GREEN CHOICE PHILIPPINES

NELP-GCP 2023XXX
PVC PIPES AND FITTINGS

1. ENVIRONMENTAL SCENARIO

PVC or polyvinyl chloride, also known as polyvinyl or vinyl, is the world's third most widely produced synthetic polymer after polyethylene and propylene. (Putrawan, et. al., 2022) It comes in two basic forms — rigid or unplasticized, abbreviated to PVC-U, and flexible. In particular, PVC-U has a wide variety of uses in urban and rural water supply schemes, spray irrigation, deep tube wells and land drainage schemes.

Due to its corrosion- and abrasion-resistance, lack of taste and odor, and smooth interior surface, PVC is suitable for drinking water supply piping and waste water piping (PVC4Pipes, 2021). These pipes are not damaged by special equipment used for clearing blocked pipes and are resistant to damage from sharp-edged backfill materials.

PVC pipes can be used above or below ground for transport of various substances but are most commonly used for transporting water (New England Institute of Technology [NEIT], 2021). With a high strength to weight ratio, manufacturers can use less material to achieve the same strength as other plastic and conventional pipe materials. Usually, a high head and friction loss will increase the pumping cost of a water distribution system. However, with the PVC pipes having smooth interior surfaces and larger diameter, the hydraulic friction is reduced which provides significant cutback in pumping costs and energy use (Sustainable Solutions, 2017).

Additionally, the material allows long sections of pipes to be made, minimizing the number of joints and subsequently reducing assembly costs. PVC pipes also have long-term durability in comparison to alternative piping materials, making PVC cost-effective and low maintenance.

This product criteria will be limited to rigid or unplasticized PVC pipes and fittings. More commonly known as PVC-Us, these pipes do not use plasticizers such as phthalates. Plasticizers are additives that increase the plasticity or decrease the viscosity of a material (Von Moody, 2004). Along with the product life cycle, this criteria also considers the product lifetime extension of PVC pipes and fittings.

2. DEFINITION OF TERMS

Abbreviations	Definition
DENR	Department of Environmental and Natural Resources
DTI BPS	Department of Trade and Industry – Bureau of Philippine Standards
EDC	Ethyl dichloride; Chlorinated carbons used to make VCM
PVC	Polyvinyl chloride; Produced from polymerization of VCM.

PVC-U	Unplasticized polyvinyl chloride; Thermoplastic material derived from common salt and fossil fuels
PNS	Philippine National Standards Contains list of standards for all products in the Philippines aimed to standardize activities and ensure manufacture, production, and distribution of quality products for the protection of the consumers
VCM	Vinyl chloride monomer; Also known as vinyl chloride or chloroethene. Main raw material for the production of PVC. A colorless, flammable gas in its natural state.

3. SCOPE

These criteria apply to unplasticized PVC or PVC-U pipes and fittings for potable, sewer, drain, waste or vent, drainage, conduit or ducting, and agriculture or irrigation applications manufactured from ethylene-based PVC resin used in exterior, interior, and underground construction systems. This means that no plasticizers such as phthalates are used during production.

4. GREEN CHOICE PHILIPPINES REQUIREMENTS

To carry the Green Choice Philippines Seal of Approval, a product must meet the following requirements.

4.1 Quality Criteria

CRITERIA	VALIDATION METHOD
4.1.1 Product Quality The product should conform to the most recent DTI-BPS standards on PVC pipes and fittings wherever applicable. a. PNS 65[1] Unplasticized polyvinyl chloride (PVC-U) pipes for potable water supply — Specification b. PNS 14[2] Unplasticized polyvinyl chloride (PVC-U) electrical conduit — Specification c. PNS 1950[3] Plastic piping systems for soil and waste discharge (low and high temperature) inside buildings — Unplasticized polyvinyl chloride (PVC-U)	The applicant shall submit data from recognized testing and calibration laboratories accredited by the DTI-Philippine Accreditation Bureau showing conformity of the products with the specified property standards or the corresponding standards (Philippine National Standards) as well as the DTI-BPS certificate.
4.1.2 Marking and Labelling Requirements The product shall be marked with an appropriate plastic resin identification code, “uPVC”, or “PVC-U”..	The applicant shall provide a product sample or prototype of its existing for visual inspection of actual marking or labels.
4.1.3 Additional Labelling Requirements Labels, markings, or stickers of the resin identification code or “uPVC” marking shall be made of the same material as the parts to which they are affixed. Any other marking and labelling shall not prohibit recycling. Labels and markings shall be visible.	The applicant shall provide a product sample or prototype of its existing for visual inspection of actual marking or labels.

[1] Philippine National Standards — PNS 65:2018
[2] Philippine National Standards — PNS 14:2019
[3] Philippine National Standards —PNS 1950: 2010

4.2 Environmental Criteria

CRITERIA	VALIDATION METHOD
4.2.1. Environmental Regulations The production, transport and disposal processes of the product shall meet applicable environmental requirements.	The applicant shall submit the applicable documents/proof listed: a. Republic Act No. 9275: Philippine Clean Water Act i. Discharge Permit ii. LLDA permit (if applicable) iii. Sewage treatment plants iv. Wastewater treatment facility b. Republic Act No. 8749: Philippine Clean Air Act of 1999 i. Gensets Permit-to-Operate (PTO) ii. PTO for other air pollution sources c. Republic Act No. 9003: Ecological Solid Waste Management Act of 2000 i. Waste management Plan or System d. Republic Act No. 6969: Toxic Substances & Hazardous & Nuclear Wastes Content i. Record on safety data and the pre-manufacture and pre-importation requirements. e. Presidential Decree No. 1586: Environmental Impact Statement System i. Environmental Compliance Certificate (ECC) / Certificate of Non-Coverage (CNC) ii. Self-Monitoring Report (SMR)/ Compliance Monitoring Report (CMR) iii. Pollution Control Officer f. Other equivalent international regulations
4.2.2 Source of VCM VCM should be manufactured from a non-mercury and non-acetylene process.	The applicant shall submit a declaration letter stating that the manufacturing process of VCM meets such requirements.
4.2.3 Hazardous Substances The product shall not contain the following: a. Arsenic b. Cadmium	The applicant shall submit a portfolio and statement in writing signed by the Chief Executive Officer or counterpart of the company and shall be accompanied by the relevant documentation, including relevant laboratory test results and/or material safety

CRITERIA	VALIDATION METHOD
c. Chromium d. Lead e. Mercury	data sheet (MSDS). Certification can be based on the PNS 65.
4.2.4 Manual for Installation, Use, Maintenance and Disposal The product shall have an instruction manual relating to the proper installation, use, maintenance, disassembly, disposal and recycling (if applicable) process that serves as a guide for the builders.	The applicant shall submit a sample of an instruction manual relating to installation, use, maintenance, disassembly, disposal and recycling process. In any case that other instructions are not specified regarding the product's life cycle from installation to recycling, the reason shall be indicated.
4.2.5 Take Back System	
4.2.6 Label As vinyl chloride monomer (VCM) is a primary raw material of the product, a label stating "DO NOT BURN" shall be included.	The applicant shall provide a product sample or prototype of its existing for visual inspection of actual marking or labels.

5. PERIOD OF VALIDITY

The product criteria is valid for three (3) years from the date of its approval unless otherwise revised or withdrawn by the NELP-GCP Board, if proven necessary at any period of time.

6. TECHNICAL COMMITTEE MEMBERS

Institution	Member and Alternative
DTI-BPS	Engr. Czerr Cruz
DOST-ITDI	Dr. Marissa Paglicawan Dr. Persia Ada N. de Yro
UP-Diliman	Dr. Terrence Tumolva
PHILGBC	Arch. Christopher de la Cruz Mr. John Reniel Englis
NAMPAP	Engr. Joenel Gallago
PRII	Ms. Marlene Arcenas Ms. Mary Rose Castro Ms. Kristel Franco

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