Titel

Experimental investigation on high-shear and low-pressure **grinding** process for Inconel718 superalloy

Autor

TIAN YB
Li LG
Liu B
Han JG
Fan ZH

Institution

Shandong Univ Technol, Sch Mech Engn, 266 Xincun West Rd, Zibo 255049, Peoples R China.
Shandong Univ Technol, Inst Adv Mfg, Zibo 255049, Peoples R China.

Abstrakt

In this work, we reported a novel **grinding** method with high tangential **grinding** force and low normal **grinding** force using specially developed **grinding tools**. The **tools** were made of flexible composites based on the principle of liquid body armor and the shear thickening mechanism of non-Newtonian fluid. During **grinding**, **abrasive** particles are capable of generating a "hydro-cluster effects" under reverse tangential load, which **lead** to the decreased normal **grinding** force and the increased tangential **grinding** force. Hence, workpiece materials are removed under "high-shear and low-pressure" **grinding** mode. A serial of **grinding** experiments were carried out on Inconel718. The results showed that the novel **grinding tool** had an excellent **grinding** performance on Inconel718 workpieces. The value of surface roughness decreased from Ra 473.7 nm to Ra 153.0 nm under the optimal **grinding** parameters, i.e., **wheel** speed of 1 m/s, workpiece speed of 2000 mm/min, and **grinding** depth of **cut** of 180 mu m. The surface defects of the Inconel718 workpiece were gradually removed. Meanwhile, the uniformed grinding textures were generated. The surface of the grinding tool had residual wear debris, and there was a little loss of grains after 240 grinding cycles.

Veröffentlichungsjahr

2020

Quelle

INTERNATIONAL JOURNAL OF ADVANCED MANUFACTURING TECHNOLOGY

Klassifikation

Automation & Control Systems
Engineering

Schlagworte des Autors

FLEXIBLE COMPOSITES
Grinding tools
High-shear and low-pressure **grinding**
Precision **grinding**
Nickel-based superalloy

Thesaurusbegriffe

SURFACE INTEGRITY
MATERIAL REMOVAL
FORCE
BURN

Sprache

ENGLISH

Recherchedatum

12.03.2021

Dokument Nr.: 53

Titel

Internal Cylindrical **Grinding** Process of INCONEL (R) Alloy 600 Using **Grinding Wheels** with Sol-Gel Alumina and a Synthetic Organosilicon Polymer-Based Impregnate

Autor

KAPLONEK W
Nadolny K
Rokosz K
Marciano J
Mia M
Pimenov DY
Kulik O
Gupta MK

Institution

Koszalin Univ Technol, Fac Mech Engn, Dept Prod Engn, PL-75620 Koszalin, Poland.
Koszalin Univ Technol, Dept Engn & Informat Syst, PL-75620 Koszalin, Poland.
Horiba France SAS, Ave Vauve Passage Jobin Yvon, CS 45002, F-91120 Palaiseau, France.
Imperial Coll London, Dept Mech Engn, Exhibit Rd, London SW7 2AZ, England.
South Ural State Univ, Dept Automated Mech Engn, Chelyabinsk 454080, Russia.
Volgograd State Tech Univ, Volzhsky Polytech Inst Branch, Dept Mech Engn, Volzhsky 404121, Russia.
Shandong Univ, Sch Mech Engn, Key Lab High Efficiency & Clean Mech Manufacture, Minist Educ, Jinan 250061, Peoples R China.

Abstrakt

The development of modern jet engines would not be possible without dynamically developed nickel-chromium-based superalloys, such as INCONEL (R) The effective **abrasive** machining of above materials brings with it many problems and challenges, such as intensive **clogging** of the **grinding wheel** active surface (GWAS). This extremely unfavorable effect causes a reduction in the **cutting** ability of the **abrasive tool** as well as increase to **grinding** forces and friction in the whole process. The authors of this work demonstrate that introduction of a synthetic organosilicon polymer-based impregnating substance to the GWAS can significantly improve the effects of carrying out the **abrasive** process of hard-to-cut materials. Experimental studies were carried out on a set of a silicon-treated small-sized sol-gel alumina 1-35x10x10-SG/F46G10VTO **grinding wheels**. The set contained **abrasive tools** after the internal cylindrical **grinding** process of INCONEL (R) alloy 600 rings and reference **abrasive tools**. The condition of the GWAS after the impregnation process was studied, including imaging and measurements of its microgeometry using confocal laser scanning microscopy (CLSM), microanalysis of its elemental distribution using energy dispersive X-ray fluorescence (EDXRF), and the influence of impregnation process on the grinding temperature using infrared thermography (IRT). The obtained results confirmed the correctness of introduction of the impregnating substance into the grinding wheel structure, and it was possible to obtain an abrasive tool with a recommended characteristic. The main favorable features of treated grinding wheel concerning the reduction of adhesion between the GWAS and grinding process products (limitation of the clogging phenomenon) as well as reduction of friction in the grinding process, which has a positive effect on the thermal conditions in the grinding zone.

Veröffentlichungsjahr

2020

Quelle

MICROMACHINES

Klassifikation

Chemistry
Science & Technology - Other Topics
Instruments & Instrumentation
Physics

Schlagworte des Autors

IMPREGNATION PROCESS
silicone
abrasive tools
internal cylindrical **grinding**
hard-to-cut materials
surface measurements and analysis

Thesaurusbegriffe

PERFORMANCE

Sprache

ENGLISH

Recherchedatum

12.03.2021

Dokument Nr.: 54

Titel

Optimization of Micropencil **Grinding Tools** Via Electrical **Discharge** Machining

Autor

ARRABIYEH PA
Dethloff M
Muller C
Kirsch B
Aurich JC

Institution

TUK Univ Kaiserslautern, Inst Mfg Technol & Prod Syst, POB 3049, D-67653 Kaiserslautern, Germany.

Abstrakt

Micropencil **grinding tools** (MPGTs) are micromachining **tools** that use superabrasives like diamond and cubic boron nitride (cBN) grits to manufacture complex microstructures in a broad range of hard and brittle materials. MPGTs suffer from a rather low **tool life**, when compared to other more established microprocessing methods. It was documented that when used on hardened steel workpieces, MPGTs suffer from a large amount of adhesions, mostly located at the pivot point of the **tool**. These adhesions **lead** to the **clogging** of the **abrasive** layer and ultimately in **tool** failure. Another problem this machining process suffers from is the formation of substructures (smaller channels inside the microchannels). The pivot is usually less prone to **abrasive** wear, has higher protrusion, and is therefore responsible for the deepest substructures. These substructures can easily take up half the depth of **cut**, obstructing the function of machined microchannels-it is one of the major flaws of this micromachining process. A microelectrical discharge machining method (mu EDM) can solve these issues by manufacturing a cavity at the pivot of these tools. A novel method that uses measurement probes to position the substrate above the mu EDM electrode is implemented and a parameter study to determine the cavity manufacturing parameters is conducted for substrates with diameters < 40 mu m. The goal is to demonstrate the first ever complete and reliable manufacturing process for MPGTs with a cavity and to demonstrate the advantages they provide in a machining process when compared to regular MPGTs.

Veröffentlichungsjahr

2019

Quelle

JOURNAL OF MANUFACTURING SCIENCE AND ENGINEERING-TRANSACTIONS OF THE ASME

Klassifikation

Engineering

Schlagworte des Autors

nicht belegt

Thesaurusbegriffe

THEORETICAL-MODELS
FABRICATION
TECHNOLOGY

Sprache

ENGLISH

Recherchedatum

12.03.2021

Dokument Nr.: 55

Titel

Research on the fabrication and **grinding** performance of 3-dimensional controllable **abrasive** arrangement **wheels**

Autor

QIU YF
Huang H

Institution

Huaqiao Univ, Inst Mfg Engn, Xiamen 361021, Fujian, Peoples R China.
Key Lab Photoelect Mat Machining, Xiamen 361021, Fujian, Peoples R China.

Abstrakt

As the spatial position of **abrasive** particles in the **grinding wheel** has a major impact on the uniform abrasion of the **grinding wheel** and the **grinding** quality of the workpiece, the design and fabrication of 3-dimensional (3D) controllable **abrasive** arrangement **wheels** are of great importance. In this paper, the simulation of **grinding** process with 3D controllable **abrasive** placement **grinding wheel** is presented by using MATLAB software. The influence of the **abrasive** spatial distribution on the uniformity of the **grinding** trajectories was theoretically studied. Based on the **additive** manufacturing technology, a stereolithography apparatus equipment was developed to produce the resin-bonded **grinding wheel** with 3D controllable **abrasive** arrangement. Some light-cured resin **grinding wheels** with different spatial arrangement of **abrasive** particles were prepared for the verification **grinding** experiments. The variation coefficient of standard deviation (VCSD) value and the non-uniformity coefficient (NUC) of the ground surface roughness were used to evaluate the uniformity of the grinding trajectories, that is, the machining quality of the workpiece surface. It can be obtained from the simulation results and the experiment results that the abrasive distribution had a significant influence on the uniformity of workpiece surface quality. Comparing with traditional random arrangement abrasives grinding wheel, the grinding experiment results indicated that the 3D controllable abrasive arrangement wheel had a longer effective grinding time and greater total material removal amount. Both the simulation results and experimental results indicated that the uniformity of the grinding trajectories could be optimized with the controllable abrasive arrangement.

Veröffentlichungsjahr

2019

Quelle

INTERNATIONAL JOURNAL OF ADVANCED MANUFACTURING TECHNOLOGY

Klassifikation

Automation & Control Systems
Engineering

Schlagworte des Autors

3D CONTROLLABLE **ABRASIVE** ARRANGEMENT **WHEEL**
Uniformity of **grinding** trajectories
Kinematic simulation
Grinding experiment

Thesaurusbegriffe

KINEMATICS

Sprache

ENGLISH

Recherchedatum

12.03.2021

Dokument Nr.: 56

Titel

Effect of **additive** particles on the performance of ultraviolet-cured resin-bond **grinding wheels** fabricated using **additive** manufacturing technology.

Autor

QIU, YANFEI
HUANG, HUI
XU, XIPENG

Institution

Huaqiao University, Xiamen, CN
Fujian Engineering Research Center of Intelligent Manufacturing for Brittle Materials, Xiamen, CN

Abstrakt

In this paper, the effect of **additive** particles on the **mechanical** properties of ultraviolet (UV)-cured resin was evaluated based on tensile strength and shear strength. The experimental results showed that the tensile strength was improved with proper particle addition, but the shear strength was always decreased. Moreover, the effects of **additive** particles on the holding force of diamond **abrasive**, critical exposure energy, and penetration depth of UV-cured resin were elucidated. The holding force of resin with 15 wt% Al2O3 addition was found to be higher than that of pure UV resin. Based on the experimentally determined critical UV exposure energy and penetration depth, UV-cured resins with and without **additive** particles were used to fabricate **grinding wheels** using **additive** manufacturing technology. **Grinding** experiment demonstrated the performance of UV resinoid **grinding wheels** was significantly improved with the addition of 15 wt% Al2O3 particles.

Veröffentlichungsjahr

2018

Quelle

International Journal of Advanced Manufacturing Technology * Band 97 (2018) Heft 9-12, Seite 3873-3882 (10 Seiten)

Klassifikation

3KMN Polymer-Matrix-Verbundstoffe (PMCs)

Schlagworte des Autors

Diamant
Schleifscheibe
mechanische Eigenschaft
Additiv
additive Fertigung
Eindringtiefe
Abschleifmittel
Zugscherfestigkeit

Thesaurusbegriffe

nicht belegt

Sprache

Englisch

Recherchedatum

12.03.2021

Dokument Nr.: 57

Titel

Impact of **grinding** aids and process parameters on dry stirred media milling

Autor

PRZIWARA P.
Hamilton L. D.
Breitung-Faes S.
Kwade A.

Institution

nicht belegt

Abstrakt

The demand on minerals with increasing product fineness is currently rising in many industrial applications. Especially in dry **grinding** processes, fine powders are difficult to produce and to handle. Particle-particle attractive forces, which become more decisive with decreasing particle size, **lead** to a higher extent of agglomeration, material adherences and a more cohesive flow behavior. As a consequence, dry fine **grinding** processes demand large quantities of energy due to the amount of applied energy that is dissipated into heat. Current approaches for improving the energy efficiency mainly cover the improvement of a) machine equipment and b) the material behavior. The main focus of this study was to investigate both aspects within one single study: On the one hand, dry fine **grinding** of limestone was investigated in a dry **operated** stirred media mill, which is a promising and emerging option for dry fine **grinding** applications. On the other hand, the impact of the particle stabilization by liquid **grinding** aids on the grinding performance was evaluated. It was demonstrated that the grinding mechanism inside the mill depends on both the mill parameters as well as the powder flow behavior. Therefore, it is of crucial importance to adjust the mill parameters to the applied grinding aid when it comes to dry fine grinding in media mills. (C) 2018 Elsevier B.V. All rights reserved.

Veröffentlichungsjahr

2018

Quelle

POWDER TECHNOLOGY

Klassifikation

nicht belegt

Schlagworte des Autors

nicht belegt

Thesaurusbegriffe

nicht belegt

Sprache

nicht belegt

Recherchedatum

12.03.2021

Dokument Nr.: 58

Titel

Impact of the powder flow behavior on continuous fine **grinding** in dry **operated** stirred media mills

Autor

PRZIWARA P.
Breitung-Faes S.
Kwade A.

Institution

nicht belegt

Abstrakt

Due to the rising demand for minerals with high product fineness, new and innovative mill types are needed, which enable the energy efficient production of fine materials within the lower micron range. As fine **grinding** processes require mills with high energy densities as well as high production capacities, there is currently a great interest in research and development of dry **operated** stirred media mills. These mills are a promising option for energy efficient dry fine **grinding** especially due to their high stress energies and frequencies. While present studies on these mills mainly focus on the investigation of machine-related parameters, the impacts of product related characteristics on the **grinding** process are still mainly unknown; Especially in continuous **grinding** mode, product properties are normally of high importance. Therefore, this study focusses on the investigation of the product flow behavior regarding the **grinding** performance in continuously and dry **operated** stirred media mills. This study revealed that the grinding performance is strongly determined by both, machine-related values like the choice of process parameters as well as product-related characteristics like the powder flowability. It was further shown that the flow behavior of the product influences the grinding process on different levels simultaneously. Thereby, both too high and too low powder flowabilities lead to inefficient grinding. Also, an overlapping retention mechanism of the grinding media deflector wheel was identified, which may lead to further crucial impacts especially at high powder flowabilities.

Veröffentlichungsjahr

2018

Quelle

MINERALS ENGINEERING

Klassifikation

nicht belegt

Schlagworte des Autors

nicht belegt

Thesaurusbegriffe

nicht belegt

Sprache

nicht belegt

Recherchedatum

12.03.2021

Dokument Nr.: 59

Titel

The effects of deposition parameters on the grain morphology and wear mechanism of monolayer diamond **grinding tools** fabricated by hot filament CVD method

Autor

SHEN XT
Wang CC
Sun FH

Institution

Shanghai Jiao Tong Univ, Sch Mech Engn, Dongchuan Rd 800, Shanghai 200240, Peoples R China.

Abstrakt

The hot filament chemical vapor deposition technique (HFCVD) is used to fabricate monolayer **grinding tools** with high quality diamond **abrasive** grains. The high pressure and high temperature (HPHT) diamond seeds are distributed on SiC substrate randomly by a spin coater machine. Then epitaxial growth of CVD diamonds is conducted on both seeds and substrate simultaneously. The heteroepitaxial diamond film on substrate serves as a bonding layer to anchor the seeds, and the homoepitaxial growth of the seeds **leads** to changes in their morphology, purity, as well as **mechanical** properties. The grown seeds can be used as **abrasive** grains of the **grinding tools**. In this work, a systematic study is presented into the effects of deposition parameters (substrate temperature, carbon concentration, reactive pressure, bias current) on the growth behavior of diamond seeds. As a result, it is found that the well-faceted single crystal diamond (SCD) grains can be grown at 800 degrees C, 4.5 KPa, carbon concentration of 1.5% and bias current of 2 A. Besides, the increase of temperature and decrease of pressure allow the changes from SCD grains to microcrystalline diamond (MCD) clusters or further, to nano crystalline diamond (NCD) clusters, while the high bias current and carbon concentration promote the growth of dislocated planes and secondary nucleation. Moreover, it is found that the protrusion of the diamond abrasives can be controlled by the difference in growth rates between seeds and diamond bonding films under various conditions. Finally, the wear resistance of diamond grains is tested. Results show that the wear of SCD grains is dominated by a high rate of wear flat and few fractures, and the wear of MCD grains exhibits less wear flat but more fractures, while the NCD grains exhibit the worst wear resistance in terms of both fracture and wear flat.

Veröffentlichungsjahr

2018

Quelle

DIAMOND AND RELATED MATERIALS

Klassifikation

Materials Science
Physics

Schlagworte des Autors

HFCVD
Deposition parameter
Morphology
Diamond grain
Wear resistance

Thesaurusbegriffe

CHEMICAL-VAPOR-DEPOSITION
SINGLE-CRYSTAL GROWTH
METHANE CONCENTRATION
ION-BOMBARDMENT
BRAZING ALLOY
FILMS
PRESSURE
QUALITY
MICROSTRUCTURE
NUCLEATION

Sprache

ENGLISH

Recherchedatum

12.03.2021

Dokument Nr.: 60

Titel

The Influence of Technological Modes of Forming the Surface, Close to Juvenile and Ultrafine Powders with a High-Speed Method in a Cryogenic Environment

Autor

TITOV Y
Kamenov R
Belan D
Zinkin A

Institution

Omsk State Tech Univ, 11 Mira Ave, Omsk 644050, Russia.
Omsk State Transport Univ, 35 Prospekt Marksa, Omsk 644046, Russia.
LLC SibTochMash, 55 Build 2, Mira Ave, Omsk 644077, Russia.

Abstrakt

Introduction. The paper describes the research results of technological modes for high-speed processing of billets with the aim of obtaining juvenile surfaces and ultrafine powders. Methods of research. As technological factors, the presence/absence of liquid nitrogen in the treatment zone, the rate of revolution of **grinding disk**, the longitudinal feed, the characteristics of the **abrasive tool**, and the physical and **mechanical** characteristics of the materials being processed are taken. As response functions, when considering the influence of technological factors, foreign impurities are taken on the treated surface, the particle size of the powder and the wear of the **abrasive tool**. All the studies were carried out on the following materials: sintered-hard alloy VK-8, **tool** steel R-18, brass L63, aluminum alloy D16, ferromagnet M2500NMC1 and neodymium magnet N45M. A scanning electronic microscope Jeol JSM-5700 was used in the studies. The method of planning a two-factor experiment was used to obtain the ratio connecting the size of powder particles with technological factors. Results and discussion. The presence of liquid nitrogen in the processing area allows keeping the surface clean, preventing its oxidation and the appearance of abrasive wear products on it. The processing of viscous materials becomes possible only with the use of liquid nitrogen. The dispersion of the billet at grinding disc rate of revolution higher than 100 m/s leads to a sharp decrease in the particle size of the resulting powder. The use of a feed of less than 1 mm/min in the processing of billets is optimal in terms of the particle size of the powder obtained and the wear of the abrasive tool. The tensile strength of materials is the only parameter considered by physicomechanical characteristics of materials that affects the particle size.

Veröffentlichungsjahr

2018

Quelle

OBRABOTKA METALLOV-METAL WORKING AND MATERIAL SCIENCE

Klassifikation

Metallurgy & Metallurgical Engineering

Schlagworte des Autors

JUVENILE SURFACE
Ultrafine powder
High-speed processing
Cryogenic medium

Thesaurusbegriffe

CLEAN SURFACES
MECHANICAL-PROPERTIES

Sprache

RUSSIAN

Recherchedatum

12.03.2021

Dokument Nr.: 61

Titel

Effect of nanosized alumina **fillers** on manufacturing of UV light-curable-resin bond **abrasive tool**

Autor

GUO L
Huang QY
Marinescu I

Institution

Changan Univ, Sch Construct Machinery, 2nd Ring Rd, Xian 710054, Shaanxi, Peoples R China.
Univ Toledo, Dept Mech Ind & Mfg Engn, 2801 W Bancroft St, Toledo, OH 43606 USA.

Abstrakt

As one of the rapid prototyping technologies, ultraviolet-curable resin (UV-resin) curing was recently introduced into the manufacturing of resin bond **abrasive tools**. This research was conducted to evaluate the influence of nanosized alumina **filler** on the manufacturing of UV-resin bond diamond **grinding wheel**, and comparatively study the machining performance of **filler-loaded** and **filler-unloaded tools**. The UV-resin and diamond **abrasive** grains were prepared with nanosized alumina **filler** in a proportion of 0, 2.5, 5.0, 7.5, and 10wt%. The cure depth, hardness, and tensile strength of the cured mixture was studied, and the interfacial bond between the diamond grain and cured resin matrix was investigated as well. Two UV-resin bond diamond **grinding wheels** were fabricated to examine the influence of **filler** loading on wear performance of the **tools**. Experimental results based on ceramic workpieces showed that the introduction of alumina **filler** improved not only the material properties of cured resin matrix but also led to a significant improvement on the abrasive machining performance of grinding wheel.

Veröffentlichungsjahr

2017

Quelle

MACHINING SCIENCE AND TECHNOLOGY

Klassifikation

Engineering
Materials Science

Schlagworte des Autors

ABRASIVE MACHINING
rapid prototyping
resin bond **grinding wheel**

Thesaurusbegriffe

MECHANICAL-PROPERTIES
COMPOSITES
RETENTION

Sprache

ENGLISH

Recherchedatum

12.03.2021

Dokument Nr.: 62

Titel

Surface integrity and removal mechanism of silicon wafers in chemo-mechanical **grinding** using a newly developed soft **abrasive grinding wheel**.

Autor

GAO, SHANG
HUANG, HAN
ZHU, XIANGLONG
KANG, RENKE

Institution

Key Laboratory for Precision & Non-Traditional Machining Technology, Xian Jiaotong University, CN
School of Mechanical & Mining Engineering, University of Queensland, St. Lucia, Brisbane, QLD, AU

Abstrakt

A new soft **abrasive grinding wheel** (SAGW) used in chemo-mechanical **grinding** (CMG) was developed for machining silicon wafers. The **wheel** consisted of magnesia (MgO) soft **abrasives**, calcium carbonate (CaCO3) **additives** and magnesium oxychloride bond. Surface topography, roughness and subsurface damage of the silicon wafers ground using the new SAGW were comprehensively investigated. The results showed that the **grinding** with the new SAGW produced a surface roughness of about 0.5 nm in Ra and a subsurface damage layer of about 10 nm in thickness, which is comparable to that produced by chemo-mechanical polishing. This study also revealed that the chemical reactions between MgO **abrasive**, CaCO3 **additives** and silicon material did occur during **grinding**, thereby generating a soft reactant layer on the ground surface. The reactant layer was easily removed during the **grinding** process.

Veröffentlichungsjahr

2017

Quelle

Materials Science in Semiconductor Processing * Band 63 (2017) Seite 97-106 (10 Seiten, 44 Quellen)

Klassifikation

3LKB Spanende Bearbeitung, Zerspanen, Zerteilen
3KXW Oberflaecheneigenschaften
3MD Tribologie
3LKG Chemisches und elektrochemisches Abtragen

Schlagworte des Autors

Silicium-Wafer
Oberflaecheneigenschaft
Abschleifmittel
CaCO3
Reaktant
Magnesium
Oxichlorid
Schleifscheibe
Erdoberflaeche
Additiv
Rauigkeit
chemische Reaktion
Oberflaechentopographie
Schleifen

Thesaurusbegriffe

oberflaechennaher Riss

Sprache

Englisch

Recherchedatum

12.03.2021

Dokument Nr.: 63

Titel

Diamond **grinding wheels** production study with the use of the finite **element** method

Autor

KUNDRAK J
Fedorovich V
Markopoulos AP
Pyzhov I
Kryukova N

Institution

Univ Miskolc, Inst Mfg Sci, Miskolc, Hungary.
Natl Tech Univ, Kharkiv Polytech Inst, Kiev, Ukraine.
Natl Tech Univ Athens, Sch Mech Engn, Mfg Technol Sect, Athens, Greece.

Abstrakt

Research results on 3D modeling of the diamond grain and its bearing layer when sintering diamond **grinding wheels** are provided in this paper. The influence of the main characteristics of the **wheel** materials and the **wheel** production process, namely the quantity of metallic phase within diamond grain, coefficient of thermal expansion of the metallic phase, the modulus of elasticity of bond material and sintering temperature, on the internal stresses arising in grains is investigated. The results indicate that the stresses in the grains are higher in the areas around the metallic phase. Additionally, sintering temperature has the greatest impact on the stresses of the grain-metallic phase-bond system regardless of the type of the bond. Furthermore, by employing factorial design for the carried out finite **element** model, a mathematical model that reflects the impact of these factors on the deflected mode of the diamond grain-metallic phasebond material system is obtained. The results of the analysis allow for the identification of optimal conditions for the efficient production of improved diamond grinding wheels. More specifically, the smallest stresses are observed when using the metal bond with modulus of elasticity 204 GPa, the quantity of metallic phase in diamond grain of not higher than 7% and coefficient of thermal expansion of 1.32 x 10(-5) 1/K or lower. The results obtained from the proposed 3D model can lead to the increase in the diamond grains utilization and improve the overall efficiency of diamond grinding. (C) 2016 Production and hosting by Elsevier B.V. on behalf of Cairo University.

Veröffentlichungsjahr

2016

Quelle

JOURNAL OF ADVANCED RESEARCH

Klassifikation

Science & Technology - Other Topics

Schlagworte des Autors

DIAMOND **GRINDING WHEEL**
Finite **element** method
Production of **grinding wheels**
Diamond **grinding**

Thesaurusbegriffe

SYNTHETIC DIAMOND
FEM SIMULATION
TEMPERATURE

Sprache

ENGLISH

Recherchedatum

12.03.2021

Dokument Nr.: 64

Titel

Surface integrity and removal mechanism of chemical **mechanical grinding** of silicon wafers using a newly developed **wheel**.

Autor

DONG, ZHIGANG
GAO, SHANG
HUANG, HAN
KANG, RENKE
WANG, ZIGUANG

Institution

Key Laboratory for Precision & Non-Traditional Machining Technology, Xian Jiaotong University, CN
School of Mechanical & Mining Engineering, University of Queensland, St. Lucia, Brisbane, QLD, AU

Abstrakt

A chemical **mechanical grinding** (CMG) **wheel** was developed for planarization of silicon wafers, which consists of magnesium oxide (MgO) **abrasives** and calcium carbonate (CaCO3) **additives**, mixed with 25% weight percentage of magnesium **chloride** (MgCl2) solution. It was shown that chemical reactions occurred during the **grinding** process, which formed a softened layer on the top of silicon substrate. The reactants could be much more easily removed by **mechanical** abrasion than the removal of Si phase itself. The newly developed **wheel** was able to produce a similar surface integrity to that obtained from chemical **mechanical** polishing (CMP), i.e., the CMG achieved a surface roughness of 0.5 nm in Ra and a subsurface damage layer of 13 nm thick. The CMG process developed thus has great potential for back **grinding** or thinning of silicon wafers in order to replace CMP.

Veröffentlichungsjahr

2016

Quelle

International Journal of Advanced Manufacturing Technology * Band 83 (2016) Heft 5-8, Seite 1231-1239 (9 Seiten)

Klassifikation

3LKB Spanende Bearbeitung, Zerspanen, Zerteilen
3KXW Oberflaecheneigenschaften
3LKG Chemisches und elektrochemisches Abtragen

Schlagworte des Autors

Silicium-Wafer
Schleifen
Magnesiumoxid
Abschleifmittel
Calciumcarbonat
Magnesiumchlorid
Siliciumsubstrat
Reaktant
chemische Reaktion
Abrasion
Oberflaechenrauigkeit
Additiv

Thesaurusbegriffe

oberflaechennaher Riss
Oberflaechenintegritaet

Sprache

Englisch

Recherchedatum

12.03.2021

Dokument Nr.: 65

Titel

The ultra-precision U-d-lap **grinding** of flat advanced ceramics

Autor

FIOCCHI AA
Sanchez LED
Lisboa PN
Fortulan CA

Institution

Univ Sao Paulo, Dept Mech Engn, Ave Trabalhador Saocarlense 400, BR-13566590 Sao Carlos, SP, Brazil.
Sao Paulo State Univ Unesp, Dept Mech Engn, Ave Luiz Edmundo Carrijo Coube 14-01, BR-17033360 Bauru, SP, Brazil.
Sao Paulo State Univ Unesp, Dept Phys, Ave Luiz Edmundo Carrijo Coube 14-01, BR-17033360 Bauru, SP, Brazil.

Abstrakt

The present study focuses on the U-d-lap **grinding** process and its machine-tool design aiming at ultra precision (UP) manufacturing of advanced ceramics. Impacts of three different overlapping factors on a dressing (U-d) and three **abrasive** grit sizes of conventional SiC **grinding wheels** were analyzed on flat nano metric surface finishing of dense **discs** of 3Y-TZP in a ductile regime of material removal. Microhardness, contact and optical profilometry, SEM-FEG, Raman spectroscopy, XRD, and confocal epi-fluorescence were applied to characterize the ceramic material. **Mechanical** and electric-electronic designs of the machine-tool were developed toward the UP ceramic **grinding**. The design methodology was successful for supporting the achievement of all design requirements of the CNC Fiocchi Lap Grinder. The machine **tool** and the U-d-lap **grinding** process were capable of manufacturing flat 3Y-TZP surfaces with nanometric finishing without introducing critical defects. The best finishing, Ra = 60.63 nm, came from the #300 grinding wheel dressed with U-d = 5. A flatness deviation of 0.308 mu m was obtained through the #800 grinding wheel and U-d = 3. Differences between theoretical and real macro and micro effects over the grinding wheels after single-point diamond dressing, epoxy bond strength, abrasive protrusion, abrasive grit size and abrasive friability play a key role in the U-d-lap grinding. There is no report of an abrasive process capable of achieving similar nanometric finishing without introducing critical defects with the same micrometric grit size and type of abrasive. The U-d-lap grinding can replace the engagement of processes such as grinding, lapping, and polishing of advanced ceramics. (C) 2016 Published by Elsevier B.V.

Veröffentlichungsjahr

2016

Quelle

JOURNAL OF MATERIALS PROCESSING TECHNOLOGY

Klassifikation

Engineering
Materials Science

Schlagworte des Autors

U-D-LAP **GRINDING**
Advanced ceramics
Ductile **grinding**
Surface characterization
Nanotechnology

Thesaurusbegriffe

YTTRIA-STABILIZED ZIRCONIA
MARTENSITIC-TRANSFORMATION
PHASE-TRANSFORMATION
RHOMBOHEDRAL PHASE
DEGRADATION
SURFACE
STRESSES

Sprache

ENGLISH

Recherchedatum

12.03.2021

Dokument Nr.: 66

Titel

Processing of metal-diamond-composites using selective laser melting

Autor

SPIERINGS AB
Leinenbach C
Kenel C
Wegener K

Institution

Inspire AG, Inst Rapid Prod Dev, St Gallen, Switzerland.
Empa, Swiss Fed Labs Mat Sci & Technol, Lab Joining Technol & Corros, Dubendorf, Switzerland.
ETH, Inst Machine Tools & Mfg, Zurich, Switzerland.

Abstrakt

Purpose - The purpose of this paper is a feasibility study that was performed to investigate the basic processability of a diamond-containing metal matrix. Powder-bed-based **additive** manufacturing processes such as selective laser melting (SLM) offer a huge degree of freedom, both in terms of part design and material options. In that respect, mixtures of different powders can offer new ways for the manufacture of materials with tailored properties for special applications such as metal-based **cutting** or **grinding tools** with incorporated hard phases.
Design/methodology/approach - A two-step approach was used to first investigate the basic SLM-processability of a Cu-Sn-Ti-Zr alloy, which is usually used for the active brazing of ceramics and superhard materials. After the identification of a suitable processing window, the processing parameters were then applied to a mixture of this matrix material with 10-20 volume per cent artificial, Ni-coated mono-crystalline diamonds. Findings - Even though the processing parameters were not yet optimized, stable specimens out of the matrix material could be produced. Also, diamond-containing mixtures with the matrix material resulted in stable specimens, where the diamonds survived the layer-wise build process with the successive heat input, as almost no graphitization was observed. The diamond particles are fully embedded in the Cu-Sn-Ti-Zr matrix material. The outer part of the diamonds partly dissolves in the matrix during the SLM process, forming small TiC particles and most likely a thin TiC layer around the diamond particles. Originality/value - The feasibility study approved the SLM processing capabilities of a metal-diamond composite. Although some cracking phenomena sill occur, this seems to be an interesting and promising way to create new abrasive tools with added value in terms of internal and local lubrication supply, tooling temperature control and improved tooling durability.

Veröffentlichungsjahr

2015

Quelle

RAPID PROTOTYPING JOURNAL

Klassifikation

Engineering
Materials Science

Schlagworte des Autors

COMPOSITES
Microstructure
Solid freeform fabrication
Rapid manufacturing

Thesaurusbegriffe

RESIDUAL-STRESSES
FRACTURE-BEHAVIOR
MICROSTRUCTURE
ALLOY
SLM
PARTS

Sprache

ENGLISH

Recherchedatum

12.03.2021

Dokument Nr.: 67

Titel

Thermoelectric phenomena in machining processes and a study of their functioning in superabrasive **grinding**

Autor

LAVRINENKO VI
Devitskii AA
Pasichnyi OO
Kukharenko SA

Institution

Natl Acad Sci Ukraine, Bakul Inst Superhard Mat, UA-04074 Kiev, Ukraine.

Abstrakt

The paper addresses thermoelectric phenomena that occur in superabrasive **grinding**. It has been found out that the machining of hardmetals using diamond **wheels** is characterized by a negative value of tribo-thermal EMF, while in the case of cBN **grinding** of high-speed steels the value is usually positive. As the tribo-thermal EMF in cBN **grinding** grows the **wheel** wear decreases, while in diamond **grinding** it increases, the removal rate being equal. Introduction of modifying metallic **additives** into the vitrified coating of superabrasive grits is shown to permit changing the value of tribo-thermal EMF: the vitrified coating of cBN grits should be metalized with copper to decrease tribo-thermal EMF and with titanium or nickel to increase it.

Veröffentlichungsjahr

2015

Quelle

JOURNAL OF SUPERHARD MATERIALS

Klassifikation

Materials Science

Schlagworte des Autors

THERMAL EMF
tribo-EMF
grinding
vitrified coating
modifying metallic impurities
superabrasive materials
grinding wheels

Thesaurusbegriffe

nicht belegt

Sprache

ENGLISH

Recherchedatum

12.03.2021

Dokument Nr.: 68

Titel

Wear phenomena of **grinding wheels** with sol-gel alumina **abrasive** grains and glass-ceramic vitrified bond during internal cylindrical traverse **grinding** of 100Cr6 steel

Autor

NADOLNY K

Institution

Koszalin Univ Technol, Dept Prod Engn, Fac Mech Engn, PL-75620 Koszalin, Poland.

Abstrakt

This article presents the results from a traverse internal cylindrical **grinding** process conducted using **grinding wheels** with sol-gel alumina **abrasive** grains and varying volumes of glass-ceramic vitrified bond. The aim was to determine how changing the bond volume within the range of V-b=11.5-14.5 % influenced the wear phenomenon of the microcrystalline sintered corundum **abrasive** grains and the ceramic bond bridges with glass-crystalline structure. The paper presents **grinding wheels** with conic chamfer and the most important wear phenomena of the **grinding wheel** components occurring in the area of contact between the **tool** and the workpiece material. The work includes the methodology of the experimental tests on the traverse internal cylindrical **grinding** of bearing rings made from steel 100Cr6 (62 +/- 2 HRC). A wide range of test results were analyzed, including machined surface roughness parameters (Ra, Rz, Sm, Delta a), **grinding** power, **grinding wheel** volumetric wear Vs, material removal V-w, G-ratio, root-mean-square roundness deviation from mean circle (Delta, rms), grinding wheel edge wear, grinding wheel microtopography parameters (Sa, St, Sdr, Sds), and SEM images of the wear marks on the grinding wheel active surface. The dominant wear phenomena of the grinding wheels with conic chamfer and the influence of the bond volume share on its intensity were experimentally determined. The results show that the decrease in bond volume from V-b=14.5 to 11.5 % increases the grinding wheel life by twofold. This was due to a decrease in abrasive wear and plastic flow phenomena and to a greater fracture wear (mostly fatigue and thermal-fatigue). These events led to a periodic shedding of the oxide layer and the plastically deformed grain layer and also revealed the crystals' sharp edges, located below the plastically deformed surface layer.

Veröffentlichungsjahr

2015

Quelle

INTERNATIONAL JOURNAL OF ADVANCED MANUFACTURING TECHNOLOGY

Klassifikation

Automation & Control Systems
Engineering

Schlagworte des Autors

GRINDING WHEEL WEAR
Abrasive wear
Adhesive wear
Fatigue wear
Glass-ceramic bond
Sol-gel alumina

Thesaurusbegriffe

PLASTIC-DEFORMATION
BINDER
AL2O3
TOOLS

Sprache

ENGLISH

Recherchedatum

12.03.2021

Dokument Nr.: 69

Titel

Optimizing the Dry **Grinding** Process on the Basis of Bond Materials.

Autor

KITZIG, HEIKE
JANDAGHI, NIMA
AZARHOUSHANG, BAHMAN
VESALI, ALIREZA

Institution

KSF Kompetenzzentrum fuer Schleiftechnologie und Feinstbearbeitung, Hochschule Furtwangen, Villingen-Schwenningen, DE

Abstrakt

In order to decrease the negative environmental impacts of the **cutting** fluids (for example, disposal of **grinding** sludge) and also to reduce the manufacturing costs and the required space for the machines the dry **grinding** can be a conceivable alternative for the conventional **grinding** processes. Nevertheless, dry **grinding** has not been widely introduced into industry because of the high temperature generated in the **grinding** zone and difficulties of heat transfer without **coolants**. Selection of the proper **grinding wheel** bonds, grit sizes and concentration has significant effect on the **grinding** performance and the generated heat in the contact zone. This paper addresses the effects of the **grinding wheel** bond and the concentration on the dry **grinding** process efficiency through comparing the results of the carried out experiments with three resin bonded cBN-cup-wheels, each consisting different bond components. For this purpose, surface roughness and thermal damages during dry and wet **grinding** (utilizing **grinding** oil) by three different resin bonds were measured. The results show almost identical surface roughness values for dry and wet grinding. Furthermore, using the resin-kryolith-graphite bonded wheel leads to a reduction in thermal damages on the workpiece. Through different experiments, it was shown that the different bonds, used in this study, have significant influence on the chip loading of the grinding wheels. This is contributed to the different chip formation mechanisms and induced grinding temperatures when grinding by the different wheel bonds. Copyright Trans Tech Publications. Reproduced with permission.

Veröffentlichungsjahr

2014

Quelle

Advances in Abrasive Technology XVII, ISAAT, International Symposium on Advances in Abrasive Technology, 17, in: Advanced Materials Research * Band 1017 (2014) Seite 237-242 (6 Seiten) Zuerich: Trans Tech Publications

Klassifikation

3LKB Spanende Bearbeitung, Zerspanen, Zerteilen
3MD Tribologie

Schlagworte des Autors

Rundschleifen
Schnellarbeitsstahl
Schleifscheibe
Umweltbeeinflussung
Waermeuebertragung
Schleifleistung
Graphit
Oberflaechenrauigkeit
Kuehlmittel
Herstellungskosten
Hochtemperatur
Werkstueck
Kontaktflaeche
Spanbildung

Thesaurusbegriffe

thermischer Schaden
required space
generated heat

Sprache

Englisch

Recherchedatum

12.03.2021

Dokument Nr.: 70

Titel

Metal Powder Applies to Vitrified Bond Diamond **Abrasive**

Autor

SHAN DD
Li ZH
Yu YY
Ye H
Zhu YM

Institution

Tianjin Univ, Sch Mat Sci & Engn, Minist Educ, Key Lab Adv Ceram & Machining Technol, Tianjin 300072, Peoples R China.

Abstrakt

Vitrified bond diamond **abrasive** was prepared by sintering diamond grains (3.5 mu m) with low temperature vitrified bonds in air. In this work, Cu and Co were chosen as the **additives** to yield more gratifying **abrasive**. The fluidity and the wetting angle were investigated to characterize the flowing ability and wettability, **mechanical** property of samples were analyzed by means of single particle compressive strength and the interfacial bonding states between diamond grains and vitrified bonds were observed by scanning electron microscope (SEM). The results indicated that the properties of vitrified bond were meliorated by adding appropriate amount metal powder by which the **mechanical** property of diamond **abrasive** was promoted.

Veröffentlichungsjahr

2012

Quelle

ASIAN JOURNAL OF CHEMISTRY

Klassifikation

Chemistry

Schlagworte des Autors

METAL POWDER
Vitrified bond
Diamond
Abrasive

Thesaurusbegriffe

CBN **GRINDING WHEELS**
PERFORMANCE

Sprache

ENGLISH

Recherchedatum

12.03.2021

Dokument Nr.: 71

Titel

Effects of nano-AlN and sintering atmosphere on microstructure and properties of vitrified bond

Autor

HOU YG
Qiao GY
Shang Y
Zou WJ
Xiao FR
Liao B

Institution

Yanshan Univ, Key Lab Metastable Mat Sci & Technol, Qinhuangdao 066004, Peoples R China.
Yanshan Univ, Coll Mat Sci & Engn, Qinhuangdao 066004, Peoples R China.
Henan Univ Technol, Coll Mat Sci & Engn, Zhengzhou 450007, Peoples R China.
Yanshan Univ, Sch Environm & Chem Engn, Qinhuangdao 066004, Peoples R China.

Abstrakt

The Na(2)O-B(2)O(3)-SiO(2) glass with low thermal expansion coefficient and melting point is suited to manufacture vitrified bond superhard **grinding tool**. However, its bending strength, fracture mode, and chemical durability are lower. Some **additives**, such as alumina, calcium and/or zinc oxides, and so on, were added in the vitrified bond in order to improve the property of **grinding tool**. In this work, a new **additive** of nano-AlN was added in Na(2)O-B(2)O(3)-SiO(2) vitrified bond for improving microstructure and properties of the vitrified bond. The Na(2)O-B(2)O(3)-SiO(2) vitrified bonds with and without nano-AlN were sintered at different atmosphere. The effects of nano-AlN and sintering atmosphere on the microstructure and properties of Na(2)O-B(2)O(3)-SiO(2) vitrified bonds were investigated. The results show that the highest bending strength, impact strength, and wear resistance were obtained when the Na(2)O-B(2)O(3)-SiO(2) with nano-AlN of 6% was sintered at argon, because nano-AlN as crystallization nucleus promotes the crystallization of alpha-SiO(2), beta-SiO(2), and tridymite during sintering process. The microstructures of the crystalline phases were refined. When the vitrified bonds with nano-AlN were sintered at air, the nano-AlN powder was oxidated and decomposed into Al(2)O(3) and gas. The decomposition of nano-AlN increases slightly the bending strength and wear resistance of the vitrified bond due to the increasing amount of crystalline phase, but the decomposition of nano-AlN increases the amount of small close pores and size of crystalline phase, which results in the decreasing of impact strength of vitrified bond.

Veröffentlichungsjahr

2011

Quelle

COMPOSITES PART B-ENGINEERING

Klassifikation

Engineering
Materials Science

Schlagworte des Autors

CERAMIC-MATRIX COMPOSITES(CMSS)
Nano-structures
Sintering
Wear
Vitrified bond

Thesaurusbegriffe

CBN **GRINDING WHEELS**
DIAMOND
INTERFACE
WATER

Sprache

ENGLISH

Recherchedatum

12.03.2021

Dokument Nr.: 72

Titel

Improvement of thermal stability of diamond by adding Ti powder during sintering of diamond/borosilicate glass composites

Autor

ZHANG XH
Wang YH
Zang JB
Cheng XZ
Xu XP
Lu J

Institution

Yanshan Univ, State Key Lab Metastable Mat Sci & Technol, Qinhuangdao 066004, Hebei, Peoples R China.
Hebei Vocat & Tech Coll Bldg Mat, Qinhuangdao 066004, Hebei, Peoples R China.
Huayiao Univ, Key Res Lab Stone Machining, Quanzhou 362021, Fujian, Peoples R China.

Abstrakt

Oxidization of diamond in the sintering process of diamond/glass composites results in thermal degradation of diamond and uncontrolled expansion of the bulk composites with many irregular pores, causing low bending strength of the composites. In this paper, Ti powder was used as oxygen getter due to its excellent affinity with oxygen. The results showed the diamond grits got good protection from oxidation during sintering due to the prior reaction of Ti powder with oxygen. As a result, expansion phenomenon was inhibited and bending strength was improved for the composites due to the Ti **additives**. TiO2, as oxidization product of Ti, could enter into the glass network. The maximum bending strength and minimum volume expansion values were obtained for the composites with 6 wt.% Ti powder. This content resulted in a decrease of volume expansion from 22.78% to -25.0%, and an increase in bending strength from 28.49 MPa to 100.54 MPa. (C) 2011 Elsevier Ltd. All rights reserved.

Veröffentlichungsjahr

2011

Quelle

JOURNAL OF THE EUROPEAN CERAMIC SOCIETY

Klassifikation

Materials Science

Schlagworte des Autors

TIO2
Cutting tool
Glass
Composites
Oxidization resistance

Thesaurusbegriffe

GRINDING WHEELS
VITRIFIED BOND
WEAR

Sprache

ENGLISH

Recherchedatum

12.03.2021

Dokument Nr.: 73

Titel

Improving oxidation resistance of diamond by adding silicon into diamond-borosilicate glass composites

Autor

ZHANG XH
Wang YH
Zang JB
Cheng XZ

Institution

Yanshan Univ, State Key Lab Metastable Mat Sci & Technol, Qinhuangdao 066004, Hebei, Peoples R China.
Hebei Vocat & Tech Coll Bldg Mat, Qinhuangdao 066004, Hebei, Peoples R China.

Abstrakt

Diamond-borosilicate glass composites have been used for vitrified diamond **tools**. The major challenge in the development of these composites is to avoid oxidation of diamond during sintering. In this study, silicon powder was added into the diamond-borosilicate glass composites to enhance oxidation resistance of diamond. The results showed that silicon powder was oxidized prior to diamond and its oxide products could enter into the glass network. Consequently, the oxidation resistance of the diamonds was improved, and the bending strength and volume expansion ratio of the composites with silicon **additive** were evidently changed compared to that of composites without silicon powder. A maximum bending strength of 60.94 MPa, and a minimum volume expansion ratio of -11.3% were obtained in the composite containing 8 wt.% silicon powder. (C) 2011 Elsevier Ltd. All rights reserved.

Veröffentlichungsjahr

2011

Quelle

INTERNATIONAL JOURNAL OF REFRACTORY METALS & HARD MATERIALS

Klassifikation

Materials Science
Metallurgy & Metallurgical Engineering

Schlagworte des Autors

SILICON POWDER
Oxidation resistance
Diamond-borosilicate glass composites

Thesaurusbegriffe

TI-COATED DIAMOND
GRINDING WHEELS
PERFORMANCE
WEAR
COATINGS
GROWTH
ALLOY
LAYER

Sprache

ENGLISH

Recherchedatum

12.03.2021

Dokument Nr.: 74

Titel

Chemical characterisation by WD-XRF and XRD of silicon carbide-based **grinding tools**

Autor

GAZULLA MF
Gomez MP
Orduna M
Rodrigo M

Institution

Univ Jaume 1, Asociac Invest Ind Ceram, Inst Tecnol Ceram, Castellon de La Plana 12006, Spain.

Abstrakt

This paper addresses the chemical characterisation of silicon carbide-based **grinding tools**. These are among the most widely used **grinding tools** in the ceramic sector, and instruments are required that enable the **grinding tool** quality to be controlled, despite the considerable complexity involved in determining **grinding tool** chemical composition. They contain components of quite different nature, ranging from the silicon carbide **abrasive** to the resin binder. To develop the analysis method, **grinding tools** containing silicon carbide with different grain sizes were selected from different tile polishing stages. To develop the **grinding tool** characterisation method, the different measurement process steps were studied, from sample preparation, in which different milling methods (each appropriate for the relevant type of test) were used, to the optimisation of the determination of **grinding tool** components by spectroscopic and **elemental** analyses. For each technique, different particle sizes were used according to their needs. For elemental analysis, a sample below 150 mu m was used, while for the rest of the determinations a sample below 60 mu m was used. After milling, the crystalline phases were characterised by X-ray powder diffraction and quantified using the Rietvel method. The different forms of carbon (organic carbon from the resin, inorganic carbon from the carbonates and carbon from the silicon carbide) were analysed using a series of elemental analyses. The other elements (Si, Al, Fe, Ca, Mg, Na, K, Ti, Mn, P and **Cl**) were determined by wavelength-dispersive X-ray fluorescence spectrometry, preparing the sample in the form of pressed pellets and fused beads. The chemical characterisation method developed was validated with mixtures of reference materials, as there are no reference materials of grinding tools available. This method can be used for quality control of silicon carbide-based grinding tools. Copyright (C) 2010 John Wiley & Sons, Ltd.

Veröffentlichungsjahr

2010

Quelle

X-RAY SPECTROMETRY

Klassifikation

Spectroscopy

Schlagworte des Autors

nicht belegt

Thesaurusbegriffe

FREE CARBON
POWDERS
REFRACTORIES

Sprache

ENGLISH

Recherchedatum

12.03.2021

Dokument Nr.: 75

Titel

Lead pigments and related **tools** at Akrotiri, Thera, Greece. Provenance and application techniques

Autor

SOTIROPOULOU S
Perdikatsis V
Apostolaki C
Karydas AG
Devetzie A
Birtacha K

Institution

ORMYLIA Fdn, Art Diag Ctr, Ormylia 63071, Chalkidiki, Greece.
Tech Univ Crete, Dept Mineral Resources Engn, Khania 73100, Greece.
NCSR Demokritos, Inst Nucl Phys, GR-15310 Athens, Greece.
IAEA, Seibersdorf Labs, A-2444 Seibersdorf, Austria.
Archaeol Soc Athens, Athens 10556, Greece.

Abstrakt

This paper refers to an investigation of finds that are associated with the raw materials and **tools** for the preparation or use of **lead** pigments at Akrotiri on Thera, Greece, during the Early, Middle and Late Cycladic Bronze Age (c. 3000-1600 BC). For the detection and the preliminary characterisation of remains of pigments that were found on stone **tools**, the in situ application of X-Ray **Fluorescence** spectroscopy proved to be invaluable. In order to identify the chemical composition of the pigments and to investigate their provenance from a geological perspective, quantitative X-Ray Diffraction analysis was conducted. A thorough visual macro and microscopic examination of the morphology of the materials permitted the determination of physical features (colour, homogeneity, grain size) as indicators of their nature or degree of processing. Based on the results of these analyses, the traces of **lead** oxides that were detected on the stone **tools** are associated with specific collections of litharge items **discovered** at the settlement of Akrotiri, and probably provide evidence of their earliest use in preparing pigments. (C) 2010 Elsevier Ltd. All rights reserved.

Veröffentlichungsjahr

2010

Quelle

JOURNAL OF ARCHAEOLOGICAL SCIENCE

Klassifikation

Anthropology
Archaeology
Geology

Schlagworte des Autors

AKROTIRI-THERA, GREECE
Lead cosmetic pigments
Litharge
Stone **grinding tools**
Bronze Age
X-ray diffraction
X-ray **fluorescence**

Thesaurusbegriffe

nicht belegt

Sprache

ENGLISH

Recherchedatum

12.03.2021

Dokument Nr.: 76

Titel

Study on **grinding** performance of soft **abrasive wheel** for silicon wafer. Untersuchung der **Schleifeigenschaften** von **Schleifscheiben** mit weichem **Schleifmittel** fuer Silicium-Wafer.

Autor

KANG, RENKE
GAO, SHANG
JIN, ZHUJI
GUO, DONGMING

Institution

Dalian University of Technology, CN

Abstrakt

With the development of IC manufacturing technology, the machining precision and surface quality of silicon wafer are proposed much higher, but now the planarization techniques of silicon wafer using free **abrasive** and bonded **abrasive** have the disadvantage of poor profile accuracy, environmental pollution, deep damage layer, etc. A soft **abrasive wheel** combining chemical and medical effect was developed in this paper, it could get super smooth, low damage wafer surface by utilizing **mechanical** friction of **abrasives** and chemical reaction among **abrasives**, **additives**, silicon. A comparison experiment between nr. 3000 soft **abrasive wheel** and nr. 3000 diamond **abrasive wheel** was given to study on the **grinding** performance of soft **abrasive wheel**. The results showed that: wafer surface roughness ground by soft **abrasive wheel** was sub-nanometer and its sub-surface damage was only 0.01 micron amorphous layer, which were much better than silicon wafer ground by diamond **abrasive wheel**, but material removal rate and **grinding** ratio of soft abrasive wheel were lower than diamond wheel. The wafer surface ground by soft abrasive wheel included Ce(4+), Ce(3+), Si(4+), Ca(2+) and Si, which indicated that the chemical reaction really occurred during grinding process. Copyright Trans Tech Publications. Reproduced with permission.

Veröffentlichungsjahr

2009

Quelle

Advances in Grinding and Abrasive Technology XV, Conference of Abrasive Technology in China, 15, in: Key Engineering Materials * Band 416 (2009) Seite 529-534 (6 Seiten, 9 Bilder, 1 Tabelle, 10 Quellen) Zuerich: Trans Tech Publications

Klassifikation

3LKB Spanende Bearbeitung, Zerspanen, Zerteilen
3FF Herstellungstechnologien fuer elektronische Bauelemente und Schaltungen
3KXW Oberflaecheneigenschaften

Schlagworte des Autors

Wafer (Halbleiterplaettchen)
Silicium
Planartechnologie
Schleifscheibe
Schleifmittel
Schaedigungsmechanismus
Oberflaechenschaden
Reibung
chemische Reaktion
Zuschlagstoff
Oberflaechenrauigkeit
Materialabtragung
Ceroxid
Schutzschichtausbildung
Oberflaechenqualitaet

Thesaurusbegriffe

weiches **Schleifmittel**

Sprache

Englisch

Recherchedatum

12.03.2021

Dokument Nr.: 77

Titel

Effects of alkali metal oxides on the properties of vitrified bond

Autor

WANG PF
Li ZH
Zhu YM

Institution

Tianjin Univ, Sch Mat Sci & Engn, Key Lab Adv Ceram & Machining Technol, Minist Educ, Tianjin 300072, Peoples R China.

Abstrakt

The effects of alkali metal oxides **additives**, Li2O and K2O, on the properties of Na2O-B2O3-Al2O3-SiO2 vitrified bond were studied. The results showed the conversion temperature and refractoriness of vitrified bond are reduced while its fluidity and devitrification are improved effectively with the addition of Li2O and K2O. The thermal expansion coefficient (TEL) of the vitrified bond increased slightly and the bond with Li2O had larger TEL. The vitrified bond's bending strength increased initially, and peaked at 6 wt%, 4 wt % respectively for Li2O and K2O.

Veröffentlichungsjahr

2007

Quelle

RARE METAL MATERIALS AND ENGINEERING

Klassifikation

Materials Science
Metallurgy & Metallurgical Engineering

Schlagworte des Autors

ALKALI METAL OXIDES
vitrified bond
structural factors
properties

Thesaurusbegriffe

GRINDING WHEELS
GLASS
STRENGTH

Sprache

CHINESE

Recherchedatum

12.03.2021

Dokument Nr.: 78

Titel

Polishing of ceramic tiles. Polieren von Keramikfliesen.

Autor

WANG, C.Y.
WEI, X.
YUAN, H.

Institution

Guangdong University of Technology, Guangzhou, CN

Abstrakt

Grinding and polishing are important steps in the production of decorative vitreous ceramic tiles. Different combinations of finishing **wheels** and polishing **wheels** are tested to optimize their selection. **Grinding wheels** are marked as rough **grinding**, fine **grinding**, and polishing **wheels**. For rough **grinding wheels**, SiC **abrasives** are bonded by magnesium oxychloride cement (MOC: MgO/MgCl2) together with some porous fills and **additives**; for fine **grinding wheels**, **abrasives** and some special polishing materials are bonded by MOC and bakelite added to increase elasticity. The polishing **wheel** is made of fine Al2O3 **abrasives** and fill bonded by unsaturated resin. The results show that the surface glossiness depends not only on the surface quality before machining, but also on the characteristics of the ceramic tiles as well as the performance of **grinding** and polishing **wheels**. The performance of the polishing **wheel** is the key for a good final surface quality. The surface glossiness after finishing must be above 20 degrees in order to get higher polishing quality because finishing will limit the maximum surface glossiness by polishing. The optimized combination of grinding and polishing wheels for all the steps will achieve shorter machining times and better surface quality. No obvious relationships are found between the hardness of ceramic tiles and surface quality or the wear of grinding wheels; therefore, the hardness of the ceramic tile cannot be used for evaluating its machinability.

Veröffentlichungsjahr

2002

Quelle

Materials and Manufacturing Processes * Band 17 (2002) Heft 3, Seite 401-413 (13 Seiten, 6 Bilder, 1 Tabelle, 9 Quellen)

Klassifikation

3LKB Spanende Bearbeitung, Zerspanen, Zerteilen
3KGG Keramik, Glaskeramik, Feuerfest-Werkstoffe
3KXW Oberflaecheneigenschaften

Schlagworte des Autors

Polieren
Polierscheibe
Schleifscheibe
hart gebrannte Keramikfliese
Fertigbearbeitung
Rauigkeit
Glaenzen (Feinpolieren)
Bearbeitungszeit
Haerte
Werkzeugverschleiss
Spanbarkeit
Schleifmittel
Siliciumcarbid
Bakelit
Aluminiumoxid
keramisches Bindemittel
Magnesiumoxid
Magnesiumchloridbinder
Fuellstoff
Sulfat
ungesaettigter Kohlenwasserstoff
Glaskeramik
Korngroesse
Mullit
Quarz
Porositaet
Porengroesse
Oberflaecheneigenschaft
Standzeit

Thesaurusbegriffe

Schleifscheibenkoernung
Schleifdauer

Sprache

Englisch

Recherchedatum

12.03.2021

Dokument Nr.: 79

Titel

Research on metal cement **grinding wheel** for ELID precision mirror surface **grinding**

Autor

GUAN JL
Fan JW
Ma CM
Yuan ZJ
Guo DM

Institution

Beijing Polytech Univ, Beijing 100022, Peoples R China.
Harbin Inst Technol, Harbin 150006, Peoples R China.
Dalian Univ Sci & Technol, Dalian, Peoples R China.

Abstrakt

As the result of the study on the effects of copper powder, cast iron powder and other relative metal **additives** used for ELID **grinding wheel** manufacturing, a new kind of **grinding wheel** is presented for ELID **grinding** and experimental results show that such **grinding wheels** have great advantages and can be used for production purpose.

Veröffentlichungsjahr

2001

Quelle

ADVANCES IN ABRASIVE PROCESSES

Klassifikation

Materials Science

Schlagworte des Autors

ELID **GRINDING**
cast iron powder
metal **additives**

Thesaurusbegriffe

nicht belegt

Sprache

ENGLISH

Recherchedatum

12.03.2021

Dokument Nr.: 80

Titel

Generation of reaction layers on machined surfaces. Erzeugung von Reaktionsschichten auf maschinell bearbeiteten Oberflaechen.

Autor

BRINKSMEIER, E.
WALTER, A.

Institution

Universitaet Bremen, DE

Abstrakt

Machined surfaces are influenced by the generation of reaction layers resulting from the formulation of the metalworking fluid. **Coolants** reduce friction at the **tool**/surface interface and significantly influence the heat dissipation in machining **operations** and the generation of the surface layer. Nowadays, machining processes are evaluated with respect to the forces, **grinding wheel** wear, surface roughness, surface integrity, residual stresses, process stability, and reproducibility of the work result. Considering the chemical performance of the used **coolants**, it is necessary to gain additional information about the chemical mechanisms in the contact zone in order to evaluate the surface quality. This paper deals with investigations of the influence of machining processes on the generation of reaction layers. These layers were generated by using certain **coolant additives** in machining. For industrial applications it is very interesting to know which effects different **coolant additives** have on the workpiece surface, because it is well known that adsorption and reaction layers of machining processes hinder thermochemical heat treatment. Oscillating grinding experiments on steel using conventional grinding wheels were carried out to investigate the impact of cooling lubricant additives. With regard to the generation of reaction layers on ground surfaces fundamental results were obtained as follows: The ESCA method is appropriate to detect reaction layers on ground surfaces. Concerning the process stability and results optimal additive concentrations are necessary. Using the sulphur carrier, significant sulphur concentrations in the boundary layer were detected. The phosphorous compounds do not lead to a generation of reaction layers. An influence of the grinding wheel specification on the generation of reaction layers is to be expected.

Veröffentlichungsjahr

2000

Quelle

General Assembly of CIRP, 50, in: CIRP Annals * Band 49 (2000) Heft 1, Seite 435-438 (4 Seiten, 9 Bilder, 2 Tabellen, 11 Quellen) Bern: Hallwag

Klassifikation

3LRR Mechanische Oberflaechenbehandlung
3LKB Spanende Bearbeitung, Zerspanen, Zerteilen
3KU UEberzuege, Coatings, duenne Schichten
3MD Tribologie

Schlagworte des Autors

Reaktionsschicht
Oberflaechenbearbeitung
spanende Bearbeitung
Kuehlmittel
Reibung
Kuehlung
Oberflaechenschicht
Schleifscheibe
Verschleiss
Rauigkeit
Eigenspannung
Oberflaechenguete
Additiv
thermochemische Behandlung
Schwefel
Grenzschicht-fest-fest

Thesaurusbegriffe

Kuehlmitteladditiv

Sprache

Englisch

Recherchedatum

12.03.2021

Dokument Nr.: 81

Titel

Optimiertes **Scheibendesign** fuer den **Trennschleifprozess**.

Autor

HELLETSBERGER, H.
PREM, G.

Institution

Tyrolit Schleifmittelwerke Swarovski, Schwaz, AT

Abstrakt

Das **Trennschleifen** umfasst ein Gebiet, das weit ueber das **Trennschleifen** von Metallen oder Gestein mit rotierenden Werkzeugen hinausgeht. Sehr grosse Zuwachsraten weist das **Trennen** linear bewegter Gatter-, Seil- und Draht-'Saegen' in der Bau-, Gesteins- und Halbleiterindustrie auf. Dabei werden alle heute ueblichen **Schleifkornarten** sowie alle Bindungssysteme mit Ausnahme von Keramik und Elastic eingesetzt. Die wichtigsten **Trennschleifverfahren** fuer Metalle auf stationaeren Maschinen in Stahlwerken, Schmiedebetrieben und Giessereien sind Kappschnitt, Fahrschnitt, Oszillations- oder Schwingschnitt und Drehschnitt-Kappschnitt mit rotierendem Werkstueck. Je nach Werkstuecktemperatur kommen die Verfahren Heisstrennen (800 bis 1100 Grad C), Warmtrennen (100 bis 500 Grad C) oder Kalttrennen (unter 100 Grad C) zum Einsatz. Es kann mit und ohne Schmiermittel gearbeitet werden. Beim Trockentrennen erfolgt eine innere **Kuehlung** durch **schleifaktive Fuellstoffe** in der **Scheibenbindung**; beim Nasstrennen erfolgt eine aeussere Kuehlung mit Wasser oder Emulsion. Das optimale Trennscheibendesign wird aufgrund der Stellgroessen Schnitt- bzw. Arbeitsgeschwindigkeit, Kontaktlaenge und Zeitspanflaeche (Trennrate) sowie der vorgegebenen Faktoren Maschine, Werkstueck, verlangte Produktionsleistung und verlangte Schnittqualitaet festgelegt. Beim Design einer Hochleistungstrennscheibe ist die konische Form ein wesentlicher Aspekt. Die konische Form bewirkt eine Verringerung der Seitenreibung und dadurch geringere thermische Belastung; durch die Verringerung der Scheibenstaerke im mechanisch am staerksten belasteten Innenteil kommt es jedoch zu einer Verringerung der Stabilitaet. Daher muss die Kernzone speziell aufgebaut werden. Dafuer werden feinkoernige Schleifmittel als 'Stuetzkorn' eingesetzt. Weitere Verbesserungen erhofft man sich durch den Einsatz von CBN-Trennscheiben.

Veröffentlichungsjahr

2000

Quelle

Schleiftechnik im Wettbewerb, Stand der Technik und Zukunftschancen des Fertigungsverfahrens, Schleiftechnisches Kolloquium, 2 * (2000) Seite 1-28 (28 Seiten, 21 Bilder, 5 Tabellen), Paper-Nr. 8 Bremen: Universitaet Bremen Selbstverlag

Klassifikation

3LKB Spanende Bearbeitung, Zerspanen, Zerteilen

Schlagworte des Autors

Trennschleifen
Trennschleifmaschine
Schleifscheibe
Waermebelastung
Auslegung (Dimension)
Schleifeigenschaft
Schnittgeschwindigkeit
mechanische Belastung
Trennscheibe

Thesaurusbegriffe

nicht belegt

Sprache

Deutsch

Recherchedatum

12.03.2021

Dokument Nr.: 82

Titel

Abrasive electrodischarge **grinding** (AEDG) of silicon nitride. Elektroerosives **Schleifen** von Siliziumnitrid.

Autor

RAJURKAR, K.P.
GHODKE, D.M.
WANG, W.M.
ZHAO, W.S.

Institution

nicht belegt

Abstrakt

Advances in fabrication technology of ceramics and ceramic composites have improved their hardness, brittleness and fracture toughness even at elevated temperatures. It is difficult to machine ceramics by conventional processes due to their high hardness and brittleness. The machining of ceramic matrix composites is much more difficult due to the interaction of the properties of the matrix and the **additive** **elements** and their combined response to the machining process. Intricate and complex shapes are difficult to produce using conventional processes (such as **grinding** and turning) and the cost increases as the complexity increases. For example, **grinding** of a silicon nitride turbine blade root is approximately 30 percent costlier than **grinding** a superalloy blade. **Grinding** with a diamond **wheel** or other very hard **abrasive** **wheel** is one of the most commonly used **operations** to shape ceramics.

Veröffentlichungsjahr

1998

Quelle

ISEM, International Symposium for Electromachining, Tagung, 12, in: VDI-Berichte * Band 1405 (1998) Seite 475-483 (9 Seiten, 6 Bilder, 16 Quellen) Duesseldorf: VDI-Verlag

Klassifikation

3KGG Keramik, Glaskeramik, Feuerfest-Werkstoffe
3LKB Spanende Bearbeitung, Zerspanen, Zerteilen
3KXM Mechanische Werkstoffeigenschaften

Schlagworte des Autors

Siliciumnitrid
elektroerosive **Schleifmaschine**
elektroerosives Bearbeiten
Schleifmittel
Keramik
Verbundwerkstoff
Haerte
Bruchzaehigkeit
Sproedigkeit
Matrix (Grundmasse)
Turbinenschaufel
Superlegierung
Diamant
Schleifscheibe

Thesaurusbegriffe

nicht belegt

Sprache

Englisch

Recherchedatum

12.03.2021

Dokument Nr.: 83

Titel

Anforderungen an **Schleifwerkzeuge** zur Trockenbearbeitung.

Autor

HEIDTMANN, W.
STARK, C.
UHLMANN, E.

Institution

nicht belegt

Abstrakt

OEkologische Sachzwaenge und nicht technologische Gruende erfordern den UEbergang zum Trockenschleifen. Die betriebswirtschaftlichen Einfluesse und Wirkungen sowie der volkswirtschaftliche Gesamtnutzen sind bislang unbekannt. Wenn die Forderungen an den **Schleifprozess** und die Arbeitsergebnisse beim Trockenschleifen grundsaetzlich erhalten bleiben sollen, so muessen die Funktionen des **Kuehlschmierstoffes** wie Waermeabfuhr durch **Kuehlen**, Reduktion der Waermeentstehung durch Schmieren sowie das Freihalten der Kontaktzone von Abspanprodukten durch Reinigen im verbleibenden System auf das **Schleifwerkzeug**, das Werkstueck, die Maschine mit **Zusatzeinrichtungen** oder aber auf die Prozessparameter wie Kontaktbedingungen und Kinematik verteilt werden. Insbesondere thermische Probleme und die Spaeneabfuhr stehen einer einfachen Veraenderung eingefuehrter **Schleifprozesse** mit **Kuehlschmierstoffen** hin zur Trockenbearbeitung entgegen. Waehrend **Schleifbaender** bereits heute ein hohes Potential fuer die Trockenbearbeitung besitzen, fehlt ihnen noch das Mass an Standzeit und erzielbarer Werkstueckgenauigkeit, wie es aus Fertigungsprozessen mit gebundenen Schleifscheiben abgeleitet wird. Hier gilt es, die Leistungsfaehigkeit der Schleifbaender vor diesem Hintergrund zu optimieren. Im Gegensatz zu den Schleifbaendern sind bei gebundenen Schleifscheiben zwar die geforderten Voraussetzungen bezueglich ihrer Standzeit, Profilierbarkeit und Erfuellung werkstueckbezogener Arbeitsergebnisse beim Schleifen unter Nutzung von Kuehlschmierstoffen gegeben, jedoch zeigen erste Untersuchungen erhebliche Schwierigkeiten bei der Trockenbearbeitung. Systematische Untersuchungen zur Trockenbearbeitung beim Schleifen mit gebundenen Schleifkoerpern stehen erst am Anfang. Ergaenzende Variationen von Korn-, Bindungs- und Porenvolumen unter Verwendung schleifaktiver Wirkstoffe, wie sie fuer Schleifbaender beschrieben wurden, sind eingeleitet worden, zeigen aber noch keine gesicherten Erkenntnisse.

Veröffentlichungsjahr

1996

Quelle

Tagung der VDI-Gesellschaft Produktionstechnik (ADB), Auf dem Weg zur Trockenbearbeitung, Herausforderung an die Fertigungstechnik, 1996, in: VDI-Berichte * Band 1240 (1996) Seite 139-158 (20 Seiten, 17 Bilder, 12 Quellen) Duesseldorf: VDI-Verlag

Klassifikation

3LKB Spanende Bearbeitung, Zerspanen, Zerteilen
3AXF Forschungsentwicklung, Forschungspolitik

Schlagworte des Autors

Stand der Technik
Trend (Entwicklung)
technische Entwicklung
Schleifen
Schleifscheibe
Bandschleifmaschine (Metall)
Lastenheft
thermische Eigenschaft
Kuehlung
Kuehlschmierstoff
Spaeneabfuehreinrichtung
Spaenebeseitigung
Waermebelastung
Siliciumnitrid
Zirkoniumdioxid
Siliciumcarbid
Systemoptimierung
Trockenbearbeitung

Thesaurusbegriffe

nicht belegt

Sprache

Deutsch

Recherchedatum

12.03.2021

Dokument Nr.: 84

Titel

EFFECT OF GLASS COMPOSITION ON THE STRENGTH OF VITREOUS BONDED C-BN **GRINDING WHEELS**

Autor

YANG J
KIM DY
KIM HY

Institution

BOOKUK CO LTD,YONGIN 449820,SOUTH KOREA.

Abstrakt

The bending strength of vitreous bonded c-BN **grinding wheel** materials has been investigated in relation to the composition of the silicate glass bond. To determine the change in strength with various amounts of four **additive** oxides (Al2O3, B2O3, Na2O and CaO), the experiments were designed using the L9(3(4)) orthogonal array. The optimum glass composition for high-strength vitreous bonded c-BN **wheels** has been determined.

Veröffentlichungsjahr

1993

Quelle

CERAMICS INTERNATIONAL

Klassifikation

Materials Science

Schlagworte des Autors

nicht belegt

Thesaurusbegriffe

nicht belegt

Sprache

ENGLISH

Recherchedatum

12.03.2021

Dokument Nr.: 85

Titel

STUDIES ON TRUING OF DIAMOND VITRIFIED **WHEELS** .2. TRUING MECHANISM WITH CUP-TRUER

Autor

SYOJI K
PIAO CG

Institution

nicht belegt

Abstrakt

In the previous papers a new truing technique with the cup-truer was proposed for the preparation of diamond **wheels**. This paper describes the truing mechanism of diamond vitrified **grinding wheels**. The main results obtained are as follows: (1) The effect of truing with a cup-truer mainly depends on the impact of silicon carbide grains torn off from the truer against diamond **abrasives** and bond bridges. (2) The softer a cup-truer is, the larger grains will be torn off from the truer, leading to a higher truing rate and a rough surface texture of the diamond **wheel**. (3) In truing with an impregnated diamond **tool**, which has almost no grains to be torn off, the grains sticking out most on **grinding wheel** are removed in order. (4) In the early stage of **grinding** process, the protruding grains of silicon carbide filled as a **filler** in the vitrified bond are rapidly flattened. (5) For difficult-to-grinding materials it is desirable to use a diamond vitrified **wheel** without a **filler** such as silicon carbide **abrasives**.

Veröffentlichungsjahr

1991

Quelle

INTERNATIONAL JOURNAL OF THE JAPAN SOCIETY FOR PRECISION ENGINEERING

Klassifikation

Engineering

Schlagworte des Autors

CUP-TRUER
DIAMOND VITRIFIED **WHEEL**
TRUING
GRINDING

Thesaurusbegriffe

nicht belegt

Sprache

ENGLISH

Recherchedatum

12.03.2021

Dokument Nr.: 86

Titel

Schleifwerkzeuge und Bearbeitungsaufgabe. Influence of **grinding wheel** specifications on **grinding**.

Autor

STABENOW, R.

Institution

nicht belegt

Abstrakt

Untersuchung des Einflusses verschiedener Einflussgroessen wie **Schleifmittel**, Korngroesse, Kornart, Korngroessenkombinationen, Haerte, Struktur und Bindung auf das **Schleifergebnis**. Uebersichtsbericht mit Kennzeichnung der Bedeutung der Einflussgroessen und der Moeglichkeiten zu ihrer Veraenderung. Verbesserung der **Schleifbarkeit** saeurebestaendiger und hochwarmfester Staehle durch Einsatz sogenannter **schleifaktiver Fuellstoffe**.

Veröffentlichungsjahr

1980

Quelle

Technische Mitteilungen, Haus der Technik e.V. * Band 73 (1980) Heft 8, Seite 643-648 (6 Seiten, 10 Bilder, 5 Tabellen, 11 Quellen)

Klassifikation

3LKB Spanende Bearbeitung, Zerspanen, Zerteilen

Schlagworte des Autors

SCHLEIFEN
SCHLEIFSCHEIBE
SCHLEIFMITTEL
KORNGROESSE
KRISTALLKORN
HAERTE
MIKROGEFUEGE
KORUND
HITZEBESTAENDIGER STAHL
BINDUNGSENERGIE

Thesaurusbegriffe

nicht belegt

Sprache

Deutsch

Recherchedatum

12.03.2021

Dokument Nr.: 87

Titel

Guter Schliff bei gutem Kontakt.

Autor

<AU>

Institution

nicht belegt

Abstrakt

Bei der **Schleif**- und Polierbearbeitung auf Bandschleifmaschinen gewinnt die Kontaktscheibe, die zur sicheren **Schleifbandfuehrung** dient, im Hinblick auf hohe Qualitaets- und Leistungsanforderungen immer mehr an Bedeutung. Hier werden eine Reihe von Kontaktscheiben aus dem Programm der August Picard KG fuer die verschiedenen Anwendungsgebiete vorgestellt: **Scheiben** mit Belaegen in den Haerten zwischen 20 und 95 Shore und Laufpolster mit glatten bis grobgefraesten Oberflaechen, flexible Kontaktscheiben, Kontaktscheiben mit wechselnder Zahnstellung, Polierringe aus Tuch- oder Sisalgewebe und Sisalkordel. Eine Neuheit ist eine **schleifaktive** Polierscheibe, bei der eine wesentlich hoehere Polierkraft entwickelt wird. (Burbach)

Veröffentlichungsjahr

1978

Quelle

Oberflaeche + Jot. Zeitschrift fuer die Oberflaechenbehandlung von Metallen und Kunststoffen * Band 18 (1978) Heft 11, Seite 712,714 (2 Seiten, 2 Bilder)

Klassifikation

3LKB Spanende Bearbeitung, Zerspanen, Zerteilen

Schlagworte des Autors

SCHLEIFEN
BESCHICHTUNG (UEBERZUG)
POLIEREN
SCHLEIFSCHEIBE
KONTAKT (REIBUNG)
SCHLEIFMITTEL
RECHNERPROGRAMM
KOERNUNG
HAERTE
HAERTEN (METALL)
SCHLEIFRING
QUALITAET
OBERFLAECHE
KLINGENSCHLIFF
POLIERSCHEIBE
ANWENDUNGSGEBIET
EIGENSCHAFT

Thesaurusbegriffe

BANDSCHLEIFMASCHINE
LEISTUNGSANFORDERUNG
SCHEIBE

Sprache

Deutsch

Recherchedatum

12.03.2021

Dokument Nr.: 88

Titel

Mechanochemical synthesis of the NiSn, CuSn bimetallic and NiCuSn trimetallic nanocomposites using various types of **additives**

Autor

MUSZA KATALIN
Szabados Marton
Adam Adel Anna
Belteky Peter
Konya Zoltan
Kukovecz Akos
Sipos Pal
Palinko Istvan

Institution

nicht belegt

Abstrakt

Ni-Cu-Sn nanocomposite was prepared for the first time, in the mechanochemical way complementing with the investigation of milled Cu-Sn and Ni-Sn systems using **grinding additives**. Several chemicals were examined like NaCl, PVP, CTAB, SDS, oleylamine, n-heptane, ethylene and polyethylene glycol. X-ray diffractometry attested the varying effects of the **additives** on the quality and quantity of the milling end-products: in several cases complete or partial **mechanical** alloying occurred, while in some instances, the segregation of the starting materials were also observed verified by spatially-resolved energy dispersive X-ray analysis. Dynamic light scattering measurements revealed the efficacy of **additive** amounts used on particle size reduction and size distribution of the milled bimetallic and trimetallic solids. For the Ni-Cu-Sn nanocomposites, the average solvodynamic diameters varied in the range 180-700 nm with 0.21-0.48 polydispersity values. The application of CTAB and PVP resulted in aggregated nanoparticles under 100 nm size in significant amounts verified by the transmission electron microscopy images. The analysis of the surface plasmon resonance bands of the nanocomposites indicated the presence of the Cu(I) oxide phase, while the calculated textural parameters increased up to 5 and 24 m(2)/g and 0.01-0.05 cm(3)/g specific surface area and total pore volume values, respectively, compared to the 0.8 m(2)/g and 0.002 cm(3)/g of the milling in the absence of additives.

Veröffentlichungsjahr

2021

Quelle

JOURNAL OF SOLID STATE CHEMISTRY

Klassifikation

nicht belegt

Schlagworte des Autors

nicht belegt

Thesaurusbegriffe

nicht belegt

Sprache

nicht belegt

Recherchedatum

12.03.2021

Dokument Nr.: 89

Titel

Observation of cryogenically **cooled** ice particles inside the high-speed water jet

Autor

JERMAN MARKO
Zelenak Michal
Lebar Andrej
Foldyna Vladimir
Foldyna Josef
Valentincic Josko

Institution

nicht belegt

Abstrakt

The Ice **abrasive** water jet technology uses cryogenically **cooled** ice particles instead of the mineral **abrasive** used in the **Abrasive** water jet technology. The aim is to avoid contamination of workpieces with mineral **abrasives** and to reduce the environmental impact of this technology. The ice particles are sucked into a high-speed water jet with speeds of up to 600 m.s(-1) using the Venturi effect. Direct observation of the process is very difficult due to the extreme **operating** conditions. We have clearly shown that at least some of the ice particles, which have cryogenic temperatures when entering the high-speed water jet, neither completely melt nor are completely crushed in contact with the jet. Further on, the erosion capability of ice particles was evaluated by blasting the aluminium and glass surfaces at two impinging angles and compared to garnet mineral **abrasive**, showing that ice particles have the potential to generate similar damage in the workpiece material as garnet. These findings pave the way for exploring the potential of abrasive waterjet technology in a wide range of new applications, such as food processing, medical implant and turbine blade manufacturing, and post-processing of parts manufactured with additive manufacturing technologies.

Veröffentlichungsjahr

2021

Quelle

JOURNAL OF MATERIALS PROCESSING TECHNOLOGY

Klassifikation

nicht belegt

Schlagworte des Autors

nicht belegt

Thesaurusbegriffe

nicht belegt

Sprache

nicht belegt

Recherchedatum

12.03.2021

Dokument Nr.: 90

Titel

Additive manufacturing of metal-bonded **grinding tools**.

Autor

DENKENA, BEREND
KROEDEL, ALEXANDER
HARMES, JAN
KEMPF, FABIAN
GRIEMSMANN, TJORBEN
HOFF, CHRISTIAN
HERMSDORF, JOERG
KAIERLE, STEFAN

Institution

Universitaet Hannover, Garbsen, DE
Laser Zentrum Hannover (LZH), DE

Abstrakt

Grinding tools with superabrasive grains can be manufactured from different bond materials. In several industrial applications, metallic bond systems are used. In general, these show good grain retention and offer a high thermal conductivity, when compared to the other widely used bond types such as vitrified and resin bonds. One drawback of the metallic bond is the lack of pores in the **grinding** layer. This is caused by the manufacturing processes that are typically used, like brazing or hot pressing. These generally produce very dense layers. The high density and low porosity **lead** to comparatively little space for the transport of lubricant, **coolant**, and chips. One approach to eliminate this disadvantage is to introduce cavities into the **grinding** layer, using the laser powder bed fusion technique (LPBF). In order to evaluate the general suitability of LPBF in combination with the bond material and diamond grains, **grinding** layer samples with a nickel-titanium bond were produced. The **abrasive** behavior of these samples was tested in scratch tests on cemented carbide to verify the applicability as grinding tools. While the diamond grains in the powder mixture are not part of the fusion process, they also did not interfere with the manufacturing process, and the scratch tests showed promising abrasive capabilities. The grinding layer itself withstood the process forces, and no grain breakout could be observed. This indicates that the grain retention forces are high enough for the grinding process and that NiTi has a high potential as a bonding material for the manufacturing of grinding tools via LPBF.

Veröffentlichungsjahr

2020

Quelle

International Journal of Advanced Manufacturing Technology * Band 107 (2020) Heft 5-6, Seite 2387-2395 (9 Seiten, 29 Quellen)

Klassifikation

3LKB Spanende Bearbeitung, Zerspanen, Zerteilen
3LEK Pulvermetallurgie
3MD Tribologie
3KEX Hartmetalle, Cermets

Schlagworte des Autors

selektives Laserschmelzverfahren
additive Fertigung
dreidimensionaler Druck
Schleifwerkzeug
Nickeltitanlegierung
Formgedaechtnislegierung
Fusion
Kratztest
Abschleifmittel
Metallbindung
industrielle Anwendung
Heisspressen
Laser
Nickel
Titan
Hartmetall
hohe Dichte
Schmiermittel
Kuehlmittel
Schleifen

Thesaurusbegriffe

hohe Waermeleitfaehigkeit

Sprache

Englisch

Recherchedatum

12.03.2021

Dokument Nr.: 91

Titel

New knowledge about **grinding** using MQL simultaneous to **cooled** air and MQL combined to **wheel** cleaning jet technique

Autor

RIBEIRO FSF
Lopes JC
Garcia MV
de Moraes DL
da Silva AE
Sanchez LED
de Aguiar PR
Bianchi EC

Institution

Sao Paulo State Univ Julio de Mesquita Filho, Dept Mech Engn, Bauru Campus, Bauru, SP, Brazil.
Sao Paulo State Univ Julio de Mesquita Filho, Dept Elect Engn, Bauru Campus, Bauru, SP, Brazil.

Abstrakt

The final quality of **mechanical** components has been increasingly desired in the industry. This final quality is directly linked to surface roughness, geometric deviations, and **mechanical** integrity of components subjected to machining processes. For that, the industry makes use of **cutting** fluids so that it is possible to achieve such conditions. In the case of **grinding**, the application of **cutting** fluid in abundance allows a great reduction in temperature, as well as a better removal of chips from the **cutting** surface of the **wheel**. However, the problems generated by the **cutting** fluid related to environmental and labor liabilities have increasingly led to the development of effective techniques for **grinding** with minimal amounts of **cutting** fluid. The difficulties linked to the use of MQL are concentrated in the low rate of heat removal and in the **clogging** of the **cutting** surface, varying according to the type of **grinding wheel** applied. In this sense, the present work proposes comparison during the cylindrical **grinding** of hardened steel under conventional lubrication conditions, minimum quantity lubricant (MQL), cooled air MQL (MQL + CA), and MQL with wheel cleaning jet (MQL + WCJ), using aluminum oxide (Al2O3) and CBN grinding wheels. The results are presented in terms of surface roughness, roundness error, microhardness, tangential force, diametrical wear of the grinding wheels, and G-ratio. The application of MQL + CA and MQL + WCJ can improve the use of MQL. In terms of roughness, the MQL + WCJ presents values close to the conventional increase of 8.8%. Roundness errors were reduced by up to 36.3% during the application of MQL + CA and MQL + WCJ and up to 10.5% for the tangential force. Thus, these advanced techniques have shown that the conditions are feasible for the application of pure MQL towards an eco-friendly grinding process.

Veröffentlichungsjahr

2020

Quelle

INTERNATIONAL JOURNAL OF ADVANCED MANUFACTURING TECHNOLOGY

Klassifikation

Automation & Control Systems
Engineering

Schlagworte des Autors

GRINDING
MQL
MQL plus CA
MQL plus WCJ
Aluminum oxide **grinding wheel**
CBN **grinding wheel**
AISI 4340 hardened steel

Thesaurusbegriffe

MINIMUM QUANTITY LUBRICATION
HARDENED STEEL
COLD-AIR
CUTTING FLUIDS
CHIP FORMATION
PERFORMANCE
FRICTION
IMPROVEMENT
SURFACES
TOOLS

Sprache

ENGLISH

Recherchedatum

12.03.2021

Dokument Nr.: 92

Titel

Physicochemical and tribological characterizations of WDLC coatings and ionic-liquid lubricant **additives**: Potential candidates for low friction under boundary-lubrication conditions

Autor

ARSHAD MUHAMMAD SHAHID
Kovac Janez
Cruz Sandra
Kalin Mitjan

Institution

nicht belegt

Abstrakt

An interaction between tungsten-doped diamond-like-carbon (WDLC) coatings and ionic-liquid (IL) **additives** under boundary-lubrication conditions is investigated. Three phosphate-based IL **additives** were employed: two had dimethylphosphate anion however, third one hydrolytic trifluorophosphate anion. In tribological tests, low friction (0.024) was achieved at 10 N and 100 degrees C with both dimethylphosphate containing IL **additives**. In contrast, IL with the trifluorophosphate anion had the poorest performance of all the ILs. Surface analyses revealed the thermal dissociation of dimethylphosphate into phosphate radicals which interacted with the WDLC surface to form phosphate-based tribofilm, which provides an easy shear thus reduces the friction. However, trifluorophosphate anions are thermally stable in given conditions and don't form a tribofilm on the WDLC surface hence show poor tribological performance.

Veröffentlichungsjahr

2020

Quelle

TRIBOLOGY INTERNATIONAL

Klassifikation

nicht belegt

Schlagworte des Autors

nicht belegt

Thesaurusbegriffe

nicht belegt

Sprache

nicht belegt

Recherchedatum

12.03.2021

Dokument Nr.: 93

Titel

Assessment of water-based fluids with **additives** in **grinding disc cutting** process.

Autor

NI, JING
YANG, YONGFENG
WU, CAN

Institution

Hangzhou Dianzi University, CN

Abstrakt

Application of **cutting** fluids in **grinding disc cutting** process (GDCP) plays a significant role in minimizing production cost and energy. However, GDCP is significantly different from the **grinding wheel grinding** process (GWGP) with its very thin **disc** (3.5 mm), large diameter (400 mm), large **cutting** depth (several and even ten of millimeters) and no **cutting** fluids, which **lead** to a lot of environmental pollution such as sparking, chips splashing, smoke, dust and so on. In this regard, atomization application of water-based **cutting** fluids is good choice due to less environmental threat in addition to high thermal conductivity and supreme **cooling**/lubricating efficiency. Besides some eco-friendly properties of **additives** such as surfactant and graphene, application of such **additives** eliminates the need for toxic **additives** used frequently in the industry. Hence, in this study, four types of environmentally friendly water-based **cutting** fluids (W, W-S, W-G, W-G-S) are prepared by ultrasonic stirring of water, surfactant (sodium alcohol ether sulfate, SAES) and graphene, then their atomization applications are assessed in GDCP of AISI 1045, as one of the most common and representative material in industry application. To optimize these cutting fluids, G-ratio, Fx -Fy and cutting tilt are compared with those of dry cutting using joint analysis of specific heat, viscosity, wettability, permeability and two-direction force. Also, agglomeration of graphene is proposed to reveal the unexpected reduction in lubrication performance and finally a cutting fluid is developed for minimizing the loss of grinding disc. The obtained results of four types of cutting fluids manifest that the proposed W-S can maximally improve G-ratio by amount of 77.6%, reduce line span by amount of 34.5% and cutting tilt by amount of 14.8% compared with conventional dry cutting. Copyright Elsevier B.V. Reproduced with permission.

Veröffentlichungsjahr

2019

Quelle

Journal of Cleaner Production * Band 212 (2019) Seite 593-601 (9 Seiten, 39 Quellen)

Klassifikation

3LKB Spanende Bearbeitung, Zerspanen, Zerteilen
3MD Tribologie

Schlagworte des Autors

Graphen
Additiv
Zerstaeubung
Schleifscheibe
Umweltverschmutzung
industrielle Anwendung
Staub
Natrium
Alkohole
Sulfat
Minimalkosten
Rauch
thermische Leitfaehigkeit
Surfactant
Agglomerieren
Schmierung
Trockenbearbeitung

Thesaurusbegriffe

G-Ratio
hohe Waermeleitfaehigkeit
Ruehren mit Ultraschall

Sprache

Englisch

Recherchedatum

12.03.2021

Dokument Nr.: 94

Titel

Grinding-aided electrochemical **discharge** drilling in the light of electrochemistry

Autor

LADEESH V. G.
Manu R.

Institution

nicht belegt

Abstrakt

The electrically non-conductive materials like glass, ceramics, quartz, etc. are of great interest for many applications in modern industries. Machining them with high quality and at a faster rate is a challenging task. In this study, a novel technique called **grinding** aided electrochemical **discharge** drilling (G-ECDD) is demonstrated which uses a hollow diamond core drill as the **tool** for performing electrochemical **discharge** machining of borosilicate glass. The new hybrid technique enhances the material removal rate and machining accuracy to several folds by combining the thermal melting action of **discharges** and **grinding** action of the **abrasive tool**. This paper presents the experimental investigation on the material removal rate during G-ECDD of glass while using different electrolytes. An attempt has been made to explore the influence of electrolyte temperature on G-ECDD performance by maintaining the electrolyte at different temperatures. Experiments were conducted using three different electrolytes which include NaOH, KOH, and the mixture of both. The results obtained from this study revealed that an increase in temperature will favor chemical etching as well as electrochemical reaction rate. Also, it was observed that heating the electrolyte leads to an increase in the bubble density and enhances the ion mobility. This causes the formation of gas film at a faster rate and thereby improving the discharge activity. Thus, machining will be done at a faster rate. Better results are obtained while using a mixture of NaOH and KOH. From the microscopic images of the machined surface, it was observed that material removal mechanism in G-ECDD is a combination of grinding action, electrochemical discharges, and chemical etching. Response surface methodology was adopted for studying the influence of process parameters on the performance of G-ECDD. The new technique of grinding aided electrochemical discharge drilling proved its potential to machine borosilicate glass and simultaneously offers good material removal rate, repeatability, and accuracy.

Veröffentlichungsjahr

2019

Quelle

PROCEEDINGS OF THE INSTITUTION OF MECHANICAL ENGINEERS PART C-JOURNAL OF MECHANICAL ENGINEERING SCIENCE

Klassifikation

nicht belegt

Schlagworte des Autors

nicht belegt

Thesaurusbegriffe

nicht belegt

Sprache

nicht belegt

Recherchedatum

12.03.2021

Dokument Nr.: 95

Titel

Nanofluids assisted environmental friendly lubricating strategies for the surface **grinding** of titanium alloy: Ti6Al4V-ELI.

Autor

SINGH, HARPINDER
SHARMA, VISHAL S.
SINGH, SARABJIT
DOGRA, MANU

Institution

Ambedkar National Institute of Technology, Jalandhar, IN
Panjab University Swami Sarvanand Giri Regional Centre, Hoshiarpur, IN

Abstrakt

Graphene is the thriving area of research for its remarkable **mechanical**, electrical and optical properties. Around the globe, researchers are working for its myriad application in different fields, but the studies pertaining to its tribological applications are hard to find. The unique properties of graphene had inspired the authors to portray its application for green tribological. With the **aid** of graphene **additives** in the canola oil, the current experimental study of minimum quantity lubrication (MQL) has reached to propose an environmentally benign lubrication solution for the surface **grinding** of Ti6Al4V-ELI alloy with cubic boron nitride **grinding wheel**. The unique properties of 3–6 multilayered graphene viz. highest thermal conductivity (˜5000 W/m ∼5000W/mK), interlayer shear behaviour, chemical inertness and superoleophilic nature had resulted canola oil with graphene **additives** based MQL in synergistic lubrication and outperformed the conventional synthetic fluid based MQL. In order to validate the potential of graphene, the nano-additives of graphite and molybdenum disulfide (MoS2) were chosen for comparison. The nanoparticles were taken in five different weight concentrations viz. 0.5, 1, 1.5, 2 & 2.5% as additives in canola oil. It was also evaluated that 1.5% weight concentrations of graphene in canola oil had shown optimal results. The performance of nanofluids in canola oil had followed the order as MoS2 < graphite < graphene. The tribological performance of three vegetable oils (canola, soybean and olive) was also evaluated experimentally for surface grinding.

Veröffentlichungsjahr

2019

Quelle

Journal of Manufacturing Processes * Band 39 (2019) Seite 241-249 (9 Seiten, 29 Quellen)

Klassifikation

3MD Tribologie
3LKB Spanende Bearbeitung, Zerspanen, Zerteilen
3KXW Oberflaecheneigenschaften

Schlagworte des Autors

Nanofluid
Graphen
Graphit
Molybdaendisulfid
Titan
Flachschleifen
Minimalmengenschmierung
pflanzliches OEl
Titanlegierung
kubisches Bornitrid
Additiv
Canola
Experimentalstudie
Nanopartikel
Zwischenschicht
thermische Leitfaehigkeit
Verschleissverhalten

Thesaurusbegriffe

Green Manufacturing
chemisch inertes Verhalten

Sprache

Englisch

Recherchedatum

12.03.2021

Dokument Nr.: 96

Titel

A novel technique for dressing metal-bonded diamond **grinding wheel** with **abrasive** waterjet and touch truing

Autor

ZHANG ZZ
Yao P
Zhang ZY
Xue DL
Wang C
Huang CZ
Zhu HT

Institution

Shandong Univ, CaJET, Key Lab High Efficiency & Clean Mech Manufacture, Minist Educ, Sch Mech Engn, Jingshi Rd 17923, Jinan 250061, Shandong, Peoples R China.
Chinese Acad Sci, Changchun Inst Opt Fine Mech & Phys, Key Lab Opt Syst Adv Mfg Technol, Changchun 130033, Peoples R China.

Abstrakt

The dressing of metal-bonded diamond **grinding wheels** is difficult despite their availabilities on hard and brittle materials. In this paper, a novel compound technology that combines **abrasive** waterjet (AWJ) and touch truing is proposed for dressing metal-bonded diamond **grinding wheel** precisely and efficiently. The dressing experiments of a coarse-grained and a fine-grained bronze-bonded diamond **grinding wheel** were carried out on a surface grinder with a developed AWJ system. The feasibility of this method was verified by analyzing the **wheel** runout, the truing forces, and the **wheel** surface topography. The variations of 3D surface roughness of **wheel** surface topography during the compound dressing process were quantitatively analyzed. The mechanism of AWJ and touch compound dressing is also **discussed**. Further, a reaction-bonded silicon carbide block was ground to validate the dressing quality. The experiment results indicate that the **grinding wheels** that were well dressed by the proposed technique **leads** to a smaller grinding force and a smaller surface roughness than that of undressed wheels.

Veröffentlichungsjahr

2017

Quelle

INTERNATIONAL JOURNAL OF ADVANCED MANUFACTURING TECHNOLOGY

Klassifikation

Automation & Control Systems
Engineering

Schlagworte des Autors

DRESSING
Abrasive waterjet
Touch truing
Diamond **grinding wheel**
3D surface roughness

Thesaurusbegriffe

JET
PERFORMANCE

Sprache

ENGLISH

Recherchedatum

12.03.2021

Dokument Nr.: 97

Titel

Grinding of Ti-6Al-4V Under Small Quantity **Cooling** Lubrication Environment Using Alumina and MWCNT Nanofluids

Autor

PAUL S
Singh AK
Ghosh A

Institution

Indian Inst Technol, Dept Mech Engn, Madras 600036, Tamil Nadu, India.

Abstrakt

Ti-6Al-4V is a difficult-to-grind material as chips tend to adhere to the grit materials of an **abrasive wheel** due to its chemical affinity. In the present work, it has been attempted to improve the grindability by application of small quantity **cooling** lubrication (SQCL) technology using nanofluids, namely, multiwalled carbon nanotube (MWCNT) and alumina nanofluid. The suitability of nanofluids was experimentally evaluated in reciprocating surface **grinding** using a vitrified SiC **wheel**. Substantial improvement in grindability under the influence of MWCNT nanofluid (SQCL) could be achieved compared to soluble oil (flood). Reduction of specific **grinding** forces and specific energy was observed due to the combined effect of superior heat dissipation and lubrication abilities; when the latter one was realized through on-site rolling of MWCNT strands, inter-tubular slip and solid lubrication of the film adhered onto the **wheel** surface. These outperforming characteristics of MWCNT nanofluid helped in retaining grit sharpness superiorly, thus resulting in better surface finish and less re-deposition of metal on the ground workpiece. On the contrary, Al2O3 nanofluid (SQCL) underperformed even soluble oil (flood). For an ageing effect, Al2O3 nanoparticles resulted in abrasive agglomerates, which led to its failure, despite its good heat dissipation capability.

Veröffentlichungsjahr

2017

Quelle

MATERIALS AND MANUFACTURING PROCESSES

Klassifikation

Engineering
Materials Science

Schlagworte des Autors

CHIPS
force
grinding
microloading
nanofluids
roughness
specific energy
SQCL
Ti-6Al-4V

Thesaurusbegriffe

MINIMUM QUANTITY
TITANIUM-ALLOY
FLUID
TI6AL4V
ENHANCEMENT
PERFORMANCE

Sprache

ENGLISH

Recherchedatum

12.03.2021

Dokument Nr.: 98

Titel

ToF-SIMS-Analysen der durch Endbearbeitung mit **additivierten Kuehlschmierstoffen** erzeugten tribologischen Grenzschichten.

Autor

BRITT, LUKAS G.H.
JENKE, PHILIPP K.
LIPINSKY, DIETER
ARLINGHAUS, HEINRICH F.

Institution

Universitaet Muenster, DE

Abstrakt

Mit Hilfe der ToF-SIMS wurde die Anbindung verschiedener **Kuehlschmierstoffadditive** an Stahloberflaechen bei der Endbearbeitung durch Aussenrundschleifen sowie in Abhaengigkeit von der Substrattemperatur untersucht. Das Anlagerungsverhalten von ZDDP an unterschiedlich stark erhitzten Substratoberflaechen wurde unter Verwendung von integralen Oberflaechenspektren sowie Tiefenprofilen untersucht. Dabei konnte gezeigt werden, dass bei genuegend hohen Substrattemperaturen Schichten aus den Bestandteilen des ZDDP gebildet werden, die, abhaengig von der Substrattemperatur, unterschiedliche Dicken aufweisen. Anhand von Tiefenprofilen von mit unterschiedlich **additivierten Kuehlschmierstoffen** bearbeiteten Synchronkonus-Modellkoerpern konnte gezeigt werden, dass es zur Bildung von Phosphatglas- oder phosphatglasaehnlichen Schichten kommt, die vermutlich aufgrund der geringen Interaktionszeit zwischen **Schleifscheibe** und Werkstueck, sehr duenn ausfallen. PAO-based **cooling** lubricants are used in finishing processes for metallic components but their influence on formation of life-span increasing boundary layers is poorly known. The binding characteristics of different additives during finishing processes has been investigated using time of flight secondary ion mass spectrometry. Steel substrates were dipped in different cooling lubricants at different temperatures to study fundamental binding processes. Results of these studies indicate the temperatures in which additives bind to steel surfaces and provide information regarding the thickness of the boundary layers formed during finishing processes.

Veröffentlichungsjahr

2017

Quelle

Reibung, Schmierung und Verschleiss: Forschung und praktische Anwendungen, Tribologie-Fachtagung, 58 * (2017) Seite 1-10 (10 Seiten, 2 Quellen), Datei: 30_Britt.pdf

Klassifikation

3MD Tribologie
3KU UEberzuege, Coatings, duenne Schichten
3LXR Zerstaeuben, Sputtern, Aufdampfen
3KXU Chemische Werkstoffeigenschaften, Korrosions- und Erosionsverhalten

Schlagworte des Autors

Substrattemperatur
Kuehlschmierstoff
Aussenrundschleifen
Schleifscheibe
Werkstueck
Grenzschicht
Stahloberflaeche
Fertigbearbeitung
Schmiermittel
Additiv
Nutzungszeit
Stahlsubstrat
Sekundaerionenmassenspektrometrie

Thesaurusbegriffe

Endbearbeitung
Tiefenprofil
TOF-SIMS-Analyse

Sprache

Deutsch

Recherchedatum

12.03.2021

Dokument Nr.: 99

Titel

Influence of metalworking fluid **additives** on the thermal conditions in **grinding**.

Autor

MEYER, DANIEL
WAGNER, ANDRE

Institution

IWT Stiftung Institut fuer Werkstofftechnik, Bremen, DE
Universitaet Bremen, DE

Abstrakt

Extreme pressure (EP)-**additives** are applied in nearly all metalworking fluids to enable better performance and improved lubrication at high thermomechanical loads. Especially in **grinding**, lubrication of the contact zone between **grinding wheel** and workpiece is of high relevance. This paper presents the results of a systematic study to reveal the potential of different **additives** in surface **grinding** to reduce the contact zone temperature and to shift the **grinding** burn limit. It is shown that the performed defined variation of the **additive** combinations considerably influenced effects regarding the thermal load in the contact zone and the performance of the **grinding** process.

Veröffentlichungsjahr

2016

Quelle

CIRP General Assembly, 66, in: CIRP Annals * Band 65 (2016) Heft 1, Seite 313-316 (4 Seiten, 15 Quellen)

Klassifikation

3MD Tribologie
3LKB Spanende Bearbeitung, Zerspanen, Zerteilen
3IFM Messung/Pruefung mechanischer/geometrischer Groessen, der Masse und Dichte

Schlagworte des Autors

Schleifen
Schmierung
Metallbearbeitung
Additiv
thermischer Zustand
thermische Belastung
Schleifscheibe
Werkstueck
Kontaktflaeche

Thesaurusbegriffe

nicht belegt

Sprache

Englisch

Recherchedatum

12.03.2021

Dokument Nr.: 100

Titel

An investigation on surface **grinding** of hardened stainless steel S34700 and aluminum alloy AA6061 using minimum quantity of lubrication (MQL) technique. Untersuchung zum Oberflaechenschleifen von gehaertetem nichtrostenden Stahl S34700 und der Aluminiumlegierung AA6061 bei Minimalmengenschmierung.

Autor

HADAD, MOHAMMADJAFAR
HADI, MOSTAFA

Institution

Islamic Azad University, Dehaghan, IR

Abstrakt

In **grinding** process, the **abrasives** plunge and slide against the workpiece during material removal with high specific energy consumption and high **grinding** zone temperature. To improve process efficiency, lubrication becomes an important requirement of the **grinding** fluids, along with chip removal and **cooling** the **grinding** zone. **Grinding** fluids have negative influences on the working environment and machining cost in terms of the health of the machine **operator**, pollution, the possibility of explosion (for oil), filtering, and waste disposal. The use of minimum quantity of lubrication (MQL) with an extremely low consumption of lubricant has been reported as a technologically and environmentally feasible alternative to flood **cooling**. This paper deals with an investigation of the grindability of hardened stainless steel (UNS S34700) and aluminum alloy AA6061 using dry, MQL, and conventional fluid techniques. One type of silicon carbide (SiC) and five types of aluminum oxide (Al2O3) **wheels** (corundum) as well as vegetable and synthetic ester MQL oils have been tested. The influences of wheel and coolant-lubricant types have been studied on the basis of the grinding forces, surface topography, and surface temperature. Synthetic ester MQL oil was found to give better grinding performance than the vegetable MQL oils. It was argued that the improved performance of the ester oil is caused by the formation of tribo-films on the abrasives and the workpiece, which enhances lubrication by inhibiting metal-abrasive interaction. Also, the grindability of the machined specimens was found to increase substantially by using the MQL grinding process with soft and coarse wheels. In MQL grinding of AA6061 alloy, the use of vegetable oil resulted in the lowest surface roughness, whereas using synthetic ester additives lead to highest surface roughness because of higher chip loading on the grinding wheel and consequently more redeposited material on the workpiece surface.

Veröffentlichungsjahr

2013

Quelle

International Journal of Advanced Manufacturing Technology * Band 68 (2013) Heft 9-12, Seite 2145-2158 (14 Seiten, 12 Bilder, 5 Tabellen, 22 Quellen)

Klassifikation

3LKB Spanende Bearbeitung, Zerspanen, Zerteilen
3MD Tribologie
3KEB Staehle, Stahlguss
3KEM Nichteisenmetalle (auch Sondermetalle), -legierungen, -gusswerkstoffe

Schlagworte des Autors

Schleifen mit **Scheibe**
Kuehlschmierstoff
Minimalmengenschmierung
Vergleichstest
Werkzeugverschleiss
Kostensenkung
Umweltvertraeglichkeit
Verfahrenseignung
experimentelle Untersuchung
gehaerteter Stahl
Chrom-Nickel-Stahl
Aluminiummagnesiumsiliciumlegierung
Trockenbearbeitung
Siliciumcarbidkeramik
keramisches Werkzeug
Aluminiumoxid
Korund
pflanzliches OEl
synthetisches OEl
Esteroel
Schleifdruck
Oberflaechentopographie
Oberflaechentemperatur
Schleifleistung
Schmierfilm
Rauigkeit
Werkstoffauswahl

Thesaurusbegriffe

Schmierstoffauswahl

Sprache

Englisch

Recherchedatum

12.03.2021

Dokument Nr.: 101

Titel

Influence of lubrication-cooling on the surface quality of metal **grinding**

Autor

ALVES MCD
Bianchi EC
de Aguiar PR

Institution

UNESP, Fac Eng Ind Madeireira, Itapeva, SP, Brazil.
UNESP, Fac Engn Bauru, Bauru, SP, Brazil.

Abstrakt

In the manufacture of precise **mechanical** components, which requires high **mechanical** and wear resistance, the **grinding** process is used to give the desired finishing and to eliminate the distortion occurred during the quenching step in the steel heat treatment process. However, the **grinding** conditions should be appropriate so that flaws are not incorporated into the piece. New lubrication and **cooling** concepts for the **grinding** process are being researched in order to reduce costs and environmental damage caused by **cutting** fluids. The influences on the surface integrity and surface quality of the ABNT 4340 hardened parts have been analyzed in this research by employing the minimum quantity of lubrication (MQL), optimized and conventional **cooling**, different flows and velocities in the application of the **cutting** fluid and a super **abrasive grinding wheel** in the cylindrical plunge **grinding** process. The ABNT 4340 steel, with several industrial applications, is considered for aeronautical use due to its high strength without increasing the weight of the components. The quality analysis of the parts was done by roughness verification and electron scanning microscopy (ESM). The tangential cutting force was also verified. Regarding the different forms of the cutting fluid application, the best performance was verified for the optimized for higher speeds showing the efficiency of the nozzle used. The optimized and the MQL processes were able to maintain the surface hardness and integrity of the produced parts. The only exception occurred for the MQL condition with a cutting fluid flow rate at 40ml/h, which led to cracks and superficial burns. Grinding wheels with low CBN concentration, therefore cheaper, produced good results when associated with more efficient techniques of cutting fluid application, showing reduced wear.

Veröffentlichungsjahr

2011

Quelle

REM-REVISTA ESCOLA DE MINAS

Klassifikation

Engineering
Metallurgy & Metallurgical Engineering
Mining & Mineral Processing

Schlagworte des Autors

GRINDING PROCESS
CBN **grinding wheel**
ABNT 4340 Steel
minimum quantity of lubrication (MQL)
optimized **cooling**
conventional **cooling**

Thesaurusbegriffe

nicht belegt

Sprache

PORTUGUESE

Recherchedatum

12.03.2021

Dokument Nr.: 102

Titel

A qualitative approach on marginal adaptation of conditioned dental infrastructures using optical coherence tomography

Autor

ROMINU M.
Sinescu C.
Negrutiu M.
Birtea N.M.
Petrescu E.
Rominu R.
Hughes M.
Bradu A.
Dobre G.
Podoleanu A.G.

Institution

nicht belegt

Abstrakt

Ceramic prosthesis performed through **additive** and subtractive technologies, **lead** to superior esthetic results towards metal-ceramic prosthesis. Ceramic veneers can be bonded to dental preparations with different types of cement. 100 ceramic veneers were performed on a preparation at the central maxilar incisor. The veneers were treated with different methods for obtaining a superior adhesion to dental structures. The veneers were divided into five groups and treated by (1) sandblasting, (2) sandblasting and then conditioned with HFA 9,6% (hidrofluoric acid), (3)sandblasting with HFA (hidrofluoric acid) 5,5%, (4) HFA 9,6% (hidrofluoric acid), (5) HFA 5,5% (hidrofluoric acid). After conditioning, the surfaces were investigated by scanning electronic microscopy technology (SEM). The aim of this study was to analyze the quality of marginal adaptation and gap width of Empress veneers using en-face optical coherence tomography. The results prove the importance of investigation the marginal adaptation after every veneer bonding.

Veröffentlichungsjahr

2009

Quelle

Proceedings of the 1st International conference on Manufacturing Engineering, Quality and Production Systems (MEQAPS 2009)

Klassifikation

nicht belegt

Schlagworte des Autors

nicht belegt

Thesaurusbegriffe

nicht belegt

Sprache

nicht belegt

Recherchedatum

12.03.2021

Dokument Nr.: 103

Titel

Characterization of lubrication and friction phenomena in machining. Characterisation von Schmierungs- und Reibungs-Phaenomenen bei der spanenden Bearbeitung.

Autor

BRINKSMEIER, E.
WALTER, A.
BLEIL, N.

Institution

IWT Stiftung Institut fuer Werkstofftechnik, Bremen, DE

Abstrakt

In this paper different research approaches for analyzing basic tribological processes in the contact zone between **grinding wheel** and workpiece are **discussed**. Investigations of physical as well as chemical effects within the tribosystem describing lubrication and friction phenomena in **grinding** have been presented. Characterizing the role of lubrication, a special attention is given to generation of reaction layers at the workpiece surface. These layers result from the use of certain **coolant** **additives** and can be detected applying ESCA (Electron Spectroscopy for Chemical Analysis). The generation of a reaction layer depends on the type of the **additive** carrier used as well as on machining parameter settings and the **grinding wheel** type. These factors also determine the layers composition. Once a reaction layer is generated, a measurable influence of the concentration of the **additive** carrier in the **coolant** on the **grinding** forces and workpiece roughness can be observed. It can be stated that: 1.) the use of reacting additives in metalworking fluids is seen to lead to the formation of adsorption and reaction layers. In particular, sulfur used as a metalworking fluid additive is seen to have a significant effect on the chemical state of the surface, 2.) the generation of reaction layers on cutting tools can improve wear resistance resulting in overall improvement of the material removal process, 3.) cutting tool selection plays a role in the formation of reaction layers, 4.) proper choice of metalworking fluid formulation and supply conditions is necessary in order to optimize process stability and resulting workpiece quality, 5.) the chemical state of the surface which results from the process used to create it can have a significant effect on further processes steps or its intended use, 6.) advances in the development of techniques for surface analysis have made it possible to obtain detailed information about the chemical state of the surface. Under constant grinding and lubrication conditions, friction in the contact zone is determined by the grinding wheel specification. Provided thermal effects are negligible. Essential work results in grinding can be characterized by quantities applicable to abrasive wear. Under these conditions, the grinding performance of different tools depends on the single grain chip thickness, which, in turn, influences the overall friction coefficient. The last quantity correlates with Archards wear coefficient and the G-ratio describing the efficiency of chip formation and tool wear resistance respectively. Considering a grinding process as a process of abrasive wear shows the advantage of an objective assessment of differences in grinding performance regardless the tool specification. Applying low cutting speeds thermal effects were successfully suppressed and compressive workpiece residual stresses induced. Since higher specific grinding energies were found to increase compressive residual stresses and their penetration depth, low cutting speeds and low depth of cut are considered to be promising for further investigations to enhance this new technology.

Veröffentlichungsjahr

2005

Quelle

Viennano, Vienna International Conference on Micro- and Nano-Technology, 1 * (2005) Seite 313-317 (5 Seiten, 13 Quellen) Wien: OEsterreichische Tribologische Gesellschaft

Klassifikation

3LKB Spanende Bearbeitung, Zerspanen, Zerteilen
3MD Tribologie

Schlagworte des Autors

Schmierung
Reibung
spanende Bearbeitung
Mikrohaerte
Schallemissionspruefung
Roentgenbeugung
Chrommolybdaenstahl
Abrasionsversuch
Schleifen
Chromstahl

Thesaurusbegriffe

Langsamschleifen

Sprache

Englisch

Recherchedatum

12.03.2021

Dokument Nr.: 104

Titel

Characterization of lubrication and friction phenomena in **grinding**.

Autor

BRINKSMEIER, E.
WALTER, A.
GIWERZEW, A.
BLEIL, N.

Institution

Universitaet Bremen, DE

Abstrakt

Using **abrasive** processes the resulting properties and qualities of surface layers depend on **mechanical**, thermal , and chemical loading in the contact zone. The tribosystem in **grinding** is characterized by the components **grinding wheel**, workpiece, **cooling** lubricant, and the surrounding medium. Within this system tribophysical interactions **lead** to friction and wear as well as tribochemical interactions result in the generation of reaction layers. For the optimisation of the tribosystem regarding the resulting surface layers a fundamental knowledge of the mechanisms in the contact zone is needed. This paper shows different research approaches for analysing **elementary** tribological processes in the contact zone between **grinding wheel** and workpiece with considerations of physical as well as chemical effects. For the investigations of tribochemical effects the heat treatable steel 42CrMo4 (AISI 4140) was used. The investigations were performed with a resin bonded corundum **wheel** and basic mineral oil. Reaction layers result from the use of certain coolant additives and were detected by ESCA (Electron Spectroscopy for Chemical Analysis). For the investigation of tribophysical effects grinding tests were performed in an analogous process for gear honing using the case hardening steel 16MnCr5E (AISI 5115). Different grinding wheels were used. Each grinding experiment consists of a series of 18 unified grinding cycles performed in one set up without an intermediate tool dressing. It was found that the grinding performance depends on the single grain chip thickness, which, in turn, influences the overall friction coefficient. It also correlates with the Archard's wear coefficient and the G-ratio describing the efficiency of chip formation and tool wear resistance respectively.

Veröffentlichungsjahr

2004

Quelle

ICTMP, International Conference on Tribology in Manufacturing Processes, 2 * (2004) Seite 119-128 (10 Seiten, 9 Bilder, 1 Tabelle, 19 Quellen)

Klassifikation

3LKB Spanende Bearbeitung, Zerspanen, Zerteilen
3MD Tribologie

Schlagworte des Autors

Schleifen
Tribologie
experimentelle Untersuchung
Kuehlschmierstoff
Schleifscheibe
Verschleiss
Mineraloel
Reibung

Thesaurusbegriffe

tribochemische Eigenschaft
tribophysikalische Eigenschaft
tribologisches Prozessverhalten
Tiefenprofil

Sprache

Englisch

Recherchedatum

12.03.2021

Dokument Nr.: 105

Titel

Application of solid lubricants in **grinding**: Investigations on graphite sandwiched **grinding wheels**

Autor

SHAJI S
Radhakrishnan V

Institution

Indian Inst Technol Madras, Dept Mech Engn, Mfg Engn Sect, Madras 600036, Tamil Nadu, India.

Abstrakt

The intense heat generated in **grinding** process, if not controlled, will **lead** to major quality defects. Conventional liquid **coolants**, employed in flood form, have many limitations from technical, environmental and economic angles. Minimization or possible elimination of **cutting** fluids by substituting their functions by some other means is emerging as a thrust area of research in **grinding**. The authors have reported the feasibility of application of solid lubricants in **grinding**. This paper deals with the detailed investigations on solid lubricant integrated **grinding wheels**, by providing peripheral graphite sandwiching. Improvement in process results has been observed with this concept.

Veröffentlichungsjahr

2003

Quelle

MACHINING SCIENCE AND TECHNOLOGY

Klassifikation

Engineering
Materials Science

Schlagworte des Autors

GRINDING
lubrication
coolant
graphite
solid lubricant

Thesaurusbegriffe

nicht belegt

Sprache

ENGLISH

Recherchedatum

12.03.2021

Dokument Nr.: 106

Titel

Development of new **grinding** fluids for CBN **grinding wheels**: Part IV - a study of **grinding** performance when two types of metal working **additives** are used together.

Autor

YAMANAKA, Y.
HAYAMA, M.
OI, T.
IMAI, J.
SATOH, M.

Institution

Kyodo Yushi, Fujisawa, JP

Abstrakt

This paper reports the results of studies as to wether or not any synergetic effect can be observed in **grinding** performance when two different types of metal working **additives** are used together. Studies showed there was no synergetic effect observed at all in the **grinding** performance in a total of 12 cases. The workpiece surfaces were analyzed using X-ray photoelectron spectroscopy (XPS), it was found that **grinding** performance is governed by the reaction film formed on the workpiece surfaces. Further, the surfaces of the workpieces tested were observed by SEM to evaluate their surface quality.

Veröffentlichungsjahr

2000

Quelle

Lubrication Engineering * Band 56 (2000) Heft 3, Seite 17-24 (8 Seiten, 8 Quellen)

Klassifikation

3MD Tribologie
3LKB Spanende Bearbeitung, Zerspanen, Zerteilen

Schlagworte des Autors

Schleifscheibe
Schleifen
Additiv
Metallbearbeitung
Oberflaecheneigenschaft
Roentgenphotoelektronenspektroskopie
Rasterelektronenmikroskopie
Kuehlschmierstoff
CBN-Schleifscheibe

Thesaurusbegriffe

nicht belegt

Sprache

Englisch

Recherchedatum

12.03.2021

Dokument Nr.: 107

Titel

Formation of reaction layers in machining processes.

Autor

BRINKSMEIER, E.
WALTER, A.

Institution

IWT Stiftung Institut fuer Werkstofftechnik, Bremen, DE

Abstrakt

Grinding processes can be characterized by large contact lengths and the generation of great heat quantities, therefore requiring the use of **cooling** lubricants. Several researchers showed that due to the high temperatures and pressures a hydrodynamical lubrication in material removal processes is impossible. Nevertheless, lubricants are known to reduce the heat generation. Focussing on the lubrication task of **cooling** lubricants, especially the impact of the **additives** on the process have to be analysed, because they are responsible for the formation of wear protecting and friction minimizing layers at the **tool**/workpiece interface. Such sorption and reaction layers can influence the chip formation positively and **lead** to reduced surface roughness and friction forces. Using an advanced measuring technique it was possible to analyse the tribochemical influence of definite lubricants on the **grinding** process. The investigations also focussed on the interactions between the bonding system of the **grinding wheel** and the cooling lubricant additives.

Veröffentlichungsjahr

2000

Quelle

Tribology, International Colloquium, 12 * (2000) Seite 847-852 (6 Seiten, 14 Bilder, 1 Tabelle, 5 Quellen)

Klassifikation

3MD Tribologie
3LKB Spanende Bearbeitung, Zerspanen, Zerteilen

Schlagworte des Autors

Additiv
Anpressdruck
Beruehrungsflaeche
Grenzschicht
Kuehlschmierstoff
Messtechnik
Rauigkeit
Reibkraft
Reibung
Schleifen
Sorption
Spanbildung
Verschleissfestigkeit
Waermemenge
Reaktionsschicht

Thesaurusbegriffe

nicht belegt

Sprache

Englisch

Recherchedatum

12.03.2021

Dokument Nr.: 108

Titel

Schmierstoffe fuer das **Schleifen** mit reduziertem **Kuehlschmierstoffvolumenstrom**.

Autor

REHBEIN, W.

Institution

OEL-HELD, DE

Abstrakt

Der Einsatz von Mindermengen- und Minimalmengenschmierung beim Hochgeschwindigkeitsschleifen erfordert exakt auf die Bearbeitung abgestimmte Schmierstoffe. Unter Beruecksichtigung oekonomischer und toxikologischer Aspekte wurden von **Kuehlschmierstoffen** die Basisfluessigkeiten aromatenarme Kohlenwasserstoffgemische (Mineraloelraffinate, Hydrocrackoele und Polyalphaolefine), Carbonsaeureester und Alkohole im Werkzeugmaschinenlabor des Lehrstuhls fuer die Technologie der Fertigungsverfahren an der RWTH-Aachen getestet. Die Erprobung erfolgte am Aussenrundeinstechschleifen mit einer CBN-Schleifscheibe mit keramischer Bindung. Die **Schleifgeschwindigkeit** betrug 100 m/s, die Werkstueckumfangsgeschwindigkeit 97 m/s (Staehle 100Cr6 und 16MnCr5). Ermittelt wurden die Normalkraft, die Tangentialkraft und die gemittelte Rauhtiefe sowie die thermische Schaedigung des Werkstuecks durch **Schleifbrand** beurteilt. Es zeigte sich, dass die Mineraloele und Polyalphaolefine gegenueber den nativen und synthetischen Estern bessere Ergebnisse erzielten. In weiteren Versuchsreihen wurde der Einfluss von Additiven zur Verbesserung des Reibbeiwertes, der Oberflaechenguete und Verringerung des Kraefte bewertet. Sie guenstigste Additivierung bestand aus einer Kombination von Polysulfiden und geschwefelten Carbonsaeureestern mit einem aschefreien Reibungsverringerer.

Veröffentlichungsjahr

2000

Quelle

Umweltvertraegliches Schleifen, OEkologie als OEkonomie der Zukunft, Schleiftechnisches Kolloquium, 2000 * (2000) Seite 113-127 (15 Seiten, 19 Bilder, 3 Quellen) Aachen: Shaker

Klassifikation

3LKB Spanende Bearbeitung, Zerspanen, Zerteilen
3MD Tribologie

Schlagworte des Autors

Schleifscheibe
Rundschleifen
Schleifen
Kuehlschmierstoff
Kraftbedarf
Tangentialkraft
Normalkraft
Additiv
EP-Zusatz
Rautiefe
Hochgeschwindigkeitsschleifen
Minimalmengenschmierung
Reibungsminderung

Thesaurusbegriffe

nicht belegt

Sprache

Deutsch

Recherchedatum

12.03.2021

Dokument Nr.: 109

Titel

Contribution to the role of **coolants** on **grinding** process and work results.

Autor

MINKE, E.

Institution

Universitaet Bremen, DE

Abstrakt

Oil- or water-based fluids? Which **coolant** should be used in **grinding** processes when problems in terms of high forces, **tool life**, or subsurface damages occur? This paper will give an answer for the field of drill-flute and tap drill **grinding** under practical conditions. Parts of M2- and M3-steel were ground with different sintered corundum **wheels** and the influence that **additives** such as fatty acid and phosphorous in a mineral oil have on the **grinding** process and work results was analyzed. In addition, a comparison was drawn between results achieved using an ester based oil and an emulsion. This comparison focused on the **grinding** forces, the work surface roughness, and the thermal influence on the subsurface.

Veröffentlichungsjahr

1999

Quelle

International Machining and Grinding, 3, in: Technical Paper - Society of Manufacturing Engineers, MR * (1999) Heft MR99-227, Seite 1-18 (18 Seiten, 17 Quellen) Dearborn: Society of Manufacturing Engineers (SME)

Klassifikation

3LKB Spanende Bearbeitung, Zerspanen, Zerteilen
3BB Mechanik von Festkoerpern, Fluessigkeiten und Gasen
3MD Tribologie

Schlagworte des Autors

Kuehlmittel
Konzentrationseinfluss
Verschleiss
Schleifscheibe
Schmierung
Rauigkeit
Kuehlung
Kraftmessung
Temperatureinfluss
OEl-in-Wasser-Emulsion
Korund
Schleifkraft
Werkstoffverschleiss

Thesaurusbegriffe

nicht belegt

Sprache

Englisch

Recherchedatum

12.03.2021

Dokument Nr.: 110

Titel

Development of new **grinding** fluid for CBN **grinding wheels** - Part III: Study of concentration of metalworking **additives** on **grinding** performance

Autor

YAMANAKA Y
Hayama M
Oi T
Imai J
Satoh M

Institution

Kyodo Yushi Co Ltd, Fujisawa, Kanagawa 251, Japan.
Iwate Univ, Morioka, Iwate 020, Japan.
Noritake Co Ltd, Aichi 451, Japan.

Abstrakt

In order to develop new **grinding** fluids for CBN **wheels**, the authors have devised an easy and accurate evaluation method for the performance of **grinding** fluids. This paper reports the **grinding** performance of various types of metal working **additives** evaluated by this method. Observation and analysis of the surface face quality of workpieces were done after the **grinding** tests. It was found that, among all the metalworking **additives** tested, sulfur-type extreme-pressure **additives** and phosphorus-type extreme-pressure **additives** showed excellent **grinding** performance, even at a low concentration.

Veröffentlichungsjahr

1998

Quelle

LUBRICATION ENGINEERING

Klassifikation

Engineering

Schlagworte des Autors

GRINDING FLUIDS, METALWORKING FLUIDS
additives
grinding

Thesaurusbegriffe

nicht belegt

Sprache

ENGLISH

Recherchedatum

12.03.2021

Dokument Nr.: 111

Titel

Optimierung beim Bandschleifen. Opportunities for optimizing the use of **grinding** belts.

Autor

HEIDTMANN, W.

Institution

Hermes Schleifmittel, Hamburg, DE

Abstrakt

Das technologische Ergebnis und die Wirtschaftlichkeit eines **Schleifprozesses** kann bei gegebenem Werkstoff und gegebener Werkstueckgeometrie durch die Spezifikation und Topographie des **Schleifwerkzeugs**, durch die Art der Fertigungseinrichtungen und der **Zusatzeinrichtungen** sowie durch die Zerspanungsbedingungen beeinflusst werden. Bei **Schleifbaendern** aus **Schleifmitteln** auf Unterlage, wie sie in der industriellen Fertigung meist eingesetzt werden, sind die **Schleifkoerner** mittels einer Grundbindung auf einer Unterlage fixiert und durch eine Deckbindung abgestuetzt und verankert. Die Unterlage kann hinsichtlich ihrer Festigkeit, Biegsamkeit und Formbarkeit, die Kornart hinsichtlich Haerte, Zaehigkeit, makro- und mikrogeometrischem Aufbau ausgewaehlt werden. Neben den gaengigen **Schleifkoernern** aus Elektrokorund Siliziumkarbid, Zirkonkorund, CBN und Diamant kommen in juengster Zeit mikrokristalline Aluminiumoxide zum Einsatz. Fuer die Bindung werden hauptsaechliche Kunstharzbindungssysteme aus Phenolharz seltener aus Epoxid-, Alkyd- oder Polyurethanharzen verwendet. Zur Standzeitverlaengerung wurden mehrschichtige Schleifbaender entwickelt, wobei die Kornhohlkugelschleifbaender mit ihrer dreifach hoeheren Kornzahl hervorzuheben sind. Im Zerspanungsprozess kann durch Einarbeitung eines schleifaktiven Wirkstoff in die Grund- oder Deckbindung beim Trockenschleifen das Zeitspanungsvolumen um bis zu 200 % gesteigert werden. Bei weichen Werkstoffen wie Aluminium kann ein Zusetzen der Schleifwerkzeugoberflaeche durch ein intermittierendes Aufbringen von Spruehoel verhindert werden. Kann auf den Einsatz von Kuehlschmierstoffen nicht verzichtet werden, werden Schleifemulsionen oder -oele eingesetzt, wobei die Auswahl der Kuehlschmierstoffart Erfahrung voraussetzt. Die Entwicklung intelligenter Steuerungen fuer Bandschleifanlagen, bei denen die Veraenderung der Rauhtiefe und sinkende Zeitspanungsvolumina waehrend der Schleifzeit kompensiert werden koennen, ist ein Entwicklungspotential fuer die Zukunft.

Veröffentlichungsjahr

1998

Quelle

Metalloberflaeche * Band 52 (1998) Heft 8, Seite 609-612 (4 Seiten, 5 Bilder, 4 Quellen)

Klassifikation

3LKB Spanende Bearbeitung, Zerspanen, Zerteilen

Schlagworte des Autors

Schleifen
Bandschleifen
Schleifmaschine
Schleifmittel
Bindemittel
Prozessoptimierung
Standzeit
Wirtschaftlichkeit
Kuehlschmierstoff

Thesaurusbegriffe

schleifaktiver Wirkstoff
Kornhohlkugelschleifband

Sprache

Deutsch

Recherchedatum

12.03.2021

Dokument Nr.: 112

Titel

Bearbeitung von Nickelbasissuperlegierungen fuer stationaere Gasturbinen.

Autor

SPUR, G.
MEIER, A.

Institution

TU Berlin, DE

Abstrakt

Ziel der Untersuchungen ist die Entwicklung einer schaedigungsarmen und produktiven Fertigungstechnologie fuer hochwarmfeste Nickelbasislegierungen. Speziell der Herstellung des komplexen Fussprofiles der Turbinenschaufeln ist eine fertigungstechnisch relevante Aufgabenstellung, da grosse Werkstoffvolumina abzutragen und dabei enge Toleranzen bezueglich Mass- und Formgenauigkeit einzuhalten sind. Als Bearbeitungsverfahren werden **Schleifen** und Drahterodieren betrachtet. Die wesentlichen Maschineneinstellparameter beim **Schleifen** sind neben dem bezeichneten Zeitspannungsvolumen die Schnittgeschwindigkeit beim **Schleifen** mit CBN (kubisches Bornitrid), sowie die Abrichtzustellung beim CD (continuous dressing)-**Schleifen** mit konventionellen Korundschleifscheiben. Die Untersuchungen zeigten, dass auch die Prozessperipherie wie der **Kuehlschmierstoff** einen entscheidenden Einfluss auf das Arbeitsergebnis besitzt. Durch die gezielte **Additivierung** eines Esterproduktes konnten die **Schleifkraefte** um 60 % reduziert werden. Fuer die Drahterosion gilt, dass eine Optimierung der Bauteilqualitaet durch eine geeignete Mehrschnittetechnologie realisiert werden sollte. In einem Bearbeitungsmodus sollte dagegen die Optimierung der Wirtschaftlichkeit des Prozesses durch eine Maximierung der Schnittrate erfolgen.

Veröffentlichungsjahr

1997

Quelle

Kongress und Ausstellung fuer Werkstoffe und Anwendungen, Werkstoffwoche, 1996 * (1997) Seite 151-156 (6 Seiten, 6 Bilder, 2 Quellen) Frankfurt am Main: DGM Informationsgesellschaft

Klassifikation

3KER Superlegierungen
3LKB Spanende Bearbeitung, Zerspanen, Zerteilen
3KWG Kristallstruktur, Werkstoffgefuege und -textur

Schlagworte des Autors

Nickellegierung
Gasturbine
Hochtemperaturtechnik
Hochtemperaturwerkstoff
Fertigungsverfahren
Turbinenschaufel
Massgenauigkeit
Schleifen
Korund
Nitrid
Schleifscheibe
Werkstoffgefuege
Elektroerosion
Prozessoptimierung
Erzeugnisqualitaet
Kosten-Nutzen-Analyse
Nickelbasislegierung

Thesaurusbegriffe

schaedigungsarme Bearbeitung

Sprache

Deutsch

Recherchedatum

12.03.2021

Dokument Nr.: 113

Titel

Development of a new **grinding** fluid for the CBN **grinding wheel** .2.

Autor

YAMANAKA Y
Hayama M
Oi T
Sakai Y
Satoh M

Institution

NORITAKE CO LTD,GRINDING LAB DEPT,NAGOYA,AICHI 451,JAPAN.

Abstrakt

A new evaluation method was established to easily and accurately evaluate the performance of **grinding** fluids by means of the block-on-ring testing machine and an electroplated CBN **wheel** as the first step toward the authors' final objective of developing new **grinding** fluids for cubic boron nitrite (CBN) **grinding wheels**. The **grinding** performance of various metalworking **additives** was evaluated as the second step using this method, in order to select various **additives** to be used for these new **grinding** fluids. The metalworking **additives** evaluated included three types of **additives**: oiliness agents, friction modifiers and extreme-pressure agents. A study was also done on the viscosities of base oils. As a result, it was found that the extreme-pressure agents provided the most impact on **grinding** performance. Further, an attempt was made to clarify the reasons for the outstanding properties of the extreme-pressure agents by the analysis of test specimen surfaces after the test.

Veröffentlichungsjahr

1997

Quelle

LUBRICATION ENGINEERING

Klassifikation

Engineering

Schlagworte des Autors

GRINDING FLUIDS
grinding
metalworking
additives

Thesaurusbegriffe

nicht belegt

Sprache

ENGLISH

Recherchedatum

12.03.2021

Dokument Nr.: 114

Titel

Einfluss des **Schleifoels** beim Tiefschleifen von Hartmetall. Influence of lubricating oil in cermet deep **grinding**.

Autor

BREVERN, P. VON

Institution

TU Hamburg-Harburg, DE

Abstrakt

In der vorliegenden Arbeit wurde das **Schleifverhalten** unterschiedlicher **Schleifscheiben** und Schmierstoffe, die fuer das Tiefschleifen von Hartmetall geeignet sind, untersucht. Getestet wurden die **Schleifoele** SE-Fluid 180, G 500, G 600, 190/29-3, sowie die nicht wassermischbaren **Kuehlschmierstoffe** Honilo 987 und 194/20 der Firma Castrol. Die Ergebnisse zeigten, dass zum Tiefschleifen von Hartmetall eine geringe Viskositaet des **Schleifoels** sowie der **Zusatz** von **Additiven** notwendig ist, um positive **Schleifergebnisse** zu erhalten. Wird der Anteil schmierender Fettstoffe und somit die Viskositaet des Schmiermittels zu hoch, so sinkt die Moeglichkeit des **Schleifoels** den Spanraum ausreichend zu fuellen und an der Kontaktzone zu wirken. Aus diesen Gruenden eignen sich die Schmieroele SE-Fluid 180 und G 500 nicht. Die besten Resultate zeigte das **Schleifoel** 190/29-3 durch seine geringe Viskositaet und den **Zusatz** von **Additiven**. Bei kunstharzgebundenen **Schleifscheiben** und einem Arbeitseingriff von 0,5 mm wurden die geringsten Schleifkraftkomponenten und das hoechste Zeitspanungsvolumen erzielt. Dieses Schleifoel weist auch bei metallisch gebundenen Schleifscheiben ausgezeichnete Ergebnisse vor, sofern das Zeitspanungsvolumen nicht zu gross wird. Bei hoeheren Zeitspanungsvolumina und mittlerer Koernung der Schleifscheibe empfiehlt sich der Einsatz eines Honoels, wie z.B. Honilo 987. Arbeitsei ngriffe bis zu 1 mm sind problemlos moeglich. Noch geringere Viskositaeten der Schmierstoffe verbessern die Kuehlwirkung, erhoehen aber den Verschleiss und verschlechtern die Oberflaeche. Der Einsatz feinkoernigerer Schleifscheiben bietet sich daher fuer diese Schmieroele an.

Veröffentlichungsjahr

1997

Quelle

Industrie Diamanten Rundschau * Band 31 (1997) Heft 3, Seite 284-290 (7 Seiten, 8 Bilder, 4 Quellen)

Klassifikation

3KEX Hartmetalle, Cermets
3LKB Spanende Bearbeitung, Zerspanen, Zerteilen
3MD Tribologie

Schlagworte des Autors

Tiefschleifen
Hartmetall
Schleifscheibe
Spanen (ohne Kontur)
Viskositaet
Additiv
Schmieroel
Kuehlschmierstoff
Zeitspanvolumen

Thesaurusbegriffe

Arbeitseingriff

Sprache

Deutsch

Recherchedatum

12.03.2021

Dokument Nr.: 115

Titel

Kuehlschmierung - Ein wesentlicher Faktor fuer wirtschaftliche **Schleifbearbeitung**.

Autor

LAUFER, J.

Institution

TU Berlin, DE

Abstrakt

Obwohl bereits erste Untersuchungen zum Trockenschleifen keramischer Werkstoffe vorliegen, erfolgt in der industriellen Praxis die Bearbeitung im allgemeinen unter Zufuehrung von **Kuehlschmiermitteln**. Die Eigenschaften der **Kuehlschmierstoffe**, die durch die Art, das Grundoel, die **Additivierung**, die Konzentration und den Zustand festgelegt werden, bestimmen wesentlich die Leistungsfaehigkeit der **Kuehlschmierung**. In Abhaengigkeit von Prozessmerkmalen - wie die Spanungstiefe und der Auftreffwinkel der Schneiden auf die momentane Werkstueckoberflaeche sowie von Merkmalen der Wirkpartner, wie ihre Duktilitaet, die Geometrie der Schneiden und der vorhandene Spanraum - wirken sich das unterschiedliche **Kuehl**- und Schmiervermoegen der einzelnen Medien unterschiedlich auf den Prozess und das Arbeitsergebnis aus. In Untersuchungen wurde ein stationaerer Verlauf des **Schleifprozesses** nachgewiesen, der durch eine verbesserte Schmierfaehigkeit des **Kuehlschmierstoffes** nicht wesentlich beeinflusst werden kann. Einen grossen Einfluss auf die Effektivitaet der Kuehlschmierung hat die topographische Gestalt der Schleifscheibe, die durch die Profilier- und Schaerfbedingungen festgelegt werden kann. Zum einen wird durch sie das Kuehlschmierstoff-Transportvermoegen des Werkzeuges bestimmt. Zum anderen bewirkt sie eine AEnderung der relevanten Verschleissmechanismen, die vom Kuehlschmierstoff unterstuetzt oder eingeschraenkt werden. Die Versorgung der Kontaktzone mit dem Kuehlschmierstoff wird ueber die Zufuehreinrichtung realisiert. Als Guetemass fuer die Versorgung kann dabei der Druck in der Kontaktzone gelten. Zur Reinigung der bei der Keramikbearbeitung eingesetzten Kuehlschmierstoffe stehen die Verfahren Flotieren, Filtrieren und Zentrifugieren zur Verfuegung.

Veröffentlichungsjahr

1997

Quelle

Wirtschaftliche Schleifverfahren - Stand und Entwicklungstendenzen in der Schleiftechnik, 1997 * Band 1 (1997) Seite 1-28 (28 Seiten, 7 Bilder, 1 Tabelle, 24 Quellen), Paper-Nr. 3

Klassifikation

3LKB Spanende Bearbeitung, Zerspanen, Zerteilen
3MD Tribologie

Schlagworte des Autors

Schleifen
Schleifdruck
Schleifmittel
Schleifscheibe
Kuehlschmierstoff
Verschleissschutzadditiv
Einstellen (Maschine)
Zufuehrung
Werkzeugverschleiss

Thesaurusbegriffe

nicht belegt

Sprache

Deutsch

Recherchedatum

12.03.2021

Dokument Nr.: 116

Titel

Minimalmengenkuehlschmierung und Trockenbearbeitung beim **Schleifen**. Minimum quantity lubrication and dry machining in **grinding**.

Autor

BRINKSMEIER, E.
BROCKHOFF, T.
WALTER, A.

Institution

Universitaet Bremen, DE

Abstrakt

In Pendelschleifversuchen mit konventionellen **Schleifwerkzeugen** (A 80 L 6 V und A 80 Q 4 B) wurden von gehaerteten (Einsatzstahl 16MnCr5, Werkstoff-Nr.: 1.7131) und ungehaerteten (Verguetingsstahl 42CrMo4, Werkstoff-Nr.: 1.7225) Proben die auftretenden Normalkraefte in Abhaengigkeit der Zustellung bzw. des bezogenen Zeitspanvolumens bei unterschiedlicher **Kuehlschmierstoffzufuhr** bestimmt. Hinsichtlich der Minimalmengenkuehlschmierung (MMKS) und der Trockenbearbeitung beim **Schleifen** wurden erste grundlegende Erkenntnisse gewonnen: Trockenschleifen des gehaerteten Einsatzstahles mit einer kunstharzgebundenen Korundschleifscheibe fuehrte auch bei kleinsten bezogenen Zeitspanvolumina zu thermischen Bauteilschaedigungen. Bei Einsatz der Minimalmengenkuehlschmierung unter gleichen Bedingungen wurden bei kleinen bezogenen Zeitspanvolumen gute Ergebnisse erzielt. Tendenziell ziegt sich, dass die MMKS besonders bei geringen Schnittgeschwindigkeiten zu besseren Oberflaechengueten fuehrte. MMKS mit Ester ermoeglicht bei der Bearbeitung ungerhaeteter Bauteile hoehere Oberflaechengueten und geringere Prozesskraefte als eine MMKS mit Emulsion. Die Spanformung beim Schleifen des gehaerteteen Einsatzstahles mit einer kunstharzgebundenen Scheibe unterscheidet sich signifikant von der Spanformung bei Bearbeitung des ungehaerteten Verguetungsstahls mit einer keramisch gebundenen Scheibe. Die rasterelektronenmikroskopischen Untersuchungen der Schleifspaene erlauben Rueckschluesse auf die Waermeverteilung im Schleifprozess.

Veröffentlichungsjahr

1997

Quelle

Haerterei-Technische Mitteilungen - HTM * Band 52 (1997) Heft 3, Seite 166-170 (5 Seiten, 11 Bilder, 2 Tabellen, 7 Quellen)

Klassifikation

3LKB Spanende Bearbeitung, Zerspanen, Zerteilen

Schlagworte des Autors

Kuehlschmierstoff
Schleifen
Kuehlung
Reinigungswirkung
Korrosionsschutz
Haerte
Oberflaechenhaerte
Schnittgeschwindigkeit
Vorschub
Vorschubgeschwindigkeit
Schleifscheibe
Flachschleifen
Emulsionsschmierung
Rautiefe
Span
Trockenbearbeitung
Chrom-Mangan-Stahl
Chrom-Molybdaen-Vanadium-Stahl
Minimalmengenkuehlschmierung

Thesaurusbegriffe

nicht belegt

Sprache

Deutsch

Recherchedatum

12.03.2021

Dokument Nr.: 117

Titel

Kuehlschmierstoffe fuer das Tiefschleifen. **Cooling** lubricants for infeed **grinding**.

Autor

BOOR, U.

Institution

nicht belegt

Abstrakt

Beim Tiefschleifen werden so hohe Abtragraten erzielt, dass man die gewuenschten Konturen haeufig in einem Arbeitsgang einbringen kann. Da bei diesem Verfahren sehr hohe Temperaturen in der Kontaktzone Werkstueck/**Schleifscheibe** auftreten, muessen geeignete **Kuehlmittel** eingesetzt werden. Es erfolgt dabei eine **Kuehlung** vor und hinter der **Schleifscheibe** mit hohem Druck. Beim Tiefschleifen mit Korund- und Diamantscheiben werden wasserloesliche **Kuehlmittel** eingesetzt, bei CBN-Schleifscheiben sowie beim **Schleifen** von Hochleistungskeramik mit Diamantscheiben (nichtwasserloesbare) **Schleifoele**. - Die Grundlagen des Tiefschleifens, Aufbau von **Kuehlschmierkreislaeufen** sowie Aufbau und Eigenschaften verschiedener **Kuehlschmierstoffe** mit Beruecksichtigung der technischen, wirtschaftlichen und umweltrelevanten Parameter werden ausfuehrlich dargestellt.

Veröffentlichungsjahr

1995

Quelle

VDI-Zeitschrift * Band 137 (1995) Heft 6, Seite 40-47 (8 Seiten, 5 Bilder, 1 Tabelle, 46 Quellen)

Klassifikation

3LKB Spanende Bearbeitung, Zerspanen, Zerteilen
3MD Tribologie

Schlagworte des Autors

Tiefschleifen
Kuehlschmierstoff
CBN-Schleifscheibe
Schleifmaschine
Kuehlsystem
Flammpunkt
Preis (Handelswert)
Rapsoel
Verdampfung
Toxizitaet
Additiv
Viskositaet
Filtration
Umweltvertraeglichkeit
Waermefluss
Keramik
Diamantschleifscheibe
Schmiermittel
Kuehlung
Schleifscheibe
Diamant
Schleifoel

Thesaurusbegriffe

Kontaktzonentemperatur

Sprache

Deutsch

Recherchedatum

12.03.2021

Dokument Nr.: 118

Titel

Potentiale der **Kuehlschmierung** beim **Schleifen** mit hochharten **Schleifstoffen**.

Autor

HEUER, W.

Institution

nicht belegt

Abstrakt

Neben der **Kuehlung** und Schmierung hat der **Kuehlschmierstoff** beim **Schleifen** die Aufgabe, die **Schleifscheibenoberflaeche** von Spanresten zu reinigen und die Spaene aus der Wirkzone zu entfernen. Das **Kuehlschmiersystem** muss demnach an die Anforderungen des **Schleifstoffs** und die **Schleifaufgabe** angepasst werden. Beim **Schleifen** gehaerteter Stahlwerkstoffe mit keramisch gebundenen CBN-Schleifscheiben stellt der **abrasive** Verschleiss der **Schleifscheibenbindung** die haeufigste Verschleissform dar. Dieser Verschleiss kann mit **Schleifoel** anstelle wassermischbarer **Kuehlschmierstoffe** wirksam unterdrueckt werden. Nachteilig ist dabei die verlaengerte Einschleifphase der **Schleifscheibe**. Eine **Additivierung** von **Schleifoelen** ist nur begrenzt sinnvoll. Nur **Additive**, die bei den Zerspanungstemperaturen von einigen hundert Cel wirksam sind und die Viskositaet des Grundoels nicht wesentlich erhoehen, koennen im Prozess zu Verschleisssenkungen fuehren. Beim **Schleifen** keramischer Werkstoffe mit Diamantschleifscheiben ist OEl ebenfalls anderen Kuehlschmierstoffen im Prozessverhalten ueberlegen. Beim Schleifen von Aluminiumoxidkeramik konnte mit OEl gegenueber Emulsion eine starke Verschleissreduzierung an der Schleifscheibe erzielt werden. Dadurch ergab sich ein gleichmaessiger Materialabtrag mit einem hohen Anteil plastischer Verformungen der Werkstueckrandzone. Diese Ergebnisse lassen sich nicht ohne Ausnahme auf andere Schleifverfahren oder Werkzeug/Werkstoffkombinationen uebertragen.

Veröffentlichungsjahr

1991

Quelle

Kuehlschmierstoffe in der spanenden Fertigung, Deutsches Industrieforum fuer Technologie * (1991) Seite 1-26 (26 Seiten, 19 Bilder, 15 Quellen), Paper-Nr. 10

Klassifikation

3MD Tribologie
3LKB Spanende Bearbeitung, Zerspanen, Zerteilen

Schlagworte des Autors

KUEHLSCHMIERSTOFF
SCHMIEROEL
VERSCHLEISS
SCHLEIFSCHEIBE
SCHLEIFEN
CBN (KUBISCH KRISTALLINES BORNITRID)
RANDSCHICHT
ADDITIV
EIGENSPANNUNG
KERAMIK
HARTSTOFF

Thesaurusbegriffe

nicht belegt

Sprache

Deutsch

Recherchedatum

12.03.2021

Dokument Nr.: 119

Titel

Tough stuff. CBN grinds hard materials faster with minimal wear - it is truly a super-abrasive. CBN **schleift** harte Werkstoffe schneller bei niedrigem Schneidstoffverschleiss.

Autor

SCHREIBER, R.R.

Institution

nicht belegt

Abstrakt

CBN-Schneidstoffe zeichnen sich durch grosse Haerte, Abriebfestigkeit, Druckfestigkeit sowie gute thermische Leitfaehigkeit aus. Der Beitrag **diskutiert** den CBN-Einsatz beim **Schleifen** bezueglich des Abrichtens des **Schleifkoerpers**, der **Schleiffluide**, der **Schleifgeschwindigkeit**, der thermischen Wechselwirkungen zwischen Schneidstoff und Werkstueck und der statischen und dynamischen Maschinenbelastungen beim Hochgeschwindigkeitschleifen. In Abhaengigkeit des **Schleifmittels** und dessen chemischer Bindung liegen die **Schleifgeschwindigkeiten** zwischen 125 m/s (gesintert) und 300 m/s (metallische Verbindung). Als **Kuehlschmierstoffe** eignen sich Bohr- und Schneidoele mit EP-Additiven aufgrund ihrer guten hydrodynamischen Schmierungseigenschaften. Die Arbeitsergebnisse sind abhaengig vom **Schleifscheibenzustand** und der Maschinenkonstruktion in Bezug auf Maschinensteifigkeit, Abrichtvorrichtungen sowie CNC-Steuerungen. (Oster)

Veröffentlichungsjahr

1991

Quelle

Manufacturing Engineering * Band 106 (1991) Heft 2, Seite 51-55 (5 Seiten, 5 Bilder)

Klassifikation

3LKB Spanende Bearbeitung, Zerspanen, Zerteilen
3KGG Keramik, Glaskeramik, Feuerfest-Werkstoffe

Schlagworte des Autors

CBN (KUBISCH KRISTALLINES BORNITRID)
SCHLEIFEN
HOCHGESCHWINDIGKEITSSCHLEIFEN
KUEHLSCHMIERSTOFF
SCHLEIFGESCHWINDIGKEIT
SCHLEIFSCHEIBE
ABRICHTEN
OBERFLAECHENGUETE
STEIFIGKEIT
VERSCHLEISS
MATERIALABTRAGUNG
DYNAMISCHE BELASTUNG
STATISCHE BELASTUNG
BORNITRID
KUBISCHES KRISTALLSYSTEM
ZAEHFESTIGKEIT

Thesaurusbegriffe

nicht belegt

Sprache

Englisch

Recherchedatum

12.03.2021

Dokument Nr.: 120

Titel

Kuehlschmierstoffe. Hilfsstoffe zum **Schleifen** von Hartmetall. **Cooling** lubricants. Accessory agents for **grinding** of carbides.

Autor

KOCHER, H.

Institution

nicht belegt

Abstrakt

Mit dem immer groesseren Einsatz der Hartmetalle werden an die **Kuehlschmierstoffe** fuer das Hartmetallschleifen erhoehte Forderungen gestellt. Insbesondere die Aufnahme von Kobalt-Ionen durch die **Kuehlschmierstoff-Loesungen** bringt arbeitstechnische und arbeitsmedizinische Probleme. Um das Auftreten von hohen Temperaturen beim **Schleifen** von Hartmetall zu vermeiden, bieten sich prinzipiell zwei Moeglichkeiten an: die Verwendung nichtwassermischbarer **Kuehlschmierstoffe** (haeufig mit EP-Zusaetzen), die durch gute Schmiereigenschaften fuer geringe Reibung und somit fuer eine schwaechere Waermetoenung sorgen, Einsatz waessriger **Kuehlschmieremulsionen** bzw. -loesungen, die aufgrund ihrer physikalischen Eigenschaften die Waerme besser abfuehren als nichtwaessrige **Kuehlschmieremulsionen**. Weitere Anforderungen an die beim **Schleifen** verwendeten **Kuehlschmierstoffe**. Zusammensetzung der fuer das **Schleifen** verwendeten Hartmetalle und **Schleifscheiben**. Aufstellung von Richtlinien fuer das Hartmetallschleifen. Mit den Produkten KOCHER KR 74 und 74-l stehen seit einiger Zeit zwei wassermischbare mineraloelfreie Kuehlschmierstoffe zum Hartmetallschleifen zur Verfuegung, die das Verfaerbungen verhindern. Untersuchungen an entsprechenden Gebrauchsloesungen zeigten, dass bei Einhaltung der vom Hersteller angegebenen Kuehlschmierstoff-Konzentrationen Co-Ionen nicht nachgewiesen werden konnten.

Veröffentlichungsjahr

1990

Quelle

Werkstattstechnik * Band 80 (1990) Heft 5, Seite 243-244 (2 Seiten, 1 Bild, 2 Tabellen)

Klassifikation

3LKB Spanende Bearbeitung, Zerspanen, Zerteilen
3IFM Messung/Pruefung mechanischer/geometrischer Groessen, der Masse und Dichte

Schlagworte des Autors

GESUNDHEITSRISIKO
COBALT
KONZENTRATIONSMESSUNG
EMULSION
ZUSATZSTOFF
SCHLEIFEN
HARTMETALL
SCHNEIDFLUESSIGKEIT
PHYSIKALISCHE EIGENSCHAFT
ARBEITSMEDIZIN
REIBUNG
TEMPERATUR
SCHLEIFSCHEIBE
RICHTLINIE

Thesaurusbegriffe

nicht belegt

Sprache

Deutsch

Recherchedatum

12.03.2021

Dokument Nr.: 121

Titel

Technologische Aspekte der **Kuehlschmierung** beim **Schleifen**.

Autor

VITS, R.

Institution

RWTH Aachen, DE

Abstrakt

Es wurde ein Pruefgeraet entwickelt, das es ermoeglicht, die Wirkung von **Kuehlschmierstoffen** kuenftig mit reduziertem Aufwand zu testen. Es sollte vor allem geklaert werden, welche Bedeutung dem Luftpolster sowie der **Kuehlschmierstoffeindringung** in das **Schleifscheibengefuege** bei der Ermittlung der Zufuehreinfluesse auf die thermische Schaedigung des Werkstoffgefueges beizumessen ist. Untersucht wurde u.a. die Wirkung des **Kuehlschmierstoffs** beim Eingriff einer Einzelschneide. Hier steigt mit zunehmender Schmierwirkung der **Kuehlschmierfilmfluessigkeit** die Schnitteinsatztiefe. Bei hohen Zerspanleistungen erbringen Oele auch im Hinblick auf den Verschleiss der **Schleifscheibe** sowie die erzeugten Oberflaechen erhebliche Vorteile im Vergleich zu Emulsionen und Loesungen. Auf den Einfluss der EP-Additive wird eingegangen. Untersucht wurden auch die in der Kontaktzone auftretenden **Schleiftemperaturen**. Wesentlich ist hier die Art und Weise der **Kuehlschmierstoffzufuehrung**. Die Wirkung des Luftpolsters wird meist ueberschaetzt, denn zu seiner Verdraengung reichen bereits sehr geringe Kuehlschmierstoffzufluesse aus.

Veröffentlichungsjahr

1985

Quelle

(1985) Heft Aug, Seite 1-167 (167 Seiten, 66 Bilder, 3 Tabellen, 138 Quellen)

Klassifikation

3LKB Spanende Bearbeitung, Zerspanen, Zerteilen
3EIK Kaeltetechnik

Schlagworte des Autors

KUEHLSCHMIERSTOFF
SCHLEIFEN
SCHNEIDENGEOMETRIE
WASSER
TECHNOLOGISCHE MATERIALEIGENSCHAFT
VERSCHLEISS
ZERSPANKRAFT
RAUHEIT
OEL
PRUEFUNG
ZUFUEHRUNG
WAERMEEINWIRKUNG
OBERFLAECHENSCHADEN
SCHLEIFSCHEIBE
WERKSTOFFGEFUEGE
SCHMIERUNG
SPANEN (MIT KONTUR)
ADDITIV
EP-ZUSATZ
EMULSION

Thesaurusbegriffe

nicht belegt

Sprache

Deutsch

Recherchedatum

12.03.2021

Dokument Nr.: 122

Titel

Lubrication with **cutting** and **grinding** emulsions. Schmierung mit Schneid- und **Schleifemulsionen**.

Autor

MITTAL, R.N.
PORTER, T.M.
ROWE, G.W.

Institution

University of Birmingham, GB

Abstrakt

In Laborversuchen wurde die Leistungsfaehigkeit von Schmieroelen und von Emulsionen miteinander verglichen. Ermittelt wurde im Vierkugelapparat die Schweisslast, die Belastungskurven, die Fresslast, der Reibbeiwert und die Groesse der Verschleissriefen. Die **Schleifversuche** wurden auf einer Zylinderschleifmaschine vorgenommen. Hierbei wurde die **Schleifkraft**, der **Schleifscheibenverschleiss** in Form des **Schleifverhaeltnisses** und die Oberflaechenrauheit gemessen. Auch die Art der Emulsion und der **Additive** werden angegeben. Die reinen Mineraloele mit **Zusaetzen** arbeiten wesentlich guenstiger. Bei einem Vergleich wurden nur zwischen den tangentiellen **Schleifkraeften** und dem Reibbeiwerten der beiden Gruppen Beziehungen gefunden. Das **Schleifverhaeltnis** ist beim Oel wesentlich hoeher als bei den Emulsionen. Die Gruende sollen im Material der **Scheiben** liegen. (Jensen)

Veröffentlichungsjahr

1984

Quelle

Lubrication Engineering * Band 40 (1984) Heft 3, Seite 160-165 (6 Seiten, 2 Bilder, 5 Tabellen, 5 Quellen)

Klassifikation

3LKB Spanende Bearbeitung, Zerspanen, Zerteilen
3MD Tribologie

Schlagworte des Autors

SCHLEIFEN
SCHLEIFDRUCK
REIBBEIWERT
VERSCHLEISS
SCHMIERSTOFF
EMULSION
ADDITIV
SCHLEIFSCHEIBE
SCHMIEROEL
LABORATORIUMSVERSUCH
PRUEFGERAET
EMULSIONSSCHMIERUNG
CHEMISCHE ZUSAMMENSETZUNG
SCHLEIFMASCHINE
VIERKUGELGERAET
BETRIEBSLEISTUNG

Thesaurusbegriffe

nicht belegt

Sprache

Englisch

Recherchedatum

12.03.2021

Dokument Nr.: 123

Titel

EFFECT OF GRINDING FLUID ADDITIVES ON DIAMOND ABRASIVE WHEEL EFFICIENCY

Autor

NEE AYC

Institution

nicht belegt

Abstrakt

When grinding high speed tool steel, the wear mechanism of a diamond abrasive grinding wheel can be attributed to the combined actions of carbon diffusion and mechanical abrasion due to the presence of extremely hard carbide particles.
Additionally, it is known that the wheel efficiency is particularly low if the high speed tool steel is deficient in carbon content.
The present investigation looks into a few types of commercially available grinding fluids and the introduction of certain types of elements which may enhance wheel performance. Solid lubrication technique was also briefly examined.
It was found that by introducing colloidal graphite into the grinding fluid, wheel efficiency was improved in terms of higher G-ratios. This observation was attributed to the reduced carbon diffusion between the workpiece and diamond abrasive grits.

Veröffentlichungsjahr

1979

Quelle

INTERNATIONAL JOURNAL OF MACHINE TOOLS & MANUFACTURE

Klassifikation

Engineering

Schlagworte des Autors

nicht belegt

Thesaurusbegriffe

nicht belegt

Sprache

ENGLISH

Recherchedatum

12.03.2021

Dokument Nr.: 124

Titel

The effect of **grinding** fluid **additives** on diamond **abrasive wheel** efficiency. Der Effekt von **Zusaetzen** zur **Schleiffluessigkeit** auf die Leistung einer Diamant-Schmirgelscheibe.

Autor

NEE, A.

Institution

National University of Singapore, SG

Abstrakt

Unterschiedliche **Scheiben-Werkstueck-Kombinationen** haben i.a. ganz verschiedene Auswirkungen auf die Abnutzung der **Scheibe** und auf die erzeugte Oberflaechenrauhigkeit. Die Ergebnisse frueherer Untersuchungen werden besprochen. Die meisten der handelsueblichen Schneidfluessigkeiten enthalten Mehrzweckzusaetze fuer vielfache Arbeitsbedingungen. Zur optimalen Ausnutzung der **Scheibe** in bezug auf die chemischen, thermischen und schmiertechnischen Gesichtspunkte sollten die **Zusaetze** jedoch dem jeweiligen Zweck angepasst werden. Beschrieben werden Versuche mit fuenf Basis-Schleiffluessigkeiten und verschiedenen **Zusaetzen** an verschiedenen Werkstuecken aus unterschiedlichen Werkstoffen, deren Ergebnisse besprochen werden. (Ewert)

Veröffentlichungsjahr

1979

Quelle

International Journal of Machine Tool Design and Research * Band 19 (1979) Heft 1, Seite 21-31 (11 Seiten, 10 Bilder, 1 Tabelle, 23 Quellen)

Klassifikation

3LKB Spanende Bearbeitung, Zerspanen, Zerteilen

Schlagworte des Autors

LEISTUNGSBILANZ (MASCHINE)
SCHLEIFSCHEIBE
RAUIGKEIT
WERKSTUECK
DIAMANT
SCHLEIFEN
ARBEITSBEDINGUNG
VERSCHLEISS
KUEHLSCHMIERSTOFF
WERKSTOFF
SCHLEIFFLUESSIGKEIT

Thesaurusbegriffe

VIELFACHTUBE
AUSNUTZUNG
CHEMISCH
KOMBINATION
THERMISCH
SCHEIBE
BASIS

Sprache

Englisch

Recherchedatum

12.03.2021

Dokument Nr.: 125