

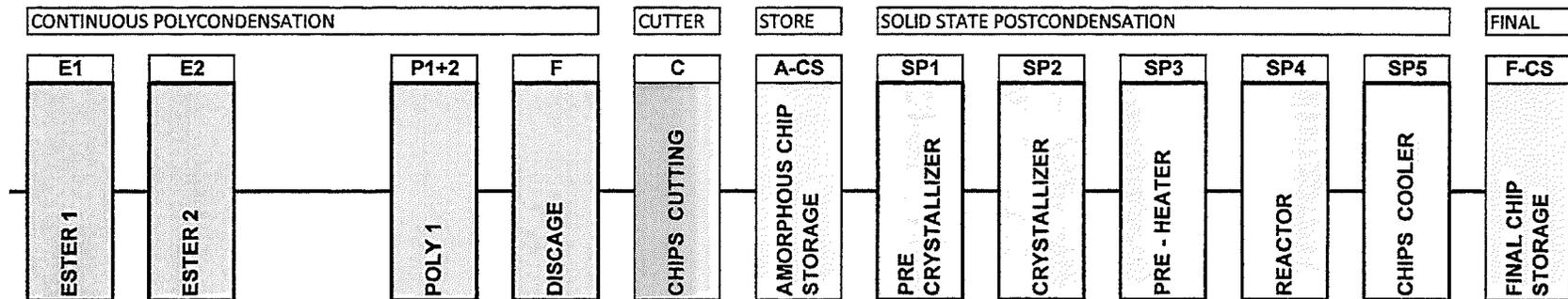
OCTAL Materials for  
International Trade Commission Staff Conference  
*Certain Polyethylene Terephthalate (PET) Resin  
from Canada, China, India and Oman, 701-TA-531-  
533 and 731-TA-1270-1273)*

March 31, 2015

# MTR Process Vs Conventional Technology

Conventional Process -

## CP- 4R + SSP

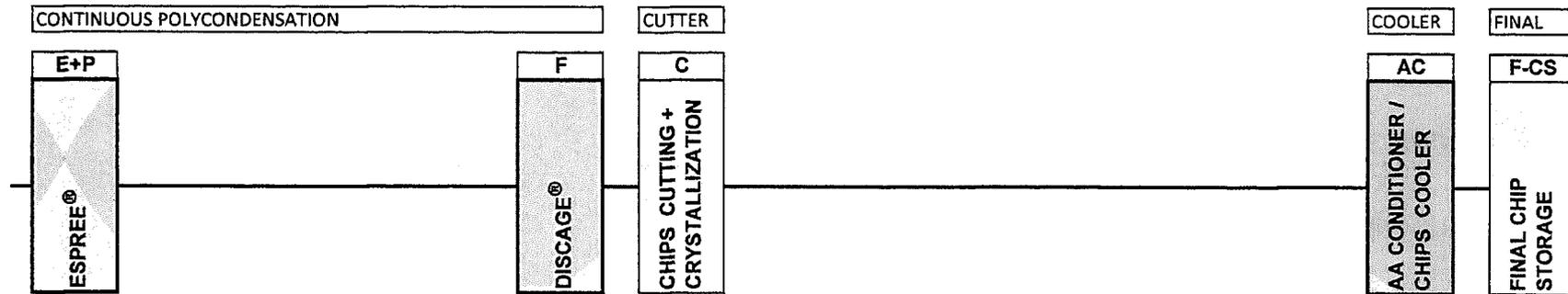


- Conventional Process 4/5R + SSP –
  - High Residence times
  - High temperature processing
  - Higher degradation and thermal stresses on product

# MTR Process Vs Conventional Technology

## MTR Process -

### CP- 2R MTR®



### MTR Process (without SSP) Advantages –

- Lower residence time resulting in minimal generation of secondary products & cross linked polymers
- More stable parameters – consistency in product quality
- Lower Crystallinity – Better strength and lower energy requirements during downstream processing
- Lower temperature processing - less thermal degradation , reduced AA regeneration and minimum secondary products generation
- Spherical shape of pellets – Lower dust generation and lower IV drop during downstream processing
- Lower thermal heat stress – Reduced haze due to less carboxyl end group and low thermal degradation
- Narrow processing window – Due to narrow molecular weight distribution and improved process-ability

# MTR Process Vs Conventional Technology

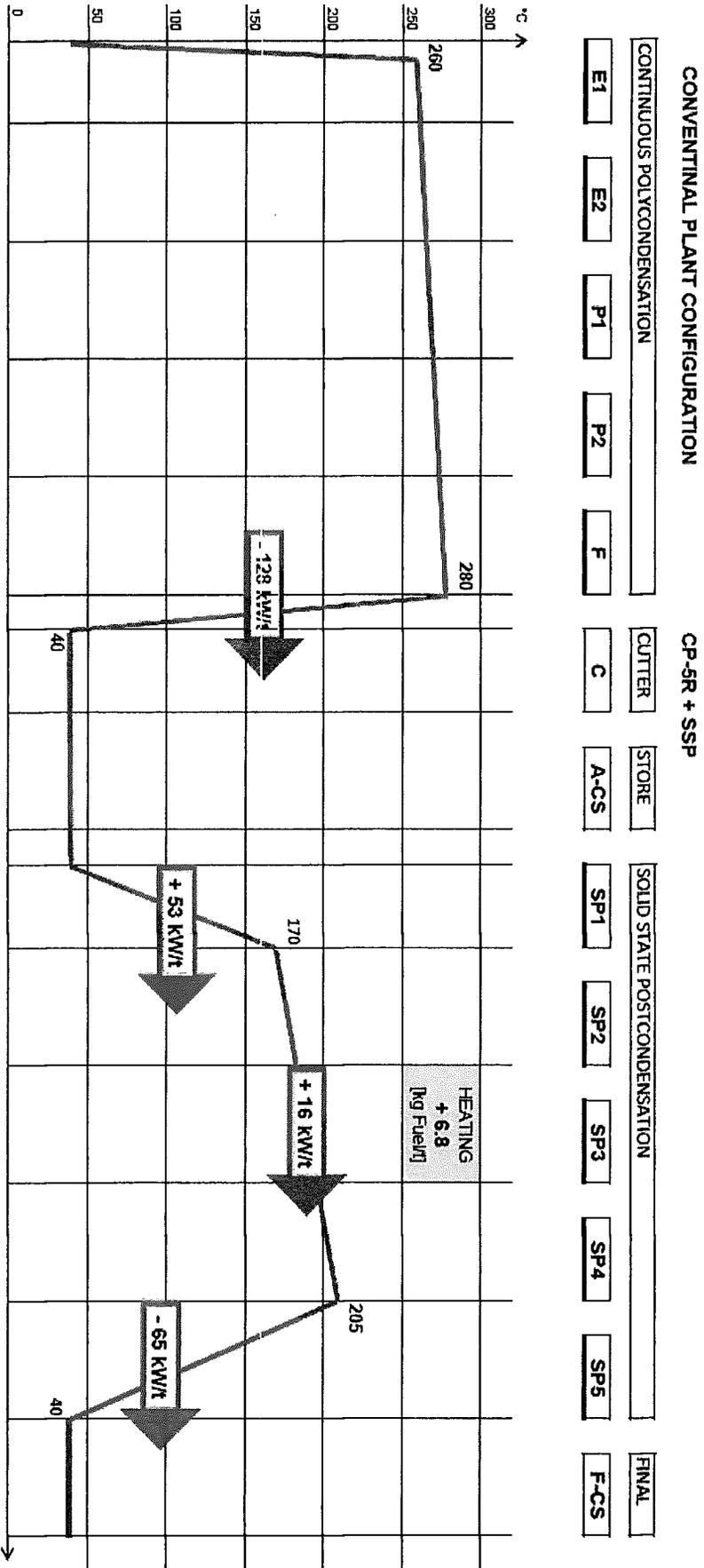
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## Residence Times -

- Conventional Process 4/5R + SSP –
  - Polycondensation 8 Hours
  - SSP 16 Hours
  - **Total 24 Hours**
- MTR Process –
  - Polycondensation 4 Hours
  - Conditioning 12 Hours
  - **Total 16 Hours**

# MTR Process Vs Conventional Technology



# MTR Process Vs Conventional Technology

MTR PLANT CONFIGURATION

CP-2R MTR

CONTINUOUS POLYCONDENSATION

CUTTER

COOLER

FINAL

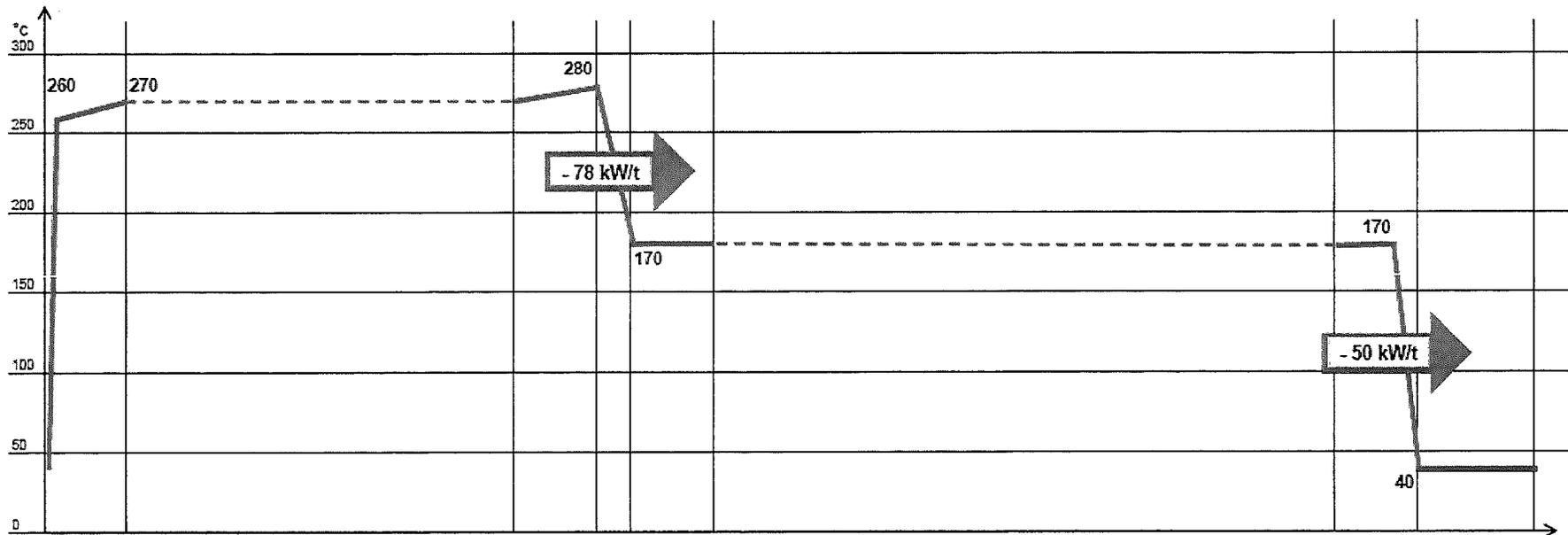
E+P

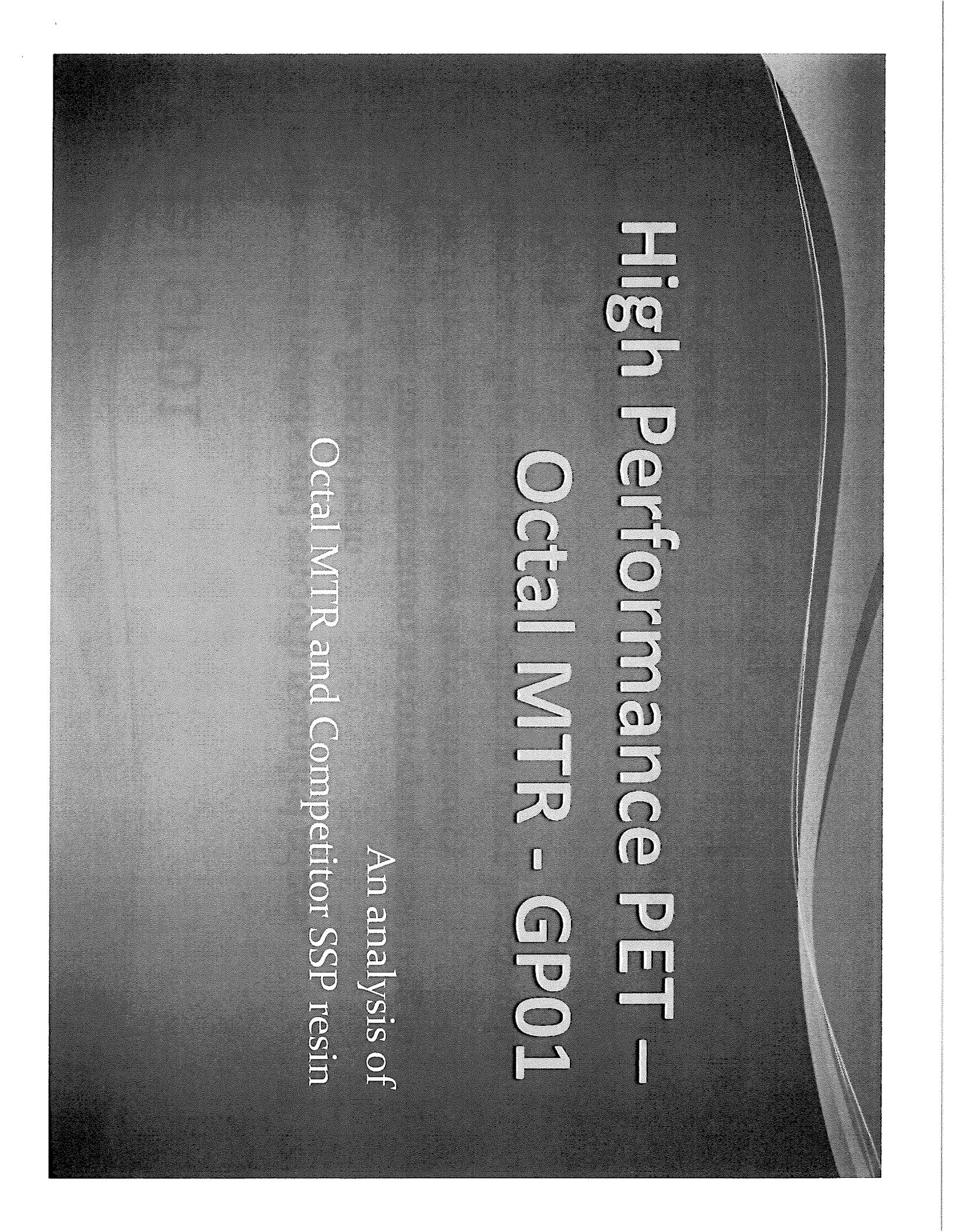
F

C

AC

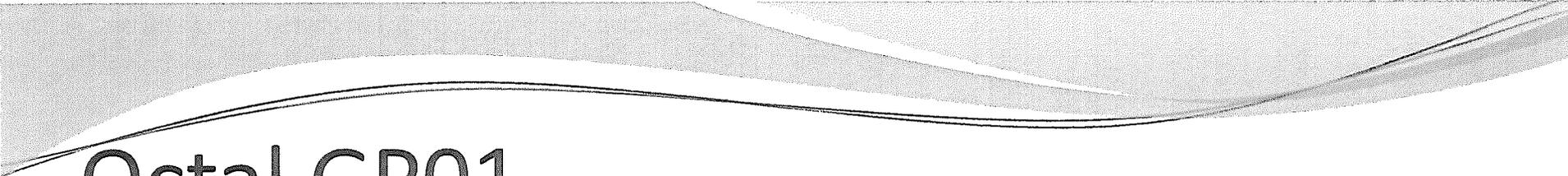
F-CS





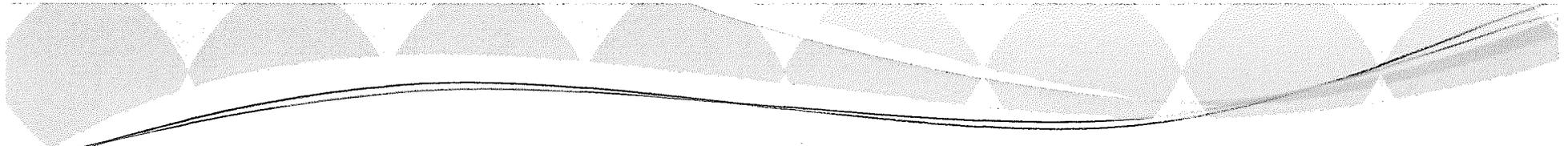
# High Performance PET – Octal MTR - GP01

*An analysis of  
Octal MTR and Competitor SSP resin*



# Octal GP01

- Spherical pellets and smooth rounded edges.
  - Very low fines in resin.
  - Negligible fines generation in conveying, resulting in less filter cleaning, better dryer efficiency.
  - Better air flow around the pellets in dryer, hence quick drying.
- Low crystallinity
  - Quick melting, less temperature in feed zones, resulting in lower heater load.
  - Lower residual AA generation.



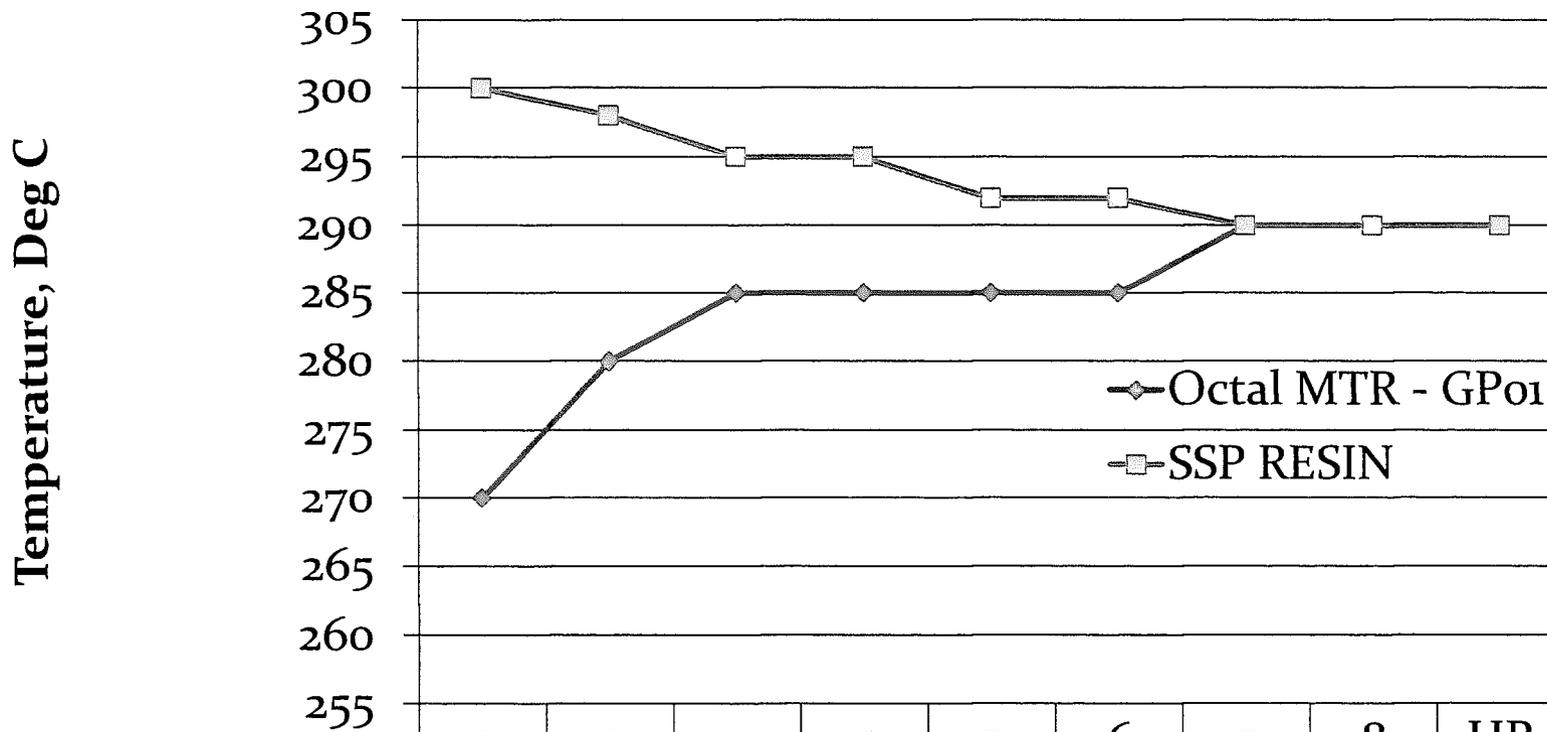
# Preform Trials: GP01 Vs SSP Resin

- Drying temperature less by 10 deg C
  - Drying temperature reduced from 180 deg C to 170 deg C
  - Drying time reduced from 6 hrs to 5 hrs.
  - Lower drying energy to a tune of 4% of total conversion power.
- Plasticization temperature
  - Feed zone temperature down by 20 ~ 30 deg C
  - Lower heat energy input by heaters to a tune of 1% of conversion power.
- Total heat input saving 5% of conversion power.

# Energy savings

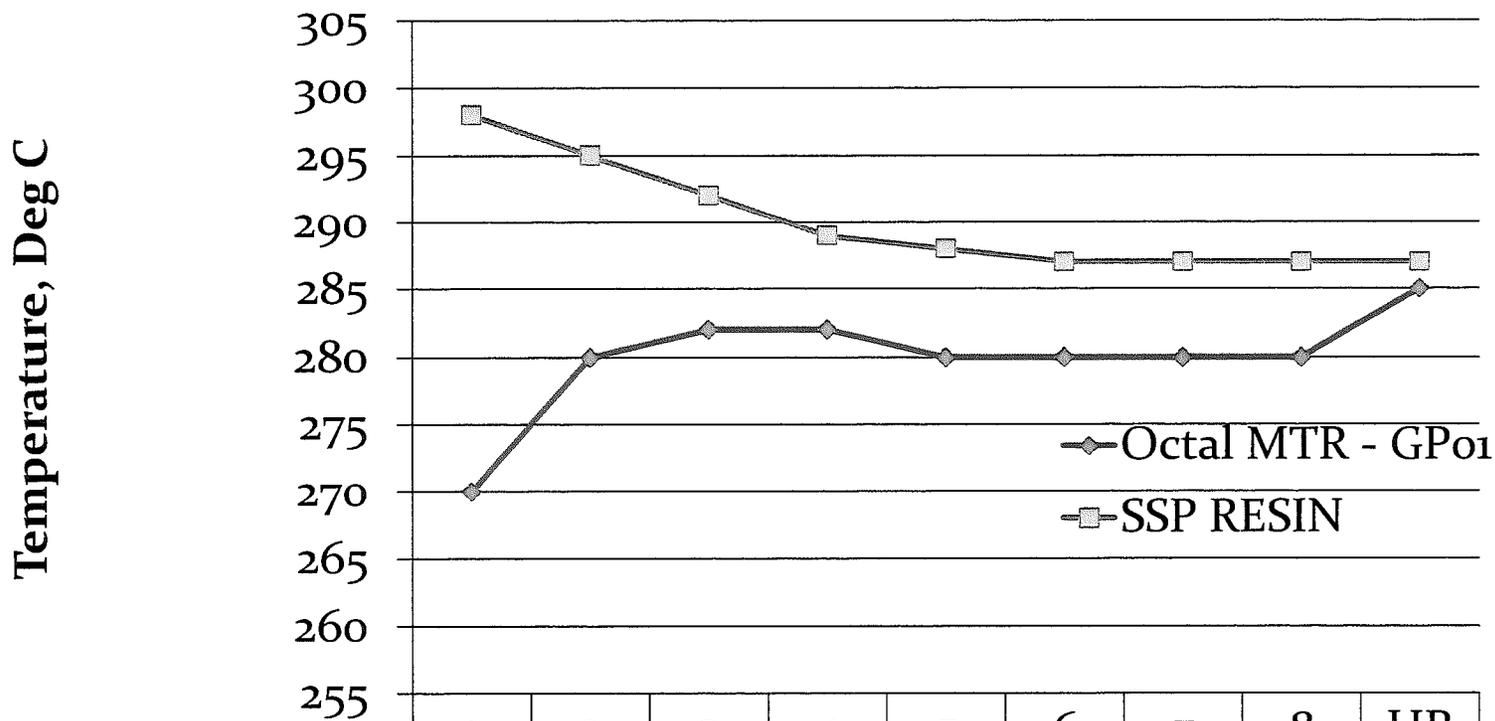
- Total conversion energy of system: 0.5KWH/Kg (typical)
- Savings in conversion power: 0.025 KWH/Kg
- Typical capacity of machine: 16,000Kgs/day
- Savings/day: 400KWH
- Savings/ annum: 124,000 KWH
- Considering 5 cents/ KWH,
  - Saving: \$ 6,200/annum/machine.

# 48gms CSD preforms – Heater settings



	1	2	3	4	5	6	7	8	HR
Octal MTR - GP01	270	280	285	285	285	285	290	290	290
SSP RESIN	300	298	295	295	292	292	290	290	290

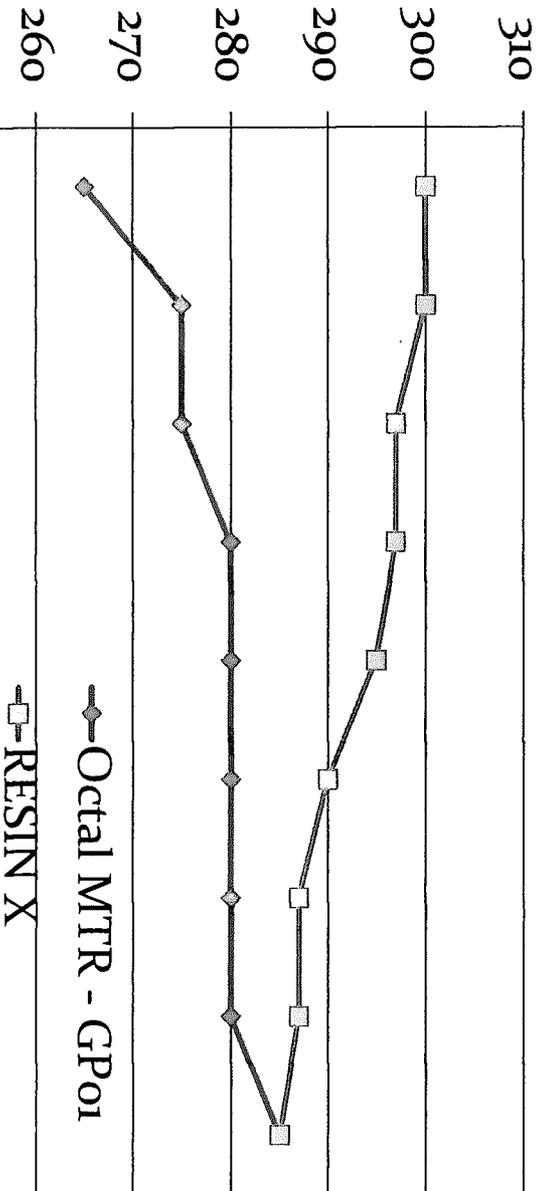
# 18.5gms Water preforms – Heater settings



	1	2	3	4	5	6	7	8	HR
Octal MTR - GP01	270	280	282	282	280	280	280	280	285
SSP RESIN	298	295	292	289	288	287	287	287	287

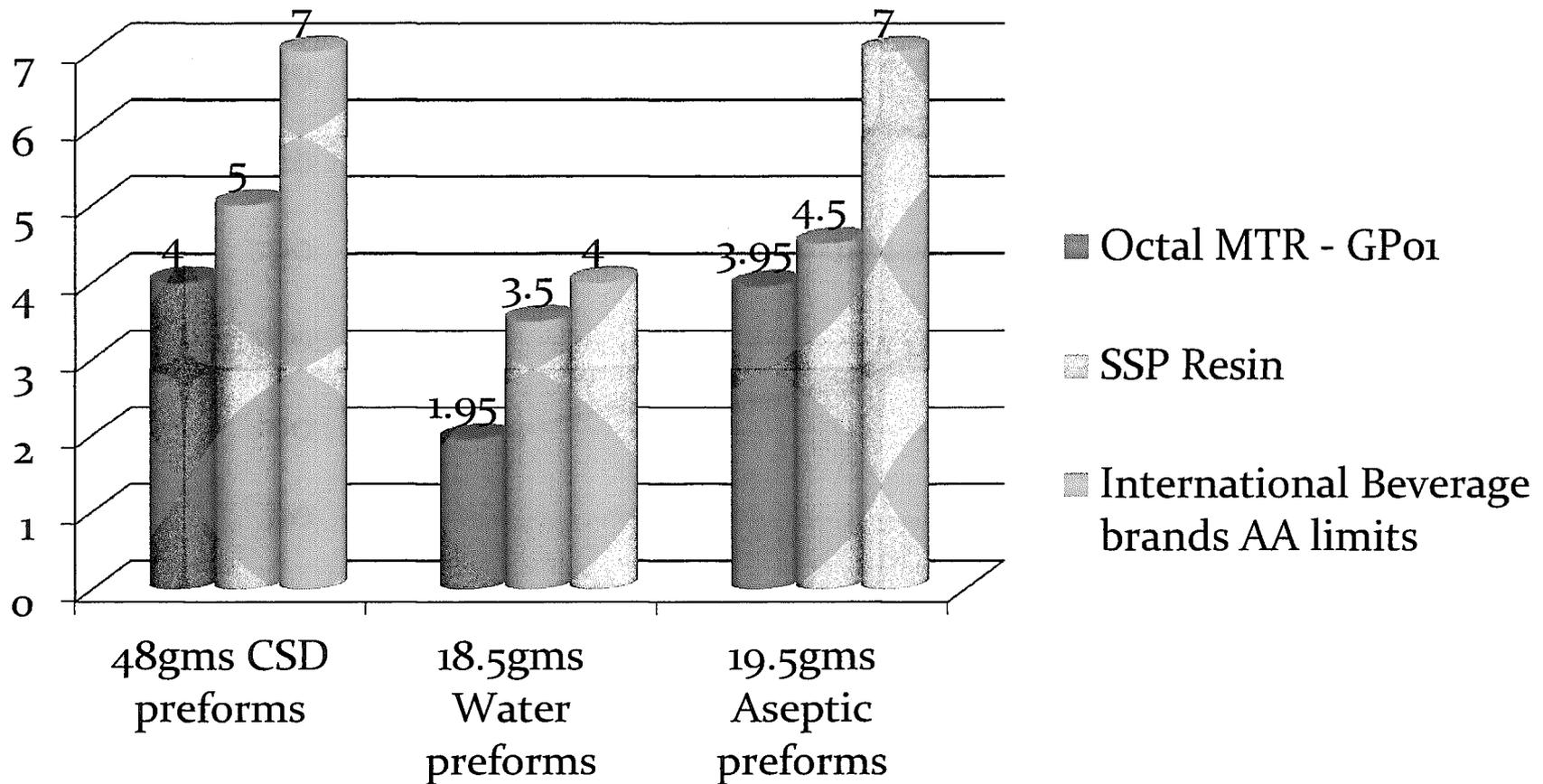
# 19.5gms Aseptic filling preforms – Heater settings

Temperature, Deg C



	1	2	3	4	5	6	7	8	HR
Octal MTR - GP01	265	275	275	280	280	280	280	280	285
RESIN X	300	300	297	297	295	290	287	287	285

# Residual AA in preforms & limits





# GP 01 - Blow molding

- The inherent color tint of the polymer from MTR technology increases the heat absorption from the infrared heaters
  - High heat absorption results in uniform heat distribution across the cross section of the preform resulting in easy stretching.
  - The uniform heat content across the cross section of the preform, increase the total heat content of the preform, thus enabling the preform to be stretching into extreme surfaces and intricate corners of the bottle easily; like the petalloid legs of smaller bottles, which is difficult to form.
  - The high heat absorption also helps in improving the throughput in high speed blowing machines.
  - Maintain lower oven temperature and lower exhaust percentage, which reduces the heat loss to the atmosphere.
  - The typical energy saving in blowing, for a 4mm thick preform is 4 ~ 5% of the heater output, compared to any standard non-fast reheat resin.

# Resin Delivery Methods

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- Bulk truck
- Supersacks
- Railcar
- Seabulk container

