



The role of lug preheating, melt pool temperature and lug iteration delay on cast on strap joining process



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Lead Acid
Battery



Despite the availability of alternative electrochemical storage systems that may have higher specific energy and efficiency, lead-acid batteries are still the world's most important rechargeable power source.

Great deal of effort has been exerted to enhance the performance of lead-acid batteries.

Even with all of these improvements, some batteries still suffer from early failure such as Poor lug-strap joints, that achieved by the cast-on-strap (COS) process.

Lack of fusion and voids forming during the COS process leads to production of poor lug-strap joints



Lower strength

Higher electrical resistance



Optimization of
COS process



Effect of lug
preheating

Effect of
melt pool
temperature

Effect of lug
entrance delay

Studied Variables



1. Lug
preheating

2. Melt pool
temperature

3. Lug entrance
delay

To investigate the joint quality, several quantities were used by which a good comparison can be made between the studied cases as below:



1- RCL (Relative Contact Length.)

2. IVP (Internal Void Percentage.)

3. H (The wetted height.)

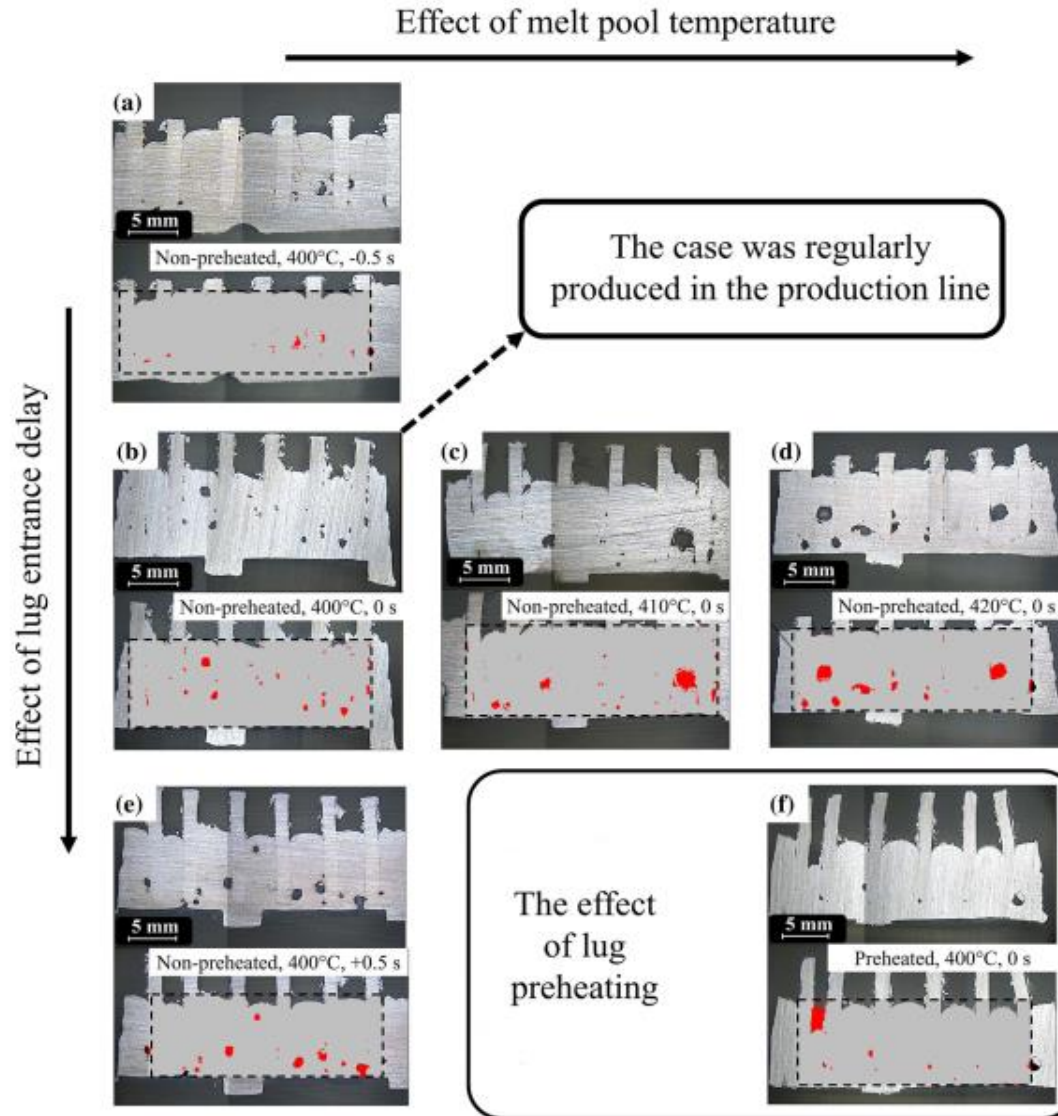
4. L (The filled height.)

A. Effect of Lug Preheating on IVP,L,H,CL

B. Effect of Melt Pool Temperature on IVP,L,H,CL

C. Effect of Lug Entrance Delay on IVP,L,H,CL

Conclusion





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