Recommended Practices for Evaluation of Well Perforators

API RECOMMENDED PRACTICE 19B
SECOND EDITION, SEPTEMBER 2006

REAFFIRMED, APRIL 2011

ADDENDUM 1, APRIL 2014
ADDENDUM 2, DECEMBER 2014

AMERICAN PETROLEUM INSTITUTE

Recommended Practices for Evaluation of Well Perforators

Upstream Segment

API RECOMMENDED PRACTICE 19B
SECOND EDITION, SEPTEMBER 2006

REAFFIRMED, APRIL 2011

ADDENDUM 1, APRIL 2014
ADDENDUM 2, XXXX 2014

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 assure 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.

Classified areas may vary depending on the location, conditions, equipment, and substances involved in any given situation. Users of this Recommended Practice should consult with the appropriate authorities having jurisdiction.

Users of this Recommended Practice should not rely exclusively on the information contained in this document. Sound business, scientific, engineering, and safety judgment should be used in employing the information contained herein.

Information concerning safety and health risks and proper precautions with respect to particular materials and conditions should be obtained from the employer, the manufacturer or supplier of that material, or the material safety data sheet.

Where applicable, authorities having jurisdiction should be consulted.

Work sites and equipment operations may differ. Users are solely responsible for assessing their specific equipment and premises in determining the appropriateness of applying the Recommended Practice. At all times users should employ sound business, scientific, engineering, and judgment safety when using this Recommended Practice.

API is not undertaking to meet the duties of employers, manufacturers, or suppliers to warn and properly train and equip their employees, and other exposed, concerning health and safety risks and precautions, nor undertaking their obligations to comply with authorities having jurisdiction.

FOREWORD

This document is under the jurisdiction of the API Subcommittee on Completion Equipment.

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.

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, N.W., Washington, D.C. 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 and updated quarterly by API, 1220 L Street, N.W., Washington, D.C. 20005.

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

CONTENTS

CONTENTS

Recommended Practices for Evaluation of Well Perforators

0 Scope

0.1 GENERAL

This Recommended Practice describes standard procedures for evaluating the performance of perforating equipment so that representations of this performance may be made to the industry under a standard practice. This document supersedes all previously issued editions of API RP 43.

Sections 1 – 4 of this Recommended Practice provides means for evaluating perforating systems (multiple shot) in 4 ways:

1. Performance under ambient temperature and atmospheric pressure test conditions.
2. Performance in stressed Berea sandstone targets (simulated wellbore pressure test conditions).
3. How performance may be changed after exposure to elevated temperature conditions.
4. Flow performance of a perforation under specific stressed test conditions.

Section 5 of this Recommended Practice provides a procedure to quantify the amount of debris that comes out of a perforating gun during detonation. The purpose of this Recommended Practice is to specify the materials and methods used to evaluate objectively the performance of perforating systems or perforators.

0.2 IMPLEMENTATION

These procedures become effective as of the date of publication.

0.3 API REGISTERED PERFORATOR SYSTEMS

Information on API Registration of perforator systems can be found in Appendix A.

0.4 REPORTS AND ADVERTISEMENTS

Reports, articles, papers, periodicals, advertisements, or similar publications which refer to results from tests conducted according to API RP 19B must not be worded in a fashion to denote that the American Petroleum Institute either endorses the result cited or recommends or disapproves the use of the perforating system described.

Use of data obtained under API RP 19B tests in reports, articles, papers, periodicals, advertisements, or other published material shall include, as a minimum, all test configuration data not specified by API RP 19B or left to the verifying company's choosing by API RP 19B and the average measured results of the test.

1 Evaluation of Perforating Systems Under Surface Conditions, Concrete Targets

1.1 INTRODUCTION

The purpose of this section is to describe recommended practices for evaluating perforating systems using concrete targets under multiple shot, ambient temperature, and atmospheric pressure test conditions.

Penetration data recorded in API RP 19B Section 1 may not directly correlate to penetration downhole.

All Section 1 perforating system tests published shall be valid for a term of 5 years from the date of the test. After 5 years published system test can be recertified as described in 1.11 of this section.

1.2 TEST TARGET

The tests shall be conducted in a concrete target contained within a steel form as illustrated in Figure 1.