PTC AQUA NATURAL™ (Technical Equivalent to YUHWA P600 / PE 100 HDPE)

Technical Data Sheet	PTC AQUA NATURAL™
High-Density Polyethylene (HDPE) PE 100	For Potable Water & Gas Pressure Pipes

Regulatory Status

For regulatory compliance information, refer to the PTC AQUA NATURAL™ Product Stewardship Bulletin (PSB) and Safety Data Sheet (SDS).
This grade is formulated for **pressure pipe applications**, including **potable water distribution** and **natural gas distribution systems**.

- For gas applications, final product must contain **2.0–2.5% carbon black** and be pigmented **orange (RAL 1033)** during pipe extrusion.

Status
Commercial: Active

Availability
Middle East, India, Turkey, Central Asia, Africa

Application
Potable Water Pressure Pipes, Natural Gas Distribution Pipes (with pigment & carbon black adjustment)

Market
Municipal Water Networks, Rural Water Supply, Gas Utility Infrastructure, Industrial Process Water

Processing Method
Pipe Extrusion (Single- or Twin-Screw)

Attribute
PE 100 HDPE, MRS = 10 MPa, Environmental Stress Crack Resistance (ESCR >1000 h, ASTM D1693), Melt Flow Rate = 0.23 g/10 min, Density = 0.950 g/cm^3, Unpigmented Base Resin, Fully Compatible with ISO 4427 (Water) and ISO 4437 (Gas)

Typical Properties
Physical

Property	Nominal Value	Units	Test Method
Melt Flow Rate (190 °C / 5.0 kg)	0.23	g/10 min	ISO 1133-1
Density	0.95	g/cm³	ISO 1183-1
Bulk Density	510	kg/m³	ISO 60

Mechanical

Property	Nominal Value	Units	Test Method
Tensile Modulus (23 °C)	880	MPa	ISO 527-1,-2
Tensile Stress at Yield (23 °C, 50 mm/min)	23.5	MPa	ISO 527-1,-2
Tensile Strain at Break (23 °C)	≥600	%	ISO 527-1,-2
Tensile Strain at Yield (23 °C, 50 mm/min)	10	%	ISO 527-1,-2

Long-Term Performance

Property	Nominal Value	Units	Test Method
Minimum Required Strength (MRS)	10	MPa	ISO 9080
Hydrostatic Strength (20 °C / 50 years)	10	MPa	ISO 9080
Environmental Stress Crack Resistance (ESCR)	>1000	h	ASTM D1693
Oxidation Induction Time (210 °C)	30	min	ISO 11357-6

Impact

Property	Nominal Value	Units	Test Method
Charpy Impact Strength – Notched (23 °C)	80	kJ/m²	ISO 179-1/1eA
Charpy Impact Strength – Notched (–30 °C)	45	kJ/m²	ISO 179-1/1eA

Hardness

Property	Nominal Value	Units	Test Method
Shore Hardness (Shore D, 3 s)	**63**	**—**	**ISO 868**

Thermal

Property	Nominal Value	Units	Test Method
Vicat Softening Temperature	**74**	**°C**	**ISO 306**
Oxidation Induction Time (210 °C)	**30**	**min**	**ISO 11357-6**
DSC Melting Point	**129**	**°C**	**DSC**

Additive

Property	Nominal Value	Units	Test Method
Pigmentation	Natural (Unpigmented Base Resin)	—	Visual
Note	For water pipes: add blue pigment (RAL 5005 or RAL 5015). For gas pipes: add orange pigment (RAL 1033) + 2.25% carbon black during extrusion.	—	—

Product Description

Product Description

PTC AQUA NATURAL™ is a PE 100 high-density polyethylene base resin, engineered as a high-performance equivalent to YUHWA HIDEN® P600. With a certified Minimum Required Strength (MRS) of 10.0 MPa, outstanding Environmental Stress Crack Resistance (ESCR >1000 h, ASTM D1693), and high oxidative stability (OIT ⩾30 min), it delivers reliable long-term hydrostatic performance and durability for critical water and gas infrastructure. Supplied as an unpigmented base resin, it gives pipe manufacturers full formulation control—allowing precise addition of blue pigment (RAL 5005/5015) for potable water or orange pigment (RAL 1033) with 2.25% carbon black for gas distribution—ensuring full compliance with ISO 4427 (water) and ISO 4437 (gas). Optimized for standard PE 100 extrusion lines, PTC AQUA NATURAL™ provides a technically robust, ISO-aligned, and regionally supported alternative to ASTM-referenced grades across the Middle East, Africa, and Asia.

Availability & Technical Support

For availability, technical information, and application-specific guidance, please contact Britannia Gulfgate Trade (BGT).

Processing Techniques

Recommended melt temperature range: 190 °C to 230 °C (typical operating window: 200–220 °C).

For PE 100 pressure pipe extrusion:

- Screw: Use a standard barrier screw or general-purpose HDPE screw; avoid excessive shear to prevent degradation
- Drying: Dry at 70 °C for 2–4 hours if moisture exceeds 200 ppm (recommended max. moisture: 150 ppm)
- Cooling: Controlled water bath cooling to ensure uniform crystallinity and minimize internal stresses
- Pigmentation: Pre-compound blue (RAL 5005 or RAL 5015) or orange (RAL 1033 + 2.25% carbon black) masterbatch at 3–5% loading for final pipe color

Optimize line speed and calibration to meet dimensional tolerances per ISO 4427 (water) or ISO 4437 (gas).

Availability & Technical Support

For availability, technical information, and application-specific guidance, please contact Britannia Gulfgate Trade (BGT).

Health and Safety

Molten HDPE may release fumes if overheated or exposed to excessive oxygen. Ensure adequate ventilation in processing areas. Avoid skin or eye contact with hot polymer. Use heat-resistant gloves, safety glasses, and protective clothing.

If overheated or exposed to air, molten polymer may degrade, producing fumes that can cause irritation to eyes or respiratory tract. Ensure adequate ventilation.

The resin is flammable and may produce dense smoke if burned. Store away from ignition sources.

Always consult the Safety Data Sheet (SDS) before handling or processing PTC AQUA NATURAL™.

Storage

Supplied in 25 kg UV-protected polyethylene bags on pallets.
Store in a dry, cool, and well-ventilated area, below 40 °C, away from direct sunlight, heat sources, and moisture.
Shelf life: 24 months under recommended conditions.
Keep separate from oxidizing agents and flammable materials.

BGT Royalty™ Commitment

✅ Britannia GulfGate Trade PE 100 Base Resin Commitment™ (A Technical Partnership – Not a Warranty)

At Britannia GulfGate Trade, PTC AQUA NATURAL™ is supplied as a certifiable, unpigmented PE 100 base resin — designed to give pipe manufacturers full control over final formulation while ensuring full compatibility with global pressure pipe standards.

What Sets Us Apart

1. Full Formulation Freedom
We supply zero pigment, zero carbon black — so you decide the exact shade (blue/orange) and carbon black loading (e.g., 2.25%) required by your local certification body (e.g., DVGW, WRAS, SASO).

2. Certification-Ready Batch Data
Every shipment includes a Certificate of Analysis (CoA) with actual MFR, density, and oxidation stability — giving your certifier the traceable data they need for ISO 4427/4437 type approval.

3. ISO-Aligned, Not ASTM-Limited
All test methods and performance claims are referenced to ISO standards — the language of certification in Europe, the Middle East, Africa, and Asia.

4. Regional Responsiveness
Direct access to polymer specialists — no call centers, no time-zone delays. We respond within your working day because pipe certification can't wait.

5. Jebel Ali Ready Stock
Available from bonded inventory in Jebel Ali Free Zone — enabling fast, duty-optimized delivery with full batch traceability.

The Britannia GulfGate Trade PE 100 Base Resin Commitment™ is a service pledge. It does not constitute a warranty, nor does it replace ISO 4427 or ISO 4437 certification, which remain the sole responsibility of the pipe manufacturer.

⚠️ Disclaimer

Disclaimer
The data presented in this document are based on standard laboratory testing and represent typical values for PTC AQUA NATURAL™. These values are not to be interpreted as guaranteed specifications and do not constitute a warranty of merchantability or fitness for a particular purpose.

Final pipe performance—including compliance with ISO 4427 (water) or ISO 4437 (gas)—depends on processing conditions, pigment and carbon black addition, pipe design, installation, and service environment. Users are solely responsible for verifying suitability for their specific application and obtaining necessary certifications from accredited pipe testing laboratories.

Britannia GulfGate Trade makes no express or implied warranties except as expressly stated in a written supply agreement.

Contact us for further inquiries

Britannia GulfGate Trade
Engineering Trust in Infrastructure Polymers

For technical inquiries, batch documentation, or regional support:
✉️ petercascolne@outlook.com
🌐 www.britanniagulfgate.trade