

Polymer Add (Thailand) Co.,Ltd.

Office - 106, Chalarempriakiat, Lor 9, Soi 22, Yak 5, Nongbon, Prawet, Bangkok, Thailand 10250

Factory - 188/3, Moo 8, Tambon Bangpu Mai, Amphoe Muang Samut Prakan, Samutprakan, Thailand 10280

Mobile - Thai : 0804531391, English: 0839415475, E-mail – contact@polymeradd.co.th



APPLICATION PROFILE

HIGH-DENSITY POLYETHYLENE (HDPE) — MICRONISED POWDER

PRODUCT FORM AND PURPOSE

Micronised HDPE is a thermoplastic polyethylene resin supplied in controlled powder form for direct powder coating, thermal bonding, rotational moulding and selected porous sintering applications.

PROPERTY	DESCRIPTION
Product	High-Density Polyethylene (HDPE), micronised
CAS number	9002-88-4
Indicative melting range	120–135°C, depending on resin grade
Physical form	Fine powder
Particle-size specification	Selected according to the application and processing equipment

The applications covered in this profile use HDPE directly in powder form at the point of coating, bonding or product formation. The particles subsequently soften, melt or sinter in place to form the finished coating, adhesive interface or article.

SPECIFIC COMMERCIAL APPLICATION

HDPE powder is used where the material must be distributed over a substrate, deposited at selected bonding points or charged directly into a mould before heating.

Its powder form allows controlled placement of the polymer before fusion. Relevant applications include fusible textile interlinings, protective powder coatings, powder-fed rotational moulding and qualified porous components.

Each application requires a suitable resin grade and particle-size distribution. A single micronised HDPE grade should not be assumed suitable for all these uses.

WHY THE POWDERED FORM IS USED

Fine HDPE powder can be distributed through patterned coating equipment, scattered over a surface or introduced into a mould as a measured powder charge.

The powder form supports:

- **Controlled adhesive placement:** Small particles fill the engraved cavities used to deposit adhesive dots on textile interlinings.
- **Direct surface coating:** Powder reaches the heated substrate and fuses into a protective layer.
- **Distribution inside rotating moulds:** Powder moves across the mould surface and progressively fuses during heating.
- **Porous structure formation:** Selected particles bond at their contact points during controlled sintering while retaining interconnected spaces.

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Particle size, particle shape, powder flow and resin melt behaviour must be considered together. Excessively fine powder can impair handling or processing; smaller particles are not automatically preferable.

TARGET APPLICATION AREAS

1. Fusible textile interlinings

APPLICATION	SPECIFIC USE OF HDPE POWDER
Shirt collar and cuff interlinings	HDPE adhesive powder is deposited onto the interlining, commonly as a pattern of powder dots. Subsequent heat pressing activates the adhesive between the interlining and garment fabric.
Garment placket and other structured interlinings	Powder is applied at controlled bonding points to attach the supporting interlining while maintaining the required fabric handle and structure.
Scatter-coated textile interlinings	HDPE powder is scattered onto a suitable interlining substrate and thermally anchored before the coated interlining is fused to the garment fabric.

Why particle size matters: The powder must fill and release from the coating equipment consistently. Its distribution influences dot formation, coating weight and the risk of uneven adhesive deposits. Polyethylene powders in approximately the 50–200 μm range have been described for interlining adhesives, but the appropriate size cut depends on the coating system.

Qualification focus: Peel strength, fabric appearance, stiffness, adhesive penetration and bond retention after the intended washing or cleaning cycle.

2. Protective powder coatings on metal

APPLICATION	SPECIFIC USE OF HDPE POWDER
Coated wire articles, racks and baskets	A suitable HDPE powder coating formulation is deposited onto heated metal, including through fluidised-bed dipping, and fused into a continuous protective layer.
Protective coatings on suitable metal components	Powder is applied directly to the component and thermally fused to provide a polyethylene barrier against moisture and compatible chemicals.

Why particle size matters: Powder flow and deposition influence coating coverage and thickness. The particles must fuse sufficiently to avoid roughness, pinholes or incomplete coverage. Direct powder deposition followed by fusion is an established thermoplastic coating method.

Qualification focus: Substrate preparation, adhesion, coating continuity, impact performance and exposure conditions. The coating may require a primer or adhesion-promoting formulation.

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3. Powder-fed rotational moulding

APPLICATION	SPECIFIC USE OF HDPE POWDER
Hollow containers and tanks	A measured charge of suitable HDPE powder is placed directly inside a mould. Heating and rotation distribute and fuse the powder against the mould wall to form the hollow article.
Hollow housings and other moulded components	Powder is charged directly into the final mould and fused during rotation to reproduce the component geometry.

Why particle size matters: Particle size and shape affect powder movement, fusion and removal of trapped air. HDPE powder has been studied directly in rotational moulding; the complete powder distribution must suit this process.

Qualification focus: Melt flow, thermal stability, wall distribution, impact strength and environmental stress-crack resistance. Rotational moulding generally uses a broader, coarser powder distribution than fine interlining coating.

4. Porous sintered components — selected grades only

APPLICATION	SPECIFIC USE OF HDPE POWDER
Porous filter elements	Selected HDPE powder is placed in a mould and heated under controlled conditions so that particles bond while retaining a porous structure.
Air-distribution plates and porous supports	Powder is sintered into a shaped component containing interconnected passages for air or compatible fluids.

Why particle size matters: Particle distribution and packing influence pore structure, permeability and strength. HDPE is among the polyethylene materials used for porous sintered articles, although this application requires careful resin selection.

Qualification focus: Molecular weight, melt flow, particle shape, pore size, pressure drop and mechanical integrity. Ordinary high-flow HDPE may fuse too extensively and close the pores.

DISCLAIMER

This Application Profile is provided for general technical and commercial guidance only. Product suitability, dosage, processing conditions and final performance depend on the customer's formulation, equipment and intended application. Customers must conduct their own trials and confirm compatibility, regulatory compliance, safety and finished product performance before commercial use. The information provided does not constitute a product-performance guarantee or specification unless separately agreed in writing by Polymer Add (Thailand) Co., Ltd.

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