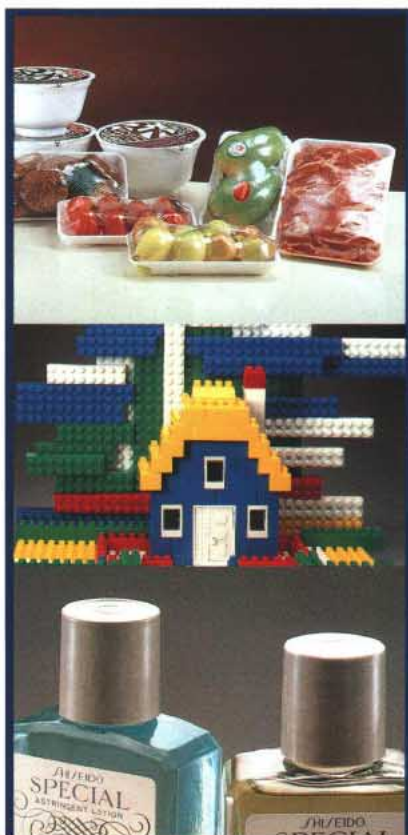




# **TEC-MCI STYRENICS POLYMER PRODUCTION PROCESS**

**BY CONTINUOUS BULK POLYMERIZATION**





HIPS Plant



## PRODUCT QUALITY AND APPLICATION

Styrenics polymer products by TEC-MCI\* continuous bulk process provide the following outstanding features and applications:

- GPPS Excellent high clarity.  
Suitable for PS foam by direct injection extrusion.
- HIPS Well balanced mechanical properties and processability.  
Suitable for electrical appliances and food packaging application.
- SAN Excellent chemical resistance and heat resistance.  
Suitable for containers and bottles contacting oil and chemicals.
- ABS Well balanced properties for both high impact resistance and chemical resistance with stable natural color due to continuous bulk process.  
Suitable for electrical appliances, office automation equipment and automotive parts.

### Styrenics Polymer:

- GPPS :General Purpose Polystyrene
- SAN :Styrene Acrylonitrile Copolymer
- HIPS :High Impact Polystyrene
- ABS :Acrylonitrile Butadiene Styrene Resin

\*MCI: MITSUI CHEMICALS INC.

## PROCESS FEATURE

The following process features are the result of our basic research on reaction kinetics and process engineering in the field of high viscosity materials:

- 1) High product quality with high performance
- 2) Wide range of product grades
- 3) Low residual monomer content products for hygienic applications
- 4) Low consumption of raw materials, chemicals and utilities
- 5) Simple process and compact plant layout
- 6) Easy operation and maintenance-free
- 7) Pollution free and proven safety
- 8) High efficiency



SAN Plant

## PROCESS DESCRIPTION

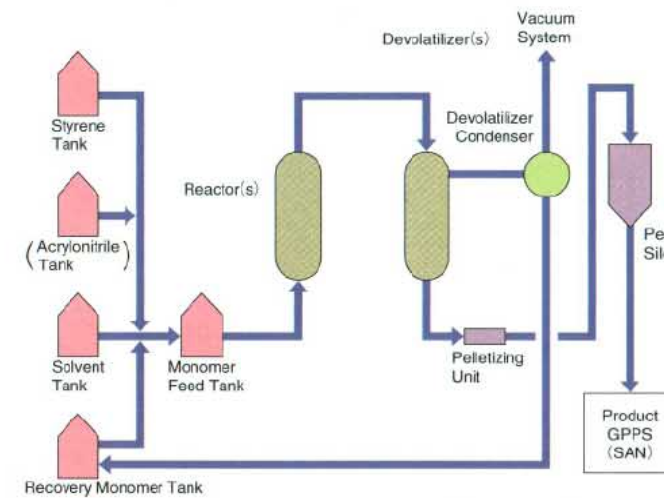
Raw material mixture (styrene, acrylonitrile, rubber), recycled monomer and a small amount of solvent are continuously fed to the specially designed reactor(s) in which polymerization takes place.

The high viscous polymer solution is transferred to an elaborate devolatilizer system, where volatile

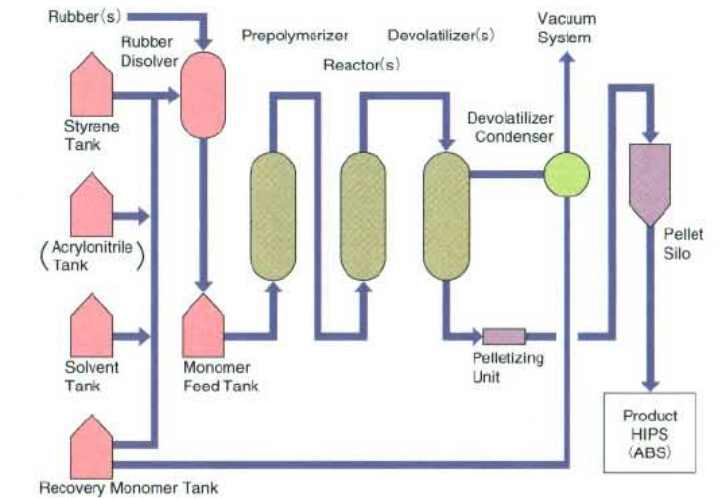
components are separated from the polymer solution by evaporation and the residual monomer content is reduced to the desired level.

The polymer from the devolatilizer system is continuously sent by the polymer pump to the pelletizing system.

Unreacted monomers and solvent are recycled as raw materials.



Transparent Styrenics Process Scheme (GPPS or SAN)



Rubber Based Styrenics Process Scheme (HIPS or ABS)



ABS Plant



GPPS Plant



# COMMERCIAL INSTALLATION

TEC has already contracted forty three styrenics polymer plants (GPPS, HIPS, SAN and ABS plants) all over the world.

Among these plants, twenty nine plants with a total production capacity of 498,000 tons per year are now operating successfully.

Client	Location	Plant	Capacity (T/Y)	TEC's Services
Mitsui Toatsu Chemicals, Inc.	Osaka (Japan)	GPPS	50,000	E. P. C.
		HIPS	35,000	E. P. C.
		SAN	20,000	E. P. C.
		ABS	15,000	E. P. C.
Sun Styrene Co.,Ltd.	Chiba (Japan)	HIPS	30,000	E. P. C.
Dainippon Ink & Chemicals Inc.	Yokkaichi (Japan)	GPPS	32,000	L. E. P. C.
Lucky, Ltd.	Yoe-su (Korea)	HIPS	75,000	L. E.
		GPPS	35,000	L. E.
		SAN	10,000	L. E.
Grand Pacific Petrochemical Corp.	Kaohsiung (Taiwan)	SAN	50,000	L. E.
Formosa Chemicals & Fibre Corp.	Chiayi (Taiwan)	SAN	120,000	L. E.
Gaoqiao Petrochemical Corp.	Shanghai (China)	SAN	5,000	L. E. P.
Jilin Chemical Ind. Corp.	Jilin (China)	HIPS	5,000	L. E. P.
		ABS	10,000	L. E. P.
Lanzhou Chemical Ind. Corp.	Lanzhou (China)	HIPS	5,000	L. E. P.
		SAN	15,000	L. E. P.
Technical Corps for Special Projects	Iraq	SAN	5,000	L. E.
Confidential	Japan	SAN	20,000	E. P. C.
P.T. Graha Swakarsa Prima	Indonesia	HIPS	13,000	L. E.
		SAN	10,000	L. E.
China Petrochemical International Co.	China	HIPS/GPPS	36,000	L. E. P.
Confidential	Thailand	SAN	53,000	L. E.
Pushpa Polymers Pvt., Ltd.	India	HIPS	30,000	L. E.
		GPPS	30,000	L. E.
Eternal Plastics Co.	Thailand	GPPS	30,000	L. E.
Hyundai Industrial Development & Construction Co., Ltd.	Korea	SAN	66,000	L. E.
		ABS	30,000	L. E.
Taita Chemical Co.	Kaohsiung (Taiwan)	SAN	30,000	L. E.

Note: L :License; E :Engineering; P :Procurement; C :Construction

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