



# QUORAL® (*pat. pend.*) BARRIER RESIN (BR)

## Product Data Document

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### Quoral ® Barrier Resin (BR)

Quoral® barrier resins are designed especially to provide barrier properties for high molecular weight (HMW) high density polyethylene (HDPE) containers utilizing an efficacious monolayer laminar structure. Quoral® is a barrier resin based on polyamide (PA) and is primarily designed for blending with HMW HDPE in an extrusion processes.

The technology specifically consists of the production of multiple overlapping layers of barrier material in the polyethylene matrix during the extrusion process. To achieve this structure, special attention must be given to the screw, barrel, head and mold designs. Also, specific machine temperature settings are required.

Specifically, Quoral® is an excellent barrier to most hydrocarbons and the barrier can be achieved in blends with selected grades of HMW HDPE in extrusion blow moulding of any size container or bottle. Also, oxygen barrier improvement and water vapour barrier improvement vs. pure HDPE is obtained.

Barrier improvement can also be achieved in pipes, sheets or other extruded shapes. Low or medium density PE can be processed with Quoral® mixtures, but the inherent lower barrier performance of these polymers must be accounted for.

**BR50, BR60** is recommended for larger containers, 5 liters and more.

**BR70, BR75** is recommended for smaller containers, 4 liters or less.

#### Typical properties

Blend :	Moisture content: max 0.20%	ASTM D798
	PA content: 50%	Flotation
PA:	Melting Point: 222°C	ISO 11357-1
	Specific gravity: 1.14 kg/m <sup>3</sup>	ISO 1183
	Vicat softening: 200°C	ISO 306 (50N/120°C/h)



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**Mechanical properties:**

All mechanical properties of the HMW HDPE grade used are maintained. The rigidity might increase because of the PA platelets in the matrix.

**Barrier properties:**

Depending on the efficiency of Quoral® processing, the following barrier improvements can be obtained:

- For polar hydrocarbons: from 60 to 200 times;
- For other solvents and additives: up to 50 times;
- For oxygen: 2 to 5 times;
- For aroma: excellent improvement;
- Amount of Quoral® BR mixture to be added: 5 to 9 %.

Example: The weight loss of a one liter standard HDPE bottle can be reduced by a factor of 100 by adding 5% to 9% of Quoral® BR when filled with xylene, toluene or similar hydrocarbons. Typical barrier performance data with various substances is available on request.

**General Info**

Quoral® barrier resins are packed in either 25kg/55lb moisture proof bags, 125kg/250lb LDPE lined UN rated fibre drums, 500KG/1,100lb or 1,000kg/2,200lb moisture proof Gaylord boxes. The resins are hygroscopic and should be processed within max. 24 hrs after opening the bag provided the conditions of atmospheric relative humidity and temperature is not excessive.

**Disclaimer**

This information and our technical advice, whether verbal, in writing or by way of trials, are given in good faith but without warranty, and this applies where proprietary rights of third parties are involved. Our advice does not release the customer from the obligation to verify the information currently provided, especially that contained in our safety data and technical information sheets, and to test our products as to their suitability for the intended processes and uses. The application, use and processing of our barrier resin products and the products manufactured by the customer on the basis of our technical advice are beyond our control and, therefore, entirely the customer's responsibility. This is the most recent Quoral® Product Data Document and as such supersedes all previously published revisions, editions and versions.

**Test Values**

Unless specified to the contrary, the values given have been established on standardised test specimens at room temperature. The figures should be regarded as guide values only and not binding minimum values. Please note that, under certain conditions, the properties can be affected to a considerable extent by the design of either the mold/die/screw/barrel/head combination or the actual processing conditions.