UTAC Reflow Analysis Capability

Thermal-Mechanical Simulation for Reflow Analysis

Industry

Singapore

Overview

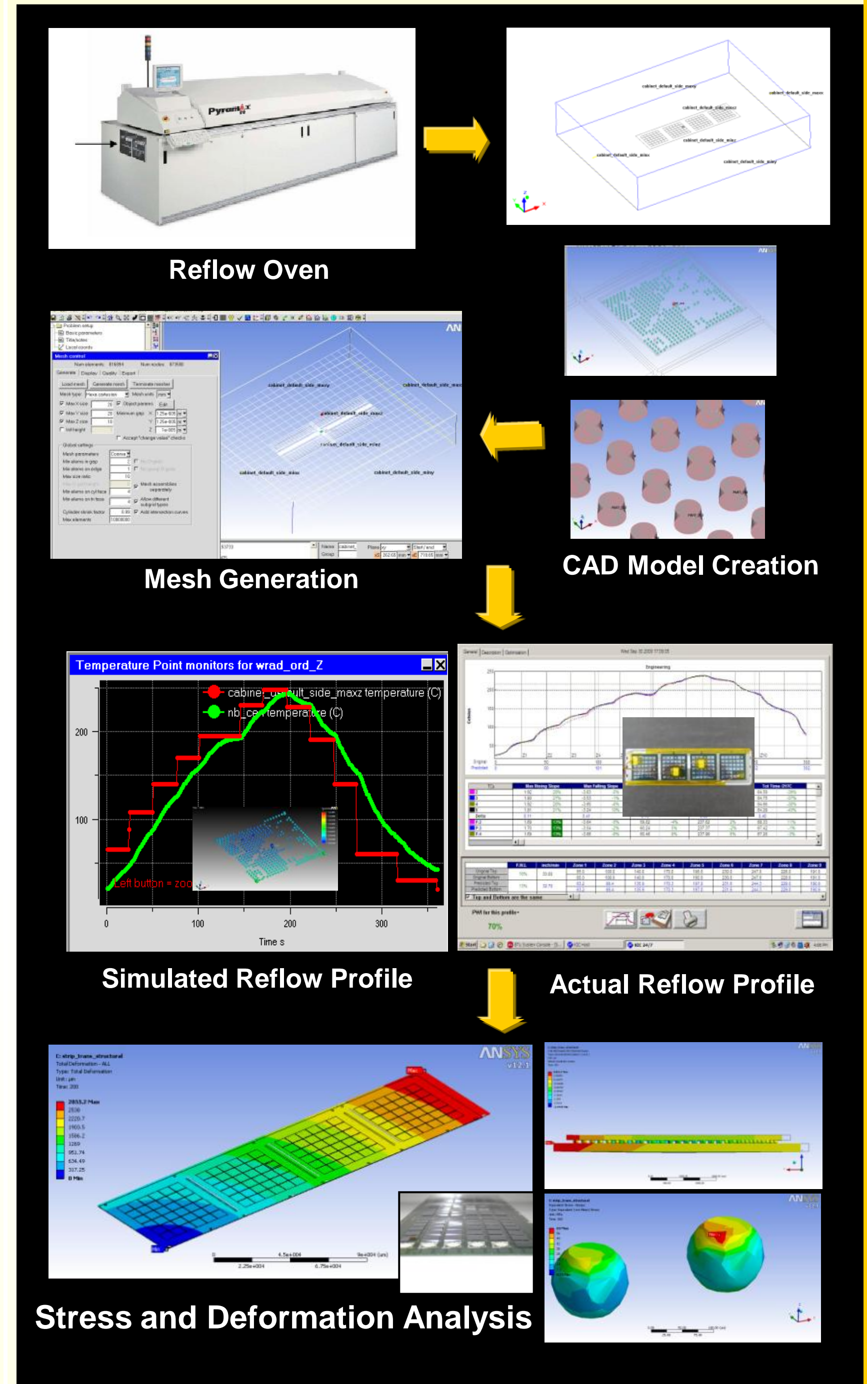
Simulation capabilities to aid in reflow applications, to assist in optimizing reflow oven settings such as zonal temperatures and conveyor speed to achieve the desired reflow profile for enhanced yield, performance and reliability.

3D CAD Generation: Chip, Bumps & Substrate Strip

Thermal Analysis: Modeling Reflow Temperature Profiles via CFD Simulation in Icepak

Thermal- Mechanical Link: Exporting Reflow Temperature Results for Structural Analysis

Mechanical Analysis: Modeling Bump Stress and Warpage during the Reflow Process



Testimonial

Demonstrated software capabilities in the thermo-stress reflow analysis, simulations can be used to evaluate the thermal, stress effects, warpage behaviors, and interactive mechanical stress with heat transfer evaluations. Such data is very useful in identifying possibilities to achieve desired goals such as reflow cooling rate reduction and reducing reflow peak temperatures without causing reliability, warpage and other problems in view of future advanced packaging. Such capabilities will increase UTAC's competitiveness by enhancing yield and customer service to our customers.

Process / Challenges

• Semiconductor industry is facing increasing challenges in the flip chip reflow process with thinner substrate, lead free materials etc leading to reliability and yield performance

Solution

• Simulation tools such as Icepak and Ansys Mechanical can be used for thermal mechanical analysis which can assist in the current reflow profiling process.

Benefits

• Enhance the current reflow profiling procedure by using modeling tools along with temperature measurements, reducing large test matrix, cost and time

• Provides critical data for in achieving industrial goals of enhanced performance, yield and reliability.

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