NACE SP0195-2017
Item No. 21009
Approved February 2, 2016

Corrosion Control of Sucker Rods by Chemical Treatment

ABSTRACT

This standard practice presents corrosion inhibition, wear reduction, and corrosion prevention techniques for use from the manufacturing of bare steel sucker rods and couplings through installation and service in the well. This standard addresses corrosion control for atmospheric conditions and downhole environments, treatment procedures, inhibitor selection, and evaluation of corrosion inhibitor programs. This standard is maintained by Task Group 492.

KEYWORDS

oil and gas, sucker rods, chemical treatment

ISBN 1-57590-122-6

Foreword

In NACE standards, the terms shall, must, should, and may are used in accordance with the definitions of these terms in the NACE Publications Style Manual. The terms shall and must are used to state a requirement, and are considered mandatory. The term should is used to state something good and is recommended, but is not considered mandatory. The term may is used to state something considered optional.

This standard practice presents corrosion inhibition and corrosion prevention techniques for use from the manufacturing of bare steel sucker rods and couplings through installation and service in the well. Although aluminum, fiberglass, coated sucker rods, and high-alloy sucker rods are not specifically addressed in this standard, many recommendations contained herein may be applied to such sucker rods and rods used in progressive cavity pumps (PCP), as appropriate, at the user's discretion. Throughout this standard, the words "sucker rod" or "rod" is used in the above described context and rods used by PCPs (generally continuous rods). Chemical treatment is one of the primary means of controlling corrosion in sucker rod in all forms of oil and gas production where beam lift and progressive cavity pumps are used.

This standard is intended for use by oil and gas producing companies, manufacturers of sucker rods, and companies involved in procurement, transportation, installation and removal and inspection of conventional and continuous sucker rods. This standard reflects the industry experience with the use of chemical treatments to control corrosion in all phases of sucker rod applications.

This standard was originally prepared as NACE Publication 1D167[1] by NACE Task Group T-1D-3 for inclusion in API[(1)] RP 11BR.[2] Beginning in 1988, it was updated for the revision of API RP 11BR by NACE Task Group T-1D-35, a component of Unit Committee T-1D on Corrosion Monitoring and Control of Corrosion Environments in Petroleum Production Operations for conversion to a standard practice, and this standard was originally issued in 1995. This standard was also balloted to and approved by API as Section 3 of API RP 11BR.[(2)] It was reaffirmed in 2001 and 2007 by Specific Technology Group (STG) 31, "Oil and Gas Production—Corrosion and Scale Inhibition." It was revised in 2016 by Task Group (TG) 492, "Review of NACE SP0195-2007." It is issued by NACE International under the auspices of STG 31.

[(1)] American Petroleum Institute (API), 1220 L Street NW, Washington, DC 20005-4070.
[(2)] This standard was developed by members of NACE International and API and also is part of API RP 11BR, which can be obtained from API.

Corrosion Control of Sucker Rods by Chemical Treatment

Section 1: General

1.1 Corrosion can lead to serious multiple failures of oil well sucker-rod strings and other equipment. The use of chemical corrosion inhibitors has proved to be a cost-effective approach to minimize corrosion damage and to extend the life of the downhole equipment. This standard addresses corrosion control for atmospheric conditions and downhole environments, treatment procedures, inhibitor selection, and evaluation of corrosion inhibitor programs. Other factors to prevent failure of sucker-rod strings are addressed in API RP 11BR.

1.2 Corrosion inhibitors fall into many chemical classes that may be physical or health hazards. The handling precautions recommended by the manufacturer in the material safety data sheet (MSDS) shall be followed. In all cases, protection of the environment shall be considered.

1.3 In all operations discussed in this standard, corrosion inhibition is enhanced when sucker rod and coupling surfaces are free of scales and deposits.

1.4 Care shall be taken to prevent air entry into the well to avoid oxygen-accelerated corrosion. Air entry can occur if casing vents are left open to the atmosphere or as a result of a failure of the stuffing box or corrosion of the polished rod.

Section 2: Atmospheric Corrosion Control During Transportation and Storage

2.1 A hydrocarbon-removable coating (HRC)[3] such as an atmospheric corrosion inhibitor or a temporary protective coating shall be used to prevent corrosion damage to sucker rods at manufacturing sites and while in the storage facilities of the vendor or final user before they are placed in service. This coating shall be applied before transportation of the sucker rods and the integrity of the coating shall be maintained through the transportation and storage of the rods. HRC may also be used to minimize atmospheric corrosion during field service of the sucker rods.

2.2 The manufacturer shall provide sucker rods and couplings free of mill scale and with a HRC applied to all exposed surfaces. The HRC shall be adequate and its selection previously agreed upon with the user to provide protection against corrosion for a minimum of one year under humid atmospheric conditions at the storage site.[4] Acceptable HRCs shall be readily removable using hydrocarbon solvents. HRCs that do not obscure manufacturer markings are preferred.

2.3 The vendor, supplier, or company agent shall inspect shipments and warehouse stocks of sucker rods and couplings for visible signs of physical damage and corrosive attack. The vendor also shall take necessary action to clean rust spots and repair damage to the HRC.

2.4 The purchaser shall inspect sucker rods and couplings upon receipt for physical damage and corrosion attack. The purchaser shall also make periodic inspections of the sucker rods and couplings and maintain the HRC integrity during storage.

[3] For the purposes of this standard, HRC refers to a material that is removed from the sucker-rod surface because it is soluble in produced hydrocarbon. The material is not necessarily formulated in a hydrocarbon solvent.
[4] Performance assessment methods are available from standards-writing organizations such as ASTM International (ASTM), 100 Barr Harbor Dr., West Conshohocken, PA 19428-2959.