

450 t/d UOP SINCO SSP UNIT SIMPE SPA – ACERRA (NAPLES) - ITALY

Structural

The SSP building is lying in an area of roughly 23x21 m, with an height of 47.5 m. It is made of steelworks for main columns and frames, whereas floors are realized in concrete.

The plant is arranged on 5 floors and at the last floor (elevation 26.5m) the building continues in a steelwork tower, up to 47.5m high, containing the SSP reactor and, at its top, the chips/nitrogen separation silo.

The structure is equipped both with staircase and an elevator (ready to be installed) up to a level of 26.5 m.

Mechanical

The main equipment, machinery and instrumentation of the new plant were supplied by Sinco UOP.

Instrumental

SSP instrumental plant is controlled by DCS System (Yokogawa).

Electrical

The SSP power electrical system is fed by LV electrical line coming from NGP electrical grid.

Design Basis, Plant Performances & Requirements

The SSP plant has been designed for a production capacity of 450 T/d of PET bottle grade quality resin with a final IV of 0.84 dl/g starting from amorphous resin with IV of 0.60 dl/g produced from SIMPE continuous polymerization line based on Chemtex technology (from PTA).

Product Quality and Base Resin Quality

| <i>Property</i> | <i>Units</i> | <i>Method</i> | <i>Value/Range</i> |
|--------------------------|--------------|----------------|------------------------|
| Intrinsic viscosity | dl/gr | UOP SINCO 0011 | 0.84 ± 0.015 |
| Intrinsic viscosity lift | dl/gr | UOP SINCO 0011 | 0.24 |
| Carboxylic end groups | | UOP SINCO 0052 | Lower than basic resin |
| Acetaldehyde Content | mg/kg | UOP SINCO 0023 | 0.7 max |
| Chips temperature | °C | | 60 max |
| Color (b*) | CIELAB | UOP SINCO 0094 | < 0 |
| Dust (fines) | W ppm | ASTM D1921 | < 50 |

| <i>Property</i> | <i>Units</i> | <i>Method</i> | <i>Value/Range</i> |
|----------------------------|--------------|----------------|----------------------------------|
| Intrinsic viscosity | dl/g | UOP SINCO 0011 | 0.60 ± 0.005 |
| IPA+DEG modification level | Wt % | UOP SINCO 0003 | 3.5 ± 0.5 max (DEG 2.0 % max) |
| Sb content | ppm | UOP 714 | > 240 |
| P content (suggested) | ppm | UOP 714 | 30 |
| Co Content (suggested) | ppm | UOP 714 | 35 |

| | | | |
|----------------------|-------|----------------|--------------------|
| Color b* | | UOP SINCO 0094 | -1 ± 0.5 |
| Carboxyl end group | | UOP SINCO 0052 | 40 ± 0.3 |
| Acetaldehyde content | mg/kg | UOP SINCO 0023 | 60 average 100 max |
| Moisture content | Wt % | ASTM E 203 | 0.4 max |
| Fines | ppm | ASTM D1921 | 300 max |

The utility consumption per ton of the product produced in the SSP plant, excluding utility units, transport systems and all the off plots will not exceed the following figures:

| UTILITY | UNITS | |
|------------------------------|--------------------|-----|
| Electrical power | kWh/t | 55 |
| HTM energy | kWh/t | 85 |
| Cooling water (25°C), ΔT=7°C | m ³ /t | 6.5 |
| Instrument air | Nm ³ /t | 5 |
| Nitrogen | Nm ³ /t | 6 |

The plant was erected in 2008-2010, never on stream.