



Thermal Blocks and Metal Buildings

What every Building Official needs to know

By: Craig Oberg

Most of us understand that the purpose of a Thermal Block is to create a thermal barrier between the outer shell or surface of a building and the inner frame system. That is easy to understand. What may be a little more difficult to understand is what happens structurally when a space is created between the outer shell and the inner frame system, especially on the roof of a metal building.

Thermal blocks have been used for some time on Standing Seam Type Roof Systems. In that case, consideration has long been given to the design adjustments for use with "Clips" that are used to support and attach the Roof System. In that case, thermal blocks are simply placed between the clips and under the panel having no bearing or effect in the design of the roof purlin system.

New Energy Compliance rules now require the use of Thermal Blocks in more applications, including "Screw Down" type roof and wall systems. That presents a whole new dimension to what is required to maintain "Structural Soundness, Water Tightness and overall integrity of the Metal Building. At Sealed "N" Safe Products LLC, we have spent extensive time and resources to gain a complete understanding of those issues. In the best interest of the industry, we wish to pass that information along to anyone interested or involved.

Number 1, when placing a 1" Thermal Block between the purlin and the roof sheet, the dynamics of the purlin design are altered significantly. Tests conducted indicate the resistance to rotation of the purlin is decreased as much as 40%. To disregard that in the design of the roof purlins, as many contractors currently are, is a disaster that is going to happen. The result, roof failure is a very possible scenario not only with gravity loads but also for uplift from wind loads and the Building Manufacturer probably doesn't even know what is happening. Every Building Official needs to know and control this situation. You need to understand the problem

Number 2, Fastener rotation and fatigue will become an issue if it is not taken into account. Be aware the AISI Standard S100-2007 Section D6.1.1 requires testing when using a "Stand Off" type fastener. Too use a "Stand Off" type fastener through a Styrofoam foam block **will not meet** the requirements of that Code. Testing must be

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done to conform to prove the performance of the application. Simply placing a 1” Styrofoam foam block between the purlin and the roof sheet and fastening down with a stand off screw does not meet the applicable criteria. What will actually happen once installed, normal movement of the building along with the unrestrained rotation of the purlin will force the fastener to rotate side to side in all directions, creating fatigue and eventually breaking the fastener off at the purlin surface. Along with the movement, the foam will compress and loosen the fastener gasket. I have seen this happen within 1 year of installation. There is no easy fix at that point. Can you even imagine the owner’s nightmare when fasteners start breaking? You will be dragged into the aftermath if you allow that happen.

Number 3, resistance to compression of the Thermal Block itself is critical in maintaining a watertight seal of the fastener gasket. Our fastener suppliers tell us the required pressure to maintain the gasket seal is 50 psi. Typical polystyrene foam will not resist that force. Eventually, as the material compresses, the seal of the gasket will be lost and the roof will leak as if it has been shot full of holes.

My message to all Building Officials is simple. Simply placing a Styrofoam foam block between the purlin and the roof sheet and screwing it down violates all the rules and soon will prove to be the disaster of your lifetime. Code requires that any new applications must be subject to the appropriate testing procedures to insure its performance. Even if tested, this application will not pass the test.

To learn more, go on our website at sealednsafe.com. I suggest you start by reading the Introductory Letter. It contains a short version of test results conducted to date. Note that an accredited 3rd party Testing Facility as is required by applicable Codes has done all testing. Hopefully, this will be of help to all of you in the Inspection Sector of the Construction Industry.

Sealed “N” Safe has developed a tested and proven product to meet the needs of the industry and solves the problems mentioned above. That product is now available across the United States and Canada. There is no need to compromise the safety of Metal Buildings by using inappropriate Thermal Blocks. Please let us know if we can be of further help.