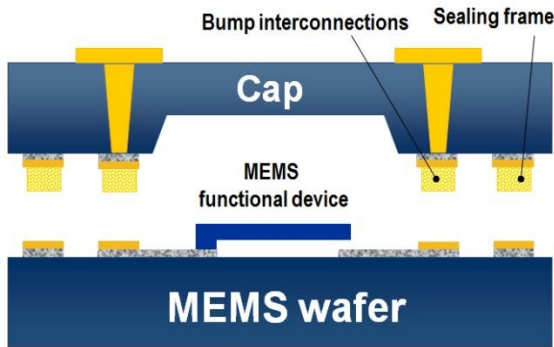


サブミクロン Au 粒子を用いた低温封止接合

田中貴金属工業(株) 小柏 俊典 E-mail : t-ogashiwa@ml.tanaka.co.jp



Au 粒子焼結体の圧縮変形(200°C)で出現する緻密組織を用いて、ウエハレベルの気密封止技術を開発しました。接合材からのアウトガスが抑制出来ることから、ゲッターフリーの実装技術を目指します。

T. Ogashiwa, K. Totsu, M. Nishizawa, H. Ishida, Y. Sasaki, M. Miyairi, H. Murai, Y. Kanehira, S. Tanaka, M. Esashi, "Hermetic Seal Bonding at Low-temperature with Sub-micron Gold Particles for Wafer Level Packaging", in Proc. of 48th International Symposium on Microelectronics (IMAPS), Orlando, Florida, USA, October 26-29, 2015, pp. 73-78.

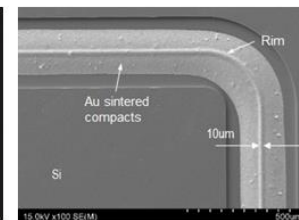
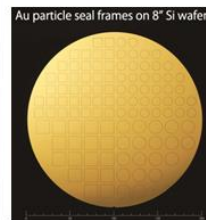
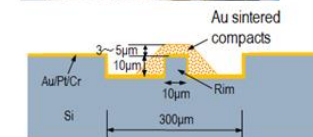
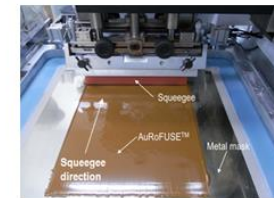
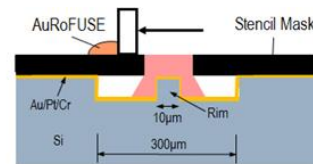
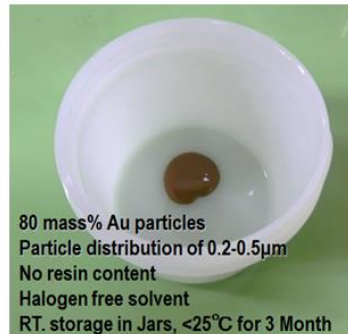
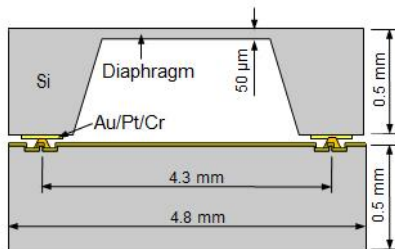
(a) Formation of a rim structure in 10 μm width by dry etching process.



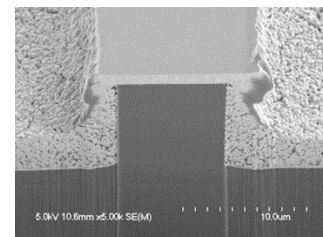
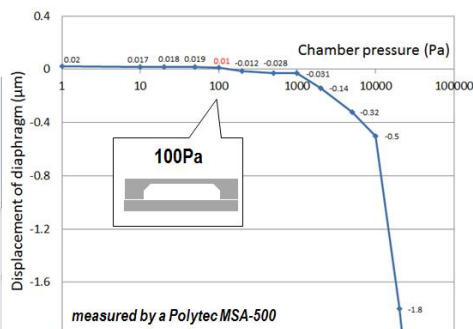
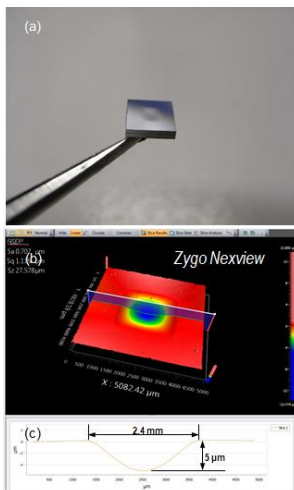
(b) Printing with Au paste and sintering at 200°C/2h in Ar-4%H₂.



(c) Thermo-compression bonding at 200°C/30min under a pressure of 200MPa for the rim.



Wafer Level Hermetic Sealing Process Appearance of Au Paste for Stencil Printing (AuRoFUSE™) Formation of Au Sintered Compacts by Stencil Printing



リム封止部の SEM 断面観察

Exposure time in He	Before exposure	After exposure		
		< Dwell time >		
72 hours	2.91E-15	1.52E-12	1.99E-13	1.09E-14
0.617MPa(abs)		< 17 min >	< 392 min >	< 1706 min >
Empty chamber	4.82E-15	4.97E-14	2.46E-14	5.37E-15

He leak rate : 10⁻¹⁴ Pa·m³/s (He)

ダイアフラム付ウエハの接合 チャンバー減圧に伴うダイアフラムの変位

He リーク測定結果