1. **Development Layer System​​**

**Inorganic Developer​**​

Components: Hydroquinone derivatives (e.g., Metol), Phenidone.

**Organic Developer**​​

Components: Ascorbic acid (Vitamin C), Sodium borohydride.

**Carrier & Stabilizer**​​

Components: Gelatin, Antioxidants (e.g., Sodium sulfite), pH adjusters (e.g., Borax).

**Manufacturing Method**​​

Mix inorganic developer with gelatin solution and uniformly coat onto the PET substrate using a coating machine.

Drying: Infrared heating or hot-air drying to remove solvents.

Disperse organic developer in gelatin solution and prepare microcapsules via emulsion-coacervation method.

Dispersion: Apply spray drying or coacervation method to uniformly distribute microcapsules in another gelatin layer.

Bond the microcapsule-containing gelatin layer with the pre-coated inorganic developer layer via hot pressing lamination.

Pre-coating of developer

Hot air drying

Hot pressing lamination

Encapsulating capsules via the emulsion-coacervation method

Spray drying

1. **Back Membrane Layer​​**

**Antistatic Polyester Film**​

Composition: Polyethylene terephthalate (PET) synthesized from terephthalic acid and ethylene glycol.

**Ink-Absorbing Layer​**​

Composition: Hydrophilic polymers (e.g., polyvinyl alcohol, PVA), silica gel particles, surfactants.

**Manufacturing Method​​**

Polymerization: Condensation polymerization of terephthalic acid and ethylene glycol to produce PET resin.

Biaxial Stretching: Melt extrusion followed by longitudinal and transverse stretching to enhance mechanical strength and flatness.

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Ink-Absorbing Layer Coating: Dissolve ink-absorbing components (polymers + additives) in water or organic solvents.

Coat via reverse-roll coating or doctor blade coating.

Drying: Hot-air oven drying to control residual solvent content below 1%.

Biaxial stretching

Poly-condensation

Physical adsorption

Antistatic treatment

Doctor blade coating

Dissolution

Chemical bonding

Hot air drying

1. **Support Layer (PET Substrate)​​**

Composition: PET (polyethylene terephthalate).

**Manufacturing Method​​**

Polymerization →Melt Extrusion→Cast Film→Biaxial Stretching →Heat Setting→ ​​Winding.

Winding

Heat Setting

Biaxial Stretching

Cast Film

Melt Extrusion

Polymerization

4. protective layer

Cooling and shaping

Surface polishing

Heating and drying

Coating additive

Bidirectional stretched gelatin

5.photosensitive layer

Ultraviolet curing

Cutting

Coated to the protective layer

Add additives such as thiosulfate sodium

Dissolve silver bromide