec And	's ARCHITECT' alysis Modeling	S GUIDE: Filled Cavity Syster was conducted by Engrana LL	ns for Metal Build LC. ASHRAE 201	dings. *Testing was con 10 requires a minimum	ducted in accordance with ASTM C R-3.5 thermal spacer block	01363, **Finite Element
ELAMINATOR Series	R-19	Machine Installed	ľ		0.059	Same
	D 401D 40	N An als in a land all a d			0.050	Como
ELAWINATOR Series 100	K-10+K-10	Machine Installed			0.059	Same



ELAMINATOR Series 300	R-10+R-10	Machine Installed			0.057	Same
ELAMINATOR Series 100	R-13+R-13	Machine Installed	1		0.052	Same
ELAMINATOR Series 300	R-13+R-13	Machine Installed			0.050	Same
ELAMINATOR Series 100	R-11+R-19	Machine Installed	Ī		0.048	Same
ELAMINATOR Series 300	R-11+R-19	Machine Installed			0.047	Same
ELAMINATOR Series 100	R-13+R-19	Machine Installed			0.047	Same
ELAMINATOR Series 300	R-13+R-19	Machine Installed	1		0.046	Same
ELAMINATOR Series	R-16+R-19	Machine Installed			0.045	Same
100or300						
ELAMINATOR Series 100or300	R-19+R-19	Machine Installed			0.044	Same
ROOF ASSE	MBLIES (Thru-F	Using Certified Metal Buildin astened)	ng Insulation & 1	"x3" FAOMULAR therma	90.1-2007 & 2010(except	90.1-2013(except
		-			as noted)	as noted)
DESCRIPTION	MATERIAL	INSTALLATION	8" Purlin	10" Purlin	U-FACTOR	U-FACTOR
Single Layer	R-10	Over the purlin	Yes	Yes	0.153	0.184
	R-11	Over the purlin	Yes	Yes	0.139	0.182
	R-13	Over the purlin	Yes	Yes	0.130	0.174
	R-16	Over the purlin	Yes	Yes	0.106	0.157
	R-19	Over the purlin	Yes	Vee	0.000	
Long Tab Banded / FC				res	0.098	0.151
System	R-11 + R- 19	Banded between and above the purlin	Yes	No	No data available	0.151 No data available
System Long Tab Banded / FC System	R-11 + R- 19 R-11 + R25	Banded between and above the purlin Banded between and above the purlin	Yes	No Yes	No data available No data available	0.151 No data available No data available
System Long Tab Banded / FC System Liner System	R-11 + R- 19 R-11 + R25 R-11+R-19	Banded between and above the purlin Banded between and above the purlin Above and between purlins	Yes Yes Yes	Yes No Yes	No data available No data available 0.044	0.151 No data available No data available 0.044
System Long Tab Banded / FC System Liner System Liner System	R-11 + R- 19 R-11 + R25 R-11+R-19 R-11 + R- 25	Banded between and above the purlin Banded between and above the purlin Above and between purlins Above and between purlins	Yes Yes Yes Yes Yes	No Yes No Yes	0.098 No data available No data available 0.044	0.151 No data available No data available 0.044

Let's get started:

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Project Envelope Interior Lighting Exterior Lighting Mechanical	Requirements	
Location	Building Envelope Area Types Interior Lighting Method and Areas Exterior Lighting Areas	
State Ohio City Kent Climate zone: 5a	Add Delete Duplicate Building Type Area Description Area W/ft2 Space Conditioning	
Project Type	1 Click to select building type. Image: Click to select building type.	
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Project Details (optional)		
Edit Project Details This information will appear on the compliance certificate.		
Title/Site/Permit		
<u>Owner/Agent</u>		
Designer/Contractor		
Notes		

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			14

Sample Building

Geometry: 100' x 200' x 20'

Slope: ½:12

Roof: Standing Seam

Walls: 4 masonry (3 walls, 8" medium weight, insulated cores), R-panel above

Door: 4 – 3070 (Expi-Door 700, U-value .0498)

Overhead Doors: 4 – 16' x 16' (The Overhead Door Company 426 series 2" Thermacore U-.057)

📸 Pennsylvania Building			
$\leftrightarrow \rightarrow \mathbf{C}$ Secure	*		
Building E	Sinergy Codes Pi	rogram	Building Energy Codes
DOE » EERE » BTO »BEC	P » Adoption » Status of State Energy Co	ode Adoption	Site Map 🛱 Printable Version 🖸 SHARE
DEVELOPMENT	Pennsylvania		Popular Links
Adoption Process State Technical Assistance	Commercial Residen	tial Code Change	Status of State Energy Codes
STATUS OF STATE ENERGY CODE	Current Code:	2009 IECC	State Related Resources
ADOPTION COMPLIANCE	Amendments / Additional State	Pennsylvania's current code is the 2009 IECC with reference to ASHRAE	PA Uniform Construction Code
RESOURCE CENTER	Code Information:	90.1-2007.	Program and Incentives
			Financial Incentives
			State Contacts
	Approved Compliance Tools:	Can use COMcheck	Primary Contact for State Adoption Joseph Marchioni
	State Specific Research:	Impacts of ASHRAE 90.1-2007 for Commercial Buildings in the State of Pennsylvania (BECP Report, Sept. 2009)	Bureau of Occupational & Industrial Safety Department of Labor and Industry UCC Administrator 651 Boas Street Harrisburg, Pennsylvania 17121 jmarchioni@pa.gov (717) 346-2729

📸 New York Building Ene	er ×	_			
$\rightarrow \mathbf{C}$ Secure	https://www.energycodes.gov/ac	☆			
Apps 🥠 HP Connected Building E HOME NEW	Energy Codes Pi vs events abo	ogram	Building Energy Codes SEARCH	-	
DOE » EERE » BTO »BEC	P » Adoption » Status of State Energy Co New York	de Adoption	Site Map Printable Version SHARE Popular Links		
ADOPTION PROCESS STATE TECHNICAL ASSISTANCE	Current News: On March 9, 2016, the State Fire F major updates to the State Energy incorporates the 2015 IECC and A	Prevention and Building Code Council completed Conservation Construction Code. The Energy Code SHRAE 90.1-2013 by reference. The newly adopted	Status of State Energy Codes)	
STATUS OF STATE ENERGY CODE ADOPTION COMPLIANCE	energy code will became formally e transition period. NYC adopted a City Specific Energ in COMcheck.	offective on October 3, 2016. There will be no	State Related Resources		
RESOURCE CENTER	Commercial Resident	tial Code Change	NY State Energy Research and Development Authority IP Northeast Energy Efficiency Partner IP Program and Incentives	-	
	Current Code:	2015 IECC with Amendments NY Amendments to Commercial Provisions	Financial Incentives ₽ State Contacts	-	
	Approved Compliance Tools:	Can use COMcheck	Primary Contact for State Adoption Joseph Hill, RA Department of State Division of Building Standards and Codes		
	Approvimato	Equivalent to 2015 JECC	Assistant Director for Code Administration		

🏠 Louisiana Building Energ	×		
\rightarrow C \triangleq Secure	https://www.energycodes.gov/a	☆ 🛸	
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DOE » EERE » BTO »BECP	» <u>Adoption</u> » <u>Status of State Energy Co</u>	ode Adoption	Site Map 🛱 Printable Version 🚺 SHARE
	Louisiana		Popular Links
Adoption Process			Status of State Energy Codes
STATE TECHNICAL Assistance	Commercial Residen	tial Code Change	Select a state
STATUS OF STATE	Current Code:	ASHRAE Standard 90.1-2007	State Related Resources
ENERGY CODE ADOPTION COMPLIANCE RESOURCE CENTER	Amendments / Additional State Code Information:	N/A	Louisiana State Uniform Construction Code Louisiana Department of Natural Resources Southeast Energy Efficiency Alliance Louisiana State Legislature
	Approved Compliance Tools:	Can use COMcheck	Program and Incentives
	State Specific	Impacts of ASHRAE 90 1-2007 for	Financial Incentives
	Research:	Commercial Buildings in the State of Louisiana (BECP Report, Sept. 2009)	State Contacts Primary Contact for State Adoption Billy Williamson
	Approximate Energy Efficiency:	Equivalent to ASHRAE 90.1-2007	Department of Natural Resources Technology Assessment Division/State Energy Office P.O. Box 94396

Live ComCheck Demo

Re-cap:

We various "what-if" solutions for the 100' x 200' sample building. In the state of New York.

Re-cap

1. COMcheck is not that scary, but in many cases the COMcheck review determines what insulation system are.

2. Know your U-values, or have someone you trust that can help.

3. The "other – U factor" option may have cost, energy efficiency, and erectablity advantages over the standard assemblies.