The ten "factories" that go to make up the Polymer Plant are:

1. The Supersuspensoid Cracking Coil is a clever adaption of the standard refinery thermal cracking unit, which had been developed by the Imperial Oil Company Limited, and is located in that refinery, not on the Polymer site. In successful operation before rubber production was considered, this development enabled the Polymer management to start operations with a minimum of delay and at considerable savings in production costs.

The Supersuspensoid cracking operation consists of heating naphtha and gas oil to high temperatures and pressures along with a small quantity of catalyst; thus breaking down the molecules into the smaller molecules required. Pipes from the coils convey to Polymer 6,255 barrels of light ends liquid petroleum and 19.4 million cubic feet of petroleum gases per day, which are the crude forms of isobutylene, normal butylenes, ethylene, and propylene, the raw materials used in the Polymer plant.

2. The Light Ends Recovery Unit is a fractional distiller in which the hydrocarbon streams from Imperial Oil are broken up into these components: ethylene, propylene fuel gas and a so-called butane-butylene cut, containing isobutylene, normal butylenes, butane and isobutane. The ethylene is for the production of styrene and the propylene for making cumene.

3. The Isobutylene Extraction Unit separates isobutylene, which later forms the major part of butyl rubber, from the liquified butane-butylene cut by treatment with acid.

4. The Butylene Concentration Unit separates and concentrates the butylene necessary for making butadiene, one of the two chief ingredients of buna-s.

5. Butadiene Unit comprises two sections, one carrying the dehydrogenation (removal of hydrogen from the molecule) and the other the concentration.

The dehydrogenation section is divided into two identical units. The normal butylenes are mixed with high temperature steam and passed over a catalyst, thus removing hydrogen and producing butadiene which is then purified by selective solvent absorption in the extraction section.

6. Styrene Unit and Cumene Section comprises four sections, the Ethyl-benzene, the Cumene, the Styrene Cracking and the Styrene Finishing.

Ethylene from the Light Ends Recovery Unit is piped to the Ethyl-benzene-Cumene building, Benzene (benzol) is brought in by lake tankers during the summer from the coke ovens at Sault Ste. Marie, Ontario, and stored for use in the winter months.

The Ethyl-benzene-Cumene section contains two sub-sections, both originally designed to turn out ethyl-benzene, one now turning out Cumene. One section was able to turn out sufficient ethyl-benzene to make the required styrene for production of buna-s rubber, and the other section produced ethyl-benzene for blending with high octane aviation gasoline. With minor alterations made during the summer of 1944, one of the ethyl-benzene sections was switched over to making Cumene, going into operation September 17, 1944.

In the Ethyl-benzene section the ethylene is reacted with benzene over a catalyst to produce ethyl-benzene.