



Green Label Product Writing Instruments (TGL-29-R1-10)

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Writing Instruments

1 Background

The cause of environmental impacts from writing instruments such as ballpoint pens and other markers stem mainly from the chemicals used in ink—organic solvents. Some volatile organic solvents can be hazardous to human health. Moreover, the photochemical oxidant generation can damage rubber, plastic, plant and animal. When photochemical oxidant combines with hydrocarbon, from car exhaust and evaporated gasoline, a secondary source of pollution are formed known as aldehydes. Pencils, color pencils, and wax crayons are usually coated with or composed of coloring paint, which may contain heavy metals that are harmful to human health.

Therefore, colours used for writing instruments certified with Green Label shall not contain hazardous substances or heavy metals for consumer safety and reduction of chemicals or heavy metals contamination in the environment.

2 Scope

Writing instruments cover ballpoint pens, pen refills, chemical markers, fountain pens, refillable black lead pencils, black lead pencils, colour pencils, wax crayons and colour chalks.

3 Definitions

Pen refers to a writing instrument for marking, drawing and writing, which have many colours depending on the ink used. Pens are composed of a handle, a sheath, a lead and ink.

Chemical marker refers to a pen with a tip made from flannel or porous materials. It has multifunctional use such as for writing on whiteboards, writing on overhead projectors, highlight important messages, and writing on CD. Solvents used in the ink are chemicals, water, or oil.

Fountain pen refers to a pen with the tip made from metal, which has an incision for transferring ink onto paper as well as a tube for ink storage. The pen is composed of 3 parts: the nib (the tip that touches paper), feed (located under the nib to control ink in the tube), and barrel (to prevent ink leakages from tube).

Ballpoint pens refer to a pen composed of handle and pen refills, or having a handle with disposable ink container. The pen's tip or ballpoint is used for writing.

Pen refill refers to a plastic tube or metal tube containing ink. One end of the tube is attached to the pen's tip and can be replaced via the handle.

Black lead pencil refers to a bar shaped writing instrument with black lead core inside the two wooden halves.

Colour pencil refers to a bar shaped writing instrument with colour core inside the two wooden halves. It is used for writing, drawing, or colouring with the exceptions of other accessories.

Wax crayon refers to a bar shaped material made mainly from colour and wax, which are used for drawing or colouring and streaking.

Pencil refill refers to a bar shaped material made from graphite and clay.

Colour chalk refers to the material made from pigment, mineral oil or other oil and other substances (if any). It can be in bar shape or other shapes suitable for art work such as drawing or colouring purposes.

4 General requirements

4.1 The product shall be certified by Thai Industrial Standard or passed the requirements specified in standards from Table 1 or other acceptable equivalent international/national standardized test of product quality such as ASTM or JIS.

Table 1 List of Thai Industrial Standard

No.	Standard No.	Standard Name
1	TIS 346	Ball-point pens
2	TIS 347	Refillable ball-point pens
3	TIS 649	Refillable black lead pencils
4	TIS 650	Black lead pencils
5	TIS 821	Water based marking pen
6	TIS 822	Oil based marking pens
7	TIS 1147	Color lead pencils
8	TIS 1149	Wax crayons
9	TIS 2275	Color chalk

4.2 Production, transportation, and post-industrial waste disposal shall comply with the government laws and regulations.

5 Product environmental requirements

5.1 Requirements for pens

5.1.1 The product shall not contain the following substances:

- Toxic, corrosive and irritable to human health
- Carcinogenic agents as specified in Group 1 and Group 2A of the International Agency of Research on Cancer (IARC) and addendum.
- Halogenated organic components such as 1,1,1-trichloroethene

5.1.2 Ink formula shall not contain the following substances:

- Aromatic substances and halogenated solvents as well as volatile organic compounds shall be not more than 0.05 µg/kg(ppb). Exception is made for ethanol, propanol, isopropanol, and methoxypropanol, phenoxypropanol, and benzylalcohol or other volatile organic compounds which have LD₅₀ more than 5,000 mg/kg (ppm) of tested animal body weight.

Table 2 Amount of heavy metals extracted from solvents.

Metal	Value (mg/kg)
Sb	60
As	25
Ba	1,000
Cd	75
Cr	60
Pb	90
Hg	60
Se	500

5.1.3 The product shall be ink refillable or ink replaceable, which shall be marked as ink refillable or ink replaceable.

5.1.4 Packaging

- Plastic packaging

- Shall not contain chlorine compound and display plastic type according to TIS 1310 or ISO 1043 or 11469.

- Paper packaging

- Shall contain at least 80% of recycled pulp by weight.

5.2 Requirements for pencils, wax crayons and color chalks.

5.2.1 The product shall not contain the following substances:

- Toxic, corrosive and irritable to human health
- Carcinogenic agents as specified in Group 1 and Group 2A of the International Agency of Research on Cancer (IARC) and addendum.
- Halogenated organic components such as 1,1,1-trichloroethene

5.2.2 Coating materials and color lead shall not contain the following substances and shall be tested according to test methods from ISO 8124-3 Safety of toys – Part 3 : Migration of certain elements. The value of heavy metals extracted from solvents shall not exceed the value specified in Table 3.

Table 3 Value of heavy metals extracted from solvents.

Metal	Value (mg/kg)
Sb	60
As	25
Ba	1,000
Cd	75
Cr	60
Pb	90
Hg	60
Se	500

5.2.3 Requirements for wooden pencils

The applicant shall submit a declaration letter for the source of wood, which shall include land titles according to relevant laws and regulations to the Green Label personnel.

5.2.4 Packaging

- Plastic packaging

- Shall not contain chlorine compound

- Paper packaging

- Shall contain at least 80% of recycled pulp by weight.

6. Testing and certification

6.1 Testing for pens

6.1.1 The applicant shall submit a license to display industrial standard mark on each of the respective products or test results according to the applicable industrial standards or according to other acceptable international or national standards.

6.1.2 The applicant shall submit list of substances used in manufacturing pens as well as a declaration letter ensuring that no prohibited substances in requirement 5.1.1 and no toxic, corrosive, and irritable substances to human health has been used. The declaration letter shall be signed by authorized director of the company and submit to the Green Label personnel.

6.1.3 The applicant shall submit test results for heavy metals extracted from ink according to requirement 5.1.2, which shall be tested by atomic absorption spectroscopy under TIS.685 for Toys Method of Test and Analysis or other equivalent test methods.

6.1.4 The applicant shall submit test results for aromatic compound used in the product and ink by using gas chromatography according to the Standard Methods for the Examination of Water and Wastewater or other equivalent methods.

6.1.5 The applicant shall submit a declaration letter ensuring that the product does not contain halogenated solvent, which shall be signed by the authorized director of the company and submit to the Green Label personnel.

6.1.6 The applicant shall submit test results for volatile organic compounds or VOCs used in ink according to test method under ASTM D5466 or other equivalent methods.

6.1.7 The applicant shall submit a declaration letter ensuring that packaging does not contain poly vinyl chloride (PVC), which shall be signed by the authorized personnel of the company. As for paper packaging, the applicant shall submit a declaration letter that at least 80% of paper packaging contains recycled pulp, which shall be signed by authorized director of the company.

6.2 Testing for pens, wax crayons, and colour chalk

- 6.2.1 The applicant shall submit a license to display industrial standard mark on each of the respective products or test results according to the applicable industrial standards or according to other acceptable international or national standards.
- 6.2.2 The applicant shall submit list of substances used in manufacturing refillable black lead pencils, black lead pencils, colour pencils, wax crayons, and colour chalks as well as a declaration letter ensuring that no prohibited substances in requirement 5.2.1 and no toxic, corrosive, and irritable substances to human health has been used. The declaration letter shall be signed by authorized director of the company and submit to the Green Label personnel.
- 6.2.3 The applicant shall submit a declaration letter ensuring that the product does not contain halogenated solvent, which shall be signed by authorized director of the company and submit to the Green Label personnel.
- 6.2.4 The applicant shall submit test results for heavy metals in coating materials and colour lead according to requirement 5.2.2, which shall be tested by atomic absorption spectroscopy under TIS.685 for Toys Method of Test and Analysis or other equivalent test methods.
- 6.2.5 The applicant shall submit a declaration letter ensuring that packaging does not contain poly vinyl chloride (PVC), which shall be signed by the authorized personnel of the company. As for paper packaging, the applicant shall submit a declaration letter that at least 80% of paper packaging contains recycled pulp, which shall be signed by authorized director of the company.

Remarks: 1. Testing shall be conducted in the following laboratories:

- Laboratories operated by the government
 - Independent laboratories certified by TIS. 17025 General Requirements for the Competence of Testing and Calibration Laboratories (ISO/IEC 17025).
2. For future improvements of Writing Instruments Green Label requirements, the following topics shall be considered:
- Substances used as solvent in ballpoint pens, chemical markers, and whiteboard markers
 - Amount of substances in solvents of ballpoint pens, chemical markers, and whiteboard markers
 - The use of technology in manufacturing in order to reduce the use of chemical substances in solvents of ballpoint pens, chemical markers, and whiteboard markers