Recommended Practice for Railroad Transportation of Line Pipe

API RECOMMENDED PRACTICE 5L1
SEVENTH EDITION, SEPTEMBER 2009

REAFFIRMED, FEBRUARY 2024

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

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Introduction

API Recommended Practice (RP) 5L1 is under jurisdiction of the API Subcommittee on the Standardization of Tubular Goods. Line pipe shipped by rail is loaded either in gondola cars or on flatcars. In either case, the loading practice shall be designed to assure that pipe, when transported under normal conditions by all rail carriers involved, will arrive at the destination undamaged. These supplementary recommendations have resulted from experience of the shippers of line pipe showing that damage to pipe during rail shipments consists of the three principal types listed below.

a) End Damage—Pipe end damage can result from longitudinal shifting of the load into the end of the car body or the pipe pile on an adjacent car.

b) Abrasions or Peening—These result from rubbing or pounding action against some protrusion, such as weld reinforcement of adjacent pipe or a rivet head in the car bottom or side wall. This condition may also be followed by the initiation of fatigue cracks at the damaged areas during transit.

c) Longitudinal Fatigue Cracks—Longitudinal fatigue cracks can be initiated in the pipe by vertical vibrations and forces, repeated many times during long rail trips. These fatigue cracks are the result of a combination of static and cyclic stresses produced by the static load of upper layers of pipe and a cyclic load caused by the vertical movement of the transportation equipment. Fatigue cracks are often associated with local abrasion or denting but may arise with no apparent surface damage.

The seventh edition of this RP incorporates revisions in light of an identification of inaccuracies in the equations for static load stress, which were derived by numerical methods decades ago. These inaccuracies were discovered when finite element analysis methods were used to check the equations. API is working to update and revise these equations for a future edition. Notwithstanding these inaccuracies, there have been no confirmed transit fatigue failures reported in pipe loaded in accordance with previous editions of this document.

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1 Scope

1.1 General

The recommendations provided herein apply to the transportation on railcars of API 5L steel line pipe in sizes 2 3/8 and larger in lengths longer than single random. These recommendations cover coated or uncoated pipe, but they do not encompass loading practices designed to protect pipe coating from damage.

1.2 Basic Rules and Requirements

Certain minimum mandatory rules governing the loading practices are prescribed by the Association of American Railroads (AAR) as referenced in the next section.

The recommendations given herein are supplementary to the AAR loading practices. If any recommendations are in conflict with AAR loading practices, those of AAR shall govern.

NOTE If the AAR loading rules are not applicable to the railroad transportation of line pipe in the country of origin, the basic loading practice shall be as prescribed in the applicable nationally recognized loading rules and requirements for the type of railroad cars used in the country of origin and that document becomes the reference to which these supplementary recommendations apply.

These supplementary recommendations to AAR rules are for the convenience of purchasers and manufacturers in the loading and shipping of pipe and are not intended to inhibit purchasers and manufacturers from using other supplementary loading and shipping practices by mutual agreement.

2 References

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

API Specification 5L, *Specification for Line Pipe*

AAR [1], *General Rules Governing the Loading of Commodities on Open Top Cars*

AAR, *General Rules Governing the Loading of Pipe on Open Top Cars*

3 Acronyms, Abbreviations, and Symbols

D	specified outside diameter
GMAW	gas metal arc welding
OD	outside diameter
SAW	submerged arc welding
t	specified wall thickness

[1] Association of American Railroads, 50 F Street, NW, Washington, DC 20001, www.aar.org.