



NATIONAL PETROCHEMICAL COMPANY
STANDARDS

CONSTRUCTION STANDARD

FOR
STEAM TRACING

NPCS-CS-PI-06

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FIGURE 1

FIGURE 2

FIGURE 3

FIGURE 4

FIGURE 5

FIGURE 6

FIGURE 7

FIGURE 8

FIGURE 9

FIGURE 10

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FIGURE 11

ATTACHMENT 1

ATTACHMENT 2

ATTACHMENT 3

ATTACHMENT 4

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1 SCOPE

This standard covers the minimum requirements for construction and installation for steam tracing of piping system and equipment for process reasons or winterization.

2 DEFINITIONS

2.1 "Severe Climate" is defined as a climate for which the winter design dry bulb temperature is -20°F or below.

2.2 "Moderate Climate" is that where the winter design dry bulb temperature is above -20°F.

3 STANDARDS AND CODES

NPCS-ES-PI-01	Engineering Standard for Piping System Design.
NPCS-ES-PI-02	Engineering Standard for Piping Material Specification.
NPCS-ES-PI-03	Engineering Standard for Steam Tracing.
NPCS-CS-PI-02	Construction Standard for Piping Fabrication & Erection.
NPCS-SD-PI-39	Standard Drawing for Steam Tracing Details.
NPCS-ES-TP-02	Engineering Standard for External Insulation (Hot).
ANSI B 31.3	Chemical Plant and Petroleum Refinery Piping.

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4 MATERIALS

4.1 Material shall be as per "Project Material Specification".

4.2 Tube fitting shall be compressed type designed for steam service. Material used shall be Carbon Steel, Brass and Stainless Steel for Carbon Steel, Copper and Stainless Steel respectively.

4.3 All fittings shall be in straight runs of tubing only and not in loops, etc., and be insulated separately.

4.4 Steel pipe schedule 80 shall be used for branches from manifolds to tracers, for interconnecting lines between two parts of a tracer which are not adjacent, and from tracer through trap to condensate header.

4.5 INSULATION MATERIAL

The type of insulation used for protection of lines and equipment shall be in accordance with NPCS-ES-TP-02 (Hot).

4.6 TIE MATERIAL

Tracer shall be held in place with Stainless Steel wire 1.5 mm (16 gage) or 10 mm X 0.5 mm Stainless Steel bands, spaced 0.5 m apart.

5 INSTALLATION DETAILS

5.1 The location of steam distribution manifolds and condensate recovery manifolds shall be as what will be specified on the steam tracing piping plans.

5.2 Drawings, showing the detail of piping from the steam source to the distribution manifold and from the condensate recovery to either a condensate header, a sewer receptable, or a dry well, shall be supplied.

5.3 Steam lines to distribution manifolds and condensate lines from condensate manifold have line numbers which are recorded in the steam tracing nomenclatures(See attachment 1 to 4).

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5.4 The type and details of steam tracing for instruments and instrument piping shall be in accordance with the instrument project drawings which will be listed on the instrument data index.

5.5 Drawings of traced piping are marked to indicate the extent of the tracer run.

5.6 Unless otherwise specified, **all dimensions** shown on the drawings and standards are approximate and may be adjusted to suit field condition.

5.7 STEAM TRACING

Quality of steam, e.g. low pressure steam, for steam tracing shall be as project specification.

5.8 TRACER SIZE AND LENGTH

5.8.1 The tracer used shall be tubing 3/8" for lines 1 1/2" and smaller and 1/2" tracer(s) for 2" and larger.

5.8.2 Maximum length and total pocket depth of tracer lines are as follow:

STEAM PRESSURE barg (Psig)	LENGTH IN METER(ft) NOTE a		POCKET DEPTH IN METER (ft) NOTE b
	1/2" OD	3/8" OD	
3.4 (50) to 5.1 (75)	42 (140)	27 (90)	3 (10)
5.2 (76) to 6.8 (100)	57 (90)	36 (120)	6 (20)
6.9 (101) to 10.2 (150)	72 (240)	45 (155)	6 (20)
10.3 (151) to 13.7 (200)	87 (290)	57 (190)	6 (20)

Note a) For moderate climates, the length of tracer in contact with item being traced. For severe climates, the total length of the tracer from supply header to trap discharge.

b) For calculation sketch of the pocket depth see NPCS-SD-PI-39, sheet 1 of 12. No pocket allowed for severe climate condition.