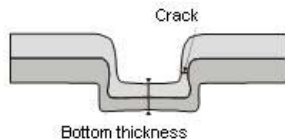


Development of Non-Destructive Testing Methods for Innovative Joining Technologies



Image and structure of a typical clinch point



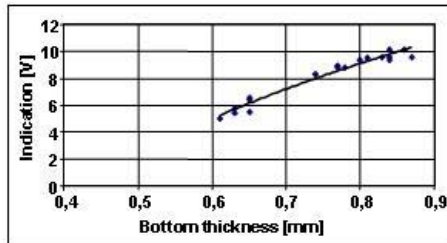
Introduction

Clinching is an innovative and proven technique for joining sheet metal, tubes and profiles. The permanent joint is created by cold forming of the parts alone, without the use of additional material. In many areas it has proven its ability to replace wellknown joining techniques like spot welding or riveting.

For offline quality control of clinch points the bottom thickness is checked using mechanical gauge. If the components are larger or can be accessed from one side only other inspection methods are needed for example eddy current methods.



Eddy current probe for bottom thickness testing



Probe indication versus bottom thickness

Bottom thickness gauging

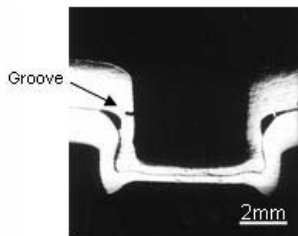
Eddy current probes were developed for bottom thickness gauging of joints made from aluminium. The maximum measuring range is about 1.2 mm. They can be used on both sides of the clinch point and are also suitable for painted or coated sheets and multilayer connections.

Crack testing

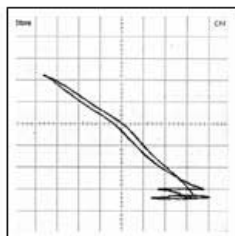
Furthermore eddy current rotating probes were developed used in a hand-held rotor for dynamic crack inspection of inner surface of clinch point bowl. They work both on Aluminium and on steel. The bowl diameter should be more than 4.8 mm.



Eddy current rotating probe for crack testing



Clinch point with test groove



Eddy current signal of test groove in the complex plane

Partners

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