



Inventors

ZAWAWI MAHIM
SAYYIDAH AMNAH MUSA
DR. NORAINIZA SAUD
NURUL RAZLIANA ABDUL RAZAK

Contact details

Zawawi Mahim
School of Materials Engineering
Universiti Malaysia Perlis (UniMAP)
P.O Box 77, d/a Pejabat Pos Besar
01000 Kangar, Perlis, Malaysia



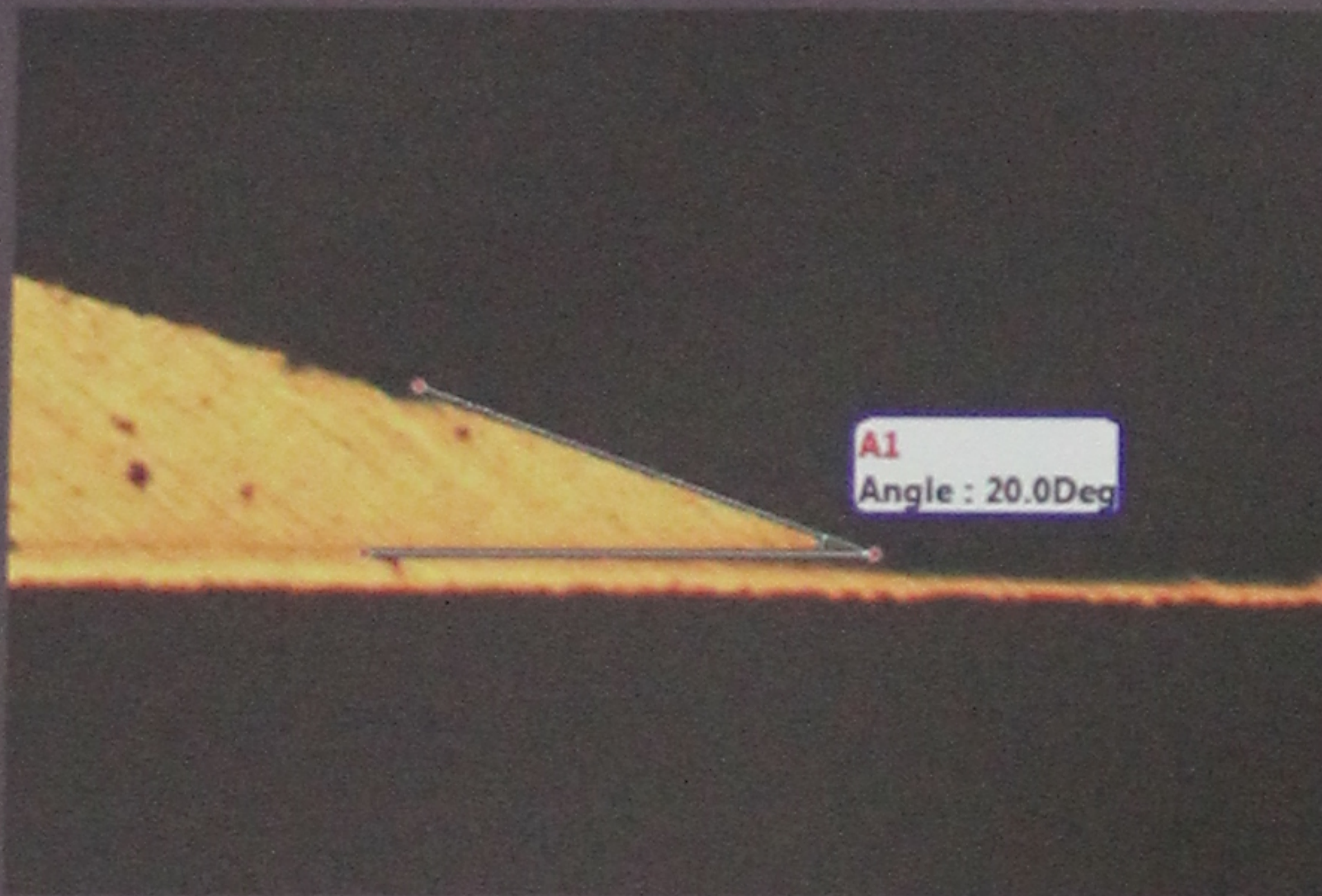
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SAC-SiC : A NEW POTENTIAL LEAD-FREE COMPOSITE SOLDER FOR GREEN TECHNOLOGY

PRODUCT DISCRPTION

Recently, the development of Sn-Ag-Cu (SAC) has gain attention in electronic packaging industry due to its good reliability in the electronics application. The tin-silver-copper family of alloys has earned a great deal of positive response from various industry consortia and organizations in recent year and the majority of manufacturers plan on implementing one of these alloys. However, as there are several different alloy formulations within the tin-silver-copper family, background information is necessary to determine which alloy is best suited for the broadest range of applications.

Literature has shown that, an attractive and potentially viable method of enhancing the performance of a solder in terms of mechanical and thermal properties is by adding reinforcements to a conventional solder alloy, forming a composite solder. The presence of the second phases such as ceramic reinforcements has been proposed as the potential mechanism controlling reliability of the solder joints. SAC added with SiC particles as reinforcement to developed "A New Potential Lead-Free Composite Solder for Green Technology" to enhance the physical and mechanical properties of the solder joint. The melting point of this composite solder were slightly increase which will not affect the processing flow in the industry. This superior lead-free composite solder was improved the solderability and mechanical properties compared to current commercial solder of SAC lead-free solder.



PRODUCT ADVANTAGES

- Environmental friendly: Pb-free solder
- Low production cost
- High performance of mechanical properties
- Oxidation resistance

COMMERCIAL POTENTIAL

- Recommended to enhance the performance of existing commercial Sn-Ag-Cu lead-free solder
- Green material with non-hazardous material content
- To enhance the durability of solder to meet the demands of the growing use of electronic and weather threat.
- Improvement for high joint reliability in current and future emerging technology

INDUSTRIAL COLLABORATION



PUBLICATIONS

1. Zawawi Mahim, Norainiza Saud and Nurul Razliana Abdul Razak, Development of Low Cost Sn-0.7Cu Base Composite Solder for High Temperature Application, Materials Science Forum, Vol. 803, (2015), 239-242.
2. Sayyidah Amnah Musa and Norainiza Saud, Design of Experiment (DOE) of Powder Metallurgy Technique in Fabricating SnCu/Carbon Lead-Free Composite Solder with Different Mixing Parameters, Materials Science Forum, Vol. 803,(2015), pp. 269-272.
3. Sayyidah Amnah Musa, Norainiza Saud, Nurul Razliana Abdul Razak, and Kamarudin Hussin, Mechanical Properties and Solderability of RobustSn-0.7Cu Lead-Free Composite Solder, Applied Mechanics and Materials Vols. 754-755, (2015), pp 556-560.
4. Norhayanti Mohd Nasir, Norainiza Saud, Mohd Nazree Derman, Mohd Arif Anuar Mohd Salleh, Mohd Izrul Izwan Ramli and Rita Mohd Said, "Effect of TiO2 Reinforcement on Microstructure and Microhardness of Low-Silver SAC107 Lead-Free Solder Composite Solder" Materials Science Forum Vol. 803, (2015), pp 273-277.
5. Norhayanti Mohd Nasir, Norainiza Saud, Mohd Arif Anuar Mohd Salleh, Mohd Nazree Derman, Mohd Izrul Izwan Ramli and Rita Mohd Said, "Microstructure and Mechanical Properties of Sn-1.0Ag-0.7Cu (SAC107) Lead-Free Solder Reinforced Silicon Nitride (Si3N4) Particles" Accepted for 3th International Conference on Advanced Engineering & Technology (ICAMET), 5-6 Dec., Ho Chi Minh City.

PERFORMANCE OF "SAC-SiC : NEW POTENTIAL LEAD-FREE COMPOSITE SOLDER FOR GREEN TECHNOLOGY"

Properties	Commercial SAC-305	Composite SAC-305 SiC
Melting Point (°C)	217	219
Wettability (°C)	30	20
Hardness (Hv)	13	16
Shear Strength (MPa)	7	12

NOVELTY / INVENTION

- High potential of green product
- Excellent solderability
- Excellent mechanical properties of solder joints
- Simple and low cost production process with mass production capability without high skill workers requirements.