

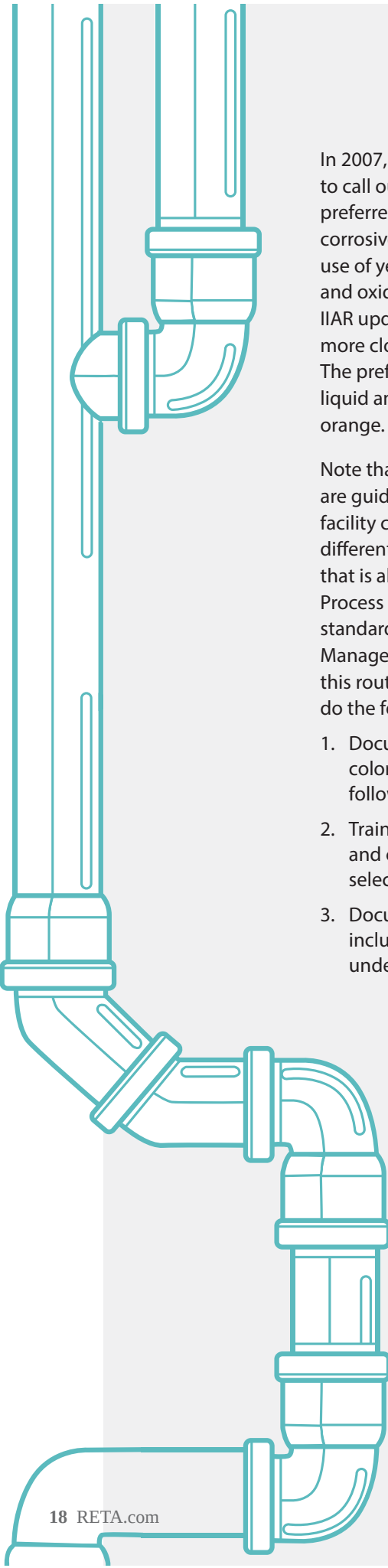
# AMMONIA PIPE AND EQUIPMENT LABELING

part  
3

BY BILL LAPE, SCS ENGINEERS

IN THIS SERIES, we have been discussing ammonia refrigeration pipe and equipment labeling. In Part I, I highlighted the possible choices for applicable good engineering practices that pertain to such labeling, highlighting the American Society of Mechanical Engineers (ASME) A13.1 and the International Institute of Ammonia Refrigeration (IIAR) Standard 2. In Part II, I began to delve into the details of IIAR's Bulletin 114, and how it has changed over the years. I limited the discussion in Part II to Bulletin 114's guidelines for piping labels. In this article, we will review the pipe color guidelines in Bulletin 114, along with component, or equipment labeling.

The first thing to note is that in the original edition of Bulletin 114, published in 1991, no recommendations were made as to pipe color. Most facilities simply assumed that painted ammonia pipe would match the yellow of the label without referring to any other RAGAGEP. Even if they had referred to ASME A13.1 as it read at that time, yellow would have been the color of choice.



In 2007, ASME updated A13.1 to call out orange as the preferred color for toxic and corrosive fluids and limited the use of yellow to flammable and oxidizing fluids. In 2014, IIAR updated Bulletin 114 to more closely align with A13.1. The preferred paint color for liquid ammonia over 70 psig is orange.

Note that these color schemes are guidelines. Should a facility choose to use a different coloration scheme, that is allowable under the Process Safety Management standard and the Risk Management Program rule. If this route is chosen, be sure to do the following:

1. Document the chosen color scheme that is being followed
2. Train affected employees and contractors on the selected color scheme
3. Document this training including proof of understanding

### **Liquid Ammonia Piping > 70 psig**

Vapor ammonia over 70 psig is called out as yellow. In 2018, a clarification was added that Booster Discharge lines should be yellow regardless of discharge pressure.

### **Vapor Ammonia Piping > 70psig**

Low pressure, high temperature vapor or liquid lines, such as HTRL or MTS lines are called out as light blue.

### **Low Pressure, High Temperature Liquid and Vapor Piping**

Low pressure, low temperature vapor or liquid lines, such as LTRL or LTS lines are called out as dark blue.

### **Low Pressure, Low Temperature Liquid and Vapor Piping**

Low low pressure, low low temperature vapor and liquid lines, such as LLTRL and LLTS are called out as purple.

### **Low Low Pressure, Low Low Temperature Liquid and Vapor Piping**

Pressure relief vent piping is called out as gray.

### **Pressure Relief Piping**

Water for condensers or auto-purgers, along with brine or glycol secondary coolant piping is called out as water green, aligning it with ASME A13.1.

*“Do I need to make the outer jacket of my pipe insulation match the appropriate color for the pipe service?”*

One question that is asked a lot is “Do I need to make the outer jacket of my pipe insulation match the appropriate color for the pipe service?” The answer is NO. A facility MAY choose to use insulation jacketing of different colors, but it is perfectly allowable to use a simple white PVC jacket or gray aluminum jacket, as long as the labeling conforms to the chosen good engineering practice. Another question that gets asked frequently is “Does the label background color need to match the recommended pipe color?” Again the answer is no. In fact, it has been argued that a label with an orange background is awful hard to read on an orange pipe. This is a valid concern and could be a good argument for developing your own internal standards for pipe colors and labeling.

Now on to equipment, or component markers. The 1991 edition called out a yellow background for the component markers with red or green pressure bands for high and low pressures, respectively. In 2014, the background was updated to orange with the same pressure bands. In 2018, the pressure band was REMOVED from the label.

Bulletin 114, calls out identifying the equipment by name or abbreviation. For instance, an air unit would have the text “air unit” or “AU” on its label. However, take note that this naming convention can cause issues under a number of government regulations. If your equipment no longer has the original manufacturer’s nameplate with the equipment serial number, then any label applied to the equipment must uniquely identify it. Even if the Original Equipment Manufacturer (OEM) nameplate is still on the equipment and is still readable, it is advisable to use unique nomenclature on this additional labeling. The best approach is to use the unique identifier that should be on your piping & instrumentation diagrams (P&IDs) for your system. In the case above, we may label the equipment as “AU-2” if it has that designator on the P&IDs.

AU-2

LOW

**Bulletin 114-1991 Component  
Marker Example**

AU-2

LOW

**Bulletin 114-2014, 2017 Component  
Marker Example**

AU-2

**Bulletin 114-2018, 2019 Component  
Marker Example**

Regardless of what standard or recommendation you choose to use as your facility’s good engineering practice, be sure to document, document, document. Document the chosen color and labeling schemes. Document that the affected employees and contractors have been trained on the chosen color and labeling scheme. Document that those trained on the chosen color and labeling scheme understood their training and can properly identify piping and equipment.

Bill Lape is Project Director for SCS Engineers. Bill is a Certified Industrial Refrigeration Operator, a Certified Refrigeration Service Technician, and a member of the National Board of Directors of the Refrigerating Engineers and Technicians Association.