



AMERICAN PETROLEUM INSTITUTE

---

# API MPMS Chapter 8.1

## Standard Practice for Manual Sampling of Petroleum and Petroleum Products

FOURTH EDITION | OCTOBER 2013 | 48 PAGES | \$120.00 | PRODUCT NO. H80104

---

This practice covers procedures and equipment for manually obtaining samples of liquid petroleum and petroleum products, crude oils, and intermediate products from the sample point into the primary container are described. Procedures are also included for the sampling of free water and other heavy components associated with petroleum and petroleum products.

This practice also addresses the sampling of semi-liquid or solid-state petroleum products.

This practice provides additional specific information about sample container selection, preparation, and sample handling.

This practice does not cover sampling of electrical insulating oils and hydraulic fluids. If sampling is for the precise determination of volatility, use Practice D5842 (API MPMS Chapter 8.4) in conjunction with this practice. For sample mixing and handling, refer to Practice D5854 (API MPMS Chapter 8.3).

The procedures described in this practice may also be applicable in sampling most non-corrosive liquid industrial chemicals provided that all safety precautions specific to these chemicals are followed. Also, refer to Practice E300. The procedures described in this practice are also applicable to sampling liquefied petroleum gases and chemicals. Also refer to Practices D1265 and D3700. The procedure for sampling bituminous materials is described in Practice D140. Practice D4306 provides guidance on sample containers and preparation for sampling aviation fuel.

For ordering information:

Online: [www.api.org/pubs](http://www.api.org/pubs)

Phone: 1-800-854-7179  
(Toll-free in the U.S. and Canada)

(+1) 303-397-7056  
(Local and International)

Fax: (+1) 303-397-2740

API members receive a 30% discount where applicable.

## Contents

	Page
1 Scope .....	1
2 Referenced Documents .....	2
3 Terminology .....	3
4 Significance and Use .....	7
5 Health and Safety Precautions.....	8
6 Apparatus.....	9
7 Sampling Devices/Equipment and Accessories .....	14
8 Manual Sampling Concepts and Objective .....	19
9 Sampling Requirements, Considerations, and Procedures.....	21
10 Special Instructions for Specific Products.....	39
11 Keywords .....	43
<b>Appendix X1 (Nonmandatory Information) Crude Oil Sample Handling—Test Matrix .....</b>	<b>44</b>

## Figures

1 Example of a Fixed Volume Cylinder with an Outage Tube .....	4
2 Example of a Fixed Volume Cylinder and Transfer Line .....	5
3 Examples of a Small Volume (5 cm (2 in.)) and a Large Volume PSU (10 cm (4 in.)).....	5
4 Examples of Closed/Restricted Sampling Equipment .....	6
5 Illustration of Common Spot Sample Positions.....	6
6 Typical Sample Carrier .....	8
7 Amber and Clear Boston Round Bottles .....	9
8 Example of Single Floating Piston (Variable Volume) Cylinder (FPC) .....	11
9 Example of Single Floating Piston (Variable Volume) Cylinder (FPC) .....	12
10 Example of Single Floating Piston (Variable Volume) Cylinder (FPC) .....	12
11 Example of Typical High-Pressure Sampling System.....	13
12 Cage Samplers.....	15
13 Weighted Bottle .....	15
14 Weighted Beakers .....	16
15 Example of Bottom Water and ROB/OBQ Sampler/Scraper.....	16
16 Tank Sample Taps .....	17
17 Probe Designs .....	18
18 Example of Core/Interface Samplers—Thief .....	19
19 Example of Core/Zone Samplers.....	20
20 Example of Dead Bottom Samplers .....	20
21 Tube Sampler.....	21
22 Auger Sampler .....	21
23 Example of Nozzle Extender .....	21
24 Slotted Standpipe .....	23
25 Examples of Sample Labels/Tags .....	26
26 Examples of Typical Vapor Control Valves.....	29
27 Example of a Lock Valve and Closed System Sampler .....	30
28 Example of Closed System Restricted Flow Sampler.....	30
29 Location of Sample Points at Different Levels for Rail Cars .....	33

	Page
<b>30 Location of Sample Points from Exposed Surface for Rail Cars.....</b>	<b>34</b>
<b>31 Example of Probe in High-Pressure Sampling System Pipeline .....</b>	<b>35</b>
<b>32 Example of Double Piston (Variable Volume) Cylinder (DPC) .....</b>	<b>38</b>
 <b>Tables</b>	
<b>1 Sampling from Horizontal Cylindrical Tanks .....</b>	<b>7</b>
<b>2 Commonly Used Manual Sampling Devices for Liquid Products .....</b>	<b>14</b>
<b>3 Typical Sampling Procedures and Applicability .....</b>	<b>22</b>
<b>4 Recommended Weighted Sampling Bottle or Beaker Openings.....</b>	<b>27</b>
<b>5 Spot Sample Minimum Requirements.....</b>	<b>27</b>
<b>6 Tap Sampling Requirements .....</b>	<b>28</b>
<b>7 Minimum Number of Packages to be Selected for Sampling.....</b>	<b>32</b>
<b>8 Size of Grease Samples .....</b>	<b>43</b>
<b>X1.1 Crude Oil Sample Handling—Test Matrix .....</b>	<b>45</b>