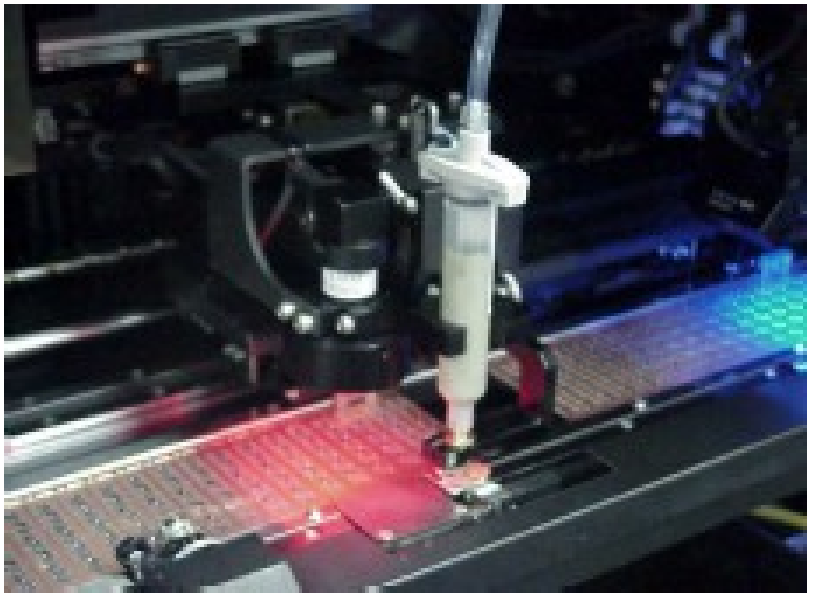
TCC
Top Chemical Company

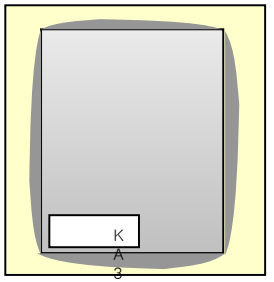
DIE ATTACH PROCESS

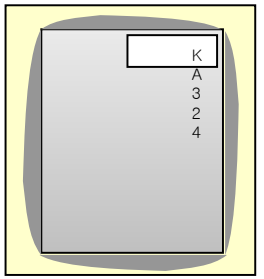


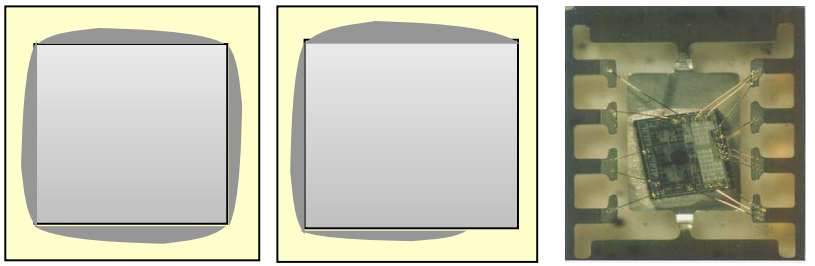
티씨씨 접착제팀

DIE ATTACH PROCESS – 시작

공정 진행 순서	관리 사항	예상 불량 유형
제품	- W/F 방향, B/D확인, T-CARD	- Die orientation defect
M/C 동작 상태 확인	- 장비 구동 상태 확인 - Die 대비 Collet size가 올바른지 확인 - Plunger pin 마모 상태 및 위치 확인 - Epoxy tool 마모상태 및 size 확인 - Lead frame 방향 확인 - Tool cleaning 상태 - Nozzle의 수평도 - Air and vacuum 압력 확인	- Epoxy On Die 불량 - Die tilt & Voids, 전기적 특성 불량 유발 - Epoxy fillet coverage 불량 (75%)
L/F Loader	- L/F Feeding 상태 및 Position 확인 Index 및 ID Mark 위치 확인 - L/F feeding시 balance 확인 - Epoxy type 확인 - Die pick-up tool 교환 시 확인 사항	- Index trouble로 인한 Die position불량 (Poor center) - Part mix 불량 - Die tilt & Glue thickness(0.3 ~2.0mil) 불량 유발 - 부적절한 자재 사용으로 해당 Lot 전량 Scrap 처리

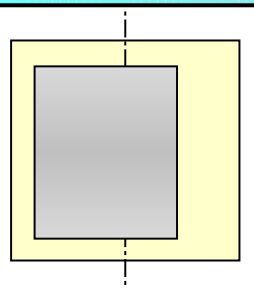


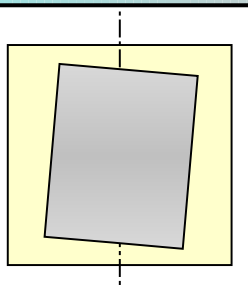




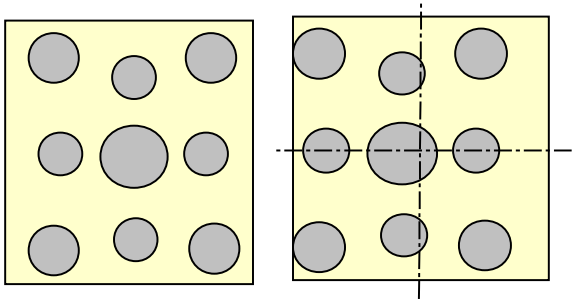
DIE BONDING 공정 및 불량의 유형

공정 진행 순서	관리 사항	예상 불량 유형
Die Bonding	- Die attach된 Die 위치가 중앙인지 확인 - Die orientation 발생 유무 확인	Poor center(10Mil) Die orientation(5도 이상)

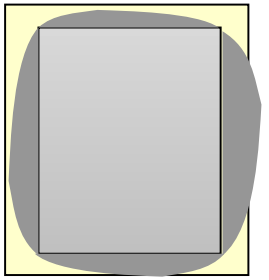


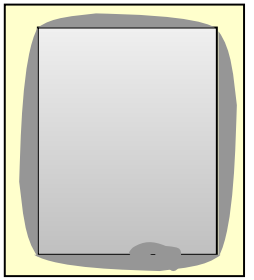


- Epoxy 양과 Dot위치는 적절한지 확인



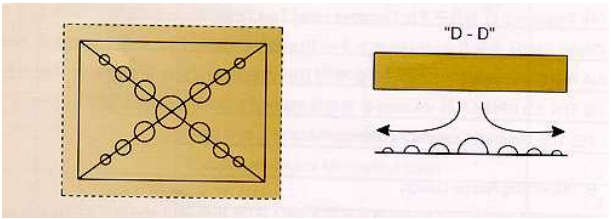
- Over flow 및 EOD 불량

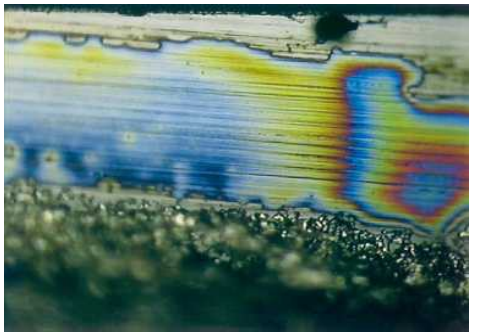




DIE BONDING 공정 및 불량의 유형 – 계속

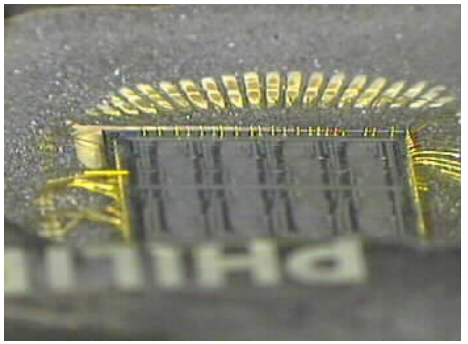
공정 진행 순서	관리 사항	예상 불량 유형
Die Bonding	- Epoxy coverage & fillet height 확인	- Resin bleed & Kerf creep 발생 초래
	- Glue thickness & die tilt 여부 확인	- Glue thickness control 문제 발생
		- W/B시 Chip damage Bond ability(BST) 문제







Good　　Die tilt(기울어짐)



DIE BONDING 공정 및 불량의 유형 – 계속

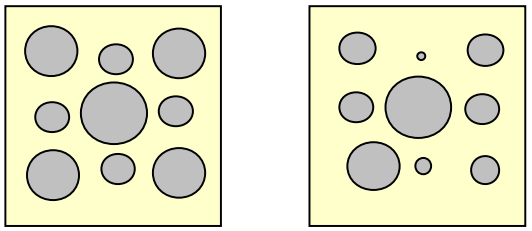
공정 진행 순서	관리 사항	예상 불량 유형

Die Bonding

⇩

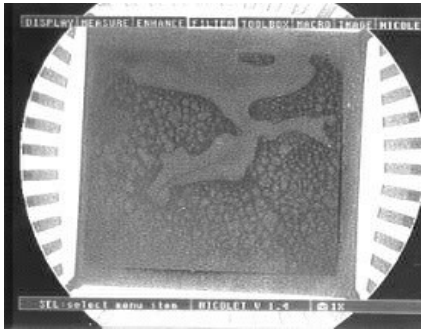
- Epoxy양 조절 및 Tool의 수평도

- Epoxy dot formation을 보고 판단한다.
(Dot size & Height를 확인한다)

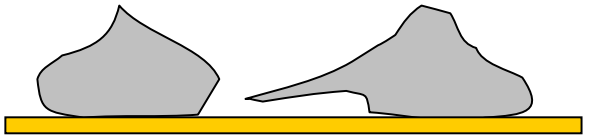


양호 Epoxy dot 불량

- Epoxy voids 발생

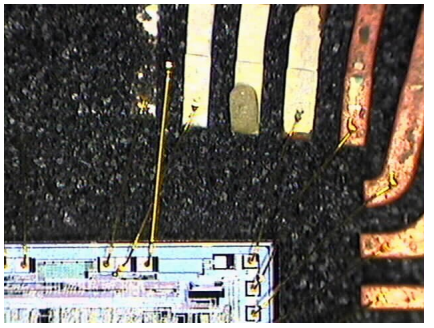


- Epoxy tail length 및 formation



양호 Epoxy tail

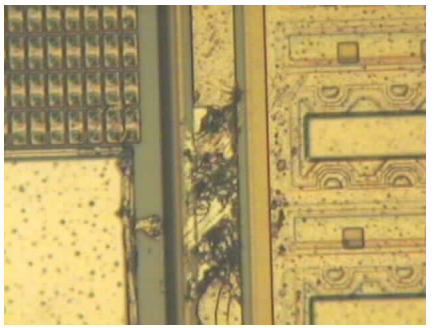
- EOD / EOL 발생



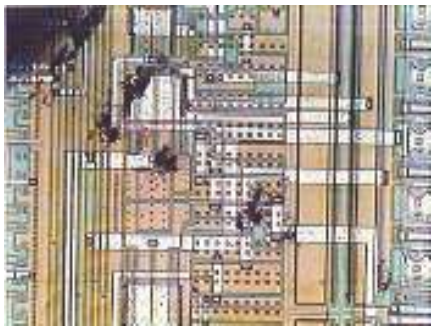
DIE BONDING 공정 및 불량의 유형 – 계속

공정 진행 순서	관리 사항	예상 불량 유형

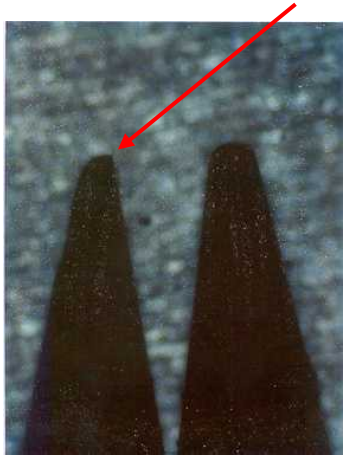
Die Bonding



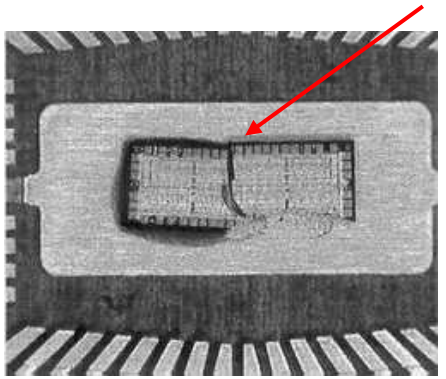
- **Collet** 및 이 물질에 의한 **TMD** 유무 확인



- **Top Metal Damage** 발생



- **Plunger pin damage & broken**

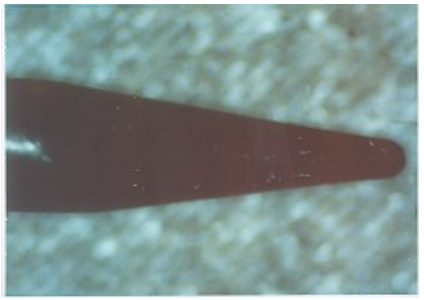


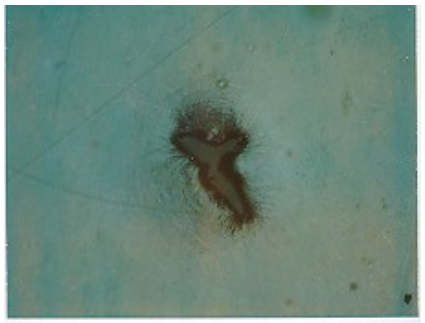
- **Die crack** 발생

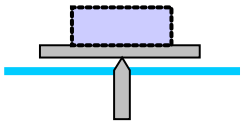
DIE BONDING 공정의 예상 불량 유형

공정 진행 순서	관리 사항	예상 불량 유형

Die Bonding



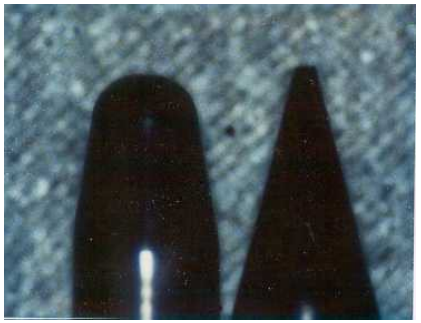




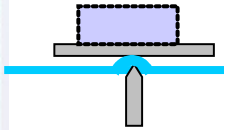


- **Expand Tape** 구멍 뚫임

- **Die back side**에 **Tape** 찌꺼기 잔존







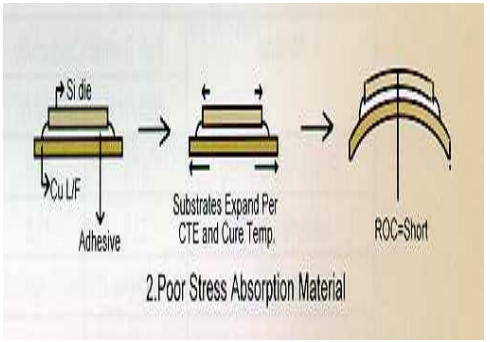


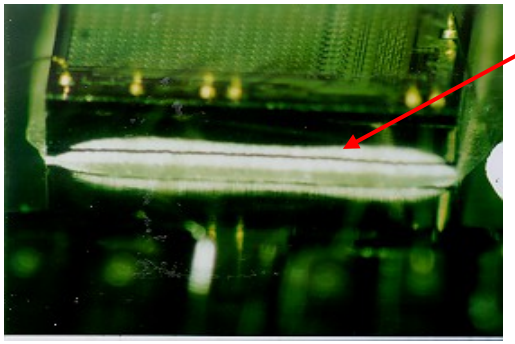
- **Expand tape** 구멍 없음

- **Die back side**에 **Tape** 찌꺼기 없음

DIE BONDING 공정의 예상 불량 유형- 계속

공정 진행 순서	관리 사항	예상 불량 유형
Unloader	- L/F unloading시 cassette에 부하가 걸리거나 충격여부 확인	- Lead damage 및 EOD & EOL 발생 - Die 위치 변함
OVEN CURE	- Epoxy type 확인 - Setting temp. 확인 - Oven burnt cleaning 상태 확인 - Oven cure후 Temp. profile 확인 - Oven cure 완료 후 자재 냉각 시 20Cm 간격만큼만 열어 둔다.	- 불완전 Cure 조건으로 W/B시 BNS.BST, Cushion 현상 발생 - Epoxy curing condition 부적합 - Pkg. Delamnation 유발 - 적정 Curing 조건 - 열팽창계수 차이로 인한 Warpage및 Horizontal crack 발생





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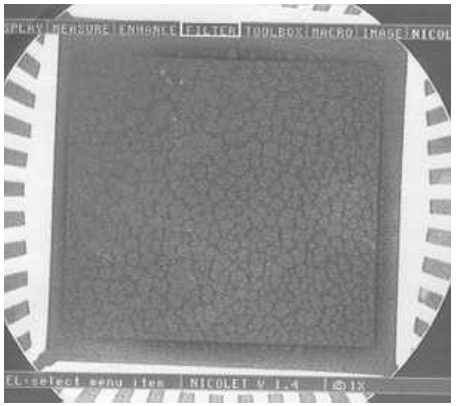
OVEN CURE 공정에 따른 EPOXY 변화 현상

공정 진행 순서

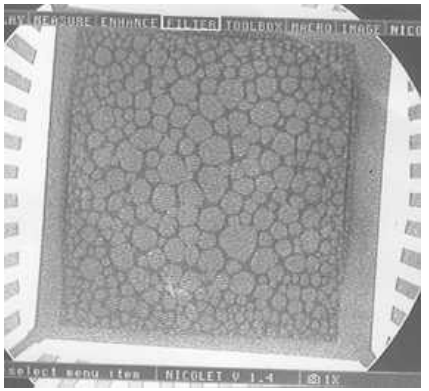
OVEN CURE

⇩

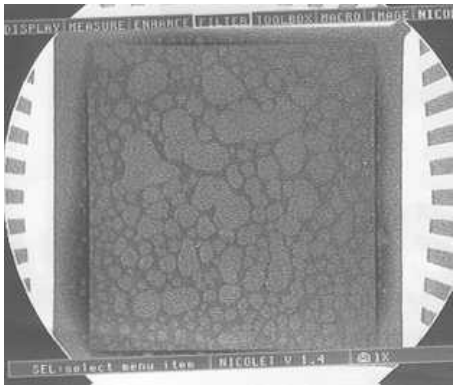
D/A후 Oven cure 대기 시간에 따른 Epoxy void 증가 및 변화 현상



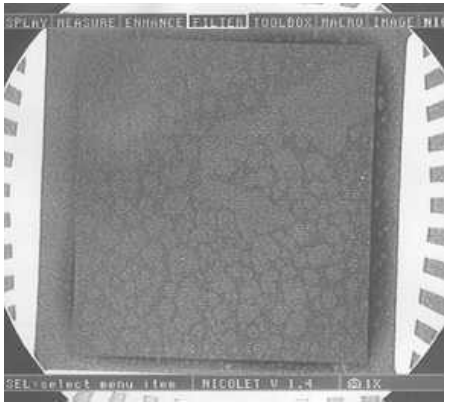
3시간 (Normal)



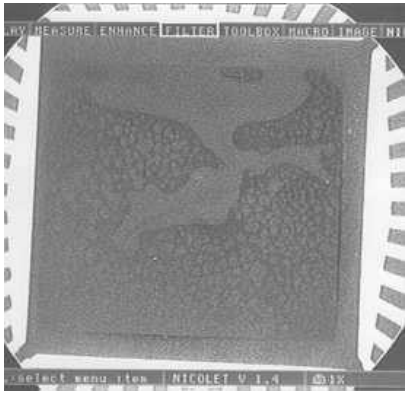
6시간(50%)



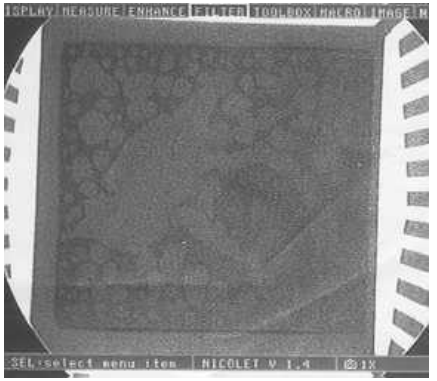
9시간(65%)



12시간 (70%)



15시간(Large Void)



21시간(Large Void)

티씨씨

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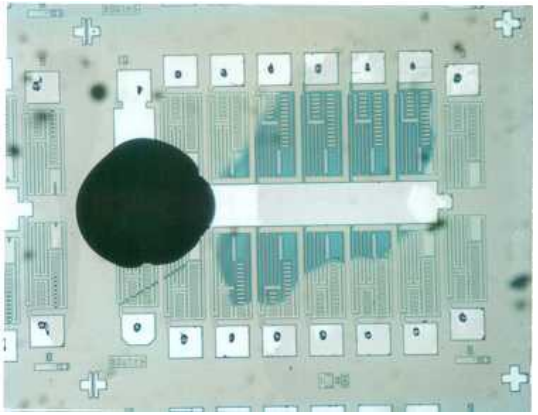
SNAP CURE 공정의 예상 불량 유형

공정 진행 순서	관리 사항	예상 불량 유형
SNAP CURE	- Snap cure용 epoxy인지 확인 - Setting temp. 확인 - Oven 내부 cleaning 상태 확인 - N2 Gas flow rate 확인	- 불완전 Cure 조건으로 W/B시 Die lifting 발생 - Epoxy curing condition 부적합 - Pkg. Delamnation 유발 - 적정 Curing 조건
⇩		
Wire Bonding		

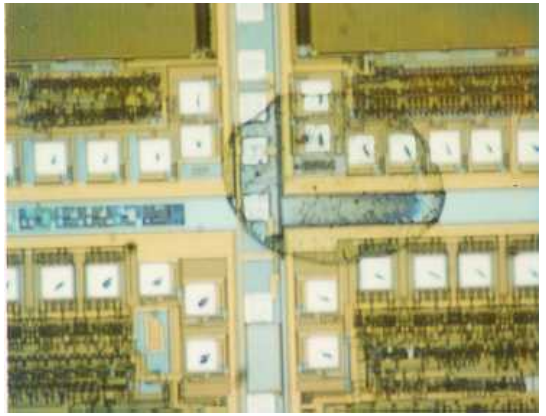
TCC
Top Chemical Company

DIE ATTACH 공정에서 발생하는 불량 유형 정리

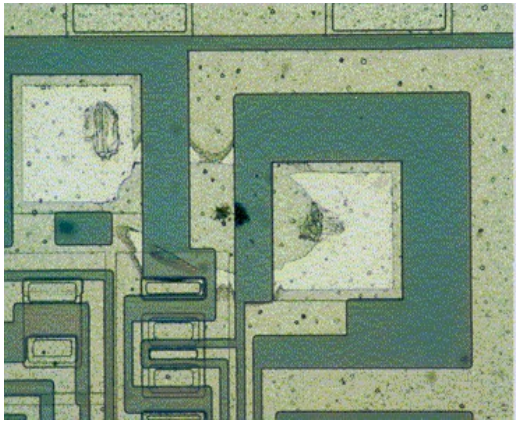
불량 유형 정리 (Fab. 관련 Defect1)



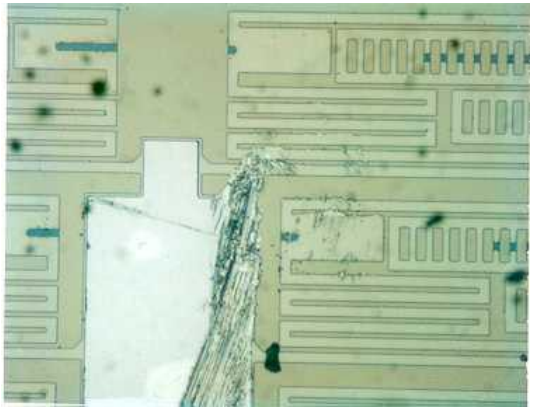
Ink location (잉크 치우침)



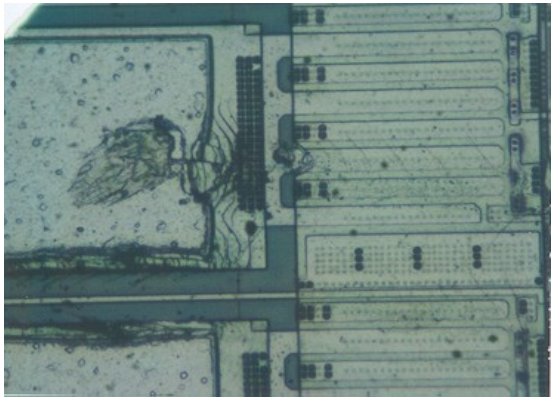
Contamination (이 물질)



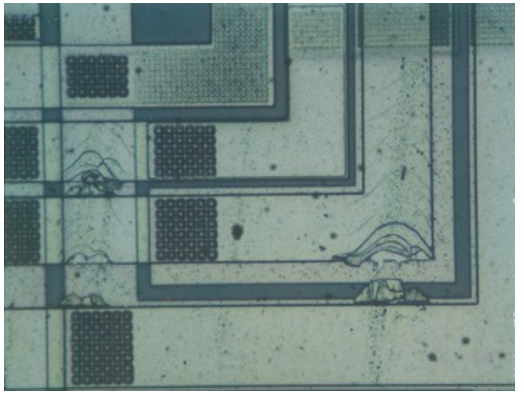
Over etching



Metal short



Scratch

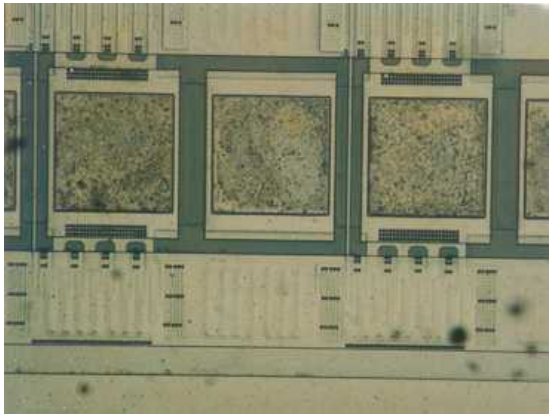


Top Metal Damage

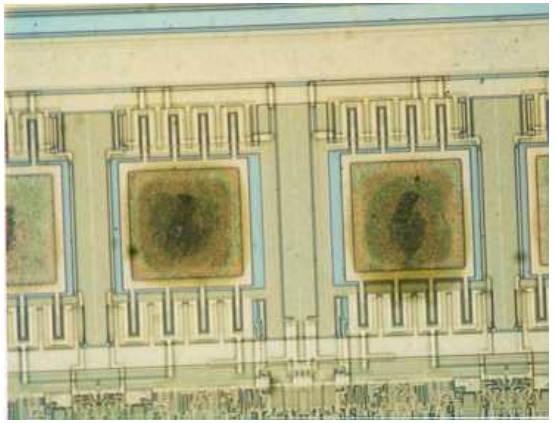
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DIE ATTACH 공정에서 발생하는 불량 유형 정리

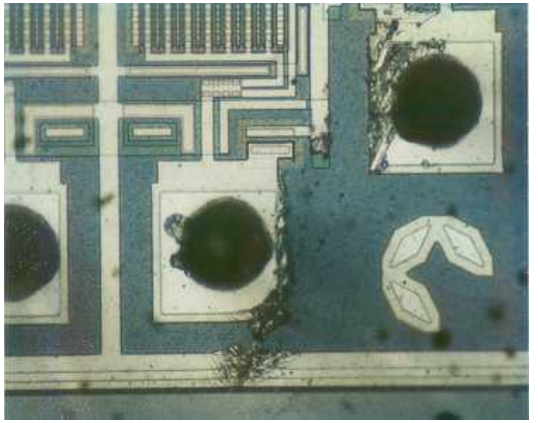
불량 유형 정리 (Fab. 관련 Defect 2)



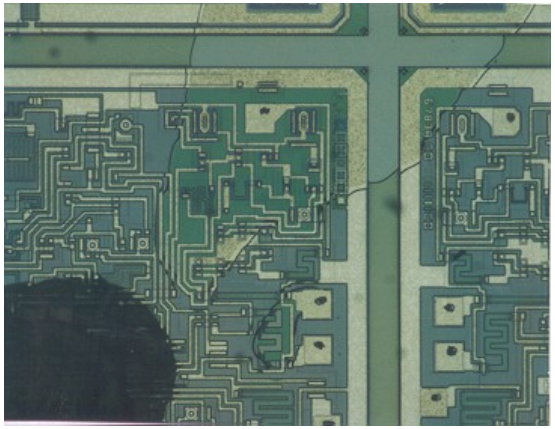
Bond pad corrosion



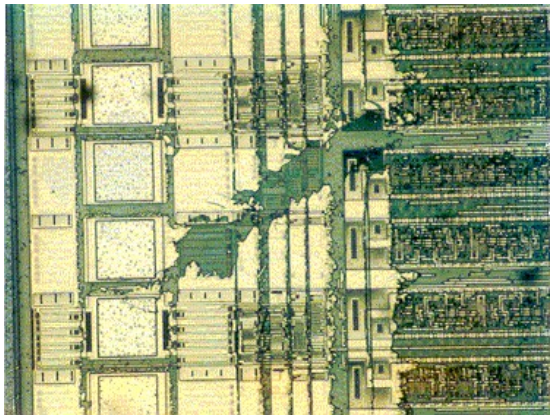
Corrosion(부식)



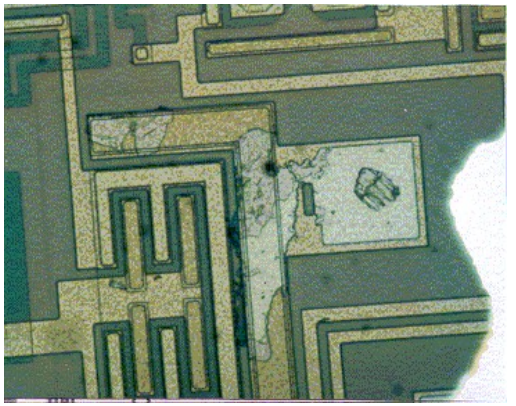
Scratch



Glassivation fault



Metal 들뜸

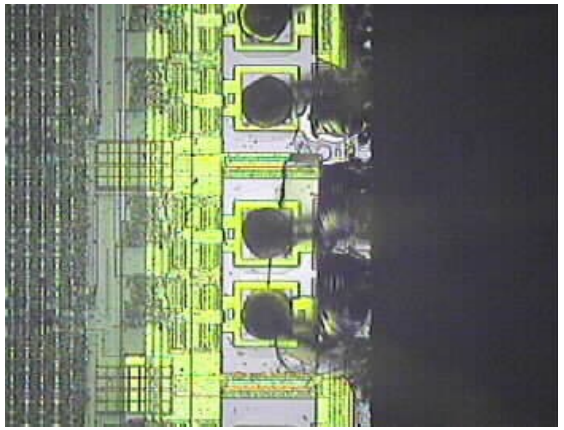


Metal void

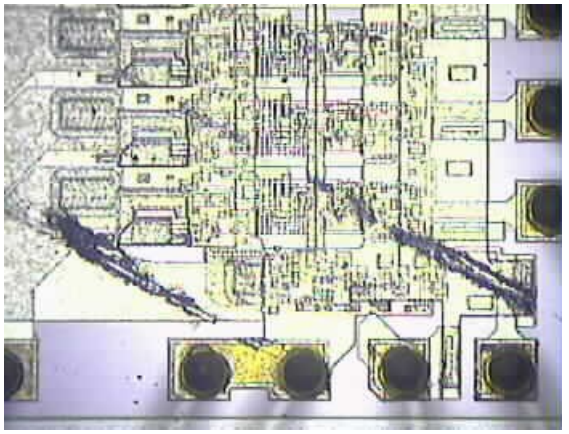
TCC
Top Chemical Company

DIE ATTACH 공정에서 발생하는 불량 유형 정리

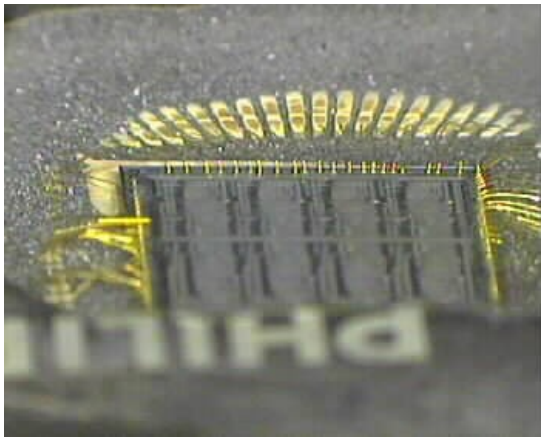
불량 유형 정리 (Assembly 관련 Defect)



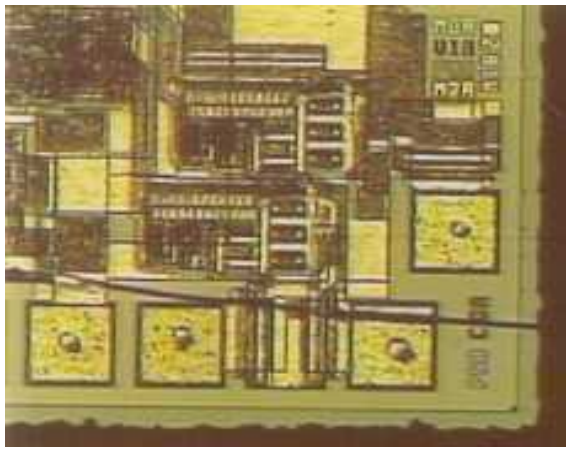
Die chipping



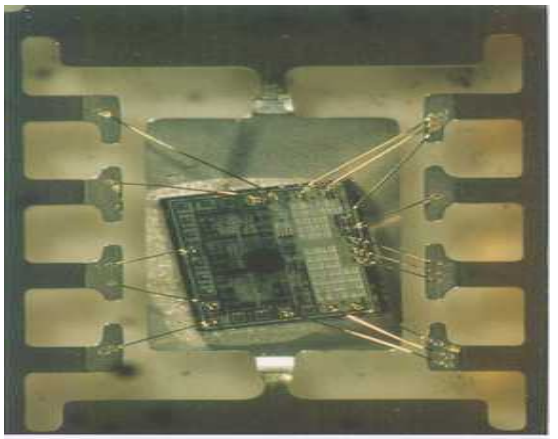
Die scratch



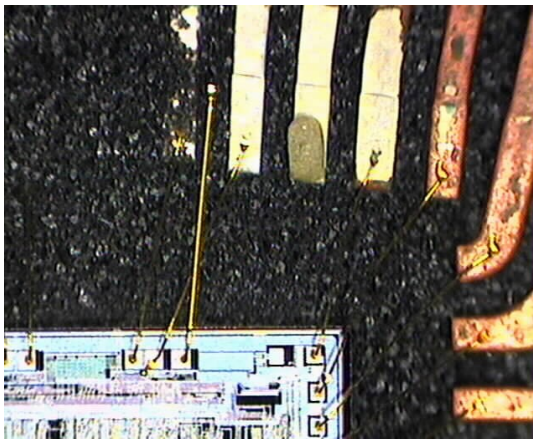
Die tilt(다이 기울어짐)



Die crack



Epoxy coverage



Epoxy On Lead