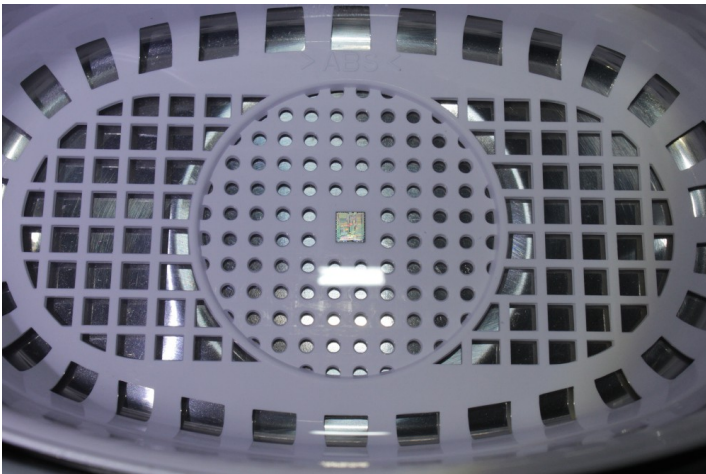


## Epoxy Removal by Ultrasonic Cleaner



Ultrasound Cleaner (Cleaning Time of 480 Seconds Specified)

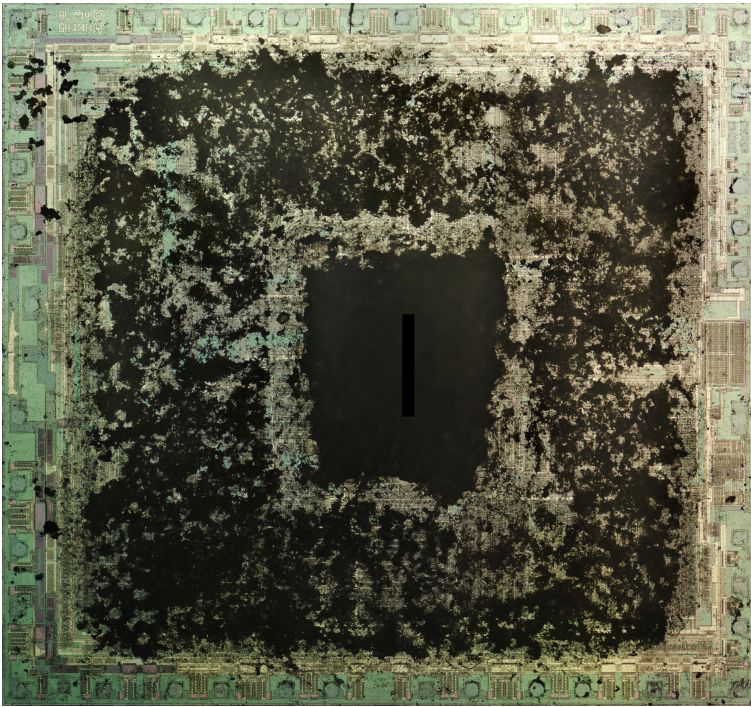


Before Cleaning (Putting Die in Basket is Essential)

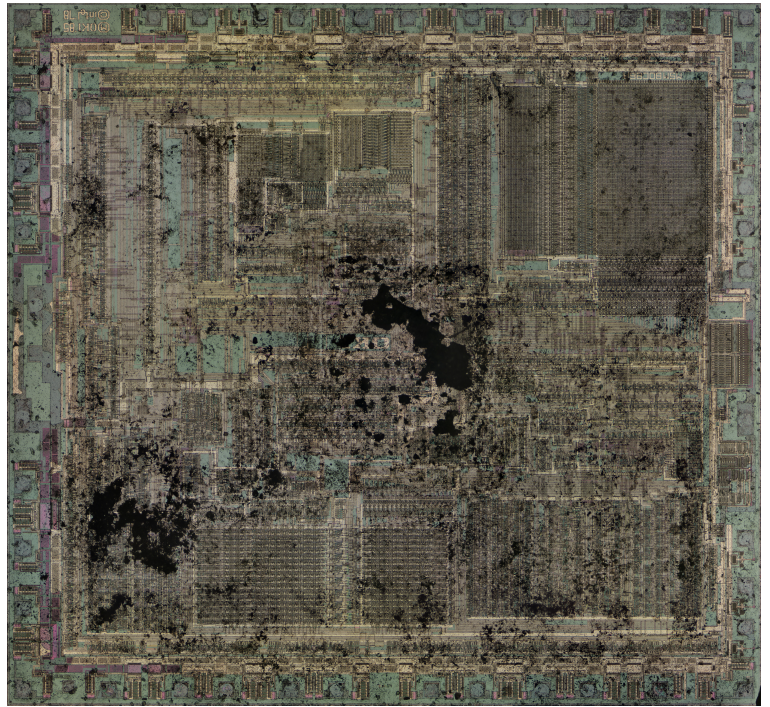


Cleaning (Huge Variety of Ripples Cleans Surface)

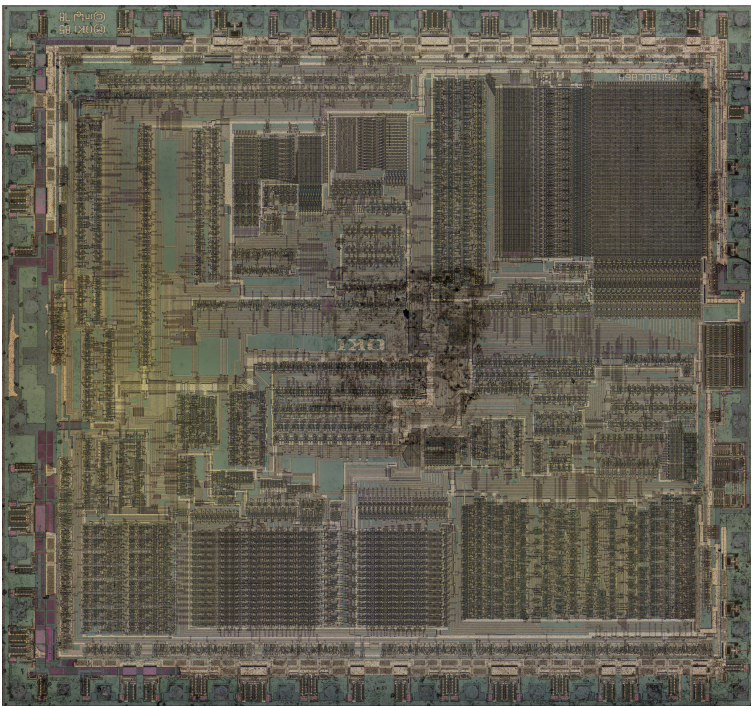
The die must be remained attaching to island (A part of base ribbon which mounts the die). If the die and island are separated accidentally, ultrasonic cleaner breaks the die when cleaning. Both the island and the basket protect the die from such catastrophic consequences.



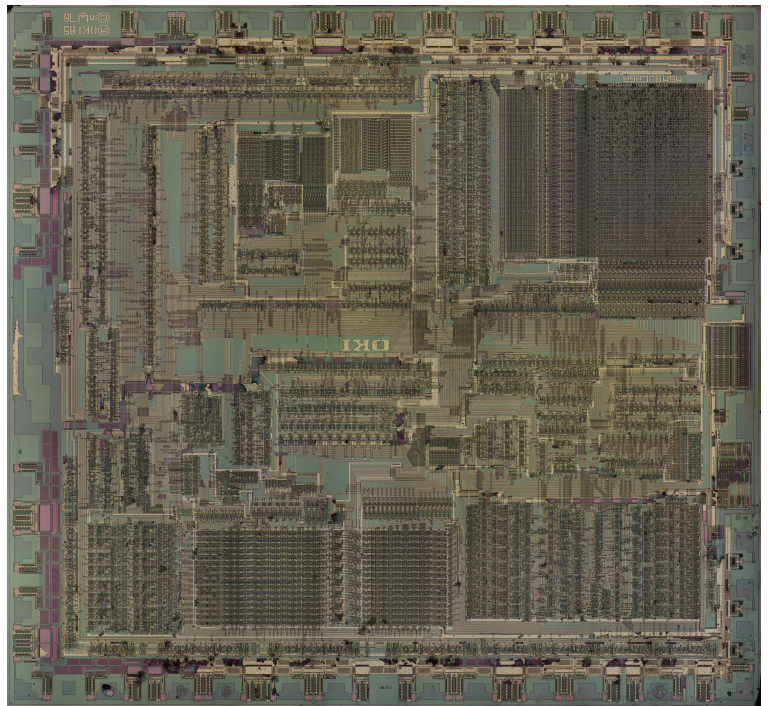
Stage 1



Stage 2



Stage 3



Stage 4 (Final)

The epoxy removal by chemical approach (nitric acid under high temperature) incurs etching metal. Therefore, as soon as interconnects are exposed, stop the chemical approach and start cleaning by Ultrasonic cleaner. Drench in water for a long possible time and clean in hot water. Every 480 seconds (8 minutes), check the result visually at early stages and by microscope at ending stages.

In this example, metal was peeled off by too much ultrasound cleaning at various places shown by black dots (it is not black actually), at stage 4. But, it does not affect the quality of die photo so much. See high resolution die photo (Intel 80C86A).