



Exploration & Production

GENERAL SPECIFICATION

HVAC

GS EP HVA 460

Marking of HVAC Piping and Ducting

01	10/2009	Updating of "Reference documents"
00	10/2007	First issue
Rev.	Date	Notes



Contents

1. Scope	3
2. Reference documents.....	3
3. Principle	4
3.1 Identification of HVAC piping and ducting	4
3.2 Direction of flow	7
3.3 Additional indications	7
4. Methods of application	8
5. Frequency of marking.....	8
6. Attachment	8



1. Scope

The purpose of this document is to define the marking of piping and ducting for the fluids used in HVAC systems.

This document is applicable to HVAC ducting and piping excluded those installed within HVAC packages (i.e. Chilled Water Unit(s), Air Handling Units).

The words and expressions in CAPITAL CHARACTERS AND *ITALIC* are defined inside the general specification **GS EP HVA 801**.

When other words require a definition only to be used in the present document, then the definition is given in a dedicated paragraph of the present document and the defined word, when used, is marked in small and *italic* letters.

2. Reference documents

The reference documents listed below form an integral part of this General Specification. Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published at the effective date of the CONTRACT.

Order of precedence of documents is defined in **GS EP HVA 100**.

Notes:

- In case of discrepancy between documents (whatever the documents and / or whatever origins), the most expensive solution must be quoted by the *BIDDER*. During the studies (Basic Engineering and/or Detailed Engineering) *CONTRACTOR*(s) shall raise the discrepancy in question to the *COMPANY*'s HVAC *SPECIALIST* who will then review and advise which document(s) is (are) to be specified for the project.
- The HVAC *VENDOR* or *CONTRACTOR* may propose proven improvements to the reference documents but must obtain written approval of the *COMPANY* prior to implementation.
- An International Standard is a good "engineering practice" which shall be recognised and taken into consideration by *VENDOR*, *SUPPLIER*, *MANUFACTURER* and/or *CONTRACTOR*. If required, the translation of the standards must be included into HVAC scope.
- The latest revision of Standards, codes, regulations and the published errata if any must be used and applied by *VENDOR*, *SUPPLIER*, *MANUFACTURER* and *CONTRACTOR*.

Standards

Reference	Title
NF X08-002	Limited collection of colours - Designation and catalogue of CCR colours - Secondary standards
NF X08-100	Colours - Rigid piping - Identification of fluids with conventional colours



Professional Documents

Reference	Title
Not applicable	

Regulations

Reference	Title
Not applicable	

Codes

Reference	Title
Not applicable	

Other documents

Reference	Title
Not applicable	

Total General Specifications

Reference	Title
GS EP HVA 100	Basis of design
SD EP HVA 460	Marking of HVAC Piping and Ducting - Standard Drawing
GS EP HVA 801	Terminology, definitions, abbreviations

3. Principle

3.1 Identification of HVAC piping and ducting

The identification of piping and ducting for *HVAC* systems is made by three systems of colours and by a complementary information label:

- Basic colours to distinguish the family of fluid
- Identification colours to identify particular fluids
- Status colour indicating the state of fluid
- Complementary labelling indicating the HVAC system from which the fluid is depending. This label can also be used, for safety reasons, to clearly identify the fluid. The form shape of label must also indicate the direction of flow.

3.1.1 Basic colours

The HVAC fluids are divided into families as indicated in the following table:

Families of fluids	Basic colour	Colour reference as per NF X08-002
Air (duct)	white	A655
Air (piping)	light blue	A571
Steam	light grey	A690
Water	green yellow	A466
Combustibles (liquids)	light brown	A020
Gas	yellow ochre	A340

The basic colour can be applied on HVAC ducting and HVAC piping as per one of the three different ways:

- On the whole surface of piping or ducting
- Or on one part of the surface of piping or ducting, with a ring of length L. The length L must be not less than six times the diameter of pipe (with a maximum length of L = 30 cm) and 30 cm length for ducting
- Or only on a part of piping or ducting, by a strip placed lengthways. The length L has at least six time its width I, with a maximum length L of 30 cm.

3.1.2 Identification colours for particular HVAC fluids

For each family of basic colour, some fluids must be defined by an identification colour as indicated hereunder. The identification colour has to be applied on the whole width of the background colour with a rectangle. The width of the rectangle is equal to that of the basic ring or stripe and its length, in the axis of piping / ducting, is twice its width.

Identification colour table:

Families	Basic colour	Nature of fluid	Identification colour	Colour reference as per NF X08-100
Air (duct)	White	Outdoor air (ODA)	green	-
		Supply air (SUP)	purple	-
		Indoor air (IDA)	grey	-
		Transferred air (TRA)	grey	-
		Extract air (ETA)	yellow	-
		Recirculation air (RCA)	orange	-
		Exhaust air (EHA)	brown	-
		Secondary air (SEC)	orange	-

Families	Basic colour	Nature of fluid	Identification colour	Colour reference as per NF X08-100
		Mixed air (MIA)	association of the two respective colours of flows composing mixed air (1)	-
Air (piping)	Light blue	Instrument air	black	A603
		Industrial air / service air	white	A655
Gas	Yellow ochre	Gas for combustion	pink	A870
		Refrigerant gas	light blue	A603
Water	Green yellow	Non drinking water / industrial water	black	A603
		Drinking water	light grey	A680
		Sea water	black and dark blue (1)	A603 / A571

(1) The ring dedicated to the identification colour must be split in two equal vertical parts.

When a basic colour is only applied on a part of piping / ducting surface, it must be juxtaposed on the side of the identification ring (or stripe), an additional basic colour area whose length is at least equal to L/3.

If the basic colour is continuously applied, the identification colour ring / rectangle width has to be L/3 width.

3.1.3 HVAC fluid state colours

The state colours are applied on the whole width of the basic colour with rings or rectangles whose length "l" is perpendicular to the axis of piping / ducting and whose width is equal to L/6.

If both an identification colour and a state colour are identical, the rings / rectangles must be separated by a small gap (black or white, in order to obtain the best contrast).

The same principle must be applied if the basic colour is identical to the state colour or if there is a lack of contrast between the two colours.

If the basic colour is continuously applied, an area of basic colour at least 6xL long must be left between the state ring / rectangle and the group of identification colours.

The state colours are only applicable for the following fluids:

- Refrigerant gas (piping)
- Water for heating and cooling (piping)
- Air (ducting).

States of fluids:

State of the fluid	State colour	Colour reference as per NF X08-002
Hot (equal or above ambient nominal temperature) or superheated	orange -grey	A150
Cold (lower than ambient temperature)	purple	A710
Air temperature either above, equal or lower than ambient temperature	light grey	A690
Liquified gas (refrigerant gas)	pink	A870
Refrigerant gas, hot gas (equal or above than 25°C)	red	
Refrigerant, cold gas (lower than 25°C)	light blue	A571

3.2 Direction of flow

3.2.1 Continuous basic colour

The direction of flow must be indicated by application of an arrow pointing in the adequate direction, painted in white or black in order to contrast with the background colour.

Discontinuous basic colour:

- In case of basic colour ring, the direction of flow must be indicated by application of an arrow pointing in the adequate direction, painted in white or black in order to contrast with the background colour
- In case of rectangles, the rectangle displaying the basic colour shall end in arrow shape corresponding to the direction of the flow.

3.3 Additional indications

In case of several HVAC systems (i.e. Essential, Non essential, ...), the system name has to be mentioned on the piping / ducting. The label must be fixed as indicated hereafter:

Basic colour	Location of additional information
Continuously applied	Over the arrow indicating the direction of flow
Discontinuously applied– Rings	Over the arrow indicating the direction of flow
Discontinuously applied - Rectangles	Over the rectangles

The letters for these additional indications must be 12 to 20 mm height. The label height must be inferior to 40 mm. The background colour of the label must be identical to piping / ducting background colour or must be white.



4. Methods of application

The colours, indication of flow direction, and additional indications can be applied by painting, or by adhesive strips or dilophane sheet.

The application method depends on the support and must be chosen to guarantee the permanence of indication during the life-time of equipment.

5. Frequency of marking

Fluid identification marking must be placed to allow identification in each closed *AREA* and in open *AREA* where piping / ducting is passing.

The maximum distance between two fluid identifications must be 5 meters. In addition a full identification (basic colour, identification colour, state colour and additional indications) must be placed:

- At 0.5 m from each equipment to which piping / ducting is connected
- At 0.5 m from WALL, on both sides.

6. Attachment

Refer to drawing: Marking of HVAC Piping and Ducting - Typical (**SD EP HVA 460**).