PHENOL PRODUCTION

Phenol is principally used in the production of Bisphenol A (BPA), which also provides us with polycarbonate, a high performance engineering plastic mainly used in the automotive and construction sectors.

Our raw material is cumene, which we also produce in a process involving state-of-the-art technology.

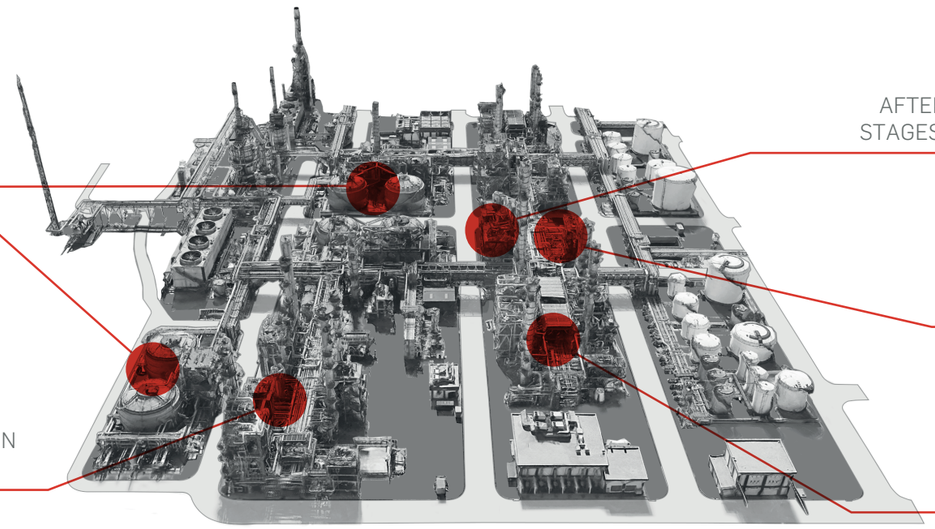
If we stop to think about it, phenol is present in many items that make a big difference in our lives. From vehicle dashboards to building insulation, helmets, wind turbines and even aspirin.

During the production process we also produce acetone, which is an excellent solvent used to manufacture resins, rubbers, paints, varnishes and inks. Its most important use, however, is for the production of methyl methacrylate (MMA).

In addition, we also obtain a high added value derivative called alpha-methylstyrene (AMS), used primarily in the coating, anti-oxidant and adhesives industries.

Cepsa manufactures these products at its plants in Palos and Shanghai, which have the following nominal capacities:

- **1,360,000** MT/year of **Cumene**
- **520,000** MT/year of **Acetone**
- **800,000** MT/year of **Phenol**
- **24,000** MT/year of **AMS**



2 CUMENE TREATED WITH OXYGEN FOR CHP PRODUCTION: **OXIDIZERS**

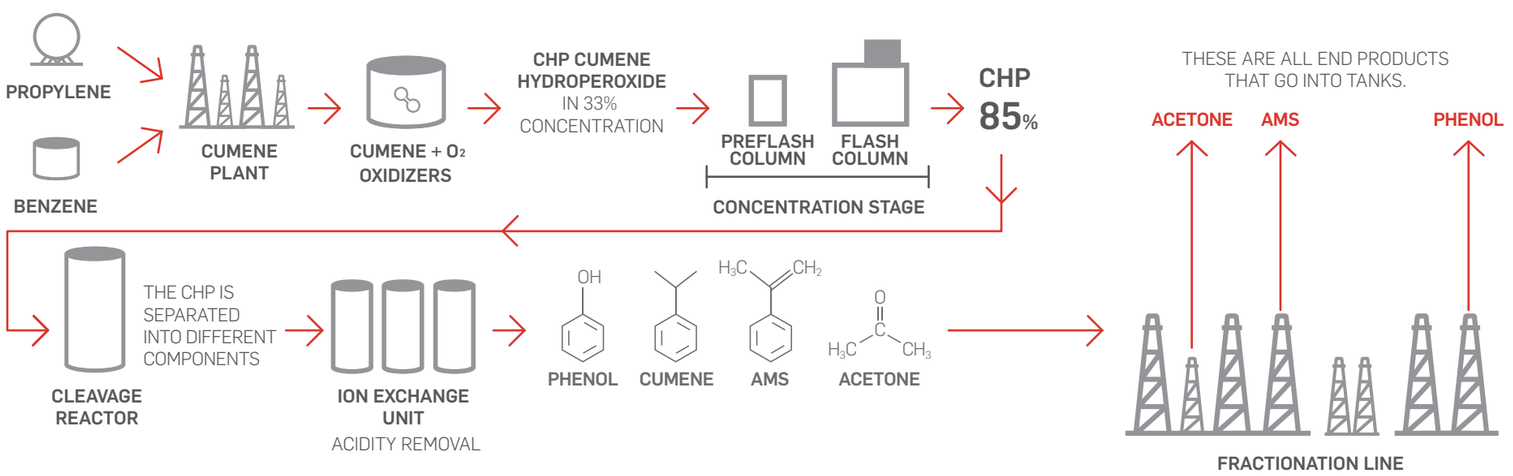
1 CUMENE PLANT
CUMENE PRODUCTION BASED ON BENZENE AND PROPYLENE

PREFLASH AND FLASH COLUMNS **3**
CONCENTRATION/EVAPORATION STAGE AFTER GOING THROUGH PREFLASH AND FLASH STAGES, CHP CONCENTRATED FROM 33% TO 85%

THE 85% CHP CONCENTRATE IS **4** SEPARATED IN THE **CLEAVAGE REACTOR** AND ACIDITY IS REMOVED IN THE **ION EXCHANGE UNIT**

FINAL STAGE **5** **FRACTIONATION LINE** WE DISTILL AND OBTAIN THE DIFFERENT COMPONENTS: **ACETONE, AMS AND PHENOL**

INITIAL DIAGRAM FOR **PHENOL**



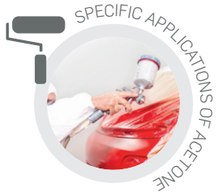
MOST COMMON USES FOR **PHENOL** AND **ACETONE**

PLASTICS MANUFACTURING CONSUMER PRODUCTS LIKE CELLPHONES, COMPUTERS, LED LAMPS, POLYCARBONATES AND OTHER ENGINEERING PLASTICS.

MANUFACTURING OF STRONG, LIGHT-WEIGHT PLASTICS AND RUBBER THAT ENHANCE ENERGY EFFICIENCY.

COMPOSITE MATERIALS. SCRATCH RESISTANT AND EASY TO CLEAN. FURNITURE AND MOLDED RESINS FOR CONSTRUCTION AND BUILDING INSULATION.

PHARMACEUTIAL USES FOR THE PRODUCTION OF ACETYLSALICYLIC ACID AND OTHER COMPLEX VITAMINS.



ALL-PURPOSE SOLVENTS, ACRYLIC POLYMERS FOR PAINTS AND COATINGS.

CEPSA