



ANSI/IIAR STANDARD FOR AMMONIA IDENTIFICATION

COMPLIES WITH THE AMERICAN NATIONAL STANDARD FOR EQUIPMENT, DESIGN AND
INSTALLATION OF AMMONIA REFRIGERATING SYSTEMS

Marking Services Inc. (MSI) understands the need for proper marking of piping and equipment in food and beverage facilities. Durable pipe markers and component labels provide long-term protection to workers and plant infrastructure. We work with leading associations and companies to establish marking products and services to uniformly identify ammonia refrigeration piping and components to ensure safe, reliable plant operations.

Appendix Q: Identification of Ammonia Piping and System Components

The ammonia refrigeration industry has widely adopted recommended practices for pipe marking, to establish uniformity among users in identifying refrigerant piping. The basis of the guidelines was ANSI Standard A13.1-1981 "Scheme for Identification of Piping Systems." This standard was revised in 2014, dictating orange backgrounds, rather than yellow backgrounds, should be used for toxic and corrosive fluids. Appendix Q which was added to the standard in 2021 is a reproduction of the previously published IIAR Bulletin 114, Guidelines for the Identification of Ammonia Refrigeration Piping and System Components.

- The use of color to identify fluid characteristics for ammonia refrigeration piping brings consistency to the industry aiding in training and safety efforts.
- This suggested color theme is not intended to replace existing color schemes that have been established by facilities.

Ammonia Refrigeration Marker Layout

Piping markers in accordance with this guideline, are designed to identify the refrigerant contained within that piping segment (i.e., ammonia) including the physical state of the refrigerant, relative pressure level of the refrigerant and direction of flow.

Each marker has five important parts:

1. Ammonia piping abbreviation section: Black letters on Safety Orange background
2. Physical State: LIQ (Black letters on Yellow band) and/or VAP (Black letters on Sky Blue band)
3. Ammonia: Black letters on Safety Orange background
4. Pressure Level: LOW (70 PSIG or less) = Black letters on Green band, HIGH (greater than 70 PSIG) = Black letters on Red band
5. Directional arrow (printed on marker) - scored: Black arrow



Ammonia Pipe Identification

All piping mains, headers and branches must identify the physical state of the refrigerant (that is, vapor, liquid, etc.), the relative pressure level of the refrigerant, and the direction of flow. The identification system used must either be one established as a standard by a recognized code or standards body, or one described and documented by the facility owner. Appendix Q dictates orange labels as standard, however this color is not intended to replace existing color schemes that have been established by facilities.



Choosing the Proper Material

- Pipe markers may be self-adhesive, wrap-around or strap-on type.
- Pipe surfaces should be prepared properly by cleaning and drying the pipe before placing self-adhesive markers as to avoid moisture and corrosion on uninsulated carbon steel pipe.
- Pipe markers to be made of suitable materials for the area of use.
- Markers should resist fading in the presence of indoor lighting or if subjected to infra-red or ultraviolet radiation.
- Markers must be suitable for application to insulated or non-insulated piping.
- MSI highly recommends using a carrier with feet due to temperature of the pipe to ensure the integrity of the marker. These include Hot Gas Discharge (HGD) and Booster Discharge (BD).



Component Markers

- Component Markers will bear the name of the equipment they identify, e.g., RECEIVER, ACCUMULATOR, RECIRCULATOR, etc. In addition, component markers will be provided with a pressure level designation.
- Black letters on Safety Orange background
- Pressure Level will be indicated by the word HIGH in BLACK letters with a RED band or the word LOW in BLACK letters on a GREEN band printed or applied flush with the right edge of the marker.
- Colors for component markers are described by the ANSI Z535 Safety Color Chart.
- Component markers will be approximately 3-1/2" wide and long enough to accommodate the name of the component leaving a 2-1/2" margin at either end of the name to allow room for the pressure level designation.
- Lettering on component markers will be 2-1/2" high



Ammonia System Component Abbreviations

Applying abbreviations of the names commonly given to components or equipment in an ammonia refrigeration system will assist the operator in identifying components and tracing system piping. In addition to the abbreviation, the use of a temperature or a pressure commonly associated with a particular line may further assist the operator.

Common Ammonia System Component/Equipment Abbreviations	
Component/Equipment	Abbreviation
Accumulator (with/without int. coil)	ACC
Air Cooled Condenser	AC
Air Handling Unit	AHU
Air Unit	AU
Booster Compressor	BC
Controlled Pressure Receiver	CPR
Evaporative Condenser	EC
Heat Exchanger	HEX
High Pressure Receiver	HPR
High Stage Compressor	HSC
High Temperature Recirculator	HTR
Intercooler (with/without int. coil)	IC
Liquid Transfer Unit	LTU
Low Temperature Compressor	LTC
Low Temperature Recirculator	LTR
Low Low Temp Recirculator	LLTR
Oil Pot	OP
Oil Separator	OS
Pilot Receiver	PR
Purger Unit	PRG
Refrigerant Pump	RP
Refrigerated Make-Up Air Unit	RMAU
Rooftop Air Unit	RTU
Surge Drum	SD
Swing Compressor	SWC
Thermosyphon Receiver	TSR
Water Cooled Condenser	WC

Selecting the Proper Size

The size of the pipe marker and the lettering thereon is determined by two factors:

1. The outside diameter of the pipe, including insulation on insulated pipe
2. The distance between the viewer and the pipe

Considering these factors, the size of the pipe marker and lettering should be selected to provide quick and positive identification. Pipe location, from a viewer's standpoint, will be different on every installation. Therefore, on-site decisions will be necessary to provide the optimum pipe marking system.

MS-900 SELF-ADHESIVE AMMONIA MARKERS			
MSI PART #	DIAMETER OD RANGE	MARKER WIDTH	MARKER LENGTH
A1	Up to 1-1/4"	1"	8"
A2	Greater than 1-1/4" - 2"	1.5"	12"
A3	Greater than 2" - 7"	2.25"	16"
A4	Greater than 7" - 10"	4"	24"
A5	Over 10"	4.5"	32"

MS-995/MS-1000 COILED PIPE MARKERS			
MSI PART #	OUTSIDE DIAMETER	MARKER WIDTH	MARKER LENGTH
AAO	Up to 1-1/4"	5"	8"
ABO	3/4" - 2-1/2"	9"	8"
ACO	2" - 2-1/2"	12"	12"
ADO	2-3/4" - 4-3/4"	17"	12"
AEO	5" - 5-7/8"	26"	12"

CARRIER PIPE MARKERS			
MSI PART #	OUTSIDE DIAMETER	MARKER WIDTH	MARKER LENGTH
AMAO	Up to 2"	2"	15"
AMFO	2-1/4" - 5-7/8"	2.5"	16"
AMO	>8"	4.5"	32"

COMPONENT MARKERS			
		MARKER WIDTH	MARKER LENGTH
		4"	32"

Proper labeling has an impact on the reliable and safe operation of new food and beverage facilities or upgraded existing plants. When you invest in the world-class quality and expertise of MSI's labeling, you gain significant returns on protecting the productivity of your plant for years to come. Contact us today for answers to your material questions. We'll help you choose the right materials and services for all your ammonia refrigeration piping and system component needs. MSI offers a complete line of identification to meet every labeling challenge with extremely fast fulfillment, industry best quality, and no minimum order requirements. Through our value-added services and high quality products, we significantly raise the level of safety awareness, promote safe work conditions and reduce total "in-place" costs.

For more information on the ANSI/IIAR 2-2021 Standard, please visit the following source:

International Institute of Ammonia Refrigeration – www.iiar.org

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