

A NEW ALTERNATIVE OFFERED BY TOPTIG WELDING FOR AUTOMOTIVE APPLICATIONS

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Recent developments in the power source technology for the MIG and TIG processes, VBC Interpulse, Lincoln STT, the Air Liquide Toptig and the Fronius CMT technology have improved the performance and quality of these welding processes.

The advantage of this configuration is that it reduces the size of the torch, which improves accessibility when robotic welding is used on work pieces with complex geometries, and avoids the necessity of maintaining the alignment angle between the wire and the joint. As a result, tool orientation is no longer a crucial factor for TOPTIG, liberating the use of sixth robotic axis, facilitating programming and optimization of robotic movement.

The innovative design of TOPTIG fosters optimization of robotic welding, while removing programming constraints and producing spatter free welds of high quality

This process allows welding speeds of about 1 m/min combined with good-looking weld beads. It is noticeable that it is possible to use a weaving technique to compensate for part fit-up variations; consequently the welding speed might slightly reduce.

The TOPTIG package consists of:

- A dedicated TIG transistorized power source (220A 100% DC & DC pulsed current) matched with the torch capacity. The power source remote control allows on-the-fly parameter adjustment.
- The torch and harness linked to the push-pull wire feeder unit through a quick Euro connector.
- The push-pull wire feeder unit (WFS up to 10 m/min in constant or pulsed wire).

The equipment is high-frequency protected and fully insulated from the robot, the wire feeder and the interface signals with opto-couplers.

Bibliography

- [4] FORTAIN, J.M., RIMANO, L.: TOPTIG: A new alternative for sheet metal welding, Session 3: JOURNAL OF APPLIED TECHNOLOGY, 2008, pp. 89-103, ISSN 0855-2215
- [7] MOCUTA, G.E., POPESCU, M., RADUTA, A., BELU-NICA, R.: *TOPTIG-state of the art engineering-exceptional performance for applications in the automotive use*, The 8-th International Conference “RADMI 2008” Research and Development in Mechanical Industry, 14-17 September, Serbia, Uzice, ISSN 86-83803-21-x
- [8] OPDERBECKE, T. and GUIHEUX, S.: *TOPTIG WIG Roboterschweissen mit Kaltdrahtzufuhr bringt, Schweissqualität and geschwindigkeit*, DVS Proceedings, COMPETENCE OERLIKON, 2007, may, pp16-24, Germany, ISSN 0921-9986
- [9] STRECKX, E.: *TOPTIG een nieuw lasprocede dat smelheid en hoge kwaliteit doen samengaan*, JOURNEE d'ETUDE DE L'IBS, Belgium, 18 mai, 2006, ISSN 1466-1387
- [10] YUDODIBROTO, H. and HIRATA, O.: Influence of filler wire addition on weld pool oscillation during gas tungsten arc welding, SCIENCE AND TECHNOLOGY OF WELDING AND JOINING, 2004, vol. 9, nr. 2, pp. 56-60, ISSN 1362-1718
- [11] ***: AIR LIQUIDE WELDING FRANCE – TOPTIG patent 927266/04.05.2007
- [12] ***: TOPTIG Alternative to Weld Very Thin Sheet, DOC IIS/IIW-XII-1855-06