

MINNESOTA HIGH PRESSURE PIPING SYSTEMS BOARD

ORDER DENYING VARIANCE REQUEST

Pursuant to Minn. Stat. §§ 14.055 and 14.056, Evapco, Inc. (“Evapco”), by and through company representative Jake Dennison, submitted a Petition for Variance dated April 25, 2016 (“Petition”), to the Minnesota High Pressure Piping Systems Board (“Board”)(*see* Attachment A). A hearing on the Petition for Variance was conducted by the Board at a special meeting held on June 08, 2016. Representatives for the Petitioner were present at the meeting by telephone and allowed to participate, including Mr. Dennison and Mr. Don Hamilton.

The petition requested a variance from Minnesota Rule Part 5230.5005, subpart 3 (2009), which adopted as modified Section 10.2.2.1 of the American National Standards Institute and the International Institute of Ammonia Refrigeration’s 2008 revision of the standards for Equipment, Design, and Installation of Closed-Circuit Ammonia Mechanical Refrigeration Systems (“ANSI/IIAR 2”) to require that welded stainless steel piping comply with schedule 40 material thickness requirements if 6 inches in diameter or less and schedule 10 material requirements if 8 inches or larger. According to the petition and Mr. Dennison, Evapco’s refrigeration system product line has been designed with 4 inch diameter welded stainless steel piping that complies with the national standard’s schedule 10 requirements, but not with Minnesota’s modified standard in rule part 5320.5005 that requires compliance with schedule 40 for 4 inch stainless steel piping. As explained by Mr. Dennison, Evapco believes that its product is safe enough since it complies with the national standard; Evapco was not aware of the differences between the national standard and Minnesota rule at the time of their product’s development; and that the variance urged by Evapco is being requested to avoid the additional cost of re-design and differential marketing of their product in this state in order to comply with Minnesota Rule Part 5230.5005.

At the June 08, 2016 meeting, the Board voted to deny the variance request. In so doing, the Board acknowledges that Minn. Rule Part 5230.5005 is more restrictive than the national standard, but relies upon the rule’s Statement of Need and Reasonableness (“SONAR”) which justifies the modification both in terms of additional safety to ensure mechanical strength in ammonia-based mechanical refrigeration systems and in increased material/labor costs for owners/manufacturers of high pressure systems in Minnesota. It is unfortunate that Evapco was not aware of the more restrictive Minnesota requirements for welded stainless steel piping in ammonia systems at the time of their product’s development. Nevertheless, the Board does not believe that the additional costs needed for Evapco to comply with Minnesota requirements outweigh the need and reasonableness for additional, heightened and uniform safety standards in ammonia- based piping systems under rule part 5230.5005 adopted for the protection of the public in Minnesota.

NOW, THEREFORE IT IS ORDERED that the April 25, 2016 Request for Variance filed on behalf of Evapco, Inc., by and through Jake Dennison, is hereby **DENIED**.



Dated: June 9, 2016

Larry Stevens, Jr.
Chairperson,
Minnesota High Pressure
Piping Systems Board

April 25, 2016

Jake Denison
Evapco, Inc.
P.O Box 1300
Westminster, MD 21157

Lyndy Lutz
Minnesota Department of Labor and Industry
443 Lafayette Road N.
St. Paul, MN 55155
lyndy.lutz@state.mn.us

Ms. Lutz,

We have inquired about obtaining a variance to the Minnesota Code Chapter 5230 - BOARD OF HIGH PRESSURE PIPING SYSTEMS PIPEFITTERS; POWER PIPING SYSTEMS for our new product line.

The product line is called Evapcold and is a factory assembled, packaged ammonia refrigeration system. Information on the Evapcold product line can be obtained on our website at <http://www.evapco.com/>. The nomenclature for the product is LCR-Size Code-Temp Code-Condensing Type.

As we discussed, section **5230.5005 Piping, Subpart 3** requires stainless steel piping 6" and smaller to be schedule 40. The Evapcold product line utilizes a schedule 10 wet suction and compressor suction piping in 2 1/2", 3", and 4" SST. The items outlined by Minnesota statute 14-056 have been provided at the end of this document.

Table lists the ASME B31.5 calculated wall thickness and safety of Sch 10 SST pipe. The calculations are available upon request.

Table 1 - ASME B31.5 Wall Thickness Calculations at 350 psi MAWP - Sch 10 SST Pipe

Nominal Pipe OD (in)	Pipe Outside Diameter (in)	Wall Thickness (in)	Calculated Wall Thickness (in)	Safety
2 1/2	2 7/8	0.12	0.0356	3.37
3	3 1/2	0.12	0.0433	2.77
4	4 1/2	0.12	0.0557	2.15

ERW Pipe
200oF Wall
Temperature

Factor of safety for the Sch 10 pipe is 2.15 or greater. Table 2 summarizes the pipe diameter for all Evapcold models, based on the operating temperature and refrigeration capacity.

Table 2: Recirculated Suction Line Diameter (in)

Temp	Tons of Refrigeration						
	40	50	60	70	75	90	100
-30	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2
-25							
-20							
-15							
-10							
-5							
0							
5							
10							
15							
20	3	3	3	3	3	3	
25							
28							
30							
35							
40							

Due to the nature of the packaged unit, the length of piping is minimized. The pipe is located towards the back of the room, away from the entrance, shown in Figure 1. Figure 2 illustrates that the piping is also located 6 feet off of the ground, and Figure 3 shows the pipe support that limits any unsupported length of piping from exceeding 3 feet. Furthermore, the engine room is a small enclosed area (10.9' x 14' x 10' tall) that will not accommodate heavy machinery.

Could you please review the documentation and determine if a variance for the schedule 10 piping is possible?

If you have any questions, please contact me at (410) 756-2600 or at jdenison@evapco.com.

Thank You,
 Jake Denison
 Evapco, Inc.

Per Minnesota Statute 14-056, we have addressed the seven petition questions below:

1. Variance Request:
Evapco, Inc.
Jake Denison
5151 Allendale Ln
Taneytown, MD 21787
2. Description of citation:
 - a. No citation has been issued.
 - b. Evapco is developing a new product line, called Evapcold. Evapcold is a factory assembled packaged ammonia refrigeration system. The machine room of the unit contains all components of a refrigeration unit, excluding the evaporators, which are located in an adjacent room attached to the unit.
3. Variance Requested to section **5230.5005 Piping, Subpart 3:**
 - a. Evapcold has been designed with Sch 10 SST pipe per ASME B31.5
 - b. The machine room is a compact design, factory produced piping system.
 - c. The duration of the variance would be applied as long as Evapcold is being produced.
4. Reasons justifying variance, including a signed statement attesting to the accuracy of the facts asserted in the petition:
 - a. ASME B31.5 calculations provide 2 time safety factors for wall thickness at 350 psi.
 - b. The maximum pipe size utilized is 4", Sch 10 SST pipe.
 - c. The pipe is supported or protected by other components in the system.
 - d. Pipe runs are very short.
 - e. The machine room is small and will not accommodate tow motors or other lifts, so piping is protected.
5. History of the MN HPP Committee to the petitioner, as relates to the variance request: This is a new product line as a variance has not been requested.
6. Information regarding the agency's treatment of similar cases, if known: N/A
7. Name, address, and telephone number of any person the petitioner knows would be adversely affected by the grant of the petition: N/A

Evapcold Machine Room Renders

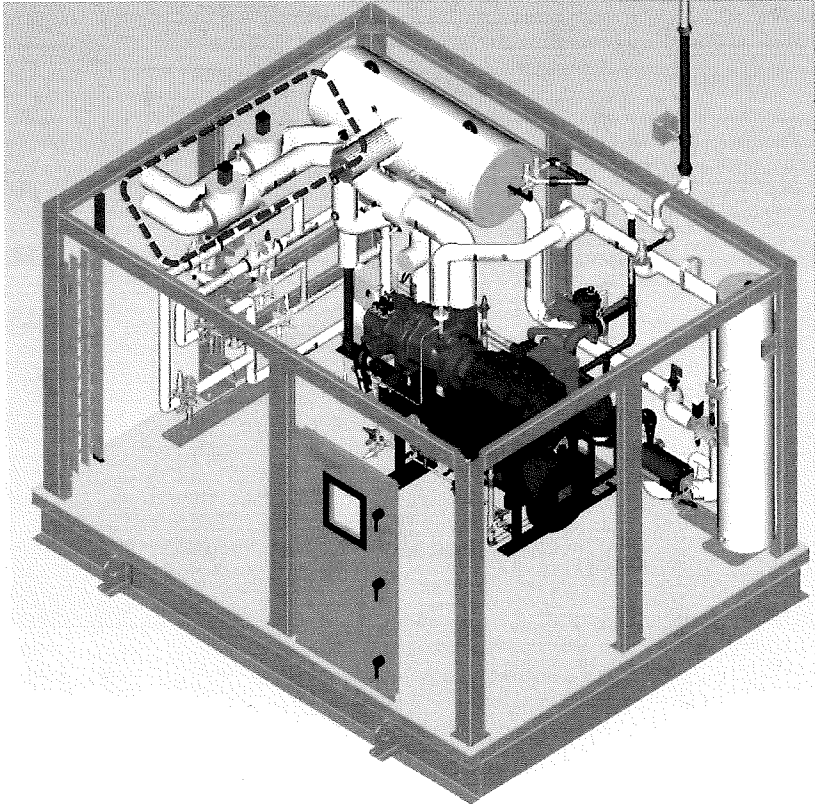


Figure 1: Evapcold machine room isometric view.

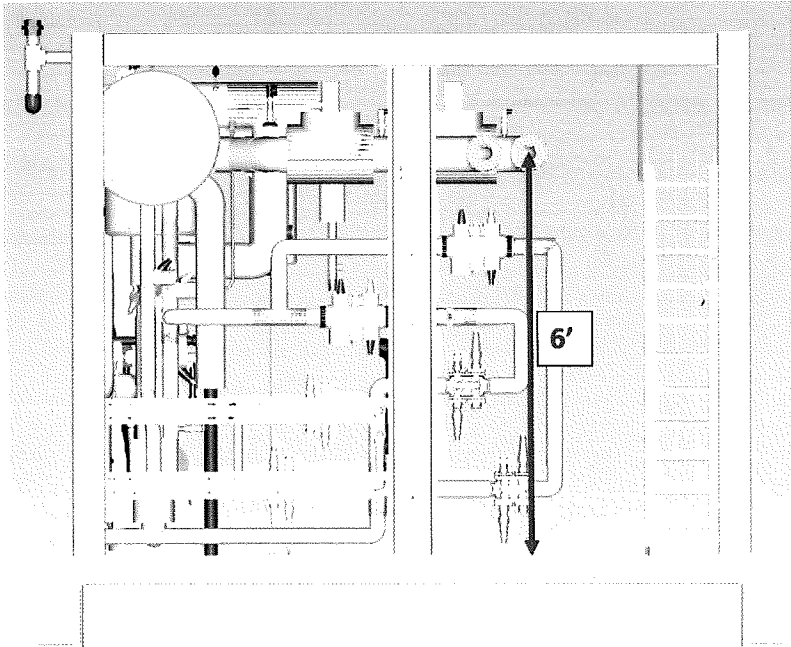


Figure 2: Evapcold LTRS pipe height off of the ground.

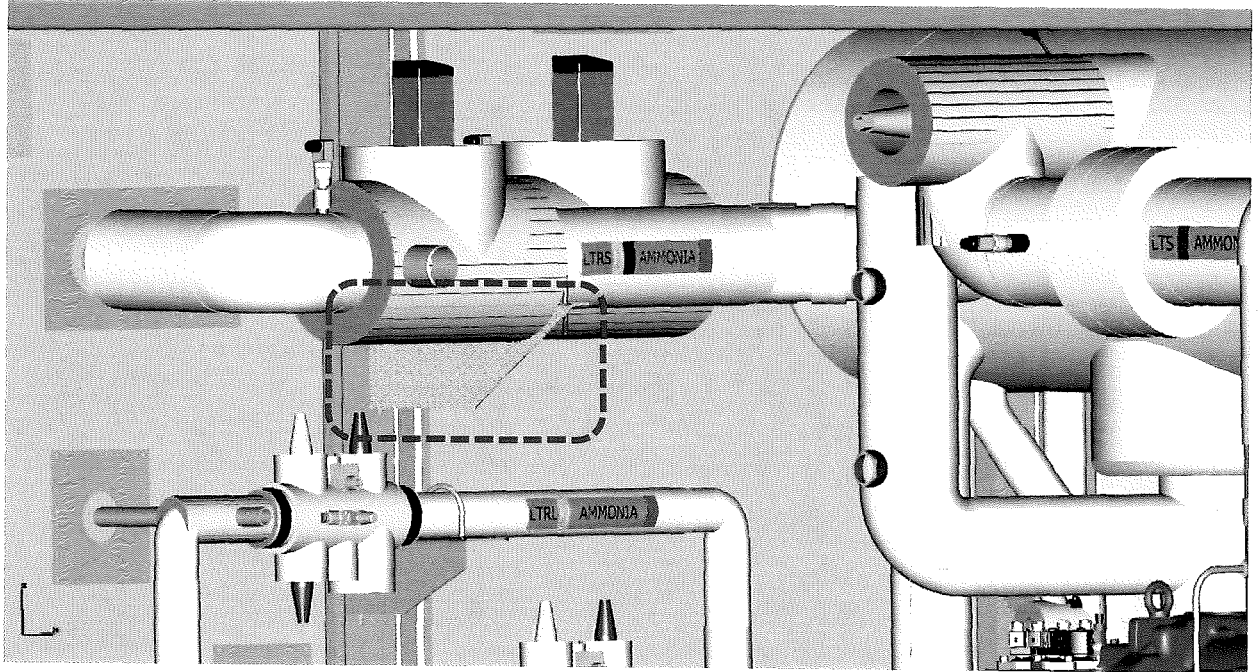


Figure 3: LTRS pipe support location.