

Nondestructive Examination Services for Equipment Used in the Petroleum and Natural Gas Industry

API STANDARD 20D
FIRST EDITION, SEPTEMBER 2013

ADDENDUM 1, OCTOBER 2016



AMERICAN PETROLEUM INSTITUTE

Special Notes

API publications necessarily address problems of a general nature. With respect to particular circumstances, local, state, and federal laws and regulations should be reviewed.

Neither API nor any of API's employees, subcontractors, consultants, committees, or other assignees make any warranty or representation, either express or implied, with respect to the accuracy, completeness, or usefulness of the information contained herein, or assume any liability or responsibility for any use, or the results of such use, of any information or process disclosed in this publication. Neither API nor any of API's employees, subcontractors, consultants, or other assignees represent that use of this publication would not infringe upon privately owned rights.

API publications may be used by anyone desiring to do so. Every effort has been made by the Institute to ensure the accuracy and reliability of the data contained in them; however, the Institute makes no representation, warranty, or guarantee in connection with this publication and hereby expressly disclaims any liability or responsibility for loss or damage resulting from its use or for the violation of any authorities having jurisdiction with which this publication may conflict.

API publications are published to facilitate the broad availability of proven, sound engineering and operating practices. These publications are not intended to obviate the need for applying sound engineering judgment regarding when and where these publications should be utilized. The formulation and publication of API publications is not intended in any way to inhibit anyone from using any other practices.

Any manufacturer marking equipment or materials in conformance with the marking requirements of an API standard is solely responsible for complying with all the applicable requirements of that standard. API does not represent, warrant, or guarantee that such products do in fact conform to the applicable API standard.

Copyright © 2013 American Petroleum Institute. No part of this work may be reproduced, translated, stored in a retrieval system, or transmitted by any means, electronic, mechanical, photocopying, recording, or otherwise, without prior written permission from the publisher. Contact the Publisher, API Publishing Services, 1220 L Street, NW, Washington, DC 20005.

Copyright © 2013 American Petroleum Institute

Foreword

Nothing contained in any API publication is to be construed as granting any right, by implication or otherwise, for the manufacture, sale, or use of any method, apparatus, or product covered by letters patent. Neither should anything contained in the publication be construed as insuring anyone against liability for infringement of letters patent.

Shall: As used in a standard, “shall” denotes a minimum requirement in order to conform to the specification.

Should: As used in a standard, “should” denotes a recommendation or that which is advised but not required in order to conform to the specification.

This document was produced under API standardization procedures that ensure appropriate notification and participation in the developmental process and is designated as an API standard. Questions concerning the interpretation of the content of this publication or comments and questions concerning the procedures under which this publication was developed should be directed in writing to the Director of Standards, American Petroleum Institute, 1220 L Street, NW, Washington, DC 20005. Requests for permission to reproduce or translate all or any part of the material published herein should also be addressed to the director.

Generally, API standards are reviewed and revised, reaffirmed, or withdrawn at least every five years. A one-time extension of up to two years may be added to this review cycle. Status of the publication can be ascertained from the API Standards Department, telephone (202) 682-8000. A catalog of API publications and materials is published annually by API, 1220 L Street, NW, Washington, DC 20005.

Suggested revisions are invited and should be submitted to the Standards Department, API, 1220 L Street, NW, Washington, DC 20005, standards@api.org.

Currently in preview, click buy full version

Contents

	Page
1 Scope	1
1.1 Purpose	1
1.2 Applicability	1
2 Normative References	1
3 Terms and Definitions	3
4 Responsibilities and Duties	5
5 Personnel Qualification Requirements	5
6 Design	6
7 NDE Equipment and Calibration	6
7.1 Inventory	6
7.2 Calibration	6
8 Quality Control Records Requirements	6
8.1 General	6
8.2 Records Retention	7
9 NDE Processes, Equipment, and Qualification Requirements	7
9.1 General	7
9.2 Magnetic Particle Examination (MT)	7
9.3 Liquid Penetrant Examination (PT)	10
9.4 Ultrasonic Examination (UT)	14
9.5 Radiographic Examination (RT)	19
Bibliography	22
Tables	
1 Required Verification Intervals for Magnetic Particle Examination	7
2 Required Calibration Intervals for Magnetic Particle Examination	7
3 Requirements of a Magnetic Particle Examination Procedure	8
4 Required Calibration and Verification for Liquid Penetrant Examination	10
5 Requirements of a Liquid Penetrant Examination Procedure	11
6 Required Performance Tests and Frequency for Liquid Penetrant Systems	12
7 Calibration and Verification Requirements for Ultrasonic Examination Equipment	14
8 Requirements of an Ultrasonic Examination Procedure	16
9 Calibration and Verification Requirements for Radiographic Examination Equipment	18
10 Process Control Checks for Radiographic Examinations	20

Currently in preview, click buy full version

Nondestructive Examination Services for Equipment Used in the Petroleum and Natural Gas Industry

1 Scope

1.1 Purpose

This standard specifies requirements for the design, development, and qualification of nondestructive examination (NDE) methods used in the manufacture of equipment for the petroleum and natural gas industries.

1.2 Applicability

This is applicable to suppliers providing NDE services for equipment used in the oil and natural gas industries. The requirements of this standard apply to magnetic particle, liquid penetrant, radiography, and ultrasonic methods of NDE.

2 Normative References

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

API Specification Q1, *Specification for Quality Management System Requirements for Manufacturing Organizations for the Petroleum and Natural Gas Industry*

API Specification Q2, *Specification for Quality Management System Requirements for Service Supply Organizations for the Petroleum and Natural Gas Industries*

ASME Boiler and Pressure Vessel Code (BPVC) ¹, Section V: *Nondestructive Examination*

ANSI/ASNT CP-106 ², *Nondestructive Testing—Qualification and Certification of Personnel*

ASNT SNT-TC-1A, *Recommended Practice for Personnel Qualification and Certification in Nondestructive Testing*

ASTM E428 ³, *Standard Practice for Fabrication and Control of Metal, Other Than Aluminum, Reference Blocks Used in Ultrasonic Testing*

ASTM E1114, *Standard Test Method for Determining the Size of Iridium-192 Industrial Radiographic Sources*

ASTM E1165, *Standard Test Method for Measurement of Focal Spots of Industrial X-Ray Tubes by Pinhole Imaging*

ASTM E1318, *Standard Terminology for Nondestructive Examinations*

¹ ASME International, 3 Park Avenue, New York, New York 10016-5990, www.asme.org.

² American Society for Nondestructive Testing, 1711 Arlingate Lane, P.O. Box 28518, Columbus, Ohio 43228, www.asnt.org.

³ ASTM International, 100 Barr Harbor Drive, West Conshohocken, Pennsylvania 19428, www.astm.org.