

**LISTA PUBLICAȚIILOR REZULTATE ÎN URMA TEZEI DE DOCTORAT  
PUBLICATE SUB AFILIERE UPT**

**Ing. Emilia Florina Binchiciu**

**1. Lucrări științifice publicate în reviste indexate Web of Science-WoS (ISI)**

**2. Lucrări științifice publicate în volumele unor manifestări științifice (Proceedings) indexate Web of Science-WoS (ISI) Proceedings**

1. E. F. Binchiciu, T. Fleșer, I. Voiculescu, „Composite Rods For Brazing” 7 th International Conference – Innovative technologies for Joining Advanced Materials, TIMA2014, ISIM Tmișoara, Romania, 19-20 June 2014, “Advance Materials Research” volume 1029(2014), p.72-77, Trans Tech. Publications, Switzerland, ISSN: 10226680; ISBN: 978-303835240-2, DOI: 10.4028/www.scientific.net/AMR.1029.72, [www.scopus.com](http://www.scopus.com), 2014.
2. T. D. Tănăsache, C. Florea, V. Geanta, E. F. Binchiciu, „Nanostructured Materials for Cladding by Welding” 7 th International Conference – Innovative technologies for Joining Advanced Materials, TIMA2014, ISIM Tmișoara, Romania, 19-20 June 2014, “Advance Materials Research” volume 1029(2014), p.78-82, Trans Tech. Publications, Switzerland ISSN:10226680, ISBN:978-303835240-2, DOI:10.4028/www.scientific.net/AMR.1029.78 ISI Proceedings, [www.scopus.com](http://www.scopus.com), 2014.
3. Tr. Fleșer, R. Szuhanek, E. F. Binchiciu, C. Szuhanek, „ Attitudes and Risks Concerning the Management of the Carrer of Young Engineers”. The 3rd International Conference ADEM 2014, Drobeta Turnu Severin, Romania, 11-12.09.2014Advances in Engineering & Management, Advanced Engineering Forum, vol. 13, 2015, p. 295-302, Trans Tech. Publications, Switzerland, doi 10.4028/www.scientific.net/AEF.13.295. ISSN 2234-9898, ISBN-13:978-3-03835-501-4, ISI Proceedings, [www.scientific.net](http://www.scientific.net), 2014.
4. E. F. Binchiciu, Tr. Fleșer, I. Voiculescu, „Experimental research regarding the development of a ecological CuSnP powder” The 5th edition of The IACSIT/SCIEI/UAstro International Conference on Smart Systems in all Fields of the Life, Aerospace, Robotics, Mechanical Engineering, Manufacturing Systems, Biomechanics, Neurorehabilitation and Human Motility, ICMERA 2014, 24-27 October 2014, Bucharest, “Applied Mechanics and Materials”, Vol. 656 (2014), p. 23-29, ISSN: 16609336, ISBN: 978-303835274-7, DOI: 10.4028/www.scientific.net/AMM.656.23, ISI Proceedings, [www.scopus.com](http://www.scopus.com), 2014.
5. T. D. Tihanov, C. Florea, E. F. Binchiciu, V. Geanta, „Armor with hyper-entropic behaviour and self-protection” The 5th edition of The IACSIT/SCIEI/UAstro International Conference on Smart Systems in all Fields of the Life, Aerospace, Robotics, Mechanical Engineering, Manufacturing Systems, Biomechanics, Neurorehabilitation and Human Motility, ICMERA 2014, 24-27 October 2014, Bucharest, Romania, “Applied Mechanics and Materials”, volume 656 (2014), p.30-36, ISSN: 16609336, ISBN: 978-303835274-7, DOI:10.4028/www.scientific.net/AMM.656.30, ISI Proceedings, [www.scopus.com](http://www.scopus.com), 2014.
6. T. D. Tihanov, E. F. Binchiciu, C. Florea, V. Geanta, H. Binchiciu, “Research regarding wear protection in sever exploitation condition of crusher jaws” 9th International Conference on Materials Science and Engineering – BRAMAT 2015, Brasov, Romania, 5-7 March 2015, “Advance Materials Research” Vol. 1128(2015), p.390-393, Trans Tech. Publications, Switzerland, doi: 10.4028/www.scientific.net/AMR.1128.390, ISI Proceedings, [www.scientific.net](http://www.scientific.net), 2015.
7. E. F. Binchiciu, Tr. Fleșer, I. Voiculescu, “Chemical Active Coated Rods Used for Brazing” in The 11 the International Conference structural Integrity of Welded Structures (ISCS15), in the frame of the 3rd IIW South – East European Welding Congress, June 3-5, 2015, Timișoara, Romania, “Advance Materials Research” Vol. 1111(2015), p.25-30, Trans Tech. Publications, Switzerland, doi: 10.4028/www.scientific.net/AMR.1111.25, ISI Proceedings, [www.scientific.net](http://www.scientific.net), 2015.

8. E. F. Binchiciu, Tr. Fleșer, I. Voiculescu, T. D. Tihanov, A. Dragomir, "Composite materials for mechanized brazing" The 8 th International Conference – Innovative technologies for Joining Advanced Materials, TIMA2016, ISIM Tmișoara, Romania, 02-03 June 2016, "Advance Materials Research" volume 1138(2016), p.78-82, Trans Tech. Publications, Switzerland, ISBN-13:978-3-03835-768-1, DOI:10.4028/www.scientific.net/AMR.1138, [www.scientifi.net](http://www.scientifi.net), 2016.

**3. Lucrări științifice publicate în reviste de specialitate indexate BDI (cu specificarea BDI)**

**4. Lucrări științifice publicate în volumele unor manifestări științifice (Proceedings) indexate BDI (cu specificarea BDI)**

**5. Lucrări științifice publicate în volumele unor manifestări științifice internaționale (Proceedings) din străinătate**

**6. Lucrări științifice publicate în volumele unor manifestări științifice**

Data

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Page 1 of 1

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1. **TUBULAR ELECTRODE WITH COMPOSITE CORE AND PROCESS FOR MAKING THE SAME**

Patent Number: RO129867-A2  
Patent Assignee: SUDOTIM AS SRL  
Inventor(s): BINCHICIU E; VOICULESCU I; BINCHICIU H; et al.

2012

2. **TUBULAR ELECTRODE WITH COMPOSITE CORE**

Patent Number: RO129868-A2  
Patent Assignee: SUDOTIM AS SRL  
Inventor(s): BUSUIOC G; BINCHICIU E.

2012

3. **ELECTRODE FOR AIR-ARC GOUGING AND PROCESS FOR MAKING THE SAME**

Patent Number: RO129992-A2  
Patent Assignee: SUDOTIM AS SRL  
Inventor(s): VOICULESCU I; BINCHICIU E; GEANTA V; et al.

2013

4. **REMOVABLE REINFORCEMENTS EQUALLY RESISTANT TO WEAR AND PROCESS FOR MAKING THE SAME**

Patent Number: RO129865-A2  
Patent Assignee: SUDOTIM AS SRL  
Inventor(s): STEFANOIU R; BINCHICIU E; BINCHICIU H; et al.

2012

5. **ELECTRODE FOR WELDING STEEL WITH HIGH BREAKING RESISTANCE AND DEPOSITION EFFICIENCY IN VARIOUS ENVIRONMENTS, RADIOACTIVE ENVIRONMENTS INCLUDED**

Patent Number: RO130495-A2  
Patent Assignee: SUDOTIM AS SRL  
Inventor(s): BINCHICIU E; VOICULESCU I; BINCHICIU A; et al.

2013

6. **MILLING CUTTER TOOL FOR ASPHALT STRIPPING WITH SYSTEMS OF WEAR-PROOF SELF-PROTECTION AND SELF-BLOCKING WHEN ROTATED AND PROCESS FOR MANUFACTURING THE SAME**

Patent Number: RO129863-A2  
Patent Assignee: SUDOTIM AS SRL  
Inventor(s): BINCHICIU E; GEANTA V; VOICULESCU I; et al.

2012

7. **COMPOSITE STRIP WITH SELF-DRESSING PROPERTIES INTENDED TO REINFORCE THE ACTIVE SURFACES OF SOIL-WORKING EQUIPMENTS AND PROCESS FOR MAKING THE SAME**

Patent Number: RO129877-A2  
Patent Assignee: SUDOTIM AS SRL  
Inventor(s): BINCHICIU E; BINCHICIU A; BINCHICIU H; et al.

2012

8. **RESEARCH ON THE PERFORMING MANDREL SUBJECTED TO HARDENING HEAT TREATMENTS**

Times Cited: 0  
(from All Databases)



## Record 1 of 19

**Inventor(s):** BINCHICIU E; VOICULESCU I; BINCHICIU A; GEANTA V; STEFANOIU R; BINCHICIU H

**Title:** ELECTRODE FOR WELDING STEEL WITH HIGH BREAKING RESISTANCE AND DEPOSITION EFFICIENCY IN VARIOUS ENVIRONMENTS, RADIOACTIVE ENVIRONMENTS INCLUDED

**Patent Number:** RO130495-A2

**Patent Assignee:** SUDOTIM AS SRL

**Abstract:** NOVELTY - The invention relates to a basic welding electrode to be employed in manual welding of steel structures with high breaking resistance and deposition efficiency which, in order to provide good exploitation behaviour in various environments, radioactive fields included, deposits welds with a reduced content of diffusible hydrogen, using iron-based alloys with a content of 1.2...1.6% Mn and the total amount of restricted residual elements of 0.9%, at the most, namely Ni=0.3% at the most, Cr=0.2% at the most, Mo=0.3% at the most and V=0.08% at the most. According to the invention, the electrode consists of a steel core low-alloyed with Mn and a coating consisting of a pre-homogenized and dehydrogenized alloy mixture which comprises 8...12% FeMn, 4...6% FeSi, 19...23% iron powder, 1.5...2% FeTi and a basic slagging mixture comprising 25...29% marble, 19...23% fluorine, 5...9% rutyl, 2.5% cellulose, 4% quartz, 0.6% CMC, 0.4% titan white and 1.5% alumina, subjected to wet homogenization with sodium and potassium silicate binder, in a ratio of 18...20% of the total powder mass and deposited onto the core at a coating coefficient of 1.65...1.75, the so obtained electrode having a breaking resistance  $R_m=715$  N/mm<sup>2</sup>, a yield point  $R_{p0.2}=560$  N/mm<sup>2</sup>, elongation  $A_5=19\%$ , and the content of diffusible hydrogen, determined by the method of vacuum absorption, of 4.35 ml/100g of deposited metal.

**Times Cited in BIOSIS Citation Index:** 0

**Times Cited in Chinese Science Citation Database:** 0

**Times Cited in Russian Science Citation Index:** 0

**Times Cited in SciELO Citation Index:** 0

**Times Cited in Web of Science Core Collection:** 0

**Total Times Cited:** 0

**Accession Number:** DIIDW:201549817K

## Record 2 of 19

**Inventor(s):** VOICULESCU I; BINCHICIU E; GEANTA V; BINCHICIU H; STEFANOIU R; BINCHICIU A

**Title:** ELECTRODE FOR AIR-ARC GOUGING AND PROCESS FOR MAKING THE SAME

**Patent Number:** RO129992-A2

**Patent Assignee:** SUDOTIM AS SRL

**Abstract:** NOVELTY - The invention relates to an electrode for air-arc gouging consisting of a thin-walled carbon steel pipe with basic fluoro-calcic lining, with alumina, cellulose and colloidal graphite additions and to a process for preparing the same. According to the invention, the electrode is made of a thin-walled carbon steel pipe cut at lengths of 400, 500 or 1000 mm, with a diameter of 4 plus minus 0.08 mm, with an external lining of a homogenized powdery mixture of 26...28% marble, 21...22% fluorspar, 7...8% rutile, 3...3.5% ferrosilicon 45, 3...3.5% alumina, 5...6% cellulose, 5...6% colloidal graphite, 23...29% iron powder, 1% carboxylcellulose and an inorganic binder of liquid sodium silicate in a ratio of 18...20% of the total powdery mass, the percentage being expressed by mass. The process, as claimed by the invention, consists in cutting the thin-walled carbon steel pipes at lengths of 400, 500 or 1000 mm, filling the ends thereof with stearin on a depth of 10 mm by submerging them into melted stearin, removing the stearin excess from the pipe exterior, preparing the basic mixture by batching and homogenizing the constituents, extruding the basic lining on pipes with high pressing pressures of 3.5 at, so as to provide high compactness thereof, the so obtained electrodes being left to dry in air, at 16...25 degrees C, after which they are introduced into a furnace provided with two stearin collectors where, in a first stage, they are maintained for 2.5 h at a temperature of 150 plus minus 10 degrees C and then are further dried at 250 plus minus 10 degrees C, for 0.5 h.

**Times Cited in BIOSIS Citation Index:** 0

**Times Cited in Chinese Science Citation Database:** 0

**Times Cited in Russian Science Citation Index:** 0

**Times Cited in SciELO Citation Index:** 0

**Times Cited in Web of Science Core Collection:** 0

**Total Times Cited:** 0

Accession Number: DIIDW:201510388H

Record 3 of 19

Inventor(s): BINCHICIU E; VOICULESCU I; BINCHICIU H; GEANTA V; STEFANORU R; BINCHICIU A

Title: TUBULAR ELECTRODE WITH COMPOSITE CORE AND PROCESS FOR MAKING THE SAME

Patent Number: RO129867-A2

Patent Assignee: SUDOTIM AS SRL

Abstract: NOVELTY - The invention relates to a tubular electrode with composite core by means whereof rough composite layers are deposited, by WIG or flame welding, and to a process for making the same. According to the invention, the electrode consists of a soft steel case and a composite core consisting of two distinct and judiciously dosed layers made of wolfram carbide as reinforcement with a share of 60% of the total of the composite core in the granulometric class of 3 mm, located in the low part of the case closing profile, having as alloying elements 17...21 % ferrochrome 60, 4...6% ferromanganese steel low-alloy with Cr, on a roller train, dosing and uniformly pre-positioning the layer (1) of reinforcing material granules in the base area of the blank from metal strip made of alloying-compensating system as a layer (2) placed over the layer (1), forming and closing the case, at a filling coefficient of 0.55% and an edge overlapping of 1 mm, settling and homogenizing, the core by rolling with a reduction coefficient of at least 16%, followed by cutting the tubular electrodes at the preset length.

Times Cited in BIOSIS Citation Index: 0

Times Cited in Chinese Science Citation Database: 0

Times Cited in Russian Science Citation Index: 0

Times Cited in SciELO Citation Index: 0

Times Cited in Web of Science Core Collection: 0

Total Times Cited: 0

Accession Number: DIIDW:201510389V

Record 4 of 19

Inventor(s): BUSUIOC G; BINCHICIU E

Title: TUBULAR ELECTRODE WITH COMPOSITE CORE

Patent Number: RO129868-A2

Patent Assignee: SUDOTIM AS SRL

Abstract: NOVELTY - The invention relates to a tubular electrode with composite core, used for WIG build-up welding or oxyhydrogen welding, which deposits thin layers of the Fe25%Cr4%W type alloys and titanium and lanthanide additions, the deposited layers having a high resistance to abrasion combined with corrosion and thermo-mechanical fatigue, characteristic needed by the anti-wear protection layers in the structure of the active surfaces of the tools for processing by hot-press at temperatures ranging between 850...1050 degrees C and to a process for carrying out the same. According to the invention, the electrode consists of a tubular metallic case made of soft carbon steel of high plasticity and a composite core made of alloys comprising 68%Fe - 25%Cr - 4%W - 2.5%C and lanthanides. As claimed by the invention, the process consists in dosing and grinding up to a granulation below 0.3 mm the following quantities of components: 76+-1% ferrochrome 6, 4 plus minus 1% ferrosilicon 75, 6 plus minus 1% ferromanganese 45, 3 plus minus 1% ferrotitanium 60, 9 plus minus 1% wolfram carbide, 2 plus minus 1% lanthanides, after which the entire quantity is homogenized, the metallic tube is filled with this mixture which is 55% of the electrode mass and, in the end, the mixture is compacted in order to prevent the composite core from scattering.

Times Cited in BIOSIS Citation Index: 0

Times Cited in Chinese Science Citation Database: 0

Times Cited in Russian Science Citation Index: 0

Times Cited in SciELO Citation Index: 0

Times Cited in Web of Science Core Collection: 0

Total Times Cited: 0

Accession Number: DIIDW:201510389E

Record 5 of 19

Inventor(s): BINCHICIU E; BINCHICIU A; BINCHICIU H; VOICULESCU I; GEANTA V; STEFANORU R

Title: COMPOSITE STRIP WITH SELF-DRESSING PROPERTIES INTENDED TO REINFORCE THE ACTIVE SURFACES OF SOIL-WORKING EQUIPMENTS AND PROCESS FOR MAKING THE SAME

Patent Number: RO129877-A2

Patent Assignee: SUDO'TIM AS SRL

**Abstract:** NOVELTY - The invention relates to a composite strip intended to reinforce the active surfaces of the soil-working equipments, which has saw teeth-like cutting edges and properties of self-dressing when used, the composite strip enabling the easy soil working with reduced fuel consumption, and to a process for making the same. According to the invention, the strip comprises a support made of steel low-alloyed with Mn, rolled at sizes of 15 x 6 mm, whereon there is deposited, by welding, an anti-wear layer with a thickness of 2 mm, consisting of a steel matrix of the Fe - 30%Cr; Fe - 12%Cr - 14%Mn; Fe - 25%Cr - 1%V type or the like, wherein particles of melted W carbide with grinding texture, in the granulometric class of 1.5 mm are embedded, in ratios of 1.5%. As claimed by the invention, the process is a sequential technological process comprising operations of cutting, chamfering, build-up welding with one of the above mentioned alloys, followed by thermal treatment of the assembly, whose work chart is selected so as to impart the product the characteristics needed for preventing the wear by abrasion under medium and/or high pressure and the wear by erosion.

Times Cited in BIOSIS Citation Index: 0

Times Cited in Chinese Science Citation Database: 0

Times Cited in Russian Science Citation Index: 0

Times Cited in SciELO Citation Index: 0

Times Cited in Web of Science Core Collection: 0

Total Times Cited: 0

Accession Number: DIIDW:2015103864

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Record 6 of 19

Inventor(s): STEFANOIU R; BINCHICIU E; BINCHICIU H; VOICULESCU I; GEANTA V; BINCHICIU A

Title: REMOVABLE REINFORCEMENTS EQUALLY RESISTANT TO WEAR AND PROCESS FOR MAKING THE SAME

Patent Number: RO129865-A2

Patent Assignee: SUDO'TIM AS SRL

**Abstract:** NOVELTY - The invention relates to removable reinforcements of solid rigid composite type, to a tubular electrode with composite core for build-up welding the areas subjected to wear and to a process for making the same, the reinforcements being used for reinforcing the active elements of crusher jaws of pit exploitation equipments in order to increase the reliability and the economical profitability thereof. According to the invention, the reinforcements consist of a matrix made of austenitic-manganese steel alloyed with max. 12% Cr and max. 3% Ni, reinforced in the area of maximum wear, in a ratio of up to 30%, with spheroidal particles having the granulation of 3...10 mm and reinforced, in the areas of medium wear, with layers of NiFe-CW-Ti, NiFe-Cr-CW, FeNi-Cr, Fe-Cr-Ti, Fe-Cr, Fe-CW alloys compatible, upon welding, with the matrix, and deposited as anti-wear intelligent systems of grid, embossed and/or grooved type. As claimed by the invention, the electrode consists of a case of 55%Ni-45%Fe alloy, which contributes by 55% by mass to forming the deposition and a composite core consisting of 80% carburetted Cr, 12% FeTi60, 5% FeSi70 and 3% FeMn45 with a contribution of 45% to the deposition mass. As claimed by the invention, the process consists in carrying out the reinforcement matrix as a rectangular plate with the dimensions of 1000 x 250 x 100 mm, antigravitationally cast into a mould made of quartz sand, of steel of the Fe-14%Mn-3%Ni-2%Cr type, onto the reinforcements of 6 mm, uniformly pre-positioned in the central area in a ceramic mass with 44% marble, 40% fluorine, 16% rutile, at a pressure of 3.5 at, the cooling speed being of min. 300 degrees C/h and the homogenization temperature of 1500 degrees C, the cooling and the solidification taking place at a rate of min. 300 degrees C/h, followed by cleaning the plate up to metallic lustre and build-up welding in two carbon-rich layers, the first with NiFe-30%Cr alloy and the second with Fe-30%Cr alloy, the temperature between the rows being of max. 75 degrees C.

Times Cited in BIOSIS Citation Index: 0

Times Cited in Chinese Science Citation Database: 0

Times Cited in Russian Science Citation Index: 0

Times Cited in SciELO Citation Index: 0

Times Cited in Web of Science Core Collection: 0

Total Times Cited: 0

Accession Number: DIIDW:2015103904

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Record 7 of 19

Inventor(s): BINCHICIU E; GEANTA V; VOICULESCU I; STEFANOIU R; IOVANAS R F; BINCHICIU A; BINCHICIU H

Title: MILLING CUTTER TOOL FOR ASPHALT STRIPPING WITH SYSTEMS OF WEAR-PROOF SELF-PROTECTION AND SELF-BLOCKING WHEN ROTATED AND PROCESS FOR MANUFACTURING THE SAME

Patent Number: RO129863-A2

Patent Assignee: SUDOTIM AS SRL

**Abstract:** NOVELTY - The invention relates to a milling cutter tool for asphalt stripping, of the composite cone type, equipped with two systems of self-protection, one against wear and the other against self-blocking. According to the invention, the tool consists of a tool support (2) which is consolidated at the conical surface level with the system (3) of self-blocking when rotated about its own axis, system which, in its turn, consists of a matrix of steel low-alloyed with Cr, with the dimensions of 10 x 2.5 mm, and wherein there are embedded particles of melted W carbide, with crushing texture in the granulometric class of 3 mm, and a reinforced cutting body (1) made of W carbides sintered and consolidated at the active surface level with the system made of grids with a depth of at least 1.5 mm. As claimed by the invention, the process has a preparing stage in which the semi-finished tool support (2) is made, with the shank for fixing into the mill body, by cutting and hot-forging at temperatures ranging between 850...1050 degrees, the hardening of the tool support (2) by thermal hardening treatments in oil at 860...900 degrees C and tempering at 480...420 degrees C for two hours, finishing the tool support (2) at dimensions of brazing in capillary joint and sliding borehole, carrying out, by W carbides sintering, the cutting body (1) reinforced with tolerance of sliding borehole with clearance suitable to brazing in capillary joint, carrying out the system (3) of self-protection against wear by creating, with laser beam or electron beam, some grids on a depth of 1.5 mm, the brazing in the tool support (2) of the cutting body (1) reinforced, at 700 degrees C, carrying out the system (3) of protection against self-blocking by flame melting the tubular rods of "relit" type at a pre-heating temperature, between rows, of 400 degrees C, at the most, and obtaining the layer with a size of 10 x 2.5 mm, followed, in the end, by the slow cooling of the tool-mill assembly at a cooling rate of 50 degrees C/h, at the most, in sand previously heated to 60 degrees C.

Times Cited in BIOSIS Citation Index: 0

Times Cited in Chinese Science Citation Database: 0

Times Cited in Russian Science Citation Index: 0

Times Cited in SciELO Citation Index: 0

Times Cited in Web of Science Core Collection: 0

Total Times Cited: 0

Accession Number: DIIDW:201510390F

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Record 8 of 19

By: Stanciu, G (Stanciu, Gabriela); Serban, CE (Serban, Cornel-Eugen); Binchiciu, E (Binchiciu, Emilia); Berchi, P (Berchi, Paul)

Title: RESEARCH ON THE PERFORMING MANDREL SUBJECTED TO HARDENING HEAT TREATMENTS

Source: METALURGIA INTERNATIONAL

Volume: 16

Issue: 5

Pages: 109-112

Published: 2011

**Abstract:** The work presents the research carried out to achieve, effective alternative of hot taps semi processing of alloy with chrome lines in order to get the semi-mechanized by preforming for shirts bearing. Drilling taps surfaces of hot, at approx. 1050 degrees C are subjected to fatigue Thermo combined with air abrasion and corrosion result in losses of material by erosion, voids and creep deformation. The preforming mandrels are made of medium alloy tool steels with chromium and tungsten which has got high wear resistance at temperatures up to 650 degrees C. At temperatures above 850 degrees C there shows up an intense process of softening accompanied by pronounced decreases in hardness, which requires the manufacture of drilling mandrels taking measures to protect their assets by superficial hardening heat treatments, alloy welded over the whole manosturaturale existence in the solid state.

Times Cited in BIOSIS Citation Index: 0

Times Cited in Chinese Science Citation Database: 0

Times Cited in Russian Science Citation Index: 0

Times Cited in SciELO Citation Index: 0

Times Cited in Web of Science Core Collection: 0

Total Times Cited: 0

ISSN: 1582-2214

Accession Number: WOS:000289606200025

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Record 9 of 19

By: Iovanas, RF (Iovanas, Razvan Florin); Binchiciu, E (Binchiciu, Emilia); Iovanas, DM (Iovanas, Daniela Maria); Trif, IN (Trif, Iacob Nicolae); Berchi, P (Berchi, Paul)

Title: RESEARCHES REGARDING THE DEVELOPMENT OF HOLLOW RODS WITH COMPOSITE CORE FOR WELD CLADDING



Source: METALURGIA INTERNATIONAL

Volume: 16

Issue: 5

Pages: 133-136

Published: 2011

**Abstract:** The paper presents research made to develop new materials for loading through welding, type tubular rods, which deposit through VIC or flame processes, thin layers of Fe-Cr-V-Ti based alloys, with high resistance to operating conditions of the asphalt cutter knives from the earth moving machinery components. The problems solved in this paper, namely to achieve manufacturing technologies of tubular rods with filling coefficients, 0.5-0.8, with composite core, with high electrical conductivity, consisted in that it has developed a composite core recipe, with self-counseling properties of constituents parts of the alloy system. The second part of the paper presents research made to determine the optimal parameters of manufacturing hollow rods VCr<sub>2</sub>S<sub>5</sub>Ti. At the end of the paper results of the tests made on the weld metal are presented, they show the metallographic structures, type martensitic, rich in complex chromium, vanadium and thallium carbides, fine-grained and with an associated hardness about 55 HRC.

Times Cited in BIOSIS Citation Index: 0

Times Cited in Chinese Science Citation Database: 0

Times Cited in Russian Science Citation Index: 0

Times Cited in SciELO Citation Index: 0

Times Cited in Web of Science Core Collection: 0

Total Times Cited: 0

ISSN: 1582-2214

Accession Number: WOS:000289606200030

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Record 10 of 19

Inventor(s): BINCHICIU A; VOICULESCU E; GEANTA V; BINCHICIU H; STEFANOIU R; BINCHICIU E

Title: Coated silver alloy rods of reduced hygroscopicity for brazing, comprises silver and tin deposited by extrusion deoxidizing flux made of synthetic vitreous precursors and metal powder additions

Patent Number: RO125836-A0 RO125836-B1

Patent Assignee: SUDOTIM AS SRL

**Abstract:** NOVELTY - The invention relates to ecological rods of silver alloys comprising 40% Ag and 2% Sn, class B-Ag<sub>40</sub>CuZnSn-670/710, on which there is deposited by extrusion deoxidizing flux made of synthetic vitreous precursors and metal powder additions, said deposit being meant to reduce hygroscopicity of the coating by fritting crystalline salts to convert them into amorphous glass and to increase the useful life of the rods which are employed in the brazing of joints with deep capillary slots carried out with highly fluid materials. According to the invention, the ecological rods are made of wire segments of Ag alloy having a diameter of 2 mm and a length of 500 mm covered by extrusion with a mixture consisting of 5-15% silver alloy powders of the same type as the rod material, with a grain size of 0,1 mm at the most, 35 plus minus 10% powder boric frit, 26 plus minus 10% potassium hydroxide, 20 plus minus 10% fluorine frit, 1 plus minus 0.5% carboxymethylcellulose as a plasticizer and 18 plus minus 5% distilled water as a binder.

Times Cited in BIOSIS Citation Index: 0

Times Cited in Chinese Science Citation Database: 0

Times Cited in Russian Science Citation Index: 0

Times Cited in SciELO Citation Index: 0

Times Cited in Web of Science Core Collection: 0

Total Times Cited: 0

Accession Number: DIIDW:2010Q11877

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Record 11 of 19

Inventor(s): BINCHICIU H; GEANTA V; VOICULESCU E; STEFANOIU R; BINCHICIU E; NEGRIU R M; BINCHICIU A

Title: Coating for electrodes for build-up welding, comprises basic coating of the fluoro-calcic type with addition of metallic powders

Patent Number: RO125834-A0 RO125834-B1

Patent Assignee: SUDOTIM AS SRL



**Abstract:** NOVELTY - The invention relates to a basic coating of the fluoro-calcic type with addition of 35% metallic powders, meant for extrusion coating of some metal core wires of alloys of the type 83% Fe, 17% Cr, thereby resulting electrodes exhibiting high efficiency of manual electric welding deposition of alloys of the type 71% Fe, 25% Cu, 2.5% C, 1% Mo, 0.5% V, micro-alloyed with rare earths, with austenitic structure in the solid state interval, with high resistance to hot abrasion and corrosion and an associated hardness ranging between 45 and 60 HRC. According to the invention, the coating comprises a mechanical powder mixture consisting of 30-33% marble, 20-22% fluorite, 6-8% rutile, 0.5-1% titanium white, 0.5-1.5% mica, 2-4% FeSi 45, 1-2% FeMn 45, 14-18% FeCr 60, 8-12% metallic Cr, 5-7% colloidal graphite, 1-2% rare earths, 1-2% carboxymethylcellulose, the mixture having a maximal grain size of 0.3 mm, being initially homogenized in dry state and then in humid state after the admixture of a liquid sodium silicate amount of 18-20% of the total powder mass.

**Times Cited in BIOSIS Citation Index:** 0

**Times Cited in Chinese Science Citation Database:** 0

**Times Cited in Russian Science Citation Index:** 0

**Times Cited in SciELO Citation Index:** 0

**Times Cited in Web of Science Core Collection:** 0

**Total Times Cited:** 0

**Accession Number:** DIIDW:2010Q11880

**Record 12 of 19**

**Inventor(s):** BINCHICIU A; VOICULESCU I; GEANTA V; STEFANOIU R; BINCHICIU H; CONSTANTIN E; BINCHICIU E; NEGRIU R M

**Title:** Electrodes with composite coating of alloy, comprises electrodes meant to deposit by manual electric welding alloys of the type copper, aluminum, nickel, iron and manganese

**Patent Number:** RO125856-A0 RO125856-B1

**Patent Assignee:** SUDOTIM AS SRL

**Abstract:** NOVELTY - The invention relates to some electrodes meant to deposit by manual electric welding alloys of the type of 81% Cu, 8% Al, 5% Ni, 5% Fe and 1% Mn, which are employed in reclaiming castings of bronze of the CuNiAl type, resistant to abrasion combined with corrosion and cavitation, enhancing the deposited metal hardness up to 135...144 HB. According to the invention, the electrodes comprise a rod of an alloy of the type 92% Cu and 8% Sn over which there is deposited by extrusion a composite powder coating comprising 18...24% marble, 14...18% fluorine, 16...21% cryolite, 12...16% boric frit, 3...4% colloidal graphite, 8...10% metallic Ni, 7...9% Fe, 5...7% FeMn 45, 1...2% Al, 0.5...1.5% carboxymethylcellulose, powders with maximal grain diameter of 0.3 mm and 16...22% parts by weight of the total powder mass, liquid sodium silicate.

**Times Cited in BIOSIS Citation Index:** 0

**Times Cited in Chinese Science Citation Database:** 0

**Times Cited in Russian Science Citation Index:** 0

**Times Cited in SciELO Citation Index:** 0

**Times Cited in Web of Science Core Collection:** 0

**Total Times Cited:** 0

**Accession Number:** DIIDW:2010Q11860

**Record 13 of 19**

**Inventor(s):** BINCHICIU H; GEANTA V; VOICULESCU I; BINCHICIU A; STEFANOIU R; BINCHICIU E; NEGRIU R M

**Title:** Ecological coated core wires of silver alloys for brazing, is made by extrusion coating with deoxidizing flux with metal powder addition

**Patent Number:** RO125835-A0 RO125835-B1

**Patent Assignee:** SUDOTIM AS SRL

**Abstract:** NOVELTY - The invention relates to ecological core wires made by extrusion coating with deoxidizing flux with metal powder addition of some core wires made of alloys of the types BCu 44 ZnAg 698-810, BCu 38 ZnAg 650-750 or BAg 45 CuZn 660-740, which are used as electrodes for the manual electric welding coating of tools for brazing in the working areas, while increasing the coating efficiency and the useful life of said tools. According to the invention, the core wires are 500 mm-long, with thicknesses of 2, 2.5 and 3 mm and contain 15%, at the most, addition of powders of ecological silver alloys of the same type as the uncoated core wire, with a maximal grain size of 0.1 mm, 35 plus minus 10% homogenized mechanical mixture of 2/3 boric acid and 1/3 dehydrated borax, 26 plus minus 10% homogenized mechanical mixture of potassium hydroxide, 20 plus minus 10% mixture of 1/2 potassium fluoride and 1/2 potassium tetrafluoroborate, 4 plus minus 5% carboxymethyl cellulose plasticizer and 18 plus minus 5% distilled water as a binder.

**Times Cited in BIOSIS Citation Index:** 0

**Times Cited in Chinese Science Citation Database:** 0

Times Cited in Russian Science Citation Index: 0  
Times Cited in SciELO Citation Index: 0  
Times Cited in Web of Science Core Collection: 0  
Total Times Cited: 0

Accession Number: DIIDW:2010Q11878

Record 14 of 19

Inventor(s): BINCHICIU H; GEANTA V; VOICULESCU I; BINCHICIU A; STEFANOIU R; BINCHICIU E; NEGRIU R M; VIDA-SIMITI J

Title: Electrodes with composite bronze and tin coating, comprises alloy wire rods made of copper and tin

Patent Number: RO125855-A0 RO125855-B1

Patent Assignee: SUDOTIM AS SRL

Abstract: NOVELTY - The invention relates to electrodes with thick coating, having the ratio between the coated electrode diameter and the uncoated electrode diameter ranging between 1.85...1.95, meant to be used in manual electric welding for reclaiming castings and making wearproof surfaces for protection against sliding and rolling friction strain. According to the invention, the electrodes are made of alloy wire rods of the type 94% Cu and 6% Sn, having a diameter of 5 mm, drawn-out at the desired diameter and cut at lengths of 350 plus minus 1 mm, which are then coated, by extrusion at working pressures of 2.2...2.5 atm., with composite coatings made of a fluoro-boro-calcic slagging system containing 22 plus minus 5% fluorite, 3 plus minus 1% rutile, 11 plus minus 3% calcinated borax, 9 plus minus 2% cryolite, 3 plus minus 1% FeMn 45, 3 plus minus 1% FeSi 45, 3 plus minus 1% ferro-boron, 1 plus minus 0.5% graphite, 1 plus minus 0.5% carboxymethylcellulose and 28% by mass, at the most, addition of synthetic powdery precursors of the type 50 plus minus 10% Cu and 50 plus minus 10% Sn having a maximal grain size of 0.3 mm, and are intended to welding deposit biphas bronze alloys with 12-14% Sn, having a hardness of at least 80 HB with possibility of growing up to 200 HB after a suitable thermal treatment.

Times Cited in BIOSIS Citation Index: 0  
Times Cited in Chinese Science Citation Database: 0  
Times Cited in Russian Science Citation Index: 0  
Times Cited in SciELO Citation Index: 0  
Times Cited in Web of Science Core Collection: 0  
Total Times Cited: 0

Accession Number: DIIDW:2010Q11861

Record 15 of 19

Inventor(s): CAPORNITA L; VOICULESCU I; GEANTA V; STEFANOIU R; BINCHICIU A; CAMPUREAN A M; IOVANUS D; BINCHICIU E; NEGRIU R M; BINCHICIU H; IOVANAS D

Title: COATING FOR ELECTRODES EMPLOYED IN WELDING HETEROGENOUS DUPLEX STAINLESS STEEL-CARBON STEEL JOINTS

Patent Number: RO125859-A0 RO125859-B1

Patent Assignee: SUDOTIM AS SRL

Abstract: NOVELTY - The invention relates to a basic coating for electrodes employed in manual electric welding between duplex stainless steel and carbon steel for the deposition of layers of the type 18% Fe, 8% Cr, 6% Ni, 2.5% Mn, and W, said coating enhancing the efficiency of weld coating by depositing layers having increased breaking resistance. According to the invention, the electrode coating consists of an alloy system comprising 15-19% metallic Mn, 5-8% finely grained W and 0.5-1.5 rare earths of the basic slagging system comprising 30-34% marble, 20-24% fluorite and 7% titanium dioxide, with burning compensation addition of 6-10% metallic Cr and refining-deoxidizing addition of 2-4% FeSi 45, 1-3% FeMn 45 and 2.5% plasticizers or binders which represent 17-19% of the total powder mass.

Times Cited in BIOSIS Citation Index: 0  
Times Cited in Chinese Science Citation Database: 0  
Times Cited in Russian Science Citation Index: 0  
Times Cited in SciELO Citation Index: 0  
Times Cited in Web of Science Core Collection: 0  
Total Times Cited: 0

Accession Number: DIIDW:2010Q11855

Record 16 of 19

Inventor(s): BINCHICIU A; BINCHICIU E; BINCHICIU H; GEANTA V; IOVANAS D; NEGRIU R M; STEFANOIU R; VOICULESCU I

**Title:** WEAR PREVENTING SHIELD WITH SELF-PROTECTION AND PROCESS FOR MAKING THE SAME

**Patent Number:** RO125760-A0 RO125760-B1

**Patent Assignee:** SUDOTIM AS SRL

**Abstract:** NOVELTY - The invention relates to a wear preventing shield with long life cycle and increased resistance to wear due to abrasion combined with corrosion, for stress in exploitation at temperatures of up to 350 degrees C. and to a process for making the same. According to the invention, the shield consists of a support (1) of sheet metal made of thermo-resistant steel slightly alloyed with Cr and/or Mo wherein there are cut channels (2) forming a rhombus-shaped grid, with the channel depth equal to its width of maximum of the support sheet metal thickness but not smaller than 10 mm, said channels wherein there are deposited by welding hard layers of alloys of the type 71% Fe, 25% Cr, 2,5% C, 1% Mo and 0,5% V, the diagonal (a) of the rhombuses and the angle (alpha) between the sides (3) for edge protection. As claimed, the process consists in metal cutting, on an universal cutter, of the wear surface of a support sheet (1) so that, on the entire surface of the support (1) there are made some channels (2) as rhombus-shaped grid wherein there are deposited, by manual or mechanical welding with a pump cooled welding device, hard layers of alloys based on Cr, Mo and V, the deposited layers exceeding the surface of the support sheet (1) by a height equal to the depth of the channel (2), afterwards the shield is stress-relieved at a temperature of 550+/-50 degrees C for 1 hour, followed by heat smoothing thereof and sand cooling down to the temperature of the environment.

**Times Cited in BIOSIS Citation Index:** 0

**Times Cited in Chinese Science Citation Database:** 0

**Times Cited in Russian Science Citation Index:** 0

**Times Cited in SciELO Citation Index:** 0

**Times Cited in Web of Science Core Collection:** 0

**Total Times Cited:** 0

**Accession Number:** DHDW:2010P53243

Record 17 of 19

**Inventor(s):** BINCHICIU A; BINCHICIU E; BINCHICIU H; GEANTA V; NEGRU R M; STEFANOIU R; VOICULESCU I

**Title:** PROCESS AND INSTALLATION FOR PRODUCING POWDERS OF BINARY ALUMINIUM-MAGNESIUM ALLOYS MEANT FOR MAKING METAL PIECES OF THIXOTROPIC STRUCTURE

**Patent Number:** RO125770-A0 RO125770-B1

**Patent Assignee:** SUDOTIM AS SRL

**Abstract:** NOVELTY - The invention relates to a process and an installation for continuously producing metal powders of aluminium-magnesium alloys with melting temperatures under 1000 degrees C, meant for the production of pieces of thixotropic structure by injection moulding. According to the invention, the installation comprises a feeding mechanism (2) for wire (1) and a feeding mechanism (3) for the cored pipe (4), which lead the components of the binary alloy with variable advance speeds to an induction-heated crucible (5) which is provided at its bottom with a system of nozzles (10) wherethrough the melted alloy flows in a laminar motion on a refractory stainless steel drum (14) which rotates with a speed ranging between 600...6000 rpm, in the preforming chamber (11) protected by argon atmosphere, the melted alloy being then projected onto a deflective plate (12) at an angle adjustable between 0...45 degrees, where it is converted into drops which, after solidification, are deposited onto the cooling collector bed (16). The claimed process consists in an adequate dosing of the quantity of 97% active Al solid wire (1), having a diameter of 2 mm, and of the quantity of Mg-cored aluminium pipe (4), having a diameter of 3,25 mm, necessary to form a melt (9) under a protective layer of cryolitic flux (8) in an induction furnace with graphite crucible (5), said melt flowing through some nozzles into the preforming chamber (11), on a drum (14) rotating with variable speed and projecting the melt jet onto a deflective plate (12) inclined under an adjustable angle ( alpha ), which achieves the jet dispersion into pulverous particles (15) which are then deposited onto the cooling collector bed (16) in an atmosphere of protective inert gas.

**Times Cited in BIOSIS Citation Index:** 0

**Times Cited in Chinese Science Citation Database:** 0

**Times Cited in Russian Science Citation Index:** 0

**Times Cited in SciELO Citation Index:** 0

**Times Cited in Web of Science Core Collection:** 0

**Total Times Cited:** 0

**Accession Number:** DHDW:2010P53358

Record 18 of 19

**Inventor(s):** BINCHICIU A; BINCHICIU E; BINCHICIU H; GEANTA V; IOVANAS D; IOVANAS R; STEFANOIU R; VOICULESCU I

Title: Irremovable modular composite element, comprises rectangular pipe made of carbon or slightly alloyed steel

Patent Number: RO125759-A0 RO125759-B1

Patent Assignee: SUDOTIM AS SRL

Abstract: NOVELTY - The invention relates to an irremovable modular element used as tool during the hot-pressing and to a process for carrying out the same. According to the invention, the modular element consists of a rectangular pipe made of carbon or slightly alloyed steel, with thick walls (2), which is reinforced on the small sides of the pipe, by depositing some hard layers (1) with thickness of 10 mm, made of steel of the type Fe, 0.3% C, 0.4% Si, 1.2% Mn, 6.5% Cr, 1.5% Mo, 1.5% W, the pipes being reinforced by filling them with metallic putty (3). As claimed, the process consists in a successive and symmetrical loading, of the two active surfaces, by flux-shielded welding, with strip-type electrodes which have the width equal to the short side of the pipe, with controlled cooling and geometry of the reinforcement depositions, the number of passes depending on the thickness of the deposition, afterwards there follows a stress-relieving thermal treatment simultaneously with the dehydrogenation of the deposited layer, for 48 hours at a temperature of 300 degrees C, and in the end there takes place the reinforcement of the rectangular pipe by filling the same with metallic putty.

Times Cited in BIOSIS Citation Index: 0

Times Cited in Chinese Science Citation Database: 0

Times Cited in Russian Science Citation Index: 0

Times Cited in SciELO Citation Index: 0

Times Cited in Web of Science Core Collection: 0

Total Times Cited: 0

Accession Number: DIIDW:2010P53422

Record 19 of 19

Inventor(s): BINCHICIU A; BINCHICIU E; BINCHICIU H; GEANTA V; IOVANAS D; NEGRU R M; STEFANOIU R; VOICULESCU I

Title: Electrode coating for build-up welding with abrasion wear-resistant alloys, contains marble, fluorine, rutile, iron, metallic chromium, colloidal graphite, rare earths, aluminum, carboxymethyl cellulose and liquid sodium silicate

Patent Number: RO125761-A0 RO125761-B1

Patent Assignee: SUDOTIM AS SRL

Abstract: NOVELTY - The invention relates to a basic fluoro-calcic coating with admixture of 28% Fe and 8% Cr, employed for making electrodes by extrusion, on rods made of alloys of the type containing 83% Fe-17% Cr, said electrodes having increased deposition efficiency and high abrasion resistance for interactions of the metal-on-metal type and permitting depositions to be carried out by welding of alloys containing 13% Cr-87% Fe with rare earths admixtures. According to the invention, the coating is a homogeneous mechanical mixture consisting of 22-26% marble, 21-25% fluorine, 5-7% rutile, 25-30% iron, 8-10% metallic chromium, 3-4% FeSi 45, 3-5% colloidal graphite, 0.5-1% rare earths, 0.5-1% aluminium, 0.5-1% carboxymethyl cellulose and liquid sodium silicate in a ratio of 18% of the total powder mass.

Times Cited in BIOSIS Citation Index: 0

Times Cited in Chinese Science Citation Database: 0

Times Cited in Russian Science Citation Index: 0

Times Cited in SciELO Citation Index: 0

Times Cited in Web of Science Core Collection: 0

Total Times Cited: 0

Accession Number: DIIDW:2010P53134

Close



## Documents

- 1) Binchiciu, E.<sup>a</sup>, Fleser, T.<sup>a</sup>, Voiculescu, I.<sup>b</sup>  
**Composite rods for brazing**  
(2014) *Advanced Materials Research*, 1029, pp. 72-77.

DOI: 10.4028/www.scientific.net/AMR.1029.72

<sup>a</sup> 'Politehnic' University of Timisoara, Romania

<sup>b</sup> 'Politehnic' University of Bucharest, Romania

**Abstract**

The paper presents research conducted for the development of precursors and wrapped rods for brazing, that deposit, through melting, two different alloys, with respect to the level of silver alloying and the melting temperature.

The alloy with the high silver content is introduced under the form of powder, in the coating of the brazing rods, in a participation proportion that assures a buffer layer, with advance proprieties of diffusion in the base metal and in the core alloy of the coated rod.

The participation ratio of the silver rich powder alloy is established within the following limits 8- 12%, depending on their melting point, the grinding degree and mixing with the deoxidizer coat. The development of the precursors was made by homogeneous melting and spraying on a oblique plan, the grains obtained were grounded, the grist obtained is considered optimum to be introduced in the coating mixture after it successfully passed through a sieve with a mesh of 0.1 mm.

The alloyed precursors with 45% silver, grounded between the above mentioned limits, were introduced in the deoxidizer coat mixture of the bare rods, type Ag30, according to SR EN 1044/1999. The resulted mixture was used to manufacture experimental lots of covered rods for brazing, which were used for testing, in order to achieve highly important joints.

The melting temperature of the precursors was established through micro-alloying so that it will be 10-150C higher than that of the deoxidizer coat, which in turn has a lower melting temperature, by 56-60°C, than the melting temperature of the core alloy.

The deoxidizer coat is usually fluoroboric type, conforming to SR EN 1045/2001.

Representative joints made with the new experimental rods, after testing, presented results consistent with the requirements, which allowed the authors to appreciate this method as appropriate for cost reduction with brazing materials in the use of composite coated rods. © (2014) Trans Tech Publications, Switzerland.

**Author Keywords**

Brazing; Coated rods; Materials

**Document Type:** Conference Paper

**Source:** Scopus

- 2) Tihanov-Tănăsache, D.<sup>a</sup>, Florea, C.<sup>a</sup>, Binchiciu, E.<sup>b</sup>, Geanta, V.<sup>c</sup>  
**Nanostructured materials for cladding by welding**  
(2014) *Advanced Materials Research*, 1029, pp. 78-82.

DOI: 10.4028/www.scientific.net/AMR.1029.78

<sup>a</sup> University of Petrosani, Romania<sup>b</sup> 'Polytechnic' University Timisoara, Romania<sup>c</sup> 'Polytechnic' University Bucharest, Romania**Abstract**

The rigorous stress conditions of active surfaces, from the components of magmatic rock processing equipment of surface pits, required finding new materials and system processes that achieve a major impact on wear processes, in the sense of decreasing them. Conducted research with classic cladding by welding materials showed a high importance of the chromium carbides in deposits, in the fight against wear. From manufacturing considerations, the participation of chromium carbides in the deposits made with traditional welding materials is 35%, which required finding new ways to obtain superior performances.

The group of authors considered the nanostructure method to be convenient, hence of finishing the deposition structure, by introducing in the cladding, welding material composition centers of crystallization with colloidal size and superior temperatures, compared to the molten through welding bath temperatures. In order to achieve a new generation of cladding by welding materials, we proceeded to develop, on the above mentioned principle, rods that deposit by welding alloys like Fe-20%Cr-4%W-1%Ti, nanostructure with melted tungsten carbides and colloidal grinded. The rods thus obtained were used for cladding active surfaces of general purpose extraction and processing machines for basaltic rocks, to achieve highways.

Results obtained confirm theoretical assumptions, which led to the implementation of new products in industrial production. © (2014) Trans Tech Publications, Switzerland.

**Author Keywords**

Abrasion; Nanostructured materials; Welding

**Document Type:** Conference Paper**Source:** Scopus

- 3) Tihanov, T.D.<sup>a</sup>, Fiorea, C.<sup>a</sup>, Binchiciu, E.<sup>b</sup>, Geanta, V.<sup>c</sup>  
**Armor with hyper-entropic behaviour and self-protection**  
 (2014) *Applied Mechanics and Materials*, 656, pp. 30-36

DOI: 10.4028/www.scientific.net/AMM.656.30

<sup>a</sup> Universitatea din Petrosani, Romania<sup>b</sup> Politehnica University Timisoara, Romania<sup>c</sup> University Politehnica of Bucharest, Romania**Abstract**

The paper presents research conducted in order to achieve some self-shielding armor with high and pre-established strength to intense wear abrasion combined with corrosion, in damp environment, with sulphur content, at temperatures up to 500°C. The first stage was dedicated to the elaboration of the concept of armor and the hardfacing technology, using a hyper-entropic filler metal which assures a self-protection characteristic. The samples used in the experiment were mild steel plates covered with weld in the rhomboid form. In the next stage some investigations were conducted in order to manufacture of new welding materials such as Fe-22%Cr-Mo-V deposited by welding in certain circumstances, having the hardness after welding about 30 HRC. This weld deposit becomes harder after a short working time, having average hardness value of 55 HRC. In stage three some exploratory research was done in order to establish the welding parameters for obtaining the self-protection layers of hyper-entropic material. In the final stage the armor element achieved was tested, to determine performance characteristics during working into the mill fan. After 2 weeks, some samples were sectioned in order to measure the hardening effect during working. © (2014) Trans Tech Publications, Switzerland.

**Author Keywords**

Armor; Hardfacing; Hyper-entropic; Self-protection

**Document Type:** Conference Paper**Source:** Scopus

- 4) Binchiciu, E.<sup>a</sup>, Fleser, T.<sup>a</sup>, Voiculescu, I.<sup>b</sup>  
 Experimental research regarding the development of ecological cusnp powder  
 (2014) *Applied Mechanics and Materials*, 656, pp. 23-29.

DOI: 10.4028/www.scientific.net/AMM.656.23

<sup>a</sup> Politehnica University Timisoara, Romania

<sup>b</sup> University Politehnica of Bucharest, Romania

#### Abstract

The paper presents research made to achieve environmental powder precursors from a CuSnP alloy, used in the manufacturing process of brazing materials, such as coated rods. The innovation of the paper consists in the elemental participation of the components in the new alloys, procedure that takes place in the alloying process, through coat conditions of the addition materials and by simultaneous obtaining the new precursors that fulfill high friability and deoxidation conditions of the participants in the brazing process. Developing the copper alloy batches is conditioned by a good protection to oxidation and gas absorption from the melting oven atmosphere. In order to protect the melt from the above mentioned phenomena's we developed a slagging flux, boron-cryolite type, which has melting proprieties below those of the copper phosphorus alloy, approx. 700°C. The load calculation was made based on the technical characteristics of the industrial base materials that were used, taking into account the loss coefficient of 5%. The melting, casting and cooling of the samples, dimensioned so they will be friable, was accomplished through classic procedures. The grinding of the sample, including the moistening thermic treatments, was achieved by experimental research, followed by calculations, based on the criteria of maximum yield for grinding. Estimating the sample friability, in the preliminary phase of the experimental determinations, was needed in order to restrain the testing domain, through structural and hardness analyses. The chemical composition of the samples was spectral determined on the copper and copper phosphorus programs. © (2014) Trans Tech Publications, Switzerland.

#### Author Keywords

Alloys; Brazing; Coated rods; Powder precursors

Document Type: Conference Paper

Source: Scopus

- 5) Stanciu, G.<sup>a</sup>, Serban, C.-E.<sup>a</sup>, Binchiciu, E.<sup>b</sup>, Berchi, P.<sup>b</sup>  
 Research on the performing mandrel subjected to hardening heat treatments  
 (2011) *Metallurgia International*, 16 (5), pp. 109-112.

<sup>a</sup> Transilvania University of Brasov, Romania

<sup>b</sup> Timisoara SC SUDOTIM AS SRL, Romania

#### Abstract

The work presents the research carried out to achieve, effective alternative of hot taps semi processing of alloy with chrome lines in order to get the semi-mechanized by preforming for shirts bearing. Drilling taps surfaces of hot, at approx. 1050 °C, are subjected to fatigue Thermo combined with air abrasion and corrosion result in losses of material by erosion, voids and creep deformation. The preforming mandrels are made of medium alloy tool steels with chromium and tungsten which has got high wear resistance at temperatures up to 650 °C. At temperatures above 850 °C there shows up an intense process of softening accompanied by pronounced decreases in hardness, which requires the manufacture of drilling mandrels taking measures to protect their assets by superficial hardening heat treatments, alloy welded over the whole manostrucurale existence in the solid state.

#### Author Keywords

Heat treatment; Mandrel

Document Type: Article

Source: Scopus

- 6) Iovanas, R.F.<sup>a</sup>, Binchiciu, E.<sup>b</sup>, Iovanas, D.M.<sup>a</sup>, Trif, I.N.<sup>a</sup>, Berchi, P.<sup>b</sup>  
 Researches regarding the development of hollow rods with composite core for weld cladding

(2011) *Metalurgia International*, 16 (5), pp. 133-136. Cited 1 time

<sup>a</sup> Transilvania University of Brasov, Romania

<sup>b</sup> S.C. Sudolim S.R.L. Timisoara, Romania

#### Abstract

The paper presents research made to develop new materials for loading through welding, type tubular rods, which deposit through VIG or flame processes, thin layers of Fe- Cr-V-Ti based alloys, with high resistance to operating conditions of the asphalt cutter knives from the earth moving machinery components. The problems solved in this paper, namely to achieve manufacturing technologies of tubular rods with filling coefficients, 0.5-0.8, with composite core, with high electrical conductivity, consisted in that it has developed a composite core recipe, with self-counseling properties of constituents parts of the alloy system. The second part of the paper presents research made to determine the optimal parameters of manufacturing hollow rods VCr<sub>2</sub>,5Ti. At the end of the paper results of the tests made on the weld metal are presented, they show the metallographic structures, type martensitic, rich in complex chromium, vanadium and titanium carbides, fine-grained and with an associated hardness about 55 HRC.

#### Author Keywords

Composite core; Milling cutters; Rods

Document Type: Article

Source: Scopus

7) Iovanas, R., Trif, I.N., Iovanas, D., Binchiciu, E., Dragan, A.M.

Elaboration of special tubular rods typed filler materials with composite core in order to increase the durability of the technological equipments for the cutters used in asphalt recycling

(2011) *Annals of DAAAM and Proceedings of the International DAAAM Symposium*, pp. 397-398.

#### Abstract

This paper presents the researches performed in order to elaborate special filler materials for hard facing, of tubular rod type with composite core, that are able to coat using TIG method, in the active surfaces zone exposed to high wears from exploitation, of the milling cutters used for recycling the asphalt, and some thick layers that are Fe-Cr-VTi based, in order to increase their persistence.

#### Author Keywords

Coating; Composite core; Milling cutters; Rods

Document Type: Conference Paper

Source: Scopus

8) Iovănaş, D.M.<sup>a</sup>, Binchiciu, H.<sup>b</sup>, Ceorapin, C.<sup>a</sup>, Binchiciu, E.<sup>c</sup>, Iovănaş, R.F.<sup>a</sup>

Rare earths micro-alloyed materials used for manufacturing modulated elements constituting tools for forging

(2008) *Welding in the World*, 52 (SPEC. ISS.), pp. 777-781.

<sup>a</sup> TRANSILVANIA University Braşov, Romania

<sup>b</sup> S.C. Sudotim, Timişoara, Romania

<sup>c</sup> Politehnica University, Timişoara, Romania

#### Abstract

The active areas of the processing tools by pressing are intensely required at efforts with a high degree of triaxiality which implies the use of hard and tenacious materials. The implementation in the tools production of the irremovability principle based on modulated elements implies the achievement of a new generation of materials for loading through microalloyed with lanthanide welding. For this purpose there has been achieved a loading material obtained through welding which lays alloys of the type Fe-2, 5 Cr-4%, 5% W with the appropriate characteristics and suitable technologies. This material has been tested and the test results are presented in the end paper.



Document Type: Article  
Source: Scopus

- 9) Iovanas, D., Binchiciu, A., Simiti, I.V., Nagy, F., Ceorapin, C.-G., Iovanas, R., Binchiciu, E.,  
Efficient materials for facing and reconditioning of the tools for hot working  
(2007) *Welding in the World*, 51 (SPEC. ISS.), pp. 625-630.

**Abstract**

In the paper it is presenting the effectuated researches for elaboration of consumables for depositing of the metals type Fe-2,5%Cr-4,5%W-V, micro alloyed with lanthanides and with a good resistance to abrasion combined with corrosion wear and thermo mechanic fatigue, specific to active surface of the tools for hot working. In the first part of the paper it is presenting the technological experimentations for realization of the fluorine-calcium consumables alloyed and micro alloyed in the cover with lanthanides conformity with the technical prescriptions. In the second part is presenting the final results of the welding behavior tests of the consumables and the results of the determination of physical and chemical characteristics and morphological of the facings.

**Author Keywords**

Alloying with lanthanides; Consumable; Reconditioning; Tools for hot working

Document Type: Article

Source: Scopus