

Title (en)  
ELECTROCHEMICAL COATING METHOD

Title (de)  
ELEKTROCHEMISCHES BESCHICHTUNGSVERFAHREN

Title (fr)  
PROCÉDÉ D'APPLICATION DE REVÊTEMENT PAR VOIE ÉLECTROCHIMIQUE

Publication  
**EP 2342371 A2 20110713 (DE)**

Application  
**EP 09740674 A 20091021**

Priority  
• EP 2009063793 W 20091021  
• AT 16612008 A 20081023

Abstract (en)  
[origin: AT506583A4] The electrochemical coating method for depositing a layer on a metallic workpiece or a non-metallic workpiece with a metallic cover in a deposition bath comprising a deposition sequence (P) that is repeated once, comprises providing two individual sequences (A, B, C) within the deposition sequence, where the two individual sequences comprise different deposition processes within the deposition sequence. Each individual sequence comprises direct current, pure cathodic pulse, combination of cathodic and anodic pulses, and combination of cathodic and anodic pulses with up to 500 single pulses. The electrochemical coating method for depositing a layer on a metallic workpiece or a non-metallic workpiece with a metallic cover in a deposition bath comprising a deposition sequence (P) that is repeated once, comprises providing two individual sequences (A, B, C) within the deposition sequence, where the two individual sequences comprise different deposition processes within the deposition sequence. Each individual sequence comprises direct current, pure cathodic pulse, combination of cathodic and anodic pulses, combination of cathodic and anodic pulses with up to 500 single pulses, ramp- and/or triangle pulse, and each of the process in combination with a base current. Between two successive individual processes and/or after flow of the deposition sequence, an interruption of external current is carried out. The deposition process comprises a direct current deposition following of a pulsed deposition. The base current comprises 1-75% of deposition current density. The duration of the individual sequence is 1-3000 ms. The deposition bath consists of aqueous solution of salt, a salt melt and/or an ionic fluid. The deposition bath consists of solid materials for the installation into a deposited layer. The solid materials are particles, fibers, flakes and/or nanotubes. The coating comprises 2-12 layers, which are subjected with direct current, pure cathodic pulse, combination of cathodic and anodic pulses, combination of cathodic and anodic pulses with up to 500 single pulses, ramp- and/or triangle pulse, and each of the process in combination with a base current. The two layers are subjected with different processes. A second layer follows on a first primary layer subjected on the workpiece surface, where the second layer comprises an increased layer thickness than the primary layer. A third upper layer follows to the second layer, where the layer thickness of the upper layer is smaller than the second layer. The second layer is produced by a flow-less process. A thermal treatment is carried out between the applied layers. The layers are subjected by a plasma oxide process.

IPC 8 full level  
**C23C 28/00** (2006.01); **C25D 5/10** (2006.01); **C25D 5/18** (2006.01); **C25D 15/00** (2006.01)

CPC (source: EP US)  
**C23C 18/1653** (2013.01 - EP); **C23C 18/31** (2013.01 - EP); **C25D 5/10** (2013.01 - EP US); **C25D 5/18** (2013.01 - EP US); **C25D 5/48** (2013.01 - EP); **C25D 5/617** (2020.08 - EP US); **C25D 5/627** (2020.08 - EP US); **C25D 15/00** (2013.01 - EP); **C25D 3/66** (2013.01 - EP); **C25D 3/665** (2013.01 - EP)

Citation (search report)  
See references of WO 2010046392A2

Citation (examination)  
• US 4511438 A 19850416 - DISTEFANO RALPH D [US], et al  
• US 2005109626 A1 20050526 - KRUGER URSUS [DE], et al

Designated contracting state (EPC)  
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Designated extension state (EPC)  
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DOCDB simple family (publication)  
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**AT 16612008 A 20081023; EP 09740674 A 20091021; EP 2009063793 W 20091021**