

Guarding of Pumping Units

API RECOMMENDED PRACTICE 11ER
FOURTH EDITION, JULY 2022



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. The use of API publications is voluntary. In some cases, third parties or authorities having jurisdiction may choose to incorporate API standards by reference and may mandate compliance.

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 used. 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.

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, 200 Massachusetts Avenue, NW, Suite 1100, Washington, DC 20001-5571.

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.

The verbal forms used to express the provisions in this document are as follows.

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

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

May: As used in a standard, “may” denotes a course of action permissible within the limits of a standard.

Can: As used in a standard, “can” denotes a statement of possibility or capability.

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, 200 Massachusetts Avenue, NW, Suite 1100, Washington, DC 20001. 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, 200 Massachusetts Avenue, NW, Suite 1100, Washington, DC 20001.

Suggested revisions are invited and should be submitted to the Standards Department, API, 200 Massachusetts Avenue, NW, Suite 1100, Washington, DC 20001, standards@api.org.

Currently in preview, click buy full version

Contents

	Page
1 Scope.....	1
2 Normative References	1
3 Terms and Definitions	1
4 General	1
5 Types of Guarding to be Used on Pumping Unit	1
5.1 General	1
5.2 Enclosures and Guardrails	1
5.3 Location	2
6 Items to be Guarded	2
6.1 General	2
6.2 Sheaves and Belts	2
6.3 Cranks, Counterweights, and Air Counterbalance Tanks.....	2
6.4 Flywheels.....	2
6.5 Horsehead and Carrier Bar.....	2
7 Requirements for Guarding	2
7.1 Enclosures	2
7.2 Guardrails	5
7.3 Guarding by Location.....	6
8 Equivalent Safety.....	6
9 Caution Signs and Color Coding	6
9.1 General	6
9.2 Signs.....	6
9.3 Color Coding.....	6
10 Pumping Unit Brake.....	6
10.1 Accessibility	6
10.2 Brake Use.....	7
10.3 Securing.....	7
11 Ladders and Platforms.....	7
11.1 General	7
11.2 Design Requirements	7
11.3 Cage	8
11.4 Fall Arrest Systems.....	8
11.5 Landing Platforms.....	9
Annex A (informative) Examples of Guarding Equipment.....	10
Bibliography.....	19

Contents

	Page
Figures	
1 Distance to Moving Part Requirements for Enclosures	3
2 Measurement of Distance Requirements for Enclosures Listed in Figure 1	4
3 Method of Measuring Opening "A" in Figure 1	5
A.1 Example of Belt Guard	9
A.2 Example of Counterbalance Guard	11
A.3 Example of Flywheel Enclosure	12
A.4 Examples of Horsehead Guards	13
A.5 Example of Color Code Application	14
A.6 Rail Ladder with Bar Steel Rails and Round Steel Rungs	15
A.7 Clearance for Unavoidable Obstruction at Rear of Fixed Ladder	16
A.8 Offset Fixed Ladder Sections	17
A.9 Basket Guard Specifications	18

Guarding of Pumping Units

1 Scope

This recommended practice (RP) provides a reference or guide for the design, manufacture, and installation of guards for moving parts on pumping units. It is based on knowledge and experience gained through the application of guards for pumping units by the production segment of the petroleum industry.

2 Normative References

There are no referenced documents that are indispensable for the application of this document.

3 Terms and Definitions

There are no terms or definitions for this document.

4 General

This RP is intended to provide safeguards for all persons who are required to work around or on oil well pumping units.

These safeguards should prevent bodily injury from contact with moving parts by anyone inadvertently walking into, falling, slipping, tripping, or similar action. The safeguards should also prevent injury from reasonable or predictable breakage of any of the component parts.

Where unattended locations present close exposure to a community of people, safety barriers, such as provided by a totally enclosed and locked perimeter, may be required (see 7.3.4).

Pumping unit manufacturers shall provide instructions for identifying and isolating all energy sources and preventing any movement of the unit while maintenance activities are being performed.

It is the responsibility of the end user to identify and ensure that all local, state, and federal regulations specific to the pumping unit installation site are met. When there is conflict between requirements, the stricter of the two shall apply.

5 Types of Guarding to be Used on Pumping Unit

5.1 General

The general types of guarding include those listed as follows or combinations thereof.

5.2 Enclosures and Guardrails

Enclosures usually provide the greatest degree of protection against moving parts of mechanical equipment. Guardrails sometimes offer less effective protection than enclosures of proper dimension and the use of guardrails shall be confined to protecting against slow moving equipment such as cranks, counterweights, air vents, balance tanks, and horseheads. Both enclosures and guardrails should be strong enough to withstand the impacts and loadings imposed upon them without collapsing against the moving mechanism they protect against, and their dimensions should be within the limits prescribed in Section 7.