Industry Loses Icon

John Rueter

It is with deep sadness and regret that we must announce the loss of John Rueter. John passed away on Sunday, July 23, 2006.

John was a 1951 graduate of the University of Washington School of Industrial Design. In 1953, he went to work for Lewis Refrigeration Company. John was an important part of the dynamic growth and success of Lewis Refrigeration Company throughout the 1960s and 1970s. Lewis was the innovator of its time. It introduced the screw compressor to the American marketplace throughout the country. It also introduced an affordable series of successful in-line product freezing belt tunnels, which became the model and the standard for others that would follow. John was a key part of all of that.

During his Lewis days, John was a noble competitor. In all my days of competing against him during his time with Lewis, I lost far more jobs than I won. He and his company were always hard to beat.

During much of the 1980s, John worked for the Wescold organization in both Portland and Seattle. From the mid 1990s and until his passing, he worked here with us at PermaCold. During our years of rapid growth, John was always the steady hand that offered good advice and guidance. John's last day with us was the Friday before his passing, so he loved his work and it loved him.

In all of my travels and all of my time in our industry, I never met anyone that didn't like John Rueter. There were some days that I didn't like him too much because he had just beat me out of another refrigeration job. However, I got over it. Everyone liked John and for many good reasons.

We at PermaCold will all miss John's humor, his stories, his car collection, his good work on our behalf and his contributions to the continuing success of PermaCold Engineering. With much love and affection, we all say goodbye and thank you, John.

Sincerely,
Ward Ristau – President
PermaCold Engineering, Inc.

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PermaCold
Engineering News
"Because Refrigeration Is Still An Engineered Product"
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Formidable Formulas

Upcoming Shows And Events

97TH Annual RETA
National Convention
October 4-6, 2006
Arlington Convention Center
Arlington, TX
(831) 455-8783

Pacific Marine Expo
November 16-18, 2006
Qwest Field Event Center
Seattle, Washington
www.pacificmarineexpo.com

Northwest Hort Expo
December 3-6, 2006
Yakima Convention Center
Yakima, Washington
(800) 221-0751

The Hansen refrigeration values and components article covers safety issues on installation, maintenance procedures, and replacement guidelines. This might be a good article to discuss during a safety review meeting.

The following formulas give the brake horsepower required for a liquid fluid pump.

For Water:

$$BHP = \frac{GPM * H}{3960 * EFF}$$

For Glycol Solutions and Other Fluids:

$$BHP = \frac{GPM * H * S.G.}{3960 * EFF}$$

Where:

BHP = Brake Horsepower
GPM = Gallons Per Minute
H = Head in Feet of Water
S.G. = Fluid's Specific Gravity
3960 = Constant
EFF = Pump Mechanical Efficiency

Useful Related Information:

One Psi (Pound Per Square Inch of Pressure)
= 2.309 Feet for Water Weighing 62.36 Pounds
Per Cubic Foot at 62 Degrees Fahrenheit.

One Cubic Foot Per Second of Fluid Flow = 448.8 GPM

It's Worth Keeping!

With the permission of Hansen Technologies, we have reprinted the Hansen "Safety Precautions" data sheet. This provides some good safety guidelines for industrial refrigeration work. We would urge refrigeration system operators to review this information. We want to the thank Hansen Technologies for its permission.

Safety Precautions

SPF January 2006
By: Ward W. Ristau, P.E.

This article outlines safety procedures for the proper selection, installation, use and maintenance of Hansen refrigeration valves or other products – hereafter all called components. Hansen components are only for refrigeration systems using ammonia, R22, R134a and other Hansen-approved refrigerants (by the factory in writing). It is intended to help you protect your personnel, product, and plant. However, this information must be supplemented by accepted and known industry safety practices and local code requirements.

Hansen valves and other components are designed and built to the highest standards of the refrigeration industry. Refrigerant in the system must be kept free of any foreign matter such as dirt, grit, rust, impure oil, wax, sludge, water, etc. However, for proper performance, components must be correctly chosen, properly installed, and periodically serviced.

All personnel working on valves or refrigeration components must be qualified to work on refrigeration systems. Any person intending to service a valve or component should completely read this summary and the bulletin describing the particular component and its operation before any work begins. Do not remove any part unless the interior pressure of the component is below zero. When installing or servicing valves or components, bonnets and bolts must be properly torqued. If there are any questions, contact Hansen before proceeding with the work.

Abnormal sounds and/or vibrations of piping, fans, pumps, pressure actuated pumping systems and hydraulic pipe pressure surges should be corrected.

If a component has failed under circumstances which caused, or could have caused, injury to personnel or damage to property, a replacement should not be installed until the reason for the previous failure is determined and corrected.

Where critical temperatures or products are involved, backup temperature controls and alarms are required. It is the responsibility of the installer to add devices (alarms, safety and limit controls, etc.) that protect against or warn of any operating control failure. Users and operators also must be aware that harmful refrigerant properties and pressure could damage products or injure people.

As with all electronic and mechanical components, there is a limited life expectancy. An expected maximum life of seven to ten years is typical for an electronic component. This should be understood as only a sug-gested replacement time period. Actual condition and performance of electronics due to ambient conditions, quality of electrical current, voltage, etc. may necessitate a different replacement schedule. Regardless, all mechanical, electrical, and electronic components should be inspected at least annually and replaced or repaired as necessary to ensure their safe and continuous service. Parts subject to wear should be replaced by factory-original components. Valves exhibiting excessive rust must be maintained, repaired or replaced as necessary.

LIQUID EXPANSION

Temperature increase in a section with trapped 100% liquid can cause extremely high pressures due to the expanding liquid and possibly rupture a gasket, pipe, or various components. When low temperature liquid lines are used, as in a liquid overfeed (recirculation) system, and the lines, valves or other components may be exposed to warm ambient conditions, particular care must be taken. Liquid expansion can occur very rapidly, even if warmed only slightly, with subsequent rupture pressure if not relieved or vented properly.

RELIEF DEVICES

Relief devices must be inspected semiannually for rust, corrosion, and other factors which may prevent valves from operating properly, and should be replaced at intervals of no longer than five years. In addition to normal pressure vessel relief requirements, atmosphere relief devices or relief methods must be used in all parts of a refrigeration system where liquid can be trapped and liquid expansion could take place. Do not use "gas service only" relief devices for liquid relief applications.

VELOCITY SHOCK

Systems must be designed and operated to avoid any velocity shock of liquid being conveyed to valves or components or other equipment. Screw compressor side port feed is very severe duty in this regard and design precautions are necessary. Delayed valve openings or closings or other methods must be utilized where shock is a potential problem.

PROBES

When removing housing (electronics) for service, do not rotate or back-out the probe itself from the pressurized level column. When removing oil from level column, follow standard pump out procedure.

SHUT-OFF VALVES

All valves that could trap liquid when closed must be marked with a warning against accidental closing. Some liquid refrigerant must be removed to be replaced by gas before the shut-off valves are closed on both sides of a control valve or any other component. Also, liquid must be removed before a shut-off valve is closed at the inlet of a solenoid valve or a regulator with a positive electric shut-off, or some outlet pressure regulators, or at the outlet of a check valve, unless these control valves are manually open. To protect personnel, product, and plant, remove the liquid from the section to be isolated before shut-off valves are closed. Make sure the control valve seat ports are open when removing the liquid. Shut-off valves leading to the atmosphere, even if it is temporary, must be plugged or capped to prevent corrosion inside of the valve, as well as leakage due to seat expansion, vibration, dirt, or improper opening; the valve seat should be left cracked open to prevent hydrostatic expansion between the valve and the plug or cap. One must take care when operating valves or regulators with threaded bonnets so that the bonnet does not turn. Bonnets must be torqued to factory specifications after field-servicing. Shut-off valves should be either wide open or closed shut in service. Shut-off valve should not be used as a throttling valve. Use hand expansion valves for throttling gas and liquid.

INSTALLATION

Installation must be done according to all applicable Safety Codes and Standards, and by personnel qualified to install refrigeration systems. Every segment of a refrigeration system, including control valves, must be field pressure tested before system is insulated and put into use. Make sure that correct high and low side pressures are used. Pressure or temperature must never exceed the limits stated in current bulletins. For most up-to-date product bulletins, go to http://www.hantech.com.

Allow proper space for installing any valves. Do not use a valve or component to “stretch” or “align” the pipe. Using flange bolts to close a large gap can distort a valve or at least stress it unduly and possibly cause it to malfunction, or the bolts may be damaged or stripped. For proper sealing, gaskets should be lightly oiled and all bolts must be tightened evenly to published torque specifications. Make sure the flange tongues are properly aligned with the grooves in the valve or component body. Where necessary, support components by brackets or hangers to avoid overstressing.

Components must not be installed in locations where they can be damaged by material handling or other equipment. Trapped ice buildup must be avoided at or between valves and other equipment. Provide reasonable access to all components for maintenance purposes. Individual valves, control stations, pumps or other components must be provided with isolation valves and means for pumping out or safely purging the refrigerant.

PUMP OUT

For the protection of personnel, product, and plant, all refrigerant must be removed from a valve or any other component of the system before any refrigerant retaining part is loosened. Before opening a valve, make sure all refrigerant has been removed. In particular, beware of strainers and other sections of valves or piping which may trap liquid refrigerant which will require a considerable length of time to remove. Pump out as much refrigerant as possible before discharging remaining refrigerant in a properly protected manner. During pump out, it is normally advisable that control valves be opened manually whenever possible to avoid trapping refrigerant.

At times, it may be necessary to discharge some small amount of refrigerant from the isolated section. When this becomes necessary, certain precautions must be observed. Make sure control of discharge rate can be easily maintained and that a quick shut-off is available. Whenever possible, refrigerant should be discharged into and disposed of in a proper container accepted by applicable safety codes and other standards including environmental. Discharge of refrigerant to atmosphere must be avoided. Never discharge any refrigerant into an area without sufficient ventilation, or into an area where open flame or electrical spark is present. Any oil in the refrigerant may cause a mist that could cause a fire or explosion. To prevent pulling excessive air and moisture into a system, avoid opening the system when it is under noticeable vacuum.

CAUTION

Do not attempt to work on any part of a refrigeration system without help nearby and observing. Disconnect all electric power to components involved. Use "lock-out/tag-out" for electrical and fluid security. Use safety goggles or safety face mask to protect the eyes. Other parts of the body, especially the face, hands, and lungs must also be protected. Protective equipment including breathing apparatus and eye flushing equipment must be readily available, and all personnel involved must be thoroughly trained in its use. Personnel must be especially protected against falling because they may be startled by escaping refrigerant. Always make sure that there is a way out and that everyone can leave the area fast. When seal caps cover manual opening or adjusting stems, the cap must be removed with caution - liquid refrigerant could accumulate under cap. Avoid all possibility of contact with any refrigerant liquid or gas.

Effective 01/01/06 and Expires 12/31/06