

Title (en)  
SURFACE TREATMENT OF METAL OBJECTS

Title (de)  
OBERFLÄCHENBEHANDLUNG VON METALLISCHEN GEGENSTÄNDEN

Title (fr)  
TRAITEMENT DE SURFACE D'OBJETS MÉTALLIQUES

Publication  
**EP 2640867 A1 20130925 (EN)**

Application  
**EP 11841504 A 20111117**

Priority  
• AU 2010905095 A 20101117  
• AU 2011001479 W 20111117

Abstract (en)  
[origin: WO2012065220A1] The specification discloses a process for forming a diffusion surface layer extending inwardly from an outer surface of a metal substrate or member to be treated, the process including in a first activation stage, providing an activation treatment furnace containing an inert particulate refractory material and a metal based material including metals and metal halides for forming said diffusion surface layer, the activation treatment furnace having a flow of an inert gas and a flow of an hydrogen halide gas introduced into the inert particulate refractory material and the metal based material in the activation treatment furnace for a first period of time to activate at least an outer surface region of said metal based material to form an activated metal based material; and in a subsequent diffusion stage, providing a diffusion treatment furnace and introducing said metal substrate into said diffusion treatment furnace, said metal substrate having been pretreated to form a diffusion zone extending inwardly from the outer surface of the metal substrate in which nitrogen has been diffused to form an inner diffusion zone and an outer compound or white layer formed, at least in part, by an iron nitride, an iron carbide or an iron carbonitride compound without an oxide layer on said outer surface of the metal substrate, treating the metal substrate in the diffusion treatment furnace, sealed against the ingress of atmospheric air and under an inert gas atmosphere, in the absence of hydrogen halide gas for at least a second period of time, in the presence of said activated metal based material, to form said diffusion surface layer on said metal substrate.

IPC 8 full level  
**C23C 16/442** (2006.01); **C23C 8/24** (2006.01); **C23C 12/02** (2006.01)

CPC (source: EP US)  
**C23C 8/02** (2013.01 - EP US); **C23C 8/24** (2013.01 - EP US); **C23C 8/26** (2013.01 - EP US)

Citation (search report)  
See references of WO 2012065220A1

Designated contracting state (EPC)  
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

DOCDB simple family (publication)  
**WO 2012065220 A1 20120524**; AU 2011331909 A1 20130620; AU 2011331909 B2 20160623; CN 103314132 A 20130918;  
CN 103314132 B 20150812; EP 2640867 A1 20130925; JP 2014504329 A 20140220; JP 5951623 B2 20160713; US 2013299047 A1 20131114

DOCDB simple family (application)  
**AU 2011001479 W 20111117**; AU 2011331909 A 20111117; CN 201180064637 A 20111117; EP 11841504 A 20111117;  
JP 2013539096 A 20111117; US 201113988254 A 20111117