

Title (en)
Method for producing thermally treated sheet metal moulded parts from sheet metal material with an anti-corrosion coating and sheet metal moulded part

Title (de)
Verfahren zur Herstellung wärmebehandelter Blechformteile aus einem Stahlblechmaterial mit einer Korrosionsschutzbeschichtung und derartiges Blechformteil

Title (fr)
Procédé de fabrication de pièces de formage en tôle traitées à chaud à partir d'un matériau en tôle d'acier et dotées d'un revêtement anticorrosion et une telle pièce de formage

Publication
EP 2239350 A3 20110629 (DE)

Application
EP 10003492 A 20100330

Priority
DE 102009016852 A 20090408

Abstract (en)
[origin: EP2239350A2] The method comprises deforming a printed circuit board made of a heat-treatable steel sheet metal material (1) to a sheet metal molded part, where the printed circuit board has a corrosion-protective coating (12) applied on one side, and carrying out a heat treatment on the sheet metal molded part for changing the material properties of the steel sheet metal material. An oxide layer (13) forms on the corrosion-protective coating in an area-wise manner and defines itself during the heat treatment. The process is carried out, so that sufficient layer quality of the oxide layer is achieved. The method comprises deforming a printed circuit board made of a heat-treatable steel sheet metal material (1) to a sheet metal molded part, where the printed circuit board has a corrosion-protective coating (12) applied on one side, and carrying out a heat treatment on the sheet metal molded part for changing the material properties of the steel sheet metal material. An oxide layer (13) forms on the corrosion-protective coating in an area-wise manner and defines itself during the heat treatment. The process is carried out in such a way that a sufficient layer quality of the oxide layer is achieved with respect to subsequent coating and/or joining of the sheet metal molded part, so that the oxide layer remains onto the sheet metal molded part. The heat treatment step is a press hardening process. The sufficient layer quality of the oxide layer is achieved by selecting the steel sheet metal material, by selecting a deformation process and/or accompanying deformation-technical measures and by adjusting the process variables of the heat treatment, where the process variable is insertion temperature, furnace temperature, processing time, removal temperature, cooling time, pressing pressure and/or tool temperature. A further step such as chemical treatment, oiling, further heat treatment and/or removal of the sheet metal molded part follows the heat treatment step to achieve the sufficient layer quality of the oxide layer. The layer quality of the oxide layer is quantified based on a parameter, which gives the information about the layer quality of the oxide layer if the sheet metal molded part is subsequently coatable and/or joinable. The parameter is an electrical resistance value, conductive value, heat-conductive value, layer-thickness value of the oxide layer, roughness value of the oxide layer, adhesion value of the oxide layer, hardness value of the oxide layer, color value of the oxide layer and/or spectral value. One of the process steps is carried out and is optionally adapted, so that the parameter of the produced sheet metal molded part or the sheet metal molded part to be produced is present within a defined range to ensure that a defined mechanical material property of the sheet metal molded part is present within a defined range. The individual steps are defaultly carried out to obtain the sheet metal molded part with the sufficient layer quality of the oxide layer. The execution of one step is adapted during the process flow to obtain the sheet metal molded part with the sufficient layer quality of the oxide layer. The steps of the process flow are repeatedly carried out to produce the sheet metal molded parts, where the layer quality of the oxide layer of the produced sheet metal molded parts is determined and is optionally adapted based on the execution of one step of the process flow to obtain the sheet metal molded part with the sufficient layer quality. The produced sheet metal molded part is classified based on the layer quality of its oxide layer to release the sheet metal molded part for subsequent coating and/or joining and to bring post-processing or other use purpose. An independent claim is included for a sheet metal molded part.

IPC 8 full level
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CPC (source: EP US)
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Citation (search report)

- [XD] DE 202004021264 U1 20070531 - VOESTALPINE STAHL GMBH [AT]
- [X] WO 2005021821 A1 20050310 - VOESTALPINE STAHL GMBH [AT], et al
- [E] EP 2177641 A1 20100421 - VOESTALPINE STAHL GMBH [AT]
- [XI] DE 102007013739 B3 20080904 - VOESTALPINE STAHL GMBH [AT]

Cited by
DE102012208494A1; WO2014032957A3; EP2890821B1

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