

Abstract
Process Economics Program Report 253
VINYL POLYMERS
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Polyvinyl Chloride (PVC) is the second largest commodity thermoplastic in the world, after the polyethylenes. The estimated global capacity of PVC was equivalent to 33 million metric tons as of 2003, and about 27 million metric tons were produced at a capacity utilization factor of 82%. Major demand, following the usual historical pattern, was in the construction sector, which accounts for about 60% of the total PVC consumption. Despite a negative environmental image created around during the past several years because of presence of certain harmful chemicals and potentially harmful residue left on incineration, the PVC market continues to show a fairly steady growth. The overall global growth averaged at 2.8% per annum from 1998 to 2003¹. Major capacity additions in the next three or four years are taking place in Asia and Middle East because of a strong demand in the region.

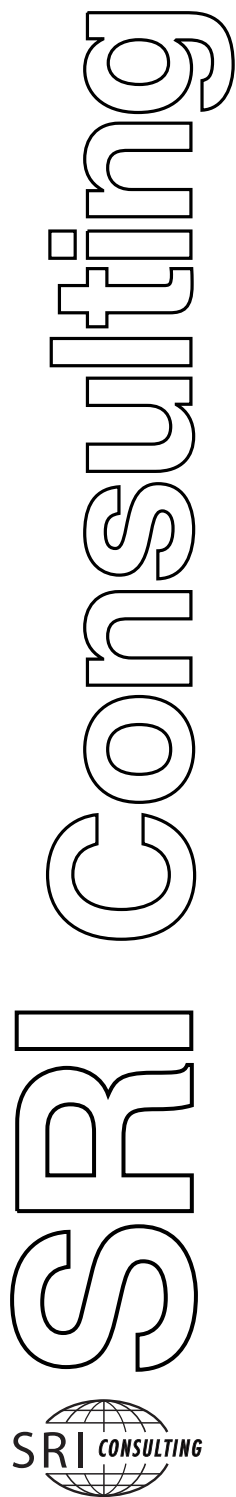
PVC is industrially produced by the following four methods.

- Suspension Polymerization
- Mass or Bulk Polymerization
- Emulsion Polymerization
- Solution Polymerization

Of the above four processes, the solution technology has been so far used on a very limited scale. On the other hand, suspension polymerization, mainly driven by the market, is the most common and relatively the fastest growing technology today. Its share in production of rigid and flexible PVC polymer is about 90% on global basis.

This report examines in detail the first three technologies as they stand today, and evaluates their capital and production economics in the typical PEP format. The report also presents manufacturing routes details and economics for ethylene dichloride (EDC) and vinyl chloride monomer (VCM)—precursors of PVC. Economic results for EDC-PVC chain integration are also included. In addition, economic analysis of an ethane to VCM route, based on the experimental work of Dow Chemical, also forms part of the report. The results and economics conclusions of our study are summarized in Chapter 2.

¹ World Petrochemicals—SRI Consulting



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VINYL POLYMERS

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