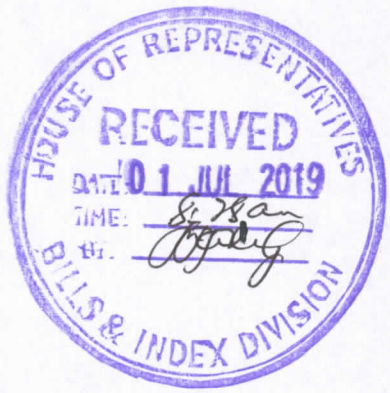

Republic of the Philippines
HOUSE OF REPRESENTATIVES
Quezon City

EIGHTEENTH CONGRESS
First Regular Session

House Bill No. 33

Introduced by **HON. ROZZANO RUFINO B. BIAZON**

EXPLANATORY NOTE

This bill seeks to mandate the labelling of plastic products according to the type of plastic resin used in such products. It also provides penalties for violations thereof.

The segregation of wastes before these are collected by garbage collectors may not be enough to lessen the impact of plastic products on our environment. It can be observed that despite the waste segregation schemes in the collection of garbage being employed by different local government units, many plastic products still end up on our waterways, rivers, seas and oceans.

Clearly, there is a need to put into place a system that would hasten the management and disposal of plastic products in order to minimize their harmful impact on the environment. The labelling of plastic products before they come out of the factories is envisioned to help achieve this objective. In this manner, it is hoped that post-consumer plastic products will be easier to sort according to what may be recycled and what may already be considered waste.

In view of the foregoing, the early passage of this bill is earnestly sought.

ROZZANO RUFINO B. BIAZON
Representative
Lone District, Muntinlupa City

Republic of the Philippines
HOUSE OF REPRESENTATIVES
Quezon City

EIGHTEENTH CONGRESS
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House Bill No. 33

Introduced by **HON. ROZZANO RUFINO B. BIAZON**

AN ACT
MANDATING THE LABELLING OF PLASTIC PRODUCTS ACCORDING TO THE TYPE OF PLASTIC RESIN USED IN SUCH PRODUCTS, PROVIDING PENALTIES FOR VIOLATIONS THEREOF AND FOR OTHER PURPOSES

Be it enacted by the Senate and House of Representatives of the Philippines in Congress assembled:

SECTION ONE. *Short Title.* – This Act shall be known as the *"Plastics Labelling Act of 2019."*

Sec. 2. *Declaration of Policy.* – It is hereby declared the policy of the State to protect the environment in order to achieve a sustainable future for its citizens. Towards this end, it shall come up with policies that shall promote the effective use of resources and materials through the principle of reducing waste, reusing and recycling resources and products.

Sec. 3. *Definition of Terms.* – As used in this Act:

a. *Bioplastics* are plastics derived from renewable biomass sources, such as vegetable fats and oils, corn starch, straw, woodchips and food waste among others. Bioplastic can be made from agricultural by-products and also from used plastic bottles and other containers using microorganisms. Common plastics, such as fossil-fuel plastics (also called petrobased polymers) are derived from petroleum or natural gas.

b. *Ethylene* is a hydrocarbon which has the formula C_2H_4 or $H_2C{=}CH_2$. It is a colorless flammable gas with a faint "sweet and musky" odour when pure. It is the simplest alkene (a hydrocarbon with carbon-carbon double bonds).

c. *High-density polyethylene* (HDPE) or *polyethylene high-density* (PEHD) is a thermoplastic polymer produced from the monomer ethylene. It is sometimes called "alkathene" or "polythene" when used for HDPE pipes.[1] With a high strength-to-density ratio, HDPE is used in the production of plastic bottles, corrosion-resistant piping, geomembranes and plastic lumber.

d. *Hydrocarbon* is an organic compound consisting entirely of hydrogen and carbon. Hydrocarbons are examples of group 14 hydrides. Hydrocarbons, from which, one hydrogen atom has been removed are functional groups called hydrocarbyls. Aromatic hydrocarbons (arenes), alkanes, cycloalkanes and alkyne-based compounds are different types of hydrocarbons.

e. *Linear low-density polyethylene* (LLDPE) is a substantially linear polymer (polyethylene), with significant numbers of short branches, commonly made by copolymerization of ethylene with longer-chain olefins. Linear low-density polyethylene differs structurally from conventional low-density polyethylene (LDPE) because of the absence of long chain branching. The linearity of LLDPE results from the different manufacturing processes of LLDPE and LDPE. In general, LLDPE is produced at lower temperatures and pressures by copolymerization of ethylene and such higher alpha-olefins as butene, hexene, or octene. The copolymerization process produces an LLDPE polymer that has a narrower molecular weight distribution than conventional LDPE and in combination with the linear structure, significantly different rheological properties.

f. *Low-density polyethylene* (LDPE) is a thermoplastic made from the monomer ethylene.

g. *Monomer* is a molecule that "can undergo polymerization thereby contributing constitutional units to the essential structure of a macromolecule". Large numbers of monomers combine to form polymers in a process called polymerization.

h. *Plastic* is a material consisting of any of a wide range of synthetic or semi-synthetic organic compounds that are malleable and so can be molded into solid objects.

i. *Polyethylene terephthalate*, sometimes written *poly(ethylene terephthalate)*, commonly abbreviated PET, PETE, or the obsolete PETP or PET-P, is the most common thermoplastic polymer resin of the polyester family and is used in fiber for clothing, containers for liquids and foods, thermoforming for manufacturing, and in combination with glass fiber for engineering resins.

j. *Polyester* is a category of polymers that contain the ester functional group in their main chain. As a specific material, it most common

k. *Polymer* refers to a molecule whose structure is composed of multiple repeating units, from which originates a characteristic of high relative molecular mass and attendant properties. The units composing polymers derive, actually or conceptually, from molecules of low relative molecular mass. Polymers range from familiar synthetic plastics such as polystyrene to natural biopolymers such as DNA and proteins that are fundamental to biological structure and function. Polymers, both natural and synthetic, are created via polymerization of many small molecules, known as monomers.

l. *Polypropylene* (PP), also known as *polypropene* is a thermoplastic polymer used in a wide variety of applications. It is produced via chain-growth polymerization bfrom the monomer propylene.

Polypropylene belongs to the group of polyolefins and is partially crystalline and non-polar. Its properties are similar to polyethylene, but it is slightly harder and more heat resistant. It is a white, mechanically rugged material and has a high chemical resistance.

m. *Polystyrene* (PS) is a synthetic aromatic hydrocarbon polymer made from the monomer styrene. Polystyrene can be solid or foamed. General-purpose polystyrene is clear, hard, and rather brittle. It is an inexpensive resin per unit weight. It is a rather poor barrier to oxygen and water vapour and has a relatively low melting point.

n. *Polyvinyl chloride* (PVC) is a tough, lightweight synthetic plastic polymer that is durable, fairly rigid and versatile, and is resistant to acids and bases. PVC comes in two basic forms: rigid (sometimes abbreviated as RPVC) and flexible. The rigid form of PVC is used in construction for pipe and in profile applications such as doors and windows. It is also used in making bottles, non-food packaging, food-covering sheets,[8] and cards (such as bank or membership cards). It can be made softer and more flexible by the addition of plasticizers, the most widely used being phthalates. In this form, it is also used in plumbing, electrical cable insulation, imitation leather, flooring, signage, phonograph records,[9] inflatable products, and many applications where it replaces rubber.[10] With cotton or linen, it is used to make canvas.

Pure polyvinyl chloride is a white, brittle solid. It is insoluble in alcohol but slightly soluble in tetrahydrofuran.

o. *Resin* is a solid or highly viscous substance of plant or synthetic origin that is typically convertible into polymers. Resins are usually mixtures of organic compounds.

p. *Styrene*, also known as *ethenylbenzene*, *vinylbenzene*, and *phenylethene*, is an organic compound with the chemical formula $C_6H_5CH=CH_2$. This derivative of benzene is a colorless oily liquid that evaporates easily and has a sweet smell, although high concentrations have a less pleasant odor. Styrene is the precursor to polystyrene and several copolymers.

q. *Thermoplastic*, or *thermosoftening plastic*, is a plastic polymer material that becomes pliable or moldable at a certain elevated temperature and solidifies upon cooling. The following are types of thermoplastics:

1. *Acrylic*, a polymer called polymethyl methacrylate (PMMA) serves as a sturdy substitute for glass for items such as aquariums, motorcycle helmet visors, aircraft windows, viewing ports of submersibles, and lenses of exterior lights of automobiles. It is extensively used to make signs, including lettering and logos. In medicine, it is used in bone cement and to replace eye lenses. Acrylic paint consists of PMMA particles suspended in water.

2. *Acrylonitrile butadiene styrene* (ABS) is a terpolymer synthesized from styrene and acrylonitrile in the presence of polybutadiene. ABS is a light-weight material that exhibits high impact resistance and mechanical toughness. It poses few risks to human health under normal handling. It is used in many consumer products, such as toys, appliances, and telephones.

3. *Nylon* belongs to a class of polymers called polyamides. It has served as a substitute mainly for hemp, cotton and silk, in products such as parachutes, cords, sails, flak vests and clothing. Nylon fibers are useful in making fabrics, rope, carpets and musical strings, whereas in bulk form, nylon is used for mechanical parts including

machine screws, gears and power tool casings. In addition, it is used in the manufacture of heat-resistant composite materials.

4. *Polybenzimidazole* (PBI, short for Poly-[2,2'-(m-phenylen)-5,5'-bisbenzimidazole]) fiber is a synthetic fiber with a very high melting point. It has exceptional thermal and chemical stability and does not readily ignite. It was first discovered by American polymer chemist Carl Shipp Marvel in the pursuit of new materials with superior stability, retention of stiffness, toughness at elevated temperature. Due to its high stability, Polybenzimidazole is used to fabricate high-performance protective apparel such as firefighter's gear, astronaut space suits, high temperature protective gloves, welders' apparel and aircraft wall fabrics. In recent years, polybenzimidazole found its application as membrane in fuel cells.

5. *Polycarbonates* (PC) are a group of thermoplastic polymers containing carbonate groups in their chemical structures. Polycarbonates used in engineering are strong, tough materials, and some grades are optically transparent. They are easily worked, molded, and thermoformed. Because of these properties, polycarbonates find many applications.

6. *Polyether sulfone* (PES) or *polysulfone* is a class of specially engineered thermoplastics[5] with high thermal, oxidative, and hydrolytic stability, and good resistance to aqueous mineral acids, alkalis, salt solutions, oils and greases.

7. *Polyoxymethylene* (POM), also known as *acetal*, *polyacetal* and *polyformaldehyde*, is an engineering thermoplastic used in precision parts requiring high stiffness, low friction, and excellent dimensional stability. As with many other synthetic polymers, it is produced by different chemical firms with slightly different formulas.

8. *Polyether ether ketone* (PEEK) is a colorless organic thermoplastic polymer in the polyaryletherketone (PAEK) family, used in engineering applications. It has attractive properties like good abrasion resistance, low flammability and emission of smoke and toxic gases.

9. *Polyetherimide* (PEI), produced by a novel nitro displacement reaction involving bisphenol A, 4, 4'-methylenedianiline and 3-nitrophthalic anhydride, has high heat distortion temperature, tensile strength and modulus. They are generally used in high performance electrical and electronic parts, microwave appliances, and under-the-hood automotive parts.

10. *Polyethylene* (polyethene, polythene, PE) is a family of similar materials categorized according to their density and molecular structure. It is also known as poly and is obtained by the addition polymerisation of ethylene.It may be of low density or high density depending upon the process used in its manufacturing. It is resistant to moisture and most of the chemicals. It is flexible at room temperature (and low temperature) and can be heat sealed. Since it is an inexpensive plastic it is made in large amounts to cater demand. For example:

i. Ultra-high-molecular-weight polyethylene (UHMWPE) is tough and resistant to chemicals. It is used to manufacture moving machine parts, bearings, gears, artificial joints and some bulletproof vests.

ii. High-density polyethylene (HDPE), recyclable plastic no. 2, is commonly used as milk jugs, liquid laundry detergent bottles, outdoor furniture, margarine tubs, portable gasoline cans, drinking water distribution systems, water drainage pipes, and grocery bags.

iii. Medium-density polyethylene (MDPE) is used for packaging film, sacks and gas pipes and fittings.

iv. Low-density polyethylene (LDPE) is flexible and is used in the manufacture of squeeze bottles, milk jug caps, retail store bags and linear low-density polyethylene (LLDPE) as stretch wrap in transporting and handling boxes of durable goods, and as the common household food covering.

11. *Polylactic acid* (polyactide) is a compostable thermoplastic aliphatic polyester derived from renewable resources such as corn starch, tapioca roots, chips or starch, or sugarcane. It is one of the materials used for 3D printing with fused deposition modelling (FDM) techniques.

12. *Polyphenylene oxide* (PPO), which is obtained from the free-radical, step-growth oxidative coupling polymerization of 2,6-xylenol, has many attractive properties such as high heat distortion and impact strength, chemical stability to mineral and organic acids, and low water absorption. PPO is difficult to process, and hence the commercial resin (Noryl) is made by blending PPO with high-impact polystyrene (HIPS), which serves to reduce the processing temperature.

13. *Polyphenylene sulfide* (PPS) obtained by the condensation polymerization of p-dichlorobenzene and sodium sulfide, has outstanding chemical resistance, good electrical properties, excellent flame retardance, low coefficient of friction and high transparency to microwave radiation. PPS is principally used in coating applications. This is done by spraying an aqueous slurry of PPS particles and heating to temperatures above 370 °C. Particular grades of PPS can be used in injection and compression molding at temperatures (300 to 370 °C) at which PPS particles soften and undergo apparent crosslinking. Principal applications of injection and compression molded PPS include cookware, bearings, and pump parts for service in various corrosive environments.

14. *Polypropylene* (PP) is useful for such diverse products as reusable plastic food containers, microwave- and dishwasher-safe plastic containers, diaper lining, sanitary pad lining and casing, ropes, carpets, plastic moldings, piping systems, car batteries, insulation for electrical cables and filters for gases and liquids. In medicine, it is used in hernia treatment and to make heat-resistant medical equipment. Polypropylene sheets are used for stationery folders and packaging and clear storage bins. Polypropylene is defined by the recyclable plastic number 5. Although relatively inert, it is vulnerable to ultraviolet radiation and can degrade considerably in direct sunlight. Polypropylene is not as impact-resistant as the

polyethylenes (HDPE, LDPE). It is also somewhat permeable to highly volatile gases and liquids.

15. *Polystyrene* is manufactured in various forms that have different applications. Extruded polystyrene (PS) is used in the manufacture of disposable cutlery, CD and DVD cases, plastic models of cars and boats, and smoke detector housings. Expanded polystyrene foam (EPS) is used in making insulation and packaging materials, such as the "peanuts" and molded foam used to cushion fragile products. Polystyrene copolymers are used in the manufacture of toys and product casings.

16. *Polyvinyl chloride* (PVC) is a tough, lightweight material that is durable, fairly rigid and versatile, and is resistant to acids and bases. Much of it is used by the construction industry, such as for vinyl siding, drainpipes, gutters and roofing sheets. It is also converted to flexible forms with the addition of plasticizers, thereby making it useful for items such as hoses, tubing, electrical insulation, coats, jackets and upholstery. Flexible PVC is also used in inflatable products, such as water beds and pool toys. PVC is also a common material in vinylaction figures, especially in countries such as Japan, where the material is used extensively in so-called Sofubi figures. As PVC bends easily and has a tendency to be bent during transit, a method to mitigate this deformation is to heat the plastic until it becomes mobile, then reform the material into the desired shape.

    PVC is produced in many specific modifications to affect its chemical and physical properties. In plasticized polyvinyl chloride (pPVC), plasticizers are added to the raw material before molding to make it more flexible or pliable. Early on, the health and environmental aspects of this were poorly understood and replacements and product bans resulted after studies. The original form is often referred to as unplasticized polyvinyl chloride (uPVC), which is the more commonly used type for installations such as water, waste, and sewer conveyance plumbing.

    Chemical modification often produces more drastic changes in properties. Chlorinated polyvinyl chloride (CPVC) is produced through exposing PVC to the continued free-radical chlorination reaction that originally formulates the PVC polymer. The chlorination reaction continues to add chlorine atoms to the polymer hydrocarbon backbone until most commercial applications reach a percent range between 56 to 74% total chlorine[6]. This increase in elemental chlorine content contributes to CPVC's increased expression of chlorine-based characteristics, such as chemical durability, resistance to acids, bases, and salts; susceptibility to ammonia-based compounds, aromatics, esters, ketones[7]; chemical stability; heat energy transfer resistance. CPVC is commonly used in water, chemical, hot and cold, delivery systems for residential, commercial, and industrial applications.

17. *Polyvinylidene fluoride*, PVDF, belongs to the fluoropolymer class of thermoplastics and is known for its high chemical inertness and resistance. PVDF is obtained through the polymerization of the vinylidene fluoride monomer. PVDF thermoplastic is fabricated into sheets and pipes for engineering uses as well as powders and coatings that can be dissolved in solvents and applied across a product surface. PVDF is widely used in the chemical industry as piping for aggressive

chemicals and high purity liquids. The PVDF material is used in construction, transportation, chemical processes, electricity, batteries, waste water and treatment.

18. *Polytetrafluoroethylene* (PTFE) is a synthetic fluoropolymer of tetrafluoroethylene is commonly recognized under the brand name Teflon. PTFE is hydrophobic: aqueous liquids do not wet the material, as fluorocarbons demonstrate mitigated London dispersion forces due to the high electronegativity of fluorine. This also supports its use in coatings of cooking ware. The polymer has one of the lowest coefficients of friction of any solid and is therefore commonly used for bearings and support of moving mechanical parts.

Sec. 3. *Labelling of Plastic Products by Manufacturers.* – Manufacturers of plastic products are hereby mandated to label their products using arrows that cycle clockwise to form a triangle that encloses a numeral from 1 to 7 that identifies the plastic resin used in said products as follows:

Resin	Resin Identification Code Option A	Resin Identification Code Option B
Polyethylene terephthalate		
High-density polyethylene		
Polyvinyl chloride		
Low-density polyethylene, Linear low-density polyethylene		
Polypropylene		

Resin	Resin Identification Code Option A	Resin Identification Code Option B
Polystyrene		
Other Resins such as acrylic, nylon, polycarbonate, and polylactic acid (a bioplastic also known as PLA), and multilayer combinations of different plastics		

Where:

a. "1" or "01" signifies that the product is made out of polyethylene terephthalate (PET);

b. "2" or "02" signifies that the product is made out of high-density polyethylene (HDPE);

c. "3" or "03" signifies that the product is made out of polyvinyl chloride (PVC);

d. "4" or "04" signifies that the product is made out of low-density polyethylene (LDPE);

e. "5" or "05" signifies that the product is made out of polypropylene (PP);

f. "6" or "06" signifies that the product is made out of polystyrene (PS); and

g. "7" or "07" signifies that the product is made out of other plastics such as acrylic, nylon, polycarbonate and polylactic acid (PLA).

Sec. 4. *Ban on Unlabeled Plastic Products.* – The sale, distribution and importation of plastic products that are not labeled as prescribed in the preceding section shall be prohibited upon the effectivity of this Act.

Sec. 5. *Penalties.* – Any violation of the provisions of this Act shall be meted a penalty of One million pesos (PhP1,000,000.00).

Sec. 6. *Implementing Rules and Regulations.* The Department of Trade and Industry shall, within sixty (60) days come up with the rules and regulations necessary for the effective implementation of this Act.

Sec. 7. *Repealing Clause*. – All laws, decrees, executive orders, rules and regulations and other issuances that are inconsistent with this Act are hereby repealed or amended accordingly.

Sec. 8. *Effectivity.* – This Act shall take effect fifteen (15) days following its publication in at least two (2) newspapers of general circulation.

Approved,