RECOMMENDED PRACTICE FOR COLOR CODING OF PIPING MATERIALS

ES-22

Prepared by

Pipe Fabrication Institute Engineering Committee

Dedicated to Technical Advancements and Standardization in the Pipe Fabrication Industry Since 1913

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1. Scope

1.1 The intent of this standard is to provide a system for easy identification of piping materials by general material classifications.

2. General

2.1 This standard cannot possibly distinguish between all the various grades or specifications of material. However, the user is encouraged to develop his own identification system depending on the specific materials involved for a project. Table 1 identifies the most common grades of material used in piping systems.

2.2 Color markings may be made using paint, dye, tape, or dry marker. Color markings are assigned on the basis of nominal chemical composition. Color coding for dual stamped materials shall be marked in accordance with the material required for the project or stock.

2.3 Identification by this method is not a substitute for other permanent manufacturer's marking, as is required by applicable piping material specifications.

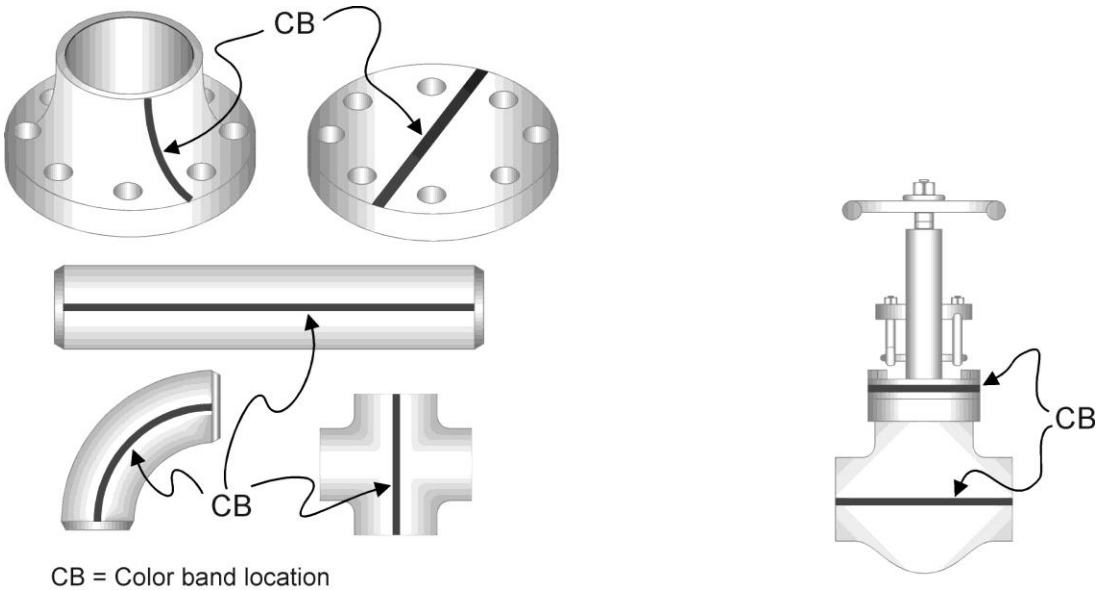
2.4 The principal purpose of this standard is to simplify identification of the pipe during storage and after the pipe has been cut for fabrication or returned to stock.

2.5 Where pipe spool pieces are painted after completion of fabrication, further material color marking is not necessary except where required by code or the purchaser. Material identification after fabrication is complete is typically traceable by referencing the spool piece mark to the corresponding fabrication drawing and bill of material. Color coding may remain on completed spools that do not require a protective coating, unless the purchaser specifies removal of color coding for fabricated spools.

2.6 Paint and marking materials for use on nuclear piping systems shall be approved as suitable for the material to which it will be applied. Marking materials for stainless steel and nickel alloy piping must not contain undesirable substances such as chlorides, fluorides, sulfur, and low melting point metals.

2.7 The Fabricator, contractor, or purchaser may choose to implement positive material identification prior to color coding. Reference PFI standard ES-42, Standard for Positive Material Identification of Piping Components using Portable X-ray Emission Type Test Equipment.

2.8 The material supplier may reject the restocking of any excess materials when permanent color coding such as paint stripes, are used.



CB = Color band location

Note : Do not apply paint to gasket-seating areas or weld bevel areas

Figure 1 - Application of Color Code

3. Location of Marking

3.1 Pipe shall be marked for its full length.

3.2 Flanges shall be banded on the back of the flange at the intersection of the back face and the hub.

3.3 Fittings shall be striped from bevel to bevel.

3.4 Miscellaneous material shall be color marked so as to provide proper identity.

3.5 The paint shall not cover welding surfaces.

3.6 Typical markings are shown in Figure 1

3.7 When markings in accordance with this standard obscures mill markings or is otherwise impractical, this Standard does not apply.

Table 1
COLOR CODE FOR MATERIAL IDENTIFICATION

Material	*Common Designation*	*UNS Designation*	*Color of Stripe(s)*
Carbon Steel			
Carbon steel, Electric Resistance Welded Pipe	SA53 Gr.B/API 5L B Wld.	None	1 solid white
Carbon Steel, Smls, specified tensile strength under 70,000 psi (483 MPA)	SA53 Gr.B	K03005	No Marking
Carbon Steel, killed steel	SA106 Gr.B	K03006	1 solid green
Carbon Steel, Specified tensile strength 70,000 psi (483 MPA) and over	SA106 Gr.C	K03501	2 solid green
Carbon steel, low temperature (impact tested)	SA333 Gr.6	K03006	1 solid red
High Yield Carbon Steel			
52,000 min yield	API 5LX-52		1 solid yellow, 1 solid green
60,000 min. yield	API 5LX-60		1 solid yellow, 1 solid pink
65,000 min yield	API 5LX-65		2 solid yellow
70,000 min yield	API 5LX-70		1 solid yellow,1 solid orange
Low Alloy Materials			
Cr-Mo steel	SA335 Gr.P1	K11522	1 solid orange
1 Cr- 1/2 Mo Steel	SA335 Gr.P12	K11562	1 solid orange, 1 solid blue
1 1/2 Cr- 1/2 Mo Steel	SA335 Gr.P11	K11597	1 solid yellow
2 1/4 Cr 1Mo Steel	SA335 Gr.P22	K21590	1 solid blue
5 Cr-1/2 Mo Steel	SA335 Gr.P5	K41545	1 solid blue, 1 solid yellow
9 Cr-1 Mo Steel	SA335 Gr.P9	K90941	2 solid orange
9 Cr 1 Mo 0.2V	SA335 Gr.P91	K91560	1 solid pink, 1 solid gray
9 Cr 1/2 Mo 0.2V2W	SA335 Gr.P92	K92460	1 solid green, 1 solid gray
Ferritic and Martensitic Stainless Steels			
Type 405	SA268 TP405	S40500	1 solid green, 1 solid black
Type 410	SA268 TP410	S41000	1 solid green, 1 solid red
Duplex Stainless Steel			
	SA790	S31803	1 intermittent pink
	SA790	S32205	1 intermittent pink 1 solid pink
Super Duplex Stainless Steel			
	SA790	S32750	1 solid red, 1 solid pink
Austenitic Stainless Steel			
Type 304	SA312 TP304	S30400	1 solid black
Type 304L	SA312 TP304L	S30403	2 solid black
Type 304H	SA312 TP304H	S30409	1 intermittent black
Type 309	SA358 Gr309	S30900	1 solid black, 1 solid brown
Type 310	SA358 Gr310	S31000	1 solid green, 1 solid orange
Type 316	SA312 TP316	S31600	1 solid grey
Type 316L	SA312 TP316L	S31603	2 solid grey
Type 316H	SA312 TP316H	S31609	1 intermittent gray
Type 317	SA312 TP317	S31700	1 solid brown, 1 solid green
Type 317L	SA312 TP317L	S31703	1 solid brown, 1 solid red
Type 321	SA312 TP321	S32100	1 solid pink
Type 321H	SA312 TP321H	S32109	2 solid pink
Type 347	SA312 TP347	S34700	1 solid brown
Type 347H	SA312 TP347H	S34709	2 solid brown
Nickel Based Alloys			
Nickel 200	SB161	N02200	1 solid black, 1 solid pink
Incoloy 800	SB407	N08800	1 solid black, 1 solid orange
Incoloy 800H	SB407	N08810	1 solid gray, 1 solid red
Incoloy 825	SB423	N08825	1 solid gray, 1 solid blue
Inconel 600	SB167	N06600	2 solid blue
Inconel 625	SB444	N06625	1 solid blue, 1 solid pink
Hastelloy Alloy B-2	SB622	N10665	1 solid red, 1 solid orange
Hastelloy Alloy C-276	SB622	N10276	1 solid red, 1 solid blue
Hastelloy Alloy C-22	SB622	N06022	2 solid red
Hastelloy Alloy G	SB622	N06007	1 solid red, 1 solid yellow
Carpenter Alloy 20 CB-3	SB465	N08020	1 solid black, 1 solid blue
Monel 400	SB165	N04400	1 solid black, 1 solid yellow
Aluminum Alloys			
Alloy 3003 Aluminum	SB241	A93003	1 solid purple
Alloy 6061 Aluminum	SB241	A96061	1 solid tan

Note: Any product manufactured by welding shall have an additional white stripe.