



ADMINISTRATIVE PROCEDURE

RESPONSIBLE ISSUING DEPT. CORPORATE SAFETY	SECTION: LOSS PREVENTION SUBJECT: SCHEME FOR THE IDENTIFICATION OF PIPING SYSTEMS	PROCEDURE NO. 8-26 PAGE 1 of 3 DATES: ISSUED September 1975 EFFECTIVE September 1975
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1 SCOPE

It is a common practice for all facilities to use some type of coding system to identify types of piping materials and valves on the mechanical flow sheets and piping drawings. This procedure outlines the Celanese Coding System. Due to the nature of the system presented, it is broad enough in scope to specify any type of piping material, specifying it in definite terms for clear and convenient communications to the field. The coding system presents a method of coding the piping material with a series of numbers to be combined with the line number, and a convenient, simple method of coding the valves for clearly designating the type of valve to be used. While at present there exists no uniform federally enforced color code or identification scheme for in-service piping, a standard is expected in the near future. At that time, this procedure will be revised to reflect those requirements.

2 PURPOSE

The purpose of this procedure is to provide a piping material identification code system which will be common to all plants within the Corporation. This, in effect, provides a common language of communication to be used on mechanical flow sheets and piping drawings. Where piping engineering and design work are concerned, it will simplify communications between engineering and construction, as well as between the various plants for an exchange of design techniques and specialized services.

In the case of piping, several groups of designers are usually involved before the work is started in the field. In order to carry out good safe piping practices as noted in the previous section, standard methods of presenting process designs, mechanical designs, and fabrication details are necessary.

3 PROCESS FLOW SHEETS

Process engineers work out the details of processes and the processing equipment for carrying out the processes. The various types of information to be provided by process engineers and their methods of presentation are outlined in Process Engineering Standards Section P1-12 and P1-13. Their function in the piping of a job is to make material balances which show the flow and composition in each pipe line, and to ascertain that all safety considerations are given due attention. They usually also specify the sizes of equipment. This information is presented in the form of process flow sheets which serve as a basis for developing mechanical flow sheets, piping drawings, plant layouts, and mechanical designs of equipment. Attachment 6 shows a section of a process flow sheet.

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4 MECHANICAL FLOW SHEETS

With process engineering flow sheets as a basis, mechanical flow sheets are prepared to present schematically all piping, valves, instruments and other items of

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equipment. Properly prepared mechanical flow sheets are an adequate basis for mechanical design and construction cost estimates. Materials of construction are jointly selected by process, corrosion, and mechanical engineers, with research, development, and production personnel. The commonly accepted method for presenting these selections is through the use of coding systems on the mechanical flow sheets. The piping draftsmen and take-off men obtain their information from the coding systems. Attachment 7 shows a section of a typical coded mechanical flow sheet. It is extremely important that these mechanical flow sheets be reviewed in accordance with the provisions of A.P. 8-62, Design Review of New Projects.

5 FINAL PIPING DRAWINGS

The coding system used on the mechanical flow sheets should also be used on the final piping drawings. The coding system may or may not be used on bills of material. Items other than commonly used fittings not covered by the coding system should be fully described by notes on the drawings.

6 EXTENT OF MATERIAL CODE

In the piping material identification code system, each pipe line and all of its components may be individually engineered according to the process material to be conveyed in the line and its temperature and pressure. This system provides for the most economical design of piping systems which will satisfactorily perform the function for which they are intended, while it also provides for usage of any surplus materials, materials from all plant stores, newly developed materials, and substitution of materials when marketing conditions require. It also leaves the responsibility of the design of the pipe line with the designer, and allows him to draw on his experience and knowledge to provide a safe, functional and economical system. In all cases, decisions are subject to review by the facility incumbent responsible for loss prevention.

7 USAGE OF MATERIAL CODE

This coding system, when used on mechanical flow sheets and piping drawings, has proved to be a great time-saver in the engineering, drafting and construction of projects and is adequate to supply accurate and definite information to the field. Applications of the system, as used on drawings, are shown on a section of a typical mechanical flow sheet. See attachment 7 and a section of a typical piping drawing, attachment 8.

8 SPECIFIC ITEMS

As will be noted, fittings are not coded on the drawings. Valve code applies to valve and flange except where valve and flange are of different pressure rating, as in the case of small size 600# steel valves used with 300# flanges. Flanges

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installed in the line without a valve are coded individually. Special items not included in the code are to be noted on the drawings. Proper fittings, gaskets, and bolting materials are chosen from the applicable tables in the attachments to this procedure according to pipe, valves and flanges used.

9 **BILLS OF MATERIAL**

It is not recommended that the code system be used on bills of material unless purchasing and engineering work very closely on processing of material orders. Where items are spelled out on bills of material, it is necessary only for the designer, draftsman, incumbent responsible for loss prevention, and material take-off man to be thoroughly familiar with the code system and the fitting, gasket, and bolting material charts. The pipefitter in the field need only have a basic knowledge of the pipe, valve and flange code.

10 **PIPING MATERIAL CODE**

The type of piping material is designated by an abbreviated form of the ASTM specification of the pipe. For example, to designate the class of pipe in a low pressure system requiring ASTM A-53 Grade A Schedule 40 seamless pipe, the designation 53A followed by -40, meaning Schedule 40, would be shown in the line number code. Any material may be so specified in a similar manner.

This system provides a superior method for designating varying wall thicknesses in a closely engineered job. Should one be trying to utilize an assorted stock of pipe from surplus, this system is very adaptable. In cases where more than one plant may be involved in the engineering of piping (due to utilization of surpluses, common processes, or consultation), this system becomes imperative.

Example:

_____ Pipe Size
 _____ Pipe Material Code
 _____ Pipe Schedule
 _____ Line No.
 _____ Unit, Area, or Dept. No.
 (Symbol or abbreviation)
 (Use if required)

Code.... 4" 53A-40-7-BP

Example:

Code.... 3" A 1

Size
Valve or Flange Rating, Material & Facing
Designation for Gate Valve
(See valve code sheet)

Example:

Code 4" C 2 (RJ)

Where flanges only are required the valve designation symbol shall be omitted.

Example:

4" - 600# carbon steel raised face flange

Code.....4" C

The prefixed letter "S" shall be understood to designate screwed pipe or components. In the case of valves (Page 9) 1"SC2 would be the proper designation for a 1" screwed 600# carbon steel globe valve. (1" - size, S - Screwed, C - 600# carbon steel, 2 - Globe)

To indicate a screwed pipe line on the mechanical flow sheets or piping drawings prefix the letter S and the pressure rating of the fittings to the line code.

Example: A screwed 1" 83A-80 pipe line number 22 with 3000 pound screwed fittings

Screwed
3000# pressure rating

Code: (S3000) 1" 83A-80-22

All pipe lines on mechanical flow sheets and drawings shall be understood to be of welded construction unless designated by the above symbol for screwed construction or otherwise specified.

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PIPING MATERIAL IDENTIFICATION BY CODE SYMBOL

The following shows coded symbols to be used in identification of pipe material according to ASTM specification and identification of valves and flanges according to material, pressure rating, and general type.

PIPE CODE

<u>ASTM or Manufacturer Designation</u>		<u>Code</u>
*A53	Welded Carbon Steel	53W
*A53	Grade A Seamless Carbon Steel	53A
A53	Grade B Seamless Carbon Steel	53B
*A83	Grade A Seamless Carbon Steel	83A
A106	Grade A Seamless Carbon Steel	106A
*A106	Grade B Seamless Carbon Steel	106B
*A120	Buttwelded Carbon Steel	120W
*A120	Buttwelded Galvanized Carbon Steel	120G
*A312	Type 304 Welded Stainless Steel	304W
A312	Type 310 Welded Stainless Steel	310W
*A312	Type 316 Welded Stainless Steel	316W
A312	Type 317 Welded Stainless Steel	317W
*B241	3003 Annealed Aluminum	AL3
*B42	Seamless Copper	CU42
*B43	Seamless Red Brass	B43
B161	Buttweld Nickel	161W
B165	Buttweld Monel	165W
Saran Lined Carbon Steel - Any Grade		SL
Double Tough Glass - Corning or equal		GL
Armored Double Tough Glass - Corning or equal		AGL

*Standard pipe stocked within corporation

- Note:
- 1) In some plants, tubing is used instead of pipe. In these instances, the code is modified by the addition of T; i.e., 316 welded tubing is 316 WT. Also suffix gage instead of schedule, thus 316 WT-14 for 14 gage.
 - 2) Should other types of pipe be required, assign each a code and identify them on a separate sheet and insert in construction standards
 - 3) For lines to be steam traced and insulated, add I&T
Example: 3" 316W-10 (I&T)
 - 4) For lines to be insulated only add (I). Example: 3" 53A-40(I)

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Flange and Valve Code

Code for Flanges & Flanged Valves

Column 1 Flange or Valve Code	Column 2 Rating, Material & Facing	Column 3 Symbols of Other Available Facings
A	150# C/S RF	(WE) (FF)
B	300# C/S RF	(WE)
C	600# C/S RF	(WE), (RJ), (T&G)
D	900# C/S RF	(WE), (RJ), (T&G)
E	1500# C/S RF	(WE), (RJ), (T&G)
F	2500# C/S RF	(WE), (RJ), (T&G)
G	125# All Iron (200#WOG) FF	
H	125# IBBM (200#WOG) FF	
J	250# IBBM RF	
K	150# Bronze(200#WOG) FF	
L	150# 316 S/S ASA FF	(WE)
M	300# 316 S/S ASA RF	
N	600# 316 S/S ASA RF	(WE)
P	900# 316 S/S ASA RF	
Q	1500# 316 S/S ASA RF	
R	150# 317 S/S ASA FF	(WE)
AS	150# C/S Lap Joint Flange w/Line material Stub Ends	
BS	300# C/S Lap Joint w/line material stub end	
V	150# 316 S/S Corrosion Std (Flange only) FF	
W	Special (see special valve category on next page)	
Wa	125# CI - Glass Lined FF	
Wb	Flanged porcelain RF	
Wc	150# monel FF	
Wd	150# C/S with Duriron, Durimet 20, or Alloy 20 trim FF	
We	150# Karbate RF	
Wf	150# Alloy 20 FF	
Wg	150# Nickel FF	
Wj	300# C/S with Durimet 20, or Alloy 20 trim	
Wk	150# Ductile Iron	
Wl	150# Ductile Iron Bronze Trim	

Symbols: (WE) - Weld End, (RJ) - Ring Joint, (T&G) - Small Tongue and Groove.
(RF) - Raised Face, (FF) - Flat Face

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Valve Code

Type of Valve	Symbol
Gate	1
Globe	2
Angle	3
Swing Check	4
Vert. Lift Check	5
Horiz. Lift Check	6
Plug	7
Ball Plug	7B
Lift Plug	7L
Needle	8
Special (see special valve pattern on next page)	
Y Pattern	9
Teflon diaphragm	10
NOTE: For screwed valves prefix "S" to Valve Code (See Special Code for Screwed Valves Below)	

Code for Screwed Valves

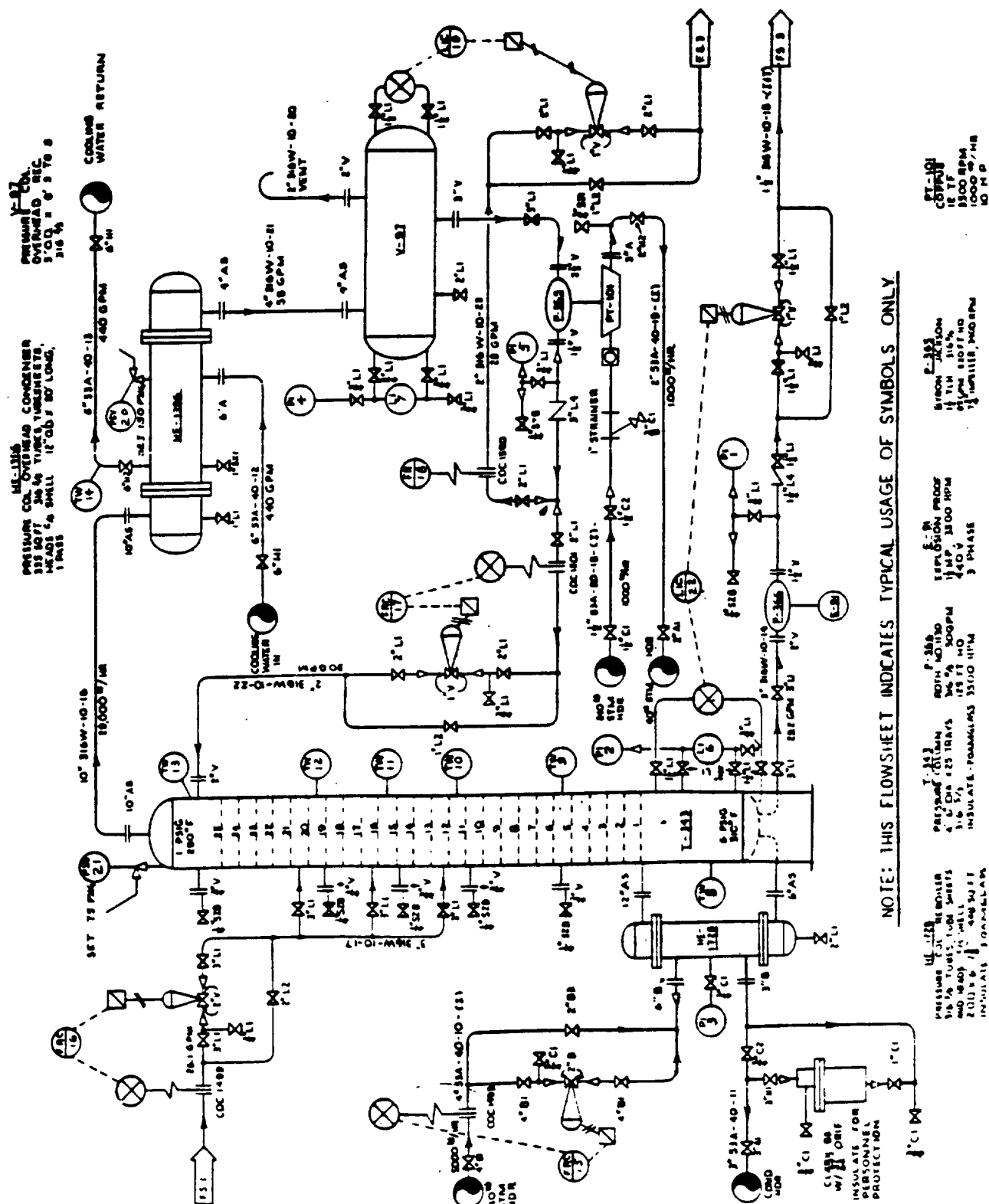
Code	Rating & Material
SX	200# Bronze
SY	3000# C/S
SZ	3000# 316 S/S

Examples of Variations of Standard Code which
may be used to designate specific types of
valves in the same general classification.

4" - A7	4" - 150# Nordstrom Lubricated Plug Valve or equal
4" - L7B	4" - 150# 316 S/S ball plug, Teflon seats
4" - B7B	4" - 300# C/S ball plug, Teflon seats
4" - C7L	4" - 600# C/S Lift Plug valve, Cameron Fig. 60062 or equal

NOTE:

- 1) All companion flanges not included in the ASA Code shall be supplied or recommended by the valve or pipe manufacturer.
- 2) Should other types of valves or flanges be required assign each a code, continuing with Wm, and identify by adding to this sheet for construction standards. For additional valve body patterns continue body code beginning with No. 11.
- 3) For typical applications and details, see Section 11.
- 4) For preferred manufacturers of valves, see Engineering Standard E3-8.1.



NOTE: THIS FLOWSHEET INDICATES TYPICAL USAGE OF SYMBOLS ONLY.

0 M O B
WM / 4-0001
with 0065
JL 21
~~FOIA~~
b7 - D

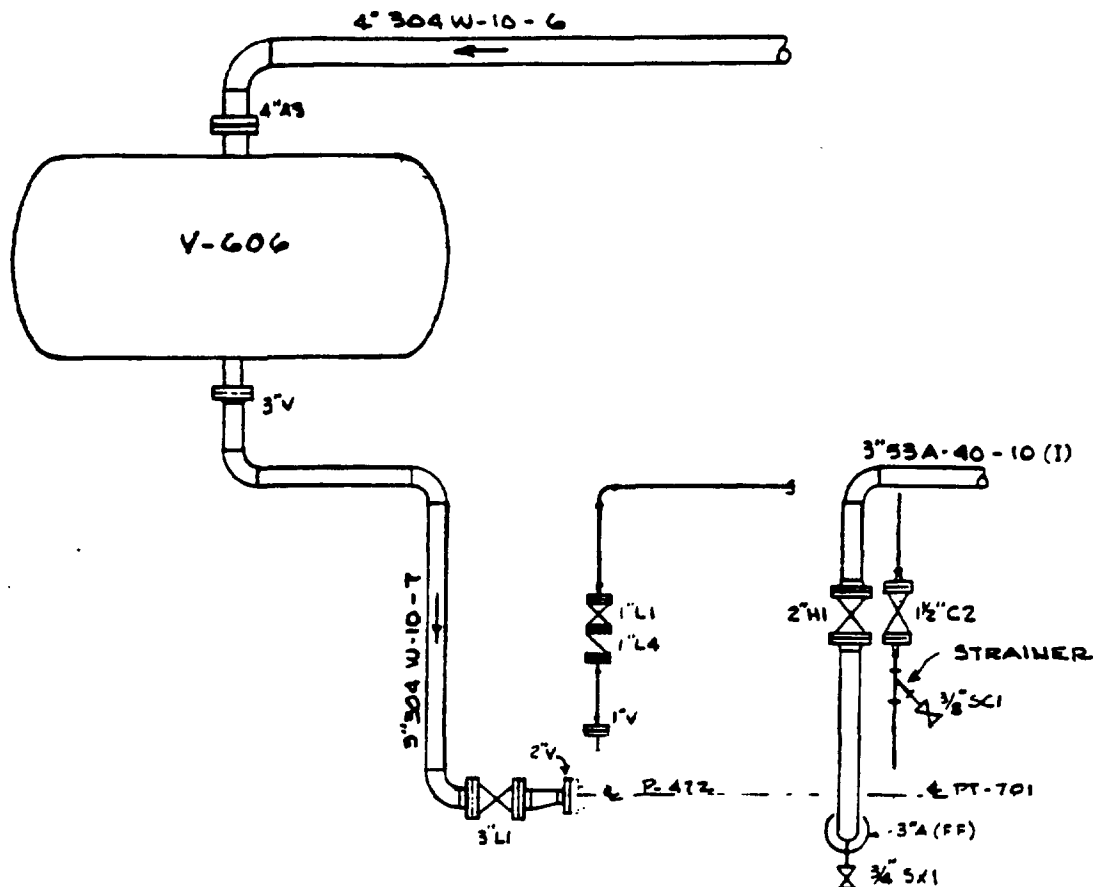
P-303
BROWN JACOBSON
1971 M 316%
2080 2087 MD
2100 21118 MD

EXPLOSION PROOF
40 V
1500 RPM
3 PHASE

Y-343
PRESSURE (11MM)
4' & 23 TRAYS
3.6 5/1
INSULATE - POLYALUMS
3300 11" M
125 FT HO
36% A 300P
SOUTH NO. 1130
P-368

[illegible]

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PIPING MATERIAL CODE APPLICATION — EXAMPLE

EXPLANATION OF CODE

CODE	MATERIAL DESCRIPTION
4" 304W-10-6	4" - 304 WELDED STAINLESS STL. - SCH.10 - LINE NO. 6
4" AS	4" - 150 POUND CARBON STL. LAP JT. FLG WITH 304 S.S. STUB END
3" V	3" - 150 POUND 316 S.S. CORROSION STD. FLANGE.
3" 304W-10-7	3" - 304 WELDED STAINLESS STL. - SCH.10 - LINE NO. 7
3" LI	3" - 150 lb. 316 STAINLESS STL. FLG'D. GATE VALVE
2" V	2" - 150 lb. TYPE 316 S.S. CORROSION STD. FLG.
1" V	1" - 150 lb. TYPE 316 S.S. CORROSION STD. FLANGE.
1" L4	1" - 150 lb. TYPE 316 S.S. FLG'D. SWING CHECK VALVE
1" LI	1" - 150 lb. TYPE 316 S.S. FLG'D. GATE VALVE
3/4" 5X1	3/4" - 200 lb. W.O.G. SCREWED BRASS GATE VALVE
3"A (FF)	3" - 150 lb. C.S. WELD NECK FLG. FLAT FACED
3/8" 5C1	3/8" - 600 lb. SCRD. CARBON STL. GATE VALVE
2" HI	2" - 125 lb. IPBM FLG'D. GATE VALVE
1 1/2" C2	1 1/2" - 600 lb. CARBON STL. FLG'D. GLOBE VALVE.
3" 53A-40-10(I)	3" - A53 GR.A SMLS. CARBON STL. - SCH 40 - LINE NO. 10 - INSULATED

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