TECHNICAL ADVISORY DOCUMENT TAD0072

API 652 Compliance - Linings

Introduction:

The American Petroleum Institute offers guidance on lining selection (API 652) and upon Inspection and Repair (API 653). These 2 guidance documents are of most relevance to Paint Suppliers and customers wishing to use linings to, potentially, extend inspection intervals.

This document is intended to review the API documents and how ~~Nova Plate 360 is~~ Sherwin-Williams linings are compliant.

API Standards referenced in this Bulletin:

1. API 652 FOURTH EDITION SEPTEMBER 2014 (ERRATA 1 2016)
2. API STANDARD 653 FIFTH EDITION, NOVEMBER 2014

Review of Standards

1. API 652 FOURTH EDITION SEPTEMBER 2014 (ERRATA 1 2016)

   API 652 covers the following

   a. Sources of corrosion
   b. Lining selection (and the importance of specifying based on the actual operating conditions – not generic)
   c. Types of lining (thin film [<20 mils], thick film [>20 mils] and reinforced linings)
   d. Importance of surface preparation
   e. Importance of application and inspection

   Section 6.4 references the ability of single FRP laminates to bridge perforations up to 8 inches (203mm) with a pressure of 37psi. Furthermore, this section identifies that newer flake and fibre reinforced thick film systems may be applied in a single layer from 20-150 mils dft and that when applied at 50-60 mils that these can bridge perforations up to 2 inch in diameter with a pressure of 30psi.

2. API STANDARD 653 FIFTH EDITION, NOVEMBER 2014

   API 653 is related to all aspects of Tank Inspection, Repair, Alteration and Reconstruction. The sections in API 653 which are relevant to linings are where the lining has an influence on the required (or minimum) inspection interval:

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a. The initial inspection interval (section 6.4.2.1) shall not exceed 10 years unless a tank has safeguards in place. Thin Film linings (as defined in API 652) will allow this to be extended by 2 years and a Reinforced Lining by 5 years. (Table 6.1)

b. The subsequent inspection interval (beyond the initial inspection) can be determined using a risk managed inspection protocol. API allows a minimum corrosion tolerance of 0.1 inches when there is a thin film lining in place and 0.05 inches when a thick film lining is applied. (Note API 653 has no allowance for perforations)

   When using the corrosion rate procedures of 6.4.2.2.1 the maximum subsequent internal inspection interval shall be 20 years for tanks (this may be increased to 30 years for tanks with a Release Prevention Barrier)

Sherwin-Williams' linings in accordance with API 652 definitions

Thin Film (<500µm)	**Thick Film (>500µm)**	**Thick Film Reinforced**
Phenicon HS (2 coats)	Dura-Plate UHS (1 Coat)	Dura-Plate UHS (Chopped Glass fibre reinforcement)
Epo-Phen HS (2 Coats)	Nova-Plate UHS (1 Coat)	Nova-Plate 360 (Internal flake reinforcement)
Dura-Plate UHS (1 Coat)	Nova-Plate 360 (1 Coat)	
Nova-Plate UHS (1 Coat)		
Nova-Plate 360 (1 Coat)		

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