



Micrographs and Mechanical Properties of 5052 Aluminum Weldments

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● Abstract

This study dealt with the metallographic analysis and mechanical property testing of aluminum weldments. Specimen thickness was 4 mm. We compared the hardness distribution, tensile properties and micrographs of 5052 aluminum weldment which was manufactured by the tungsten inert gas arc welding (TIG) with those of vacuum brazing (VB) weldment.



Fig.1 Hardness distributions of 5052-TIG and 5052-VB weldments.

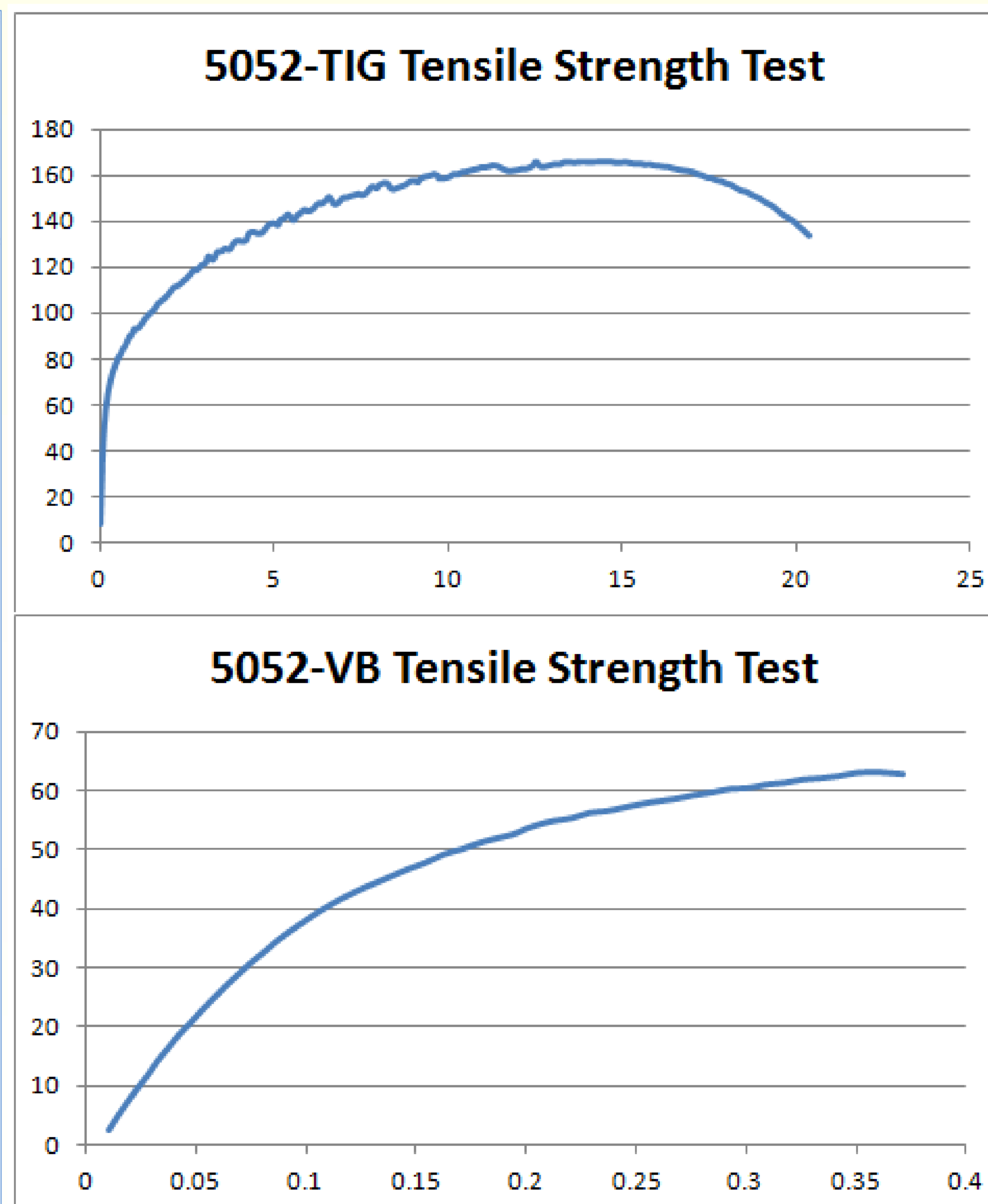


Fig.2 Stress-strain curves of 5052-TIG and 5052-VB weldments.

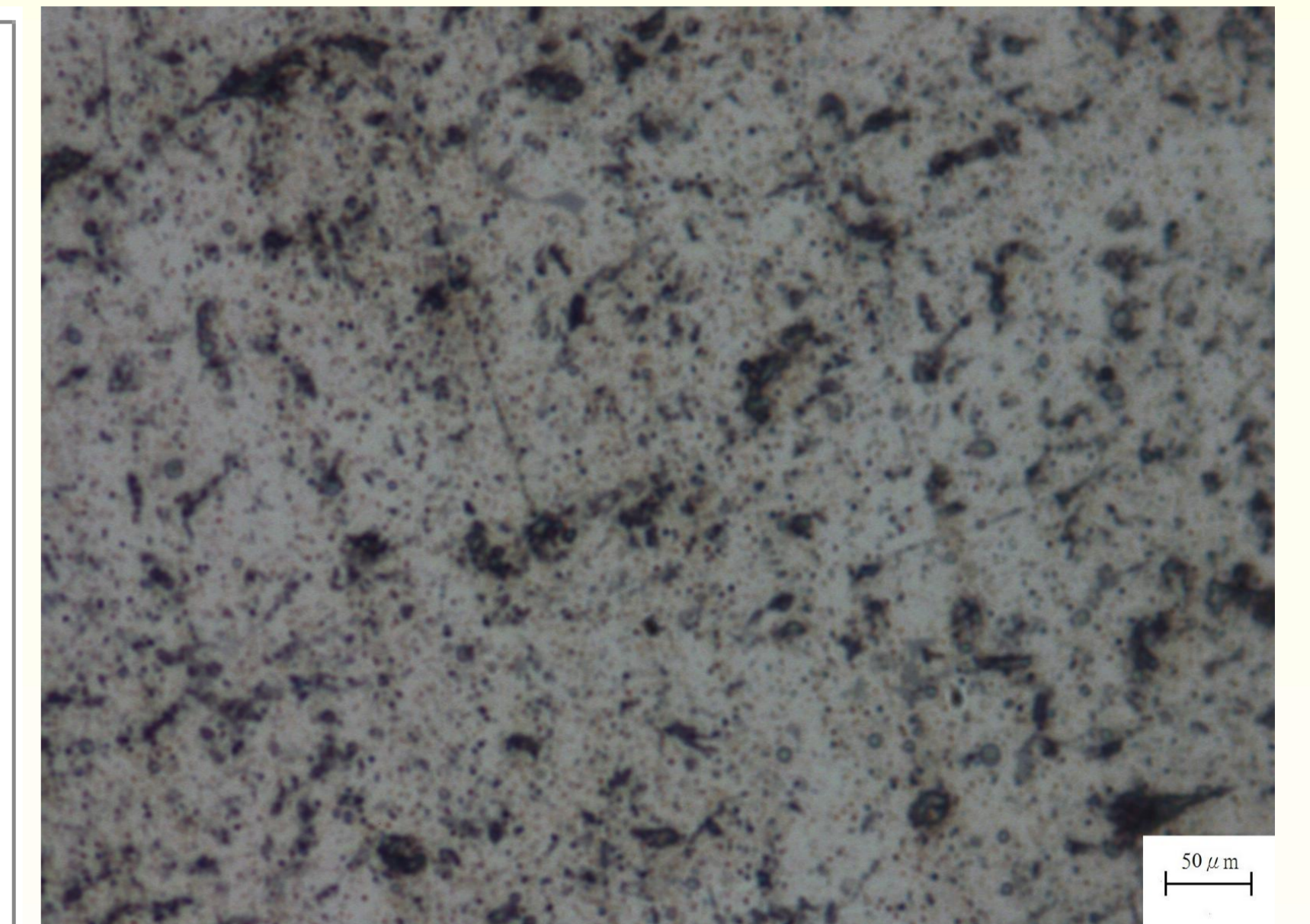


Fig.3 Micrograph of 5052-TIG weldment.

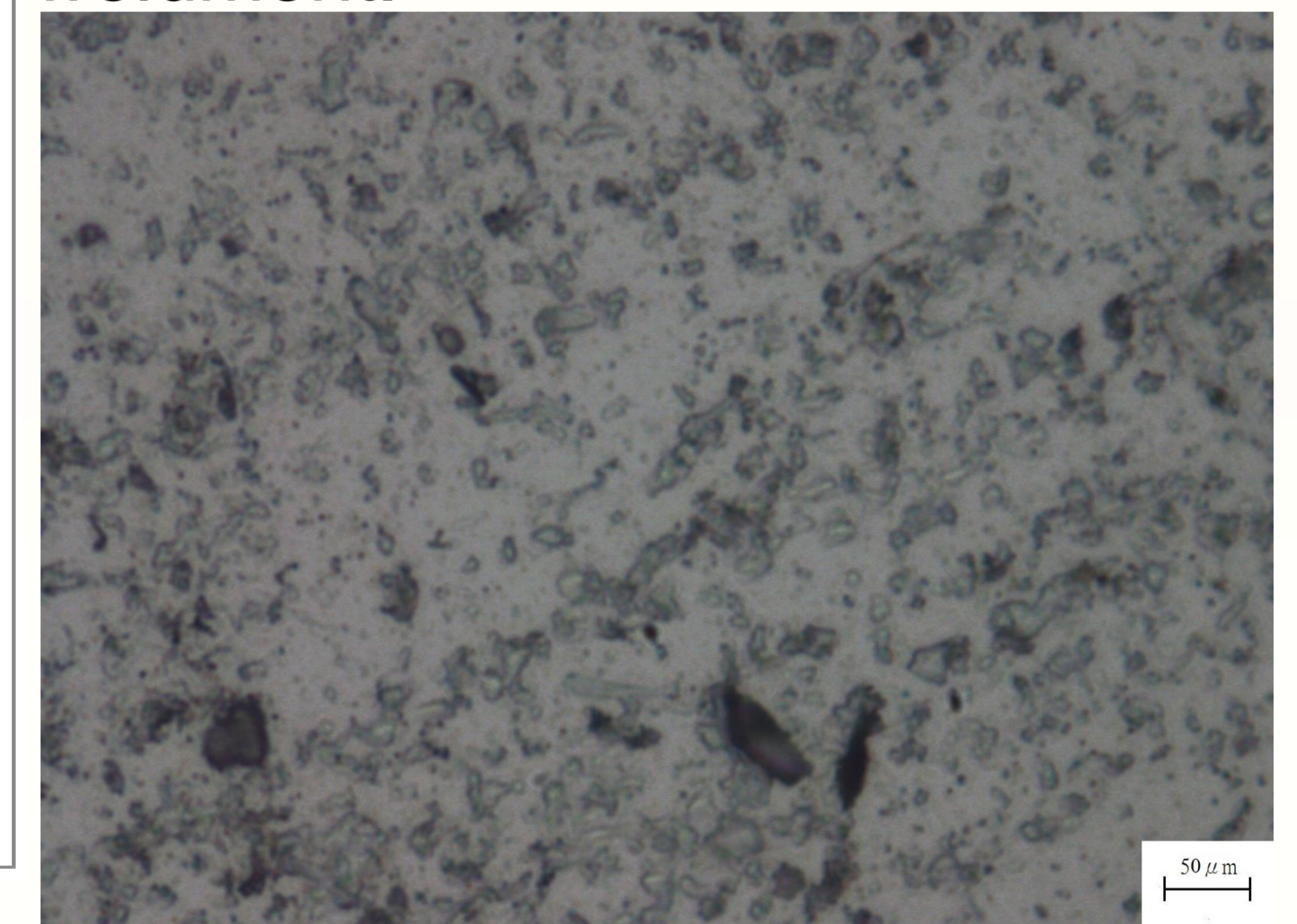


Fig.4 Micrograph of 5052-VB weldment.

•Discussion

Figure 1 shows the hardness distribution of 5052-TIG and 5052-VB weldments across welded zone. For the 5052-TIG weldment, base metal had the highest hardness, while heat affected zone had the lowest hardness. In the tensile test, the break point located at the heat affected zone. The tensile ultimate strength and elongation of 5052-VB specimen were much lower than those of 5052-TIG specimen as shown in Fig. 2.

•Conclusion

The tensile properties of 5052-VB weldment were much poor than those of 5052-TIG weldment. The coating material, geometry, and welding parameters of the present vacuum brazing need further investigation to improve mechanical properties.

