

**Proposition 65
Preliminary Compliance
Assessment
(Phase I)**

**For:
Dura Plastic Products, Inc.
533 East Third Street
Beaumont, CA 92223**



FINAL REPORT

**Prepared by:
Kelly A Magurany, M.Sc., DABT
Toxicology Services Department
NSF International (www.nsf.org)
Ann Arbor, MI, USA**

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Executive Summary

NSF International (“NSF”) conducted a desk review of the formulation and available NSF internal testing information for Dura Plastic Products, Inc. (“Dura Plastic”) pipe fittings against the Safe Drinking Water and Toxic Enforcement Act of 1986 (California Proposition 65) Chemical List (“Prop 65”). This review considered the available formulary information for certified products, test data, supplier documentation (where available), and published chemical compositional and impurity information. This information was used to identify the presence of any known or anticipated Prop 65 chemicals to determine further testing and/or an exposure assessment, where necessary, to inform warning obligations under the regulation. As concentration and exposure must be taken into consideration in determining compliance with Prop 65, NSF does not take a position as to the compliance status of these products at this time. The findings of this review for the Dura Plastic products and recommended testing is reported as follows in Table 1. Further details regarding the recommendations may be found in Table 5 below.

Table 1. Prop 65 Chemicals Associated with Dura Plastic Products

Prop 65 Listed Ingredients			
Product(s)	Chemical	Source	Prop 65 Relevance
PM01886	Carbon black	Ingredients	Applicable only to airborne particles of respirable size. No obligation for warning anticipated for these products.
PM01886, PM08819	Titanium dioxide		
PM01886	Crystalline silica		
Prop 65 Listed Impurities			
Product(s)	Chemical	Source	Prop 65 Relevance
PM01886, PM08819	Chloroform	Detected in NSF Internal Testing	Not anticipated to be present in product components. Further testing not recommended.
	Chloromethane (Methyl chloride)		Headspace and wipe testing is recommended.
	Butyl benzyl phthalate		Phthalate class (as listed per Prop 65) Wipe testing is recommended.
	Vinyl chloride	Potential Impurity based on Review of Composition	PVC monomer. Headspace and wipe testing is recommended.
	Bisphenol A		Commonly litigated Prop 65 plasticizer may be used in PVC. Wipe testing is recommended.
	Lead, cadmium, arsenic		Common impurities in PVC constituents. Wipe testing is recommended.
	1,3-butadiene		Monomer in PVC and CPVC modifiers. Headspace and wipe testing is recommended based on history of detection in plastics (US EPA, 2009b).
	Styrene		Monomer in CPVC & PVC modifiers. Wipe testing is recommended.
PM01886	Acrylonitrile		Monomers in PVC modifiers. Wipe testing is recommended.
	Ethyl acrylate	Wipe testing is recommended.	
PM01886, PM08819	Chlorinated paraffins, CAS# 108171-26-2		May be impurities in PVC constituents. Wipe testing is recommended.
	Polyaromatic hydrocarbons		

Introduction

For those manufacturers selling product(s) into the State of California, the Safe Drinking Water and Toxics Enforcement Act of 1986 (otherwise known as Proposition 65) requires that a “clear and reasonable” disclosure of chemicals known to the state to be carcinogens or reproductive toxicants (where at least one chemical per endpoint is named) be indicated on the product, its packaging, or associated marketing materials prior to exposure to the citizens of the state. Such a “warning” allows for a manufacturer to maintain Safe Harbor under the regulation, thus reducing the risk of enforcement through litigation. Exclusion from warning requires a determination that the product(s) does not contain listed chemicals or that any exposure to a listed chemical is below Safe Harbor limits, where available. To determine compliance to Proposition 65 regulations, an understanding of the presence of listed chemicals in the products is required.

NSF International was contracted by Dura Plastic Products, Inc., to conduct a Proposition 65 assessment of the following plumbing products:

Table 2. Dura Plastic Products

Product Type	Tradename	Facility	NSF DCC#
PVC Fittings	Dura Plastic Pipe Fittings (1/8 – 12”)	All	PM01886
	Manifold Tee, SPG X S X FPT (1”)		
	Manifold Tee, SPG X S X MPT (3/4-1”)		
CPVC Fittings	Dura (1/2-1”)	All	PM08819

The scope of the initial review included a compositional evaluation of the products and individual chemical ingredients of the formulation used to manufacture the product against the Prop 65 Chemical List. The formulation review also considered known contaminants associated with the specific material or ingredient based on a review of the published literature. For mixtures or materials for which NSF did not have formulary level information, an online search was conducted to identify possible formulation details or statements of regulatory compliance (supplier documentation was leveraged where available). Lastly, the review assessed recent certification test results to NSF 61 against the Prop 65 Chemical List.

It is important to note that the scope of the assessment includes the plumbing fittings as handled, and not any associated packaging materials. If product packaging is relevant for these products, the client may want to consider inclusion in a subsequent Prop 65 assessment.

Literature Sources

This review was conducted using raw material and formulation information provided by the client, components suppliers, and various online data sources or databases that may include (but are not limited to) the European Chemicals Agency (ECHA), U.S. Consumer Product Safety Commission (CPSC), U.S. Food and Drug Administration (FDA), U.S. Environmental Protection Agency (EPA), National Toxicology Program (NTP), International Agency for Research on Cancer

(IARC), the World Health Organization, TOXNET, and related resources from the U.S. National Library of Medicine. References are maintained on file at the NSF International Archives/Server. Physical property data, specifically chemical volatility (expressed according to vapor pressure) and water solubility, were investigated where necessary using these resources.

Product Information

Overview

Dura Plastic products are rigid polyvinyl chloride or chlorinated polyvinyl chloride plastic fittings that are formulations with polymer resins, modifiers, processing additives, stabilizers, pigments, etc.

These fittings may be used broadly to plumb drinking water service to commercial and residential locations.

Product Components

Dura Plastic products are formulated PVC or CPVC fittings design to impart high quality performance and low hazard within drinking water applications. Product parts lists for wetted components are as follows in Tables 3-4. Further compositional details on these parts were available to NSF International and assessed as part of this review; however, as component compositions are considered proprietary they are not further disclosed within this assessment. These products are considered homogenous, i.e. external non-wetted components or polymer layers are not present, and thus the following component lists represent the completed product compositions.

Table 3. PM01886 Component Parts List

NSF DCC#	Description	Part Tradename	Supplier
ES06042	PVC	210A Gray 172 (HS)	PolyOne Corporation
ES06042	PVC	M1010 White 1235	
ES06042	PVC	M1010 Gray 2700	
PL03913	PVC Fittings	M1000 Gray 2700	
PL03161	PVC Fittings	M5100 Beige 3190	
LA25752	PVC	M4110 Transparent 9492	
ES06042	PVC	210A Gray 172 (HS)	

Table 4. PM08819 Component Parts List

NSF DCC#	Description	Part Tradename	Supplier
PL01226	CPVC Fittings	Protherm 4526 Tan 01	GEORGIA GULF CHEMICALS AND VINYLs, LLC

Proposition 65 Formulation Review

The product formulations and annual test results under the scope of this proposal are those on file at NSF in support of their NSF Standard 61 listings. Held within the NSF file is also supplier level formulation information (where available).

As previously described, the approach consisted of a review and report of the available formulary information against the Prop 65 Chemical List, including supplier detail (confidential formulary information from suppliers was reviewed but is not disclosed). The formulation review also considered known contaminants associated with the specific material or ingredient. For mixtures or materials for which NSF does not have formulary level information, an online search was conducted to identify possible formulation detail. Lastly, the review also assessed recent certification test results to NSF 61 against the Prop 65 Chemical List.

The Prop 65 Chemical List was obtained online from the California Office of Environmental Health Hazard Assessment (OEHHA). The Prop 65 Chemical List used in this report was dated December 29, 2017.

<https://oehha.ca.gov/proposition-65/proposition-65-list>

Outside of the review of prior annual NSF Standard 61 test reports, there are no additional laboratory testing data available.

Chemicals identified within the formulation (whether ingredient or contaminant) that are listed in the Prop 65 Chemical List, were identified based on a three-tiered assessment:

1) Formulary ingredients directly listed on the Proposition 65 List

Each ingredient of the product according to the compositions and component formulation available within NSF/ANSI 61 programs or provided by the client was reviewed on a CAS# basis against the proposition 65 list to determine whether any ingredient was directly listed. Any listed ingredient was further assessed as to the relevance of the listing considering implicated routes of exposure, chemical form, etc.

2) Listed chemicals identified through water extraction testing for wetted components (NSF/ANSI 61)

The Dura Plastic products are certified to Section 4 requirements of NSF/ANSI 61. As a component of this certification, end products and/or associated components are tested for water extractants in accordance with those requirements set forth in the standard. The specific analysis that is performed on each product or component is formulation dependent. For PVC and CPVC fittings the testing includes regulated metals, phenolics, volatile organic compounds, tin, antimony, and residual vinyl chloride monomer (specific chemistries are further defined within NSF/ANSI 61). As products that are listed to NSF/ANSI 61 for production of drinking water are consistent with California OEHHA requirements for drinking water (see 17 CCR §64591. Indirect Additives), and where Proposition 65 regulations exempt listed chemical exposure from drinking water per the following,

27 CCR § 25502:

"... (a) A person otherwise responsible for an exposure to a listed chemical which involves the use of drinking water... does not "expose" an individual within the meaning of Section 25249.6 of the Act to the extent that the person can show that the listed chemical was contained in drinking water which was received from...

... (3) a source of drinking water in compliance with all applicable primary drinking water standards for all listed chemicals and the chemical in question is the result of treatment of the water in order to achieve compliance with primary drinking water standards...

extraction testing results for drinking water treatment units, including pipe fittings, are not directly relevant for assessment of Proposition 65 product exposure (i.e. dermal, hand-to-mouth, and inhalation exposures per surface contact or off-gassing of impurities from the subject product are not represented). Further, testing protocols for NSF/ANSI 61 are not exhaustive of Prop 65 listed chemicals. Overall, analytical testing results under NSF/ANSI 61 are used as an indication of the presence of listed chemicals, but not a mechanism to determine warning obligations under the regulation.

NSF/ANSI 61 analytical test batteries include, but are not limited to the following with reference to PVC and CPVC products. Analytical test results for products and components are included in Appendix A.

- C2023- BASE/NEUTRAL/ACID EPA METHOD 625 Scan for Tentatively Identified Compounds (TICs)
- C2024- Semi-volatile Compounds, Base/Neutral/Acid Target 625, Data Workup
- C4400- Vinyl chloride residual (NSF Method)
- C0743- Acrylonitrile, Acetates, and Acrylates by VOC GCMS
- C1248- Volatile Organic Compounds (US EPA 524.2)
- C1249- 1,3-butadiene (Modified US EPA 524.2)
- C4022- Acrylic acid, LC/UV
- C4267- Methacrylic acid, LC/UV
- C3032- Aluminum in Drinking Water by ICPMS (US EPA 200.8)
- C3035- Total Arsenic in Drinking Water by ICPMS (US EPA 200.8)
- C3038- Barium in Drinking Water by ICPMS (US EPA 200.8)
- C3041- Beryllium in Drinking Water by ICPMS (US EPA 200.8)
- C3043- Bismuth in Drinking Water by ICPMS (US EPA 200.8)
- C3046- Cadmium in Drinking Water by ICPMS (US EPA 200.8)
- C3052- Chromium in Drinking Water by ICPMS (US EPA 200.8)
- C3058- Copper in Drinking Water by ICPMS (US EPA 200.8)
- C3071- Mercury in Drinking Water by ICPMS (US EPA 200.8)
- C3095- Nickel in Drinking Water by ICPMS (US EPA 200.8)
- C3100- Lead in Drinking Water by ICPMS (US EPA 200.8)
- C3113- Antimony in Drinking Water by ICPMS (US EPA 200.8)
- C3115- Selenium in Drinking Water by ICPMS (US EPA 200.8)
- C3121- Tin in Drinking Water by ICPMS (US EPA 200.8)
- C3127- Thallium in Drinking Water by ICPMS (US EPA 200.8)

- C3122- Strontium in Drinking Water by ICPMS (US EPA 200.8)
- C3127- Thallium in Drinking Water by ICPMS (US EPA 200.8)
- C3135- Zinc in Drinking Water by ICPMS (US EPA 200.8)
- C6430- Silver in Drinking Water by ICPMS (US EPA 200.8)

3) Listed chemicals anticipated as impurities of component ingredients based on supplier documentation, published literature, and known starting materials identified through online resources (this is an extension of NSF/ANSI 61).

The process for this part of the assessment is that of an investigation to identify anticipated components in the absence of further supplier documented Proposition 65 disclosures. Listed chemicals were identified through ingredient composition, supplier documentation (where available, e.g. the SDS), and online resources. Quantitative values relevant for Dura Plastic Products, Inc., products were not identified.

Product Component Listed Chemical Status

The known or anticipated presence of Prop 65 listed chemicals identified on a component basis are as follows. The relevant Dura Plastic products for each component are identified as the relevant NSF DCC# per those listed in Table 2 (above). Relative risks for presence of these compounds in the finished product and next steps on recommended testing are included. The analytical reports for Dura Plastic owned products or components are included in Appendix A. All other test results are considered proprietary. Relevant listed chemical detections are noted in Table 5.

Table 5. Product & Component Proposition 65 Chemical Assessment & Testing Recommendation

Potential Listed Chemical	Source	Testing Recommendation
PM01886, PVC Fitting		
Chloroform	<u>NSF Internal Test Reports:</u> A-00232030; A-00273772	Detected at 0.7 µg/L in one water sample and 0.4 µg/L in another normalized water sample. Anticipated to be reaction product of chlorinated water used for NSF/ANSI 61 extraction with pipe components. Not anticipated to be present in product components. Further testing not recommended.
Vinyl chloride	<u>Potential impurity based on composition:</u> Starting monomer of PVC	Vinyl chloride (VC) was not detected in an exhaustive extraction of the fitting at a detection limit of 0.5 mg/kg of pipe. VC is a highly volatile organic compound (2980 mm Hg @25 °C) and is known to be present as an impurity in PVC resin. As such, headspace and wipe testing is recommended to demonstrate exposure at detection limits relevant to Prop 65 exposures of < 3 µg/day, the current Prop 65 NSRL.
Bisphenol A	<u>Potential impurity based on composition:</u> Potential plasticizer in PVC or PVC modifiers	Commonly applied plasticizer relevant to PVC (COWI, 2013). Although not specified in the product formulation and considered low risk as it relates exposure to Safe Harbor limits, it is commonly litigated and thus a potential risk where not disclosed by component suppliers. Wipe testing recommended.
Phthalates	<u>Potential impurity based on composition:</u> May be a contaminant of the PVC polymer	Although rigid plastics are not expected to contain phthalates, risk for cross contamination during manufacture may result in contamination due to common use in PVC (see BBP detection for PL01126 below). As a commonly litigated chemical class, wipe testing is recommended

Potential Listed Chemical	Source	Testing Recommendation
Lead, cadmium, arsenic	<u>Potential impurity based on composition:</u> Potential impurities of pipe constituents	Common impurities of PVC constituents. Recommended for wipe testing
PM01886 Parts: ES0642, PL03913 (PVC Fittings)		
Carbon Black	<u>Ingredient:</u> Directly added as pigment	Applicable only to airborne particles of respirable size. No obligation for warning anticipated for these products.
Titanium dioxide	<u>Ingredient:</u> Directly added as whitener and opacifier	Applicable only to airborne, unbound particles of respirable size. No obligation for warning anticipated for these products.
Crystalline silica	<u>Ingredient:</u> Identified in composition of process additive	Applicable only to airborne, particles of respirable size. No obligation for warning anticipated for these products.
Vinyl chloride	<u>Potential impurity based on composition:</u> Starting monomer of PVC	Vinyl chloride (VC) was not detected in an exhaustive extraction of the fitting at a detection limit of 0.5 mg/kg of pipe. VC is a highly volatile organic compound (2980 mm Hg @25 °C) and is known to be present as an impurity in PVC resin. As such, headspace and wipe testing is recommended to demonstrate exposure at detection limits relevant to Prop 65 exposures of < 3 µg/day, the current Prop 65 NSRL.
1,3-Butadiene	<u>Potential impurity based on composition:</u> Starting monomer of polymeric constituent	Present as an impurity of a PVC modifier that is contained in the PVC formulation at up to 3% by weight. Highly volatile gas at room temperature (vapor pressure = 2,052 mm Hg@ 25 °C). Would be expected to be lost during the curing process of the pipe, however residue may be present. It was not detected in water extraction testing despite water solubility of 735 mg/L @ 20 °C (i.e., if present would extract) and a detection limit of 0.2 µg/L. Considered low risk, however headspace and wipe testing is recommended based on history of detection in plastics (US EPA, 2009b) and to support a no warning position for Prop 65.
Styrene	<u>Potential impurity based on composition:</u> Starting monomer of polymeric constituent	Styrene is a monomeric starting material in several process additives and PVC modifiers present up to 9% of the PVC formulation. Styrene is of low volatility (6.40 mm Hg@ 25 °C) is water soluble to 300 mg/L @ 25 °C, but was not identified in extraction testing. Considered low risk with respect to exposure near Safe Harbor limits; however to support a no warning conclusion, recommended for wipe testing.
Acrylonitrile	<u>Potential impurity based on composition:</u> Starting monomer of polymeric constituent	Acrylonitrile is a monomeric starting material of moderate volatility (109 mm Hg@ 25 °C) that may be found in pipe constituents (process aids) at up to 6% of the PVC formulation. Acrylonitrile is water soluble to 7.45 x 10 ⁴ mg/L @ 25 °C, but was not identified in extraction testing. Considered low risk with respect to exposure near Safe Harbor limits; however to support a no warning conclusion, recommended for wipe testing.
Ethyl acrylate	<u>Potential impurity based on composition:</u> Starting monomer of polymeric constituent	Ethyl acrylate is a monomeric starting material of moderate volatility (38.6 mm Hg@ 25 °C) that may be found in pipe constituents (process aids) at up to 6% of the formulation. Ethyl acrylate is water soluble to 1.5 x 10 ⁴ mg/L @ 25 °C, but was not identified in extraction testing. Considered low risk with respect to exposure near Safe Harbor limits; however to support a no warning conclusion, recommended for wipe testing.

Potential Listed Chemical	Source	Testing Recommendation
Lead, cadmium, arsenic	<u>Potential impurity based on composition:</u> Potential impurities of pipe constituents	Common impurities of PVC constituents. Recommend for wipe testing
Chlorinated Paraffins, CAS# 108171-26-2	<u>Potential impurity based on composition:</u> Potential component of paraffin waxes used in PVC formulation	Generally, low volatility and limited water solubility. Per US EPA (2009) chlorinated paraffins are a common component of PVC plastics generally as components of paraffin wax which is present at up to 1.25% of the PVC formulation. Chlorinated paraffins are capable of migration from PVC (COWI, 2013). Considered of low risk for detection at Safe Harbor limits, however to support a no warning conclusion, recommended for wipe testing.
Polyaromatic hydrocarbons	<u>Potential impurity based on composition:</u> May be an impurity of component ingredients (e.g. carbon black)	Low volatility, low water soluble compounds (representative compound, benzo(a)pyrene with vapor pressure of 5.49×10^{-9} mm Hg at 25 °C; water solubility- 1.62×10^{-3} mg/L at 25 °C). Water extraction testing may not adequately capture relative to potential dermal exposure (i.e., oily hands). Negligible levels are expected based on the low concentration of oil and pigment components of the product, however to support a no warning position, PAHs are recommended for wipe testing.
PM01886 Part: PL03161 (PVC Fitting)		
Carbon Black	<u>Ingredient:</u> Directly added as pigment	Applicable only to airborne particles of respirable size. No obligation for warning anticipated for these products.
Titanium dioxide	<u>Ingredient:</u> Directly added as whitener and opacifier	Applicable only to airborne, unbound particles of respirable size. No obligation for warning anticipated for these products.
Chloroform	<u>NSF Internal Test Reports:</u> J-00199236; A-00232475)	Detected at 0.8 µg/L in one water sample and 0.2 µg/L in another normalized water sample. Anticipated to be reaction product of chlorinated water used for NSF/ANSI 61 extraction with pipe components. Not anticipated to be present in product components. Further testing not recommended.
Chloro-methane (Methyl chloride)	<u>NSF Internal Test Reports:</u> J-00199236	Detected at 0.3 µg/L in one normalized water sample. May be an impurity of PVC. Highly volatile compound (vapor pressure = 4300 mm Hg @ 25 °C) with good water solubility (5040 mg/L @ 25 °C). Considered low risk as it relates exposure at Safe Harbor limits; however, headspace and wipe testing are recommended to support a no warning conclusion.
Vinyl chloride	<u>Potential impurity based on composition:</u> Starting monomer of PVC	Vinyl chloride (VC) was not detected in an exhaustive extraction of the fitting at a detection limit of 0.5 mg/kg of pipe. VC is a highly volatile organic compound (2980 mm Hg @25 °C) and is known to be present as an impurity in PVC resin. As such, headspace and wipe testing is recommended to demonstrate exposure at detection limits relevant to Prop 65 exposures of < 3 µg/day, the current Prop 65 NSRL.
Acrylonitrile	<u>Potential impurity based on composition:</u> Starting monomer of polymeric constituent	Acrylonitrile is a monomeric starting material of moderate volatility (109 mm Hg@ 25 °C) that may be found in pipe constituents (process aids). Acrylonitrile is water soluble to 7.45×10^4 mg/L @ 25 °C, but was not identified in extraction testing. Considered low risk with respect to exposure near Safe Harbor limits; however to support a no warning conclusion, recommended for wipe testing.

Potential Listed Chemical	Source	Testing Recommendation
Styrene	<u>Potential impurity based on composition:</u> Starting monomer of polymeric constituent	Styrene is a monomeric starting material in several process additives and PVC modifiers of the PVC formulation. Styrene is of low volatility (6.40 mm Hg@ 25 °C) is water soluble to 300 mg/L @ 25 °C, but was not identified in extraction testing. Considered low risk with respect to exposure near Safe Harbor limits; however to support a no warning conclusion, recommended for wipe testing.
Ethyl acrylate	<u>Potential impurity based on composition:</u> Starting monomer of polymeric constituent	Ethyl acrylate is a monomeric starting material of moderate volatility (38.6 mm Hg@ 25 °C) that may be found in pipe constituents (process aids). Ethyl acrylate is water soluble to 1.5×10^4 mg/L @ 25 °C, but was not identified in extraction testing. Considered low risk with respect to exposure near Safe Harbor limits; however to support a no warning conclusion, recommended for wipe testing.
Lead, cadmium, arsenic	<u>Potential impurity based on composition:</u> Potential impurities of pipe constituents	Common impurities of PVC constituents. Recommended for wipe testing
Cumene	<u>Potential impurity based on composition:</u> Known impurity of component cross-linker	Cumene is a relatively low volatility organic compound similar to styrene. It may be present as an impurity of a cross-linker present at 0.12% in PVC modifier component. Given the likely insignificant concentration, it is not recommended for testing.
PM01886 Part: IA25752 (PVC Fitting)		
Vinyl chloride	<u>Potential impurity based on composition:</u> Starting monomer of PVC	Vinyl chloride (VC) was not detected in an exhaustive extraction of the fitting at a detection limit of 0.5 mg/kg of pipe. VC is a highly volatile organic compound (2980 mm Hg @25 °C) and is known to be present as an impurity in PVC resin. As such, headspace and wipe testing is recommended to demonstrate exposure at detection limits relevant to Prop 65 exposures of < 3 µg/day, the current Prop 65 NSRL.
Acrylonitrile	<u>Potential impurity based on composition:</u> Starting monomer of polymeric constituent	Acrylonitrile is a monomeric starting material of moderate volatility (109 mm Hg@ 25 °C) that may be found in pipe constituents (process aids). Acrylonitrile is water soluble to 7.45×10^4 mg/L @ 25 °C, but was not identified in extraction testing. Considered low risk with respect to exposure near Safe Harbor limits; however to support a no warning conclusion, recommended for wipe testing.
Styrene	<u>Potential impurity based on composition:</u> Starting monomer of polymeric constituent	Styrene is a monomeric starting material in several process additives and PVC modifiers of the PVC formulation. Styrene is of low volatility (6.40 mm Hg@ 25 °C) is water soluble to 300 mg/L @ 25 °C, but was not identified in extraction testing. Considered low risk with respect to exposure near Safe Harbor limits; however to support a no warning conclusion, recommended for wipe testing
Ethyl acrylate	<u>Potential impurity based on composition:</u> Starting monomer of polymeric constituent	Ethyl acrylate is a monomeric starting material of moderate volatility (38.6 mm Hg@ 25 °C) that may be found in pipe constituents (process aids). Ethyl acrylate is water soluble to 1.5×10^4 mg/L @ 25 °C, but was not identified in extraction testing. Considered low risk with respect to exposure near Safe Harbor limits; however to support a no warning conclusion, recommended for wipe testing.

Potential Listed Chemical	Source	Testing Recommendation
1,3-Butadiene	<u>Potential impurity based on composition:</u> Starting monomer of polymeric constituent	Present as an impurity of a PVC modifier that is contained in the PVC formulation at < 5%. Highly volatile gas at room temperature (vapor pressure = 2,052 mm Hg @ 25 °C). Would be expected to be lost during the curing process of the pipe, however residue may be present. It was not detected in water extraction testing despite water solubility of 735 mg/L @ 20 °C (i.e., if present would extract) and a detection limit of 0.2 µg/L. Considered low risk, however headspace and wipe testing is recommended based on history of detection in plastics (US EPA, 2009b) and to support a no warning position for Prop 65.
Lead, cadmium, arsenic	<u>Potential impurity based on composition:</u> Potential impurities of pipe constituents	Common impurities of PVC constituents. Recommended for wipe testing
PM08819, CPVC Fitting		
Vinyl chloride	<u>Potential impurity based on composition:</u> Starting monomer of CPVC	Vinyl chloride (VC) was not detected in an exhaustive extraction of the fitting at a detection limit of 0.5 mg/kg of pipe. VC is a highly volatile organic compound (2980 mm Hg @ 25 °C) and is known to be present as an impurity in PVC resin. As such, headspace and wipe testing is recommended to demonstrate exposure at detection limits relevant to Prop 65 exposures of < 3 µg/day, the current Prop 65 NSRL.
Bisphenol A	<u>Potential impurity based on composition:</u> Potential plasticizer in PVC or PVC modifiers	Commonly applied plasticizer relevant to PVC (COWI, 2013). Although not specified in the product formulation and considered low risk as it relates exposure to Safe Harbor limits, it is commonly litigated and thus a potential risk where not disclosed by component suppliers. Wipe testing recommended.
Phthalates	<u>Potential impurity based on composition:</u> May be a contaminant of the PVC polymer	Although rigid plastics are not expected to contain phthalates, risk for cross contamination during manufacture may result in contamination due to common use in PVC (see BBP detection for PL01126 below). As a commonly litigated chemical class, wipe testing is recommended
Lead, cadmium, arsenic	<u>Potential impurity based on composition:</u> Potential impurities of pipe constituents	Common impurities of CPVC constituents. Recommend for wipe testing
PM08819 Part: PL01126 (CPVC Fitting)		
Titanium dioxide	<u>Ingredient:</u> Directly added as whitener and opacifier	Applicable only to airborne, unbound particles of respirable size. No obligation for warning anticipated for these products.
Chloroform	<u>NSF Internal Test Reports:</u> A-00232837	Detected at 0.4 µg/L in one normalized water sample. Anticipated to be reaction product of chlorinated water used for NSF/ANSI 61 extraction with pipe components. Not anticipated to be present in product components. Further testing not recommended.
Chloro-methane (Methyl chloride)	<u>NSF Internal Test Reports:</u> A-00191945; A-00232837	Detected at 0.12 µg/L and 0.065 µg/L in two separate normalized water samples. May be an impurity of PVC. Highly volatile compound (vapor pressure = 4300 mm Hg @ 25 °C) with good water solubility (5040 mg/L @ 25 °C). Considered low risk as it relates exposure at Safe Harbor limits; however, headspace and wipe testing are recommended to support a no warning conclusion.

Potential Listed Chemical	Source	Testing Recommendation
Butyl benzyl phthalate	NSF Internal Test Reports: A-00232837	Detected at 0.1 µg/L in one normalized water sample. This plasticizer was not disclosed by ingredient suppliers and is typically not used in rigid plastics although it is commonly used in PVC and may be a contamination during cross manufacture. As a commonly litigated chemical class, the full phthalate class (as listed per Prop 65) is recommended for testing.
Vinyl chloride	Potential impurity based on composition: Starting monomer of CPVC	Vinyl chloride (VC) was not detected in an exhaustive extraction of the fitting at a detection limit of 0.5 mg/kg of pipe. VC is a highly volatile organic compound (2980 mm Hg @25 °C) and is known to be present as an impurity in PVC resin. As such, headspace and wipe testing is recommended to demonstrate exposure at detection limits relevant to Prop 65 exposures of < 3 µg/day, the current Prop 65 NSRL.
Styrene	Potential impurity based on composition: Starting monomer of polymeric constituent	Styrene is a monomeric starting material in several process additives and PVC modifiers of the PVC formulation. Styrene is of low volatility (6.40 mm Hg@ 25 °C) is water soluble to 300 mg/L @ 25 °C, but was not identified in extraction testing. Considered low risk with respect to exposure near Safe Harbor limits; however to support a no warning conclusion, recommended for wipe testing
1,3-Butadiene	Potential impurity based on composition: Starting monomer of polymeric constituent	Present as an impurity of a PVC modifier that is contained in the PVC formulation at < 5%. Highly volatile gas at room temperature (vapor pressure = 2,052 mm Hg@ 25 °C). Would be expected to be lost during the curing process of the pipe, however residue may be present. It was not detected in water extraction testing despite water solubility of 735 mg/L @ 20 °C (i.e., if present would extract) and a detection limit of 0.2 µg/L. Considered low risk, however headspace and wipe testing is recommended based on history of detection in plastics (US EPA, 2009b) and to support a no warning position for Prop 65.
Lead, cadmium, arsenic	Potential impurity based on composition: Potential impurities of pipe constituents	Common impurities of CPVC constituents. Recommend for wipe testing
Polyaromatic hydrocarbons	Potential impurity based on composition: May be an impurity of component ingredients (e.g. carbon black)	Low volatility, low water soluble compounds (representative compound, benzo(a)pyrene with vapor pressure of 5.49X10 ⁻⁹ mm Hg at 25 °C; water solubility- 1.62X10 ⁻³ mg/L at 25 °C). Water extraction testing may not adequately capture relative to potential dermal exposure (i.e., oily hands). Negligible levels are expected based on the low concentration of oil and pigment components of the product, however to support a no warning position, PAHs are recommended for wipe testing.
Chlorinated Paraffins, CAS# 108171-26-2	Potential impurity based on composition: Potential component of paraffin waxes used in PVC formulation	Generally, low volatility and limited water solubility. Per US EPA (2009) chlorinated paraffins are a common component of PVC plastics generally as components of paraffin wax which is present at up to 1.25% of the PVC formulation. Chlorinated paraffins are capable of migration from PVC (COWI, 2013). Considered of low risk for detection at Safe Harbor limits, however to support a no warning conclusion, recommended for wipe testing.

Product testing recommendations were based on the assumption that use and maintenance of the fittings may result in handler exposure to all constituents (the products represents a homogenous mixture of PVC or CPVC constituents, such that any ingredient or impurity maybe present on the product surface). As such, the testing recommendation is considered conservative. Further evaluation of use and maintenance of the fittings may result in reduction in testing requirements based on lack of exposure to inner layer components or a lack of surface contaminant for identified contaminants. A summary of the recommended testing (on a per product basis) applying the most conservative approach is as follows:

NSF DCC# PM01886 (Dura Plastic Pipe Fittings, Manifold Tee SPG X S X FPT, Manifold Tee SPG X S X MPT)

1) Formulary ingredients directly listed on the Proposition 65 List

Recommended for testing:

None

Not recommended for testing:

Carbon black

Titanium dioxide

Crystalline silica

2) Listed chemicals identified through water extraction testing for wetted components

Recommended for headspace & wipe testing:

Chloromethane

Not recommended for testing:

Chloroform

3) Listed chemicals anticipated as impurities for component ingredients based on supplier documentation, published literature, and known starting materials identified through online resources.

Recommended for headspace analysis:

Vinyl chloride

1,3-Butadiene

Recommended for wipe testing:

Vinyl chloride

Bisphenol A

Butyl benzyl phthalate and broader phthalate class:

Prop 65 Listed Phthalate Chemical	CAS#
Butyl benzyl phthalate (BBP)	85-68-7
Di(2-ethylhexyl)phthalate (DEHP)	117-81-7
Di-isodecyl phthalate (DIDP)	68515-49-1/ 26761-40-0
Diisononyl phthalate (DINP)	28553-12-0/ 68515-48-0
Di- <i>n</i> -butyl phthalate (DBP)	84-74-2
Di- <i>n</i> -hexyl phthalate (DnHP)	84-75-3

Lead, cadmium, and arsenic

1,3-Butadiene

Styrene

Acrylonitrile

Ethyl acrylate

Chlorinated paraffins

Polyaromatic hydrocarbons

Not recommended for testing:

None

NSF DCC# PM08819 (Dura CPVC Fittings)

1) Formulary ingredients directly listed on the Proposition 65 List

Recommended for testing:

None

Not recommended for testing:

Carbon black

Titanium dioxide

Crystalline silica

2) Listed chemicals identified through water extraction testing for wetted components

Recommended for headspace & wipe testing:

Chloromethane

Not recommended for testing:

Chloroform

3) Listed chemicals anticipated as impurities for component ingredients based on supplier documentation, published literature, and known starting materials identified through online resources.

Recommended for headspace analysis:

Vinyl chloride
1,3-Butadiene

Recommended for wipe testing:

Vinyl chloride
Bisphenol A
Butyl benzyl phthalate and broader phthalate class:

Prop 65 Listed Phthalate Chemical	CAS#
Butyl benzyl phthalate (BBP)	85-68-7
Di(2-ethylhexyl)phthalate (DEHP)	117-81-7
Di-isodecyl phthalate (DIDP)	68515-49-1/ 26761-40-0
Diisononyl phthalate (DINP)	28553-12-0/ 68515-48-0
Di-n-butyl phthalate (DBP)	84-74-2
Di-n-hexyl phthalate (DnHP)	84-75-3

Lead, cadmium, and arsenic
1,3-Butadiene
Styrene
Chlorinated paraffins
Polyaromatic hydrocarbons

Not recommended for testing:

None

Conclusions

The present desk review of the formulation and testing information held by NSF for Dura Plastic Products, Inc. plumbing fittings identified several known and potential contaminants/ingredients that are listed on the Prop 65 Chemical List (see Tables 1 and 5 above). These compounds were identified based on the currently available internal and external test data and compositional documentation for products and components and therefore represents a comprehensive review. Further information provided by component suppliers who are knowledgeable regarding specific chemical reaction by-products, raw materials, and impurities of their components, such as may be disclosed within a Proposition 65 disclosure document, may further refine this assessment.

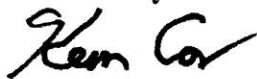
As concentration and exposure must be taken into consideration in determining compliance with Prop 65, NSF does not take a position as to the compliance status of these products at this time. In addition, the scope of this assessment includes the subject plumbing fittings and not any associated packaging material. Per the foregoing assessment, it is recommended that the client proceed with appropriate analytical testing to determine the resulting handler exposure from the expected use and maintenance for these products. From that point, an assessment of dermal, inhalation, and oral intake may be conducted based on the result of further testing to determine warning obligations, or lack thereof, under the regulation.

Prepared By:



Kelly A Magurany, M.Sc., DABT
Senior Research Toxicologist

Reviewed By:



Kevin Cox, MPH, JD
Managing Toxicologist

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