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Record 1 of 1**Title:** The practicality of TRIZ based conceptual solutions in solving tombstoning defects during SMD soldering**Author(s):** Lim, ISS (Lim, Issac Sing Sheng); Chung, ECY (Chung, Edwin Chin Yau); Tan, KBT (Tan, Kenny Boon Thong); Teoh, KS (Teoh, Kok Soo)**Source:** CHEMICAL ENGINEERING RESEARCH & DESIGN **Volume:** 103 **Special Issue:** SI **Pages:** 123-129 **DOI:** 10.1016/j.cherd.2015.09.012 **Part:** A **Published:** NOV 2015**Times Cited in Web of Science Core Collection:** 0**Total Times Cited:** 0**Usage Count (Last 180 days):** 1**Usage Count (Since 2013):** 9**Cited Reference Count:** 13

Abstract: Tombstoning is a common defect that occurs due to the uneven heating of the solder paste during the soldering process of surface-mount devices (SMDs) on circuit boards. With electronics becoming smaller in size and lighter in weight, SMDs will continue to be more compact. This shall lead to even more tombstoning defects. In this research work, the Theory of Inventive Problem Solving (TRIZ) was used to develop conceptual design solutions that prevent tombstoning. It was to be determined if the concepts are practical for actual implementation. The specific TRIZ tools used were Substance-Field model, and 76 Standard Solutions. Focus was on the redesign of the solder paste, solder pad, and substitution of convection reflow process with induction heating process. These TRIZ based concepts were then compared to existing patents and industrial practices related to solving tombstoning. It is found that there are similarities between the concepts developed with TRIZ and the existing tombstoning solutions. These results indicate TRIZ derived concepts are practical and are of lesser risk to be implemented. Other existing tombstoning solutions could also be related back to the Standard Solutions of TRIZ. Furthermore, more tombstoning solutions could possibly be developed as there are other TRIZ tools available than the ones used in this research. (C) 2015 The Institution of Chemical Engineers. Published by Elsevier B.V. All rights reserved.

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[Chung, Edwin Chin Yau] Taylors Univ, Subang Jaya, Selangor, Malaysia.

[Teoh, Kok Soo] UCSI Univ, Kuala Lumpur, Malaysia.

Reprint Address: Lim, ISS (reprint author), Monash Univ Malaysia, Sch Engr, Jalan Lagoon Selatan, Bandar Sunway 47500, Selangor, Malaysia.**E-mail Addresses:** issaclss@gmail.com**Author Identifiers:**

Author	ResearcherID Number	ORCID Number
Chung, Edwin		0000-0002-2042-3161

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