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Late 1970s
Positive Photoresist
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A positive photoresist based on a novolac based polymer was invented by Kalle Corporation in Germany in 1944 and the first AZ photoresist (AZ-15) was manufactured by Hoechst of Germany in 1962. In 1965, AZ-1350 was announced from Shipley of the United States, and it was used as the photoresist for making reticles by pattern generators. However, because the developer was an aqueous solution of sodium silicate, it was not used for wafer exposure.

In 1970 IBM announced a development method with TMAH (tetramethyl-ammonium hydroxide), and it began to be used for some wafer exposure such as Al interconnect process. However, the positive type resist had high brittleness, and in the contact exposure method bringing the photomask into close contact with the resist, defects due to film breakage were likely to occur, so that the negative type photoresist was the mainstream of wafer exposure.

In the late 1970's, proximity exposure projection exposure methods became the mainstream of photolithography instead of the contact exposure method. In addition, the positive photoresist (AZ 1350) came to be used in place of the negative photoresist which were used in the contact exposure method.

In Japan, Tokyo Ohka produced the first domestic positive photoresist (OFPR - 2) in 1971, and announced OFPR-800 in 1979, which solved the problems of AZ 1350, such as surface film peeling during development and resist residue at the pattern steps after the development. This resist was widely used in the process generation of 64Kb DRAM and became the key to opening up the reduction projection exposure method in the 1980's.

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