TOTAL

MASTERING THE FUTURE BOTTLE DESIGN

HDPE ISBM

REFINING & CHEMICALS

Total HDPE SB 1359

A solution to new market requirements in Consumer and Food Packaging applications for lighter and outperforming packages. A breakthrough combination of ISBM, a versatile processing technology, and HDPE, a recognized polymer in packaging.

HDPE ISBM technology is an innovative breakthrough solution that allows significantly decreasing production costs and packaging weight.
Total HDPE SB 1359 presents an excellent balance of properties for an optimized processing during injection and blowing steps.

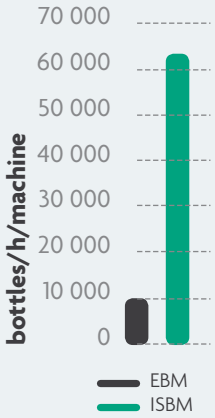
Main benefits:

- ➔ To optimize production process
- ➔ To improve bottle quality
- ➔ To reduce environmental impact
- ➔ To reduce costs

OPTIMIZING PRODUCTION PROCESS

Total HDPE SB 1359 has been tailored to give excellent processing performance on ISBM conventional machines. The same ISBM platform can smoothly run Total HDPE SB 1359 resin. Throughput as high as 60 000 bottles per hour are reached with Total resin. This is a PET throughput benchmark.

Machine throughput



Adding the benefits of ISBM:

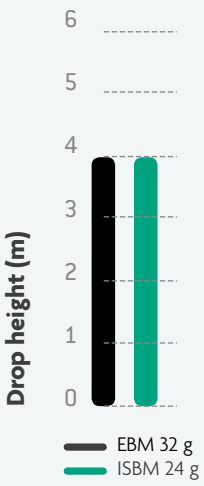
- ➔ Unrivalled machine throughput (2 000 bottles/hour/mould).
- ➔ Versatile process: easy processing, standardization, immediate start-top, no polymer purging, immediate colour change, no handling of scrap or regrind.
- ➔ Packaging standardization (several bottle design with same preform).

IMPROVING BOTTLE QUALITY

- ➔ Excellent neck finish: no need for aluminium foil, bottle can be laid horizontally without dripping from the cap.
- ➔ Freedom in packaging design: Round, oval, squares, asymmetric and off-centered shapes up to 5L.
- ➔ Better engraving and hot filling ability than PET.
- ➔ Require less masterbatch additivation for coloured bottles (white, pearlescents, colour, …) than PET.
- ➔ Improved contact transparency, clarity and gloss thanks to bi-orientation.
- ➔ Bi-orientation also allow significant downgauging without impacting mechanical properties (similar ESCR, impact and top load up to 25% weight reduction).

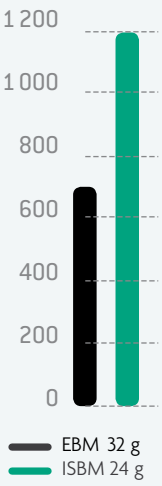
Impact Strength

Drop test



Stacking Performance

Maximum load at rupture (N)

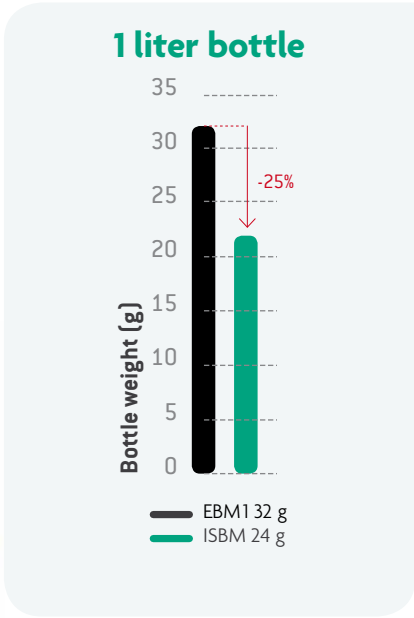


HDPE ISBM

REDUCING ENVIRONMENTAL IMPACT

The ISBM process acts as a booster for the mechanical properties of Total HDPE SB 1359. As a result, significant weight reduction (from 15% up to 40%) can be achieved with similar bottle mechanical performance.

Weight reduction

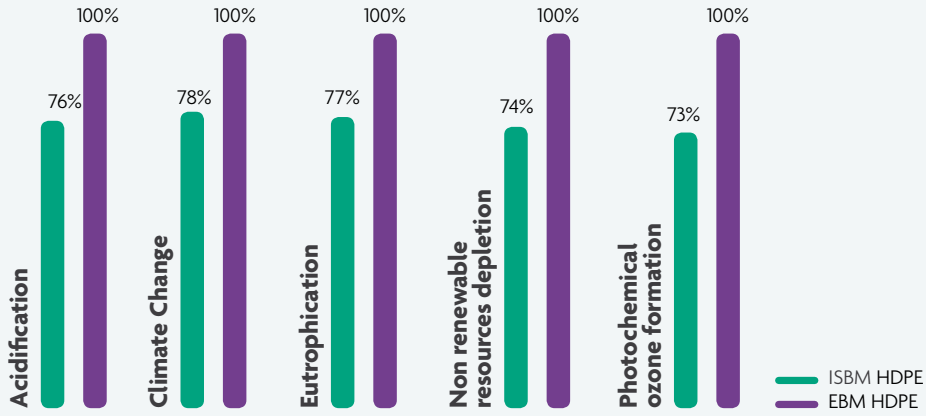


Moreover, ISBM technology requires less energy consumption than conventional EBM, and HDPE pellets, compared to PET pellets, do not need to be dried (water savings).

HDPE ISBM

Life cycle analysis evaluation

Preliminary results show a clear environmental advantage for ISBM HDPE vs. EBM HDPE mainly thanks to significant lightweighting possibilities

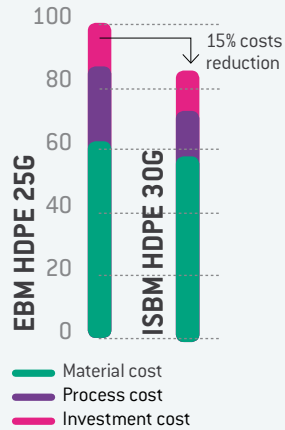


SIGNIFICANT COSTS SAVINGS

HDPE and ISBM is a unique combination for beneficing also from significant costs savings.

- ➔ **Less material consumption:** packaging weight can be reduced from 15 up to 40% with similar mechanical properties.
- ➔ **Less production costs:** compared to EBM, ISBM increases considerably productivity allowing in some cases, total costs saving of at least 15%.
- ➔ **Less maintenance required:** productivity and machine lifetime of ISBM machines are higher than EBM, implying a reduction of maintenance costs.

Costs savings for an annual production of 30 Mio bottles



At least 15% total costs savings

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