



TOTAL

COMMITTED TO BETTER ENERGY

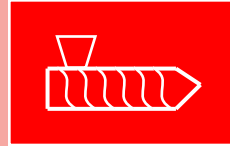


HOUSEHOLDS & CHEMICALS PP & PE PRODUCT RANGE

REQUIREMENTS FOR HDPE BLOW MOULDING MATERIALS

• Processability

- Sufficient melt strength (parison)
- High Line output
- Low sagging during shaping
- Even Wall thickness distribution

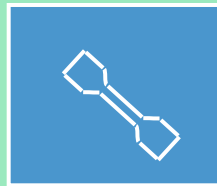


• Chemical resistance

- High Environmental Stress Crack Resistance (ESCR)
- Barrier Properties (Oxygen, CO₂, Oil)

• Mechanical performance

- High stiffness
- Good Impact properties



• Optical performance

- Good surface appearance
- High transparency,
- No frozen-in stress

CONSUMER PACKAGING

Lubricants



5802

**Household
Products**



**5502
5802**

Cosmetics



**5502
M3410**

Small jerry cans



**5802
51090
53090**

HDPE 5502

<u>TYPE</u>	<u>DENSITY</u>	<u>MI2</u>	<u>HLMI</u>	<u>ESCR</u>	<u>FLEX MOD</u>
5502	0.954	0.30	22	60	1200

Bottles and medium-size containers for **solids and liquids** (liquid food, household products, cleaning liquids, detergents, etc ...)

- general multi purpose HDPE materials
- very easy processing on all equipments
- nice surface finish
- food approved
- ESCR ok for majority of applications



HDPE 5802

<u>TYPE</u>	<u>DENSITY</u>	<u>MI2</u>	<u>HLMI</u>	<u>ESCR</u>	<u>FLEX MOD</u>
5802	0.957	0.25	23	40	1500

Bottles and medium-size containers needing a good compromise rigidity / ESCR and a very high impact resistance

- performances level close to a semi high molecular weight HDPE
- easy processing
- excellent impact resistance (up to 50 L jerry cans)
- very nice surface finish
- food approved

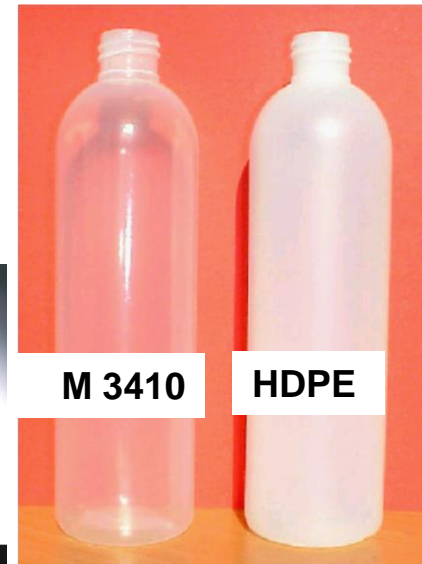


LUMICENE M3410

<u>TYPE</u>	<u>DENSITY</u>	<u>MI2</u>	<u>HLMI</u>	<u>ESCR</u>	<u>FLEX MOD</u>
M3410	0.934	0.9	27	> 1000	600

Flexible bottles with high ESCR, excellent gloss, transparency and contact clarity

- flexible, squeezable bottles in monolayer
- high contact clarity in blend with HDPE
- high gloss rigid bottles in co-ex with HDPE / PP
- very high resistance to stress cracking
- high impact resistance
- excellent transparency
- nice surface finish (gloss)
- food approved



POLYPROPYLENE IN BLOW MOULDING

- Homopolymer
 - Excellent stiffness
 - Best heat resistance (hot filling)
 - Best scratch resistance
- Random Copolymer => Most used
 - High transparency if clarified & excellent gloss
 - Good impact
 - Good compromise melt strength & processability
- Impact Copolymer
 - Best impact resistance
 - High stiffness
 - Opaque



PP GRADES FOR EXTRUSION BLOW MOULDING

Grade	MFI g/10'	Flex. Modulus MPa	IZOD notched, 23°C, kJ/m ²	
PPH 3060	1.8	1300	6	-
PPC 2660	0.8	1100	>50	-
PPC 3060	1.3	1200	>50	
PPR 3221	1.8	900	22	clarified
PPR 3260	1.8	1000	7.5	-