

## **A New Approach for PE100 Characterization; An in-Reactor HDPE Alloy with Semi Hard and Soft Segments**

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**Abstract :** GPC and RMS analysis showed no distinct difference between PE 100 On, Off, and Reference grade. But FTIR spectra and multiple endothermic peaks obtained from SSA analysis, attributed to heterogeneity of ethylene sequence length, lamellar thickness and also the non-uniformity of short chain branching, showed sharp discrepancy and proposed a blend structure of high-density polyethylenes in PE 100 grade. Catalysis along with process parameters dictates poly blend PE 100 structure. This in-reactor blend is a mixture of compatible co-crystallized phases with different crystallinity, forming a physical semi hard and soft segment network responsible for improved impact properties in PE 100 pipe grade. We propose a new approach for PE100 evaluation that is more efficient than normal microstructure characterization.

**Keywords :** HDPE, pipe grade, in-reactor blend, hard and soft segments

**Conference Title :** ICPAM 2015 : International Conference on Polymers and Advanced Materials

**Conference Location :** Singapore, Singapore

**Conference Dates :** January 08-09, 2015