



Sales Specifications of Polyethylene Naphthalate (PEN) (CAS 24968-11-4 / 25853-85-4)

IVL's polyethylene naphthalate (PEN) is a specialty polyester polymer derived from ethylene glycol plus either NDC or PNDA. It is analogous to polyethylene terephthalate (PET), but with improved thermal, barrier (both diffusional and UV penetration), mechanical, and weathering properties. Its fabricated products include specialty films, high performance fibers, rigid packaging, and other engineering resins. PEN may be used in food contact articles under US FDA regulations, and its monomers are EU REACH registered.

Table 1: PEN Product Sales Specifications

Property	Value	Test Method
Intrinsic Viscosity (dL/g)	0.45 - 0.51 ⁽¹⁾	D4603
Melting Point (°C)	262 - 275	DSC
Color (L* value)	39 - 65	D2244
Color (a* value)	-6 - 4.35	D2244
Color (b* value)	-5.84 - 10	D2244

¹ PEN is also available at higher IV upon request.

Shipping and Handling Information

PEN pellets are available in bulk 4-panel baffle polypropylene fabric bags containing 1000 kilograms. The bag dimensions are 38" x 38" x 45" (height) and has 4 corner lift loops. The bag also has a fabric top fill spout, 14" diameter x 19" long, and a fabric outlet spout with a star closure, 14" diameter x 19" long.

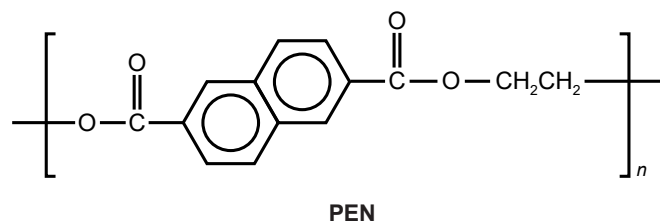
For an additional charge, PEN is also available in other packaging, including fiber drums containing 100 kilograms. Drum dimensions are 22" diameter x 35" tall. Four drums may be shipped on a pallet with shrink-wrapping. A description of pallet loads is given in Table 2.

The product has been evaluated and does not require any hazard warning on the label under OSHA criteria. With regard to transportation, the DOT product shipping name is not regulated. PEN's Harmonized System (HS) code is 3907.99. Under US Export Administration Regulations (EAR), PEN is not on the Commerce Control List (CCL), thus is designated EAR99. Please contact your Indorama Ventures PCL (IVL) representative for any additional information on product shipping.

Table 2: Shipping Weights for PEN

	Fabric Bag	Fiber Drums
Wt. per container, net	1000 kg (2205 lb)	100 kg (220.5 lb)
Containers per pallet	1	4
Wt. per pallet, net	1000 kg (2205 lb)	400 kg (881.8 lb)
Shipping wt. for freight rates	Actual weight	

Figure 1: Chemical Structure of PEN



Health and Safety Information

The product described herein may require precautions in handling and use because of toxicity, flammability, or other considerations. The available product health safety information for PEN is contained in the Safety Data Sheet (SDS) that may be obtained from your sales representative or by written request to the office address listed below. Before using any material a customer is advised to consult the SDS for the product under consideration for use.

For additional information, on samples, pricing and availability, please contact:

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