

Qualification of Suppliers of Machining Services for Use in the Petroleum and Natural Gas Industries

API STANDARD 20M
FIRST EDITION, OCTOBER 2017



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.

Users of this standard 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.

Any manufacturer marking equipment or materials in conformity with the marking requirements of an API standard is solely responsible for complying with all the applicable requirements of that standard, and this standard does not limit the responsibility of the manufacturer for ensuring compliance with all applicable requirements of that standard or any API certification program requirements. API does not represent, warrant, or guarantee that such products do, in fact, conform to the applicable API standard.

All rights reserved. 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 © 2017 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 patents.

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, 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, NW, Washington, D.C. 20005.

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

Contents

	Page
1 Scope	1
2 Normative References	1
3 Terms, Definitions, and Abbreviations	2
3.1 Terms and Definitions	2
3.2 Abbreviations	3
4 Machining Services Supplier Qualification.....	4
4.1 Minimum Requirements	4
4.2 Machining Quality Levels (MQL)	4
5 QMS Requirements	6
5.1 General.....	6
5.2 Personnel Competency Requirements	6
5.3 Equipment Maintenance.....	7
5.4 Testing, Measuring, and Monitoring Equipment	7
5.5 Document Control.....	9
5.6 Customer Property	9
5.7 Order Review	9
5.8 Identification and Traceability	10
5.9 Inspection Requirements	10
5.10 Preservation of Product	11
5.11 QMS Records.....	11
5.12 Continued Conformity of the QMS	12
6 Control of Suppliers	12
6.1 Control of MQL 1 Suppliers	12
6.2 Control of MQL 2 Suppliers	12
6.3 Control of MQL 3 Suppliers	12
7 Documentation	14
7.1 MQL 1 Documentation	14
7.2 MQL 2 Documentation	15
7.3 MQL 3 Documentation	16
Bibliography.....	18
Tables	
1 Quality Management System Requirements	6
2 Service Supplier Qualification Requirements	12

Introduction

API Standard 20M has been developed based on input from technical experts on machining services. The technical content has been established to accommodate the needs of the petroleum and natural gas industry.

This standard is not intended to inhibit a machining services supplier from offering, or the purchaser from accepting, alternative process or system solutions for the individual application.

Qualification of Suppliers of Machining Services for Use in the Petroleum and Natural Gas Industries

1 Scope

This API standard specifies requirements for the qualification of suppliers of machining services where API product standards require such services or are otherwise specified as a requirement for compliance. Compliance with this standard is not required to demonstrate compliance with any other API standard or specification.

This API standard establishes the requirements for three machining qualification levels (MQL 1, MQL 2, and MQL 3). These three MQL designations define different levels of quality and qualification requirements. These MQLs are numbered in increasing levels of requirements in order to reflect increasing quality and qualification criteria.

Final assembly, component testing (e.g. nondestructive examination, pressure testing) or a broker of machining services are outside the scope of this standard.

This standard applies when specified by the customer or voluntarily followed by the machining services supplier.

NOTE This standard does not limit the responsibility of any manufacturer of commercial products utilizing machined parts and manufactured to an API standard from its responsibility for compliance with all applicable requirements of that API standard.

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, 9th Edition, *Specification for Quality Management System Requirements for Manufacturing Organizations for the Petroleum and Natural Gas Industry*

API Standard 20D, *Nondestructive Examination Services for Equipment Used in the Petroleum and Natural Gas Industry*

API Standard 20H, *Heat Treatment Services—Batch Type for Equipment used in the Petroleum and Natural Gas Industry*

ANSI¹/NCSL Z540.3, *Requirements for the Calibration of Measuring and Test Equipment*

ISO 9001:2015², *Quality Management Systems, Requirements*

ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories*

1 American National Standards Institute, 25 West 43rd Street, 4th Floor, New York, New York 10036, www.ansi.org.

2 International Organization for Standardization, 1, ch. de la Voie-Creuse, Case postale 56, CH-1211 Geneva 20, Switzerland, www.iso.org.

ISO 17050-1, *Conformity assessment – Supplier's declaration of conformity – Part 1: General requirements*

3 Terms, Definitions, and Abbreviations

For purposes of this standard, the terms and definitions given in API Spec. Q1 and the following shall apply.

3.1 Terms and Definitions

3.1.1

acceptance criteria

Specified limits of acceptability applied to process or product characteristics.

3.1.2

broker

An organization that acts as an intermediary between two or more parties for machining services.

3.1.3

calibration status

A physical status indicator attached to or identified with the measurement or monitoring device indicating its current status of calibration.

3.1.4

coating

Application of a material to surfaces of a component where resulting conformance determination requires more than visual inspection.

NOTE Coating does not include painting for cosmetic purposes.

3.1.5

competence

The ability to apply knowledge and skills to achieve intended results.

3.1.6

conformity

Fulfillment of a requirement.

3.1.7

heat treatment

Specified, timed sequence of controlled heating and cooling of materials for the purpose of changing physical or mechanical properties.

3.1.8

machining services

A controlled material-removal process, such as cutting, electric discharge machining, electrochemical machining, grinding, honing, milling, turning, threading, and drilling.

3.1.9

on-site

The machining services supplier's facility.