

CONTINUOUS POLYMERIZATION (CP3) SIMPE SPA – ACERRA (NAPLES) - ITALY

An existing continuous polymerization line erected in 2001-2003 based on Dupont (later INVISTA) technology has been modified to produce 450 TPD of Polymer of either bottle resin or textile type.

The esterification section was originally designed to use DMT feedstock to produce 396 TPD of Polymer equivalent. A new section using TPA feedstock has been added. This will produce 450 TPD equivalent Oligomer to feed the Existing Polymerization section. The DMT section of the plant will not be used.

The existing Polymerization section has been de-bottlenecked and upgraded to produce 450 TPD of Polymer. The plant has been designed to produce both bottle resin and textile type, in the last case by adding extra components.

Technology Description:

Invista provided the technology for the TPA based esterification section and the upgrades to enhance the polymerization capacity and provided capability to make bottle grade polymer.

Functional Operation Description Esterification:

The original esterifier section was designed for 396 TPD based on DMT feedstock. This has been dismantled. A new TPA based esterifer including TPA slurry making process has been added. A new EG/water separation column with condenser and reflux system has been added. A set of oligomer pumps has been added to pump the oligomer to the polymerization section. The oligomer line is tied into the existing oligomer line at a suitable location. The existing additive injection nozzles have been checked and utilized to the extent possible for the new additives for bottle resin.

Functional Operation Description CP:

The original CP plant consists of a UFPP & Finisher designed to produce 396 TPD textile grade polymers at 0.64 IV. After de-bottlenecking, the CP will be capable to produce a maximum of 450 TPD of bottle grade polymer at 0.60 IV.

Functional Operation Description of Polymer Transfer line:

For bottle resin production, the polymer from the finisher will feed 3 nos. existing chippers modified to produce bottle resin. The polymer filter media have also been modified for producing bottle resin. New polymer filter media has 60 micron rating for bottle resin.

Capacity and Product Quality Bottle Resin

Finisher Temp Deg C	285 deg C @ 450 TPD
Polymer IV	0.6 IV (+/- 0.01)
Maximum Rate Finisher	450 TPD
Minimum Rate Finisher	150 TPD
Catalyst Concentration	250 PPM as Sb (< or =)
DEG content	1.2 % in Polymer (+/- 0.1)
IPA as Weight %	2.15 % in polymer (2.5% in TPA) or less
Toner (Cobalt Acetate)	60 PPM in Polymer
Phosphoric acid	20 PPM in Polymer
COOH	40 (< or =)
Acetaldehyde, PPM	90 PPM (<or=) at (to be defined by Invista)

Maximum flow to chipper	450 TPD
Minimum flow to chipper	150 TPD
Chipper operation	3 nos@ at 450 TPD from finisher, normally all 3 running, when one chipper is down for MTC. Total capacity that can be obtained from 2 chippers
Polymer temperature at Chipper	290 deg C Max
Polymer pressure at Chippers	8-16 Kg/cm ² G (To be decided with vendor)
Bottle Chip size	3.0mm (D1) X 2.0 mm (D2) X 2.5mm (L)
Bottle Chip weight	15 to 18 mg/chip @ 1.26 SG. (Hold)
Moisture content	0.2% (<or=)

The plant was modified in 2007-2009, never on stream.