



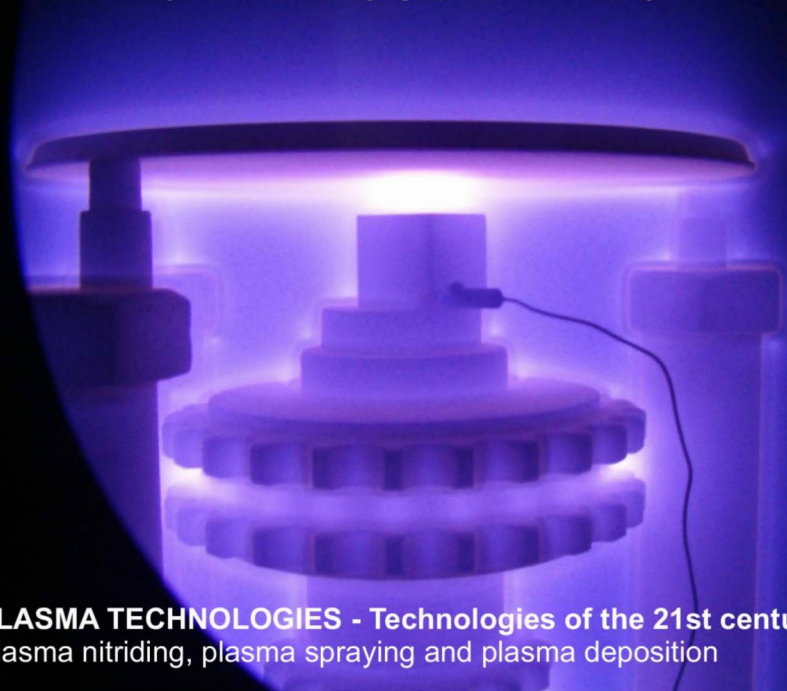
planit d.o.o.



Preduzeće za industrijsku primenu plazma tehnologija The company for the industrial applications of plasma technologies

plazma tehnologije • reparacije • karakterizacija površinskih slojeva • vakuumaska tehnika • livarstvo
plasma technologies • reparations • characterization of the surface layers • vacuum technique • castings

PLAZMA TEHNOLOGIJE -Tehnologije 21. veka
Plazma nitiranje, plazma sprejng i plazma depozicija



PLASMA TECHNOLOGIES - Technologies of the 21st century
Plasma nitriding, plasma spraying and plasma deposition

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Plazma nitiranje

Plazma nitiranje je postupak površinske termičke obrade čelika u plazmi kod koga je programiranjem parametara procesa moguće prilagoditi karakteristike nitiranog sloja traženoj primeni.

Zahvaljujući plazmi, kao aktivnom medijumu tj. jonskom bombardovanju radnog komada, površina se aktivira (otvaraju se putevi za difuziju azota) tako da se proces nitiranja odvija na znatno nižim temperaturama (50°C - 100°C) nego kod klasičnog (gasnog) nitiranja.

Ova činjenica omogućava nitiranje čelika koji se mogu tretirati gasnim nitiranjem i smanjuje rizik od deformacije radnih komada kompleksne geometrije.

Plazma nitiranjem alata za plastiku, livenje pod pritiskom, kovanje, zavojnih vretena za gumu i plastiku, zupčanika, osovina, radilica i slično, višestruko se produžava vek eksploatacije istih.

Plazma nitriding

Plazma nitriding is a process of surface heat treatment of steel in plasma in which the characteristics of nitride layer can be adjusted to required application by programming parameters.

Thanks to plasma, as an active medium, i.e. ion bombarding of work piece, the surface is activated (open the ways for nitrogen diffusion) so that the process of nitriding proceeds at considerably lower temperatures (50°C - 100°C) than those with conventional (gas) nitriding.

This fact enables nitriding of steel that can be nitride by gas nitriding and reduces the risk of work pieces deformation of complex geometry.

By plasma nitriding of tools for plastics, casting under pressure, forging, screw spindle for rubber and plastics, gears, axles, crankshafts, etc., significantly extends the exploitation life of the above mentioned.

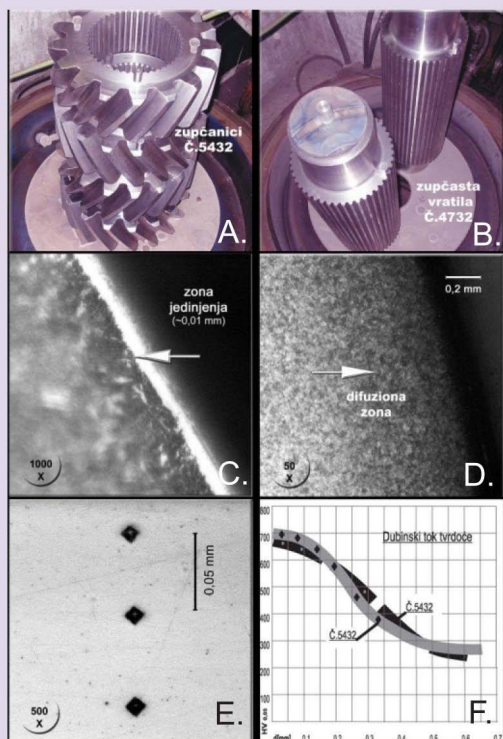


▲
Vakuumska komora sistema za plazma nitiranje "PLANIT 2002" sopstvene proizvodnje.

Vacuum chamber of "PLANIT 2002" system for plasma nitriding of own production.

U sistemu "PLANIT 2002" snage 50 kW moguće je nitrirati delove mase do 1 t, prečnika do 1000 mm, dužine (visine) do 3000 mm.

It is possible to nitride parts of mass up to 1 t, diameter up to 1000 mm, length (height) up to 3000 mm in "PLANIT 2002" system.



▲ Šarža za nitiranje sa postavljenim uzorcima za karakterizaciju A. i B.
A lot for nitriding with positioned samples for characterization A. and B.

▲ Metalografski snimci nitiranog sloja- zone jedinjenja C. i difuzione zone D.
Metallographic images of nitride layer - compound zone C. and diffusion zone D.

▲ Otisci dijamanstske glave pri merenju dubinskog toka tvrdoća E. i grafički prikaz dubinskog toka tvrdoća F.
Diamond head prints at measurement of depth flow of the hardness E. and graphical presentation of depth flow of the hardness F.

Reparacije

Planit raspolaže stručnim inženjerskim kadrom za izvođenje delikatnih sanacija oštećenih delova pri remontima industrijskih postrojenja. Radne delove postrojenja oštećene različitim mehanizmima destrukcije- habanje pri klizanju, abrazije, kavitacije, dejstva hemikalija ili površenih temperatura, korozije i slično saniramo postupcima plazma sprejinga, metalizacije i tvrdog hromiranja.

Reparation

Planit has professional engineer staff for performing of delicate reparations of damaged parts in overhaul of industrial plants. Processes of plasma spraying, metallization and hard chromium plating reparate working parts of plants damaged by different mechanisms destruction - sliding wear, abrasion, cavitation, effects of chemicals or increased temperatures, corrosion, etc.



◀ Sanacija oštećenja nastalih elektroerozijom na rukavcima rotora kompresora krek-gasa. Naručilac: Hip Petrohemija, Pančevo

◀ Reparation of damages caused by electro erosion on pivots of cracked gas compressor rotor. Customer: Hip Petrohemija, Pančevo



▲
Detalj oštećenja rukavca
A detail of damaged pivot



▲
◀ Sanacija glavnog klipa (dužina 6000 mm, težina 17 tona) pri remontu prese za istiskivanje profila. Naručilac: Novkabel, Novi Sad

◀ Reparation of the main piston (length 6000 mm, weight 17 tons) at overhaul of the profile extrusion presses. Customer: Novkabel, Novi Sad

*Deponovana keramička prevlaka (zamena za tvrdo hromiranje) na radnoj površini hidrauličnog cilindra valjačkog stana mase 2,1 t i prečnika 1000 mm.
Naručilac: Željezara, Smederevo*

*Deposited ceramic coating (replacement for hard chrome plating) on working surface of rolling mill hydraulic cylinder of mass 2,1 t and diameter 1000 mm.
Customer: Steel factory, Smederevo*



*Merenje mikro tvrdoće
Micro hardness measurement*



Završna ispitivanja

- ✓ analiza athezije deponovanih prevlaka sa podlogom
- ✓ metalografska ispitivanja u cilju analize: poroznosti, procenta nestopljenih i nevezanih čestica, oksida i sl.

The final test

- ✓ adhesion analysis of deposited coatings with substrate
- ✓ metallographic tests for analysis: porosity, percentage of unmelted and unbounded particles, oxides, etc.

Livastvo

Vezano za livarstvo Planit je vlasnik kaluparske linije DISAMATIC, opreme za metalografska ispitivanja i uređaja za DTA (Diferencijalna Termalna Analiza), pa se u kooperaciji bavi proizvodnjom i prodajom odlivaka od sivog, nodularnog i čeličnog liva.



*Metalografski mikroskop u laboratoriji Planita
Metallographic microscope in the Planit laboratory*

Foundry

Regarding the casting, Planit owns the shell molding DISAMATIC line, equipment for metallographic examination and devices for DTA (Differential Thermal Analysis) and in cooperation deals with production and sale of gray, ductile and steel iron castings.



*Nosač motora za BMW obrađen u GasTeh-u (Indija)
plazma nitriran u Planitu.*

Motor carrier for the BMW foundry has been processed at the GasTeh (Indija) and plasma nitrided in Planit.