

### Chapter 1 : LUMENPULSE LUMENSTUDIO USER MANUAL Pdf Download.

*Long-pulse energy extraction For a given laser amplifier chain, it is possible in theory to generate any desired output temporal pulse shape by correctly tailoring the input pulse shape, taking into account the effects of energy extraction.*

Anyone considering prescribing Clonazepam or any other AED must balance the risk of suicidal thoughts or behavior with the risk of untreated illness. Epilepsy and many other illnesses for which AEDs are prescribed are themselves associated with morbidity and mortality and an increased risk of suicidal thoughts and behavior. Should suicidal thoughts and behavior emerge during treatment, the prescriber needs to consider whether the emergence of these symptoms in any given patient may be related to the illness being treated. Patients, their caregivers, and families should be informed that AEDs increase the risk of suicidal thoughts and behavior and should be advised of the need to be alert for the emergence or worsening of the signs and symptoms of depression, any unusual changes in mood or behavior, or the emergence of suicidal thoughts, behavior, or thoughts about self-harm. Behaviors of concern should be reported immediately to healthcare providers. Data from several sources raise concerns about the use of Clonazepam during pregnancy. In three studies in which Clonazepam was administered orally to pregnant rabbits at doses of 0. General Concerns and Considerations About Anticonvulsants: Recent reports suggest an association between the use of anticonvulsant drugs by women with epilepsy and an elevated incidence of birth defects in children born to these women. Data are more extensive with respect to diphenylhydantoin and phenobarbital, but these are also the most commonly prescribed anticonvulsants; less systematic or anecdotal reports suggest a possible similar association with the use of all known anticonvulsant drugs. In children of women treated with drugs for epilepsy, reports suggesting an elevated incidence of birth defects cannot be regarded as adequate to prove a definite cause and effect relationship. There are intrinsic methodologic problems in obtaining adequate data on drug teratogenicity in humans; the possibility also exists that other factors e. The great majority of mothers on anticonvulsant medication deliver normal infants. It is important to note that anticonvulsant drugs should not be discontinued in patients in whom the drug is administered to prevent seizures because of the strong possibility of precipitating status epilepticus with attendant hypoxia and threat to life. In individual cases where the severity and frequency of the seizure disorder are such that the removal of medication does not pose a serious threat to the patient, discontinuation of the drug may be considered prior to and during pregnancy; however, it cannot be said with any confidence that even mild seizures do not pose some hazards to the developing embryo or fetus. General Concerns About Benzodiazepines: An increased risk of congenital malformations associated with the use of benzodiazepine drugs has been suggested in several studies. There may also be non-teratogenic risks associated with the use of benzodiazepines during pregnancy. There have been reports of neonatal flaccidity, respiratory and feeding difficulties, and hypothermia in children born to mothers who have been receiving benzodiazepines late in pregnancy. In addition, children born to mothers receiving benzodiazepines late in pregnancy may be at some risk of experiencing withdrawal symptoms during the postnatal period. In general, the use of Clonazepam in women of childbearing potential, and more specifically during known pregnancy, should be considered only when the clinical situation warrants the risk to the fetus. The specific considerations addressed above regarding the use of anticonvulsants for epilepsy in women of childbearing potential should be weighed in treating or counseling these women. Because of experience with other members of the benzodiazepine class, Clonazepam is assumed to be capable of causing an increased risk of congenital abnormalities when administered to a pregnant woman during the first trimester. Because use of these drugs is rarely a matter of urgency in the treatment of panic disorder, their use during the first trimester should almost always be avoided. The possibility that a woman of childbearing potential may be pregnant at the time of institution of therapy should be considered. If this drug is used during pregnancy, or if the patient becomes pregnant while taking this drug, the patient should be apprised of the potential hazard to the fetus. Patients should also be advised that if they become pregnant during therapy or intend to become pregnant, they should communicate with their physician about the desirability of discontinuing the drug. When used in patients in whom several different types of seizure disorders coexist,

Clonazepam may increase the incidence or precipitate the onset of generalized tonic-clonic seizures grand mal. This may require the addition of appropriate anticonvulsants or an increase in their dosages. The concomitant use of valproic acid and Clonazepam may produce absence status. Periodic blood counts and liver function tests are advisable during long-term therapy with Clonazepam. Risks of Abrupt Withdrawal: The abrupt withdrawal of Clonazepam, particularly in those patients on long-term, high-dose therapy, may precipitate status epilepticus. Therefore, when discontinuing Clonazepam, gradual withdrawal is essential. While Clonazepam is being gradually withdrawn, the simultaneous substitution of another anticonvulsant may be indicated. Caution in Renally Impaired Patients: Metabolites of Clonazepam are excreted by the kidneys; to avoid their excess accumulation, caution should be exercised in the administration of the drug to patients with impaired renal function. Clonazepam may produce an increase in salivation. This should be considered before giving the drug to patients who have difficulty handling secretions. Clonazepam should be used with caution in patients with compromised respiratory function. Clonazepam may have a porphyrogenic effect and should be used with care in patients with porphyria. A Clonazepam Tablets Medication Guide must be given to the patient each time Clonazepam is dispensed, as required by law. Patients should be instructed to take Clonazepam only as prescribed. Physicians are advised to discuss the following issues with patients for whom they prescribe Clonazepam: To assure the safe and effective use of benzodiazepines, patients should be informed that, since benzodiazepines may produce psychological and physical dependence, it is advisable that they consult with their physician before either increasing the dose or abruptly discontinuing this drug. Interference With Cognitive and Motor Performance: Because benzodiazepines have the potential to impair judgment, thinking or motor skills, patients should be cautioned about operating hazardous machinery, including automobiles, until they are reasonably certain that Clonazepam therapy does not affect them adversely. Suicidal Thinking and Behavior: Patients, their caregivers, and families should be counseled that AEDs, including Clonazepam, may increase the risk of suicidal thoughts and behavior and should be advised of the need to be alert for the emergence or worsening of symptoms of depression, any unusual changes in mood or behavior, or the emergence of suicidal thoughts, behavior, or thoughts about self-harm. This registry is collecting information about the safety of antiepileptic drugs during pregnancy. Patients should be advised not to breastfeed an infant if they are taking Clonazepam. Patients should be advised to inform their physicians if they are taking, or plan to take, any prescription or over-the-counter drugs, since there is a potential for interactions. Patients should be advised to avoid alcohol while taking Clonazepam. Effect of Clonazepam on the Pharmacokinetics of Other Drugs: Clonazepam does not appear to alter the pharmacokinetics of phenytoin, carbamazepine or phenobarbital. The effect of Clonazepam on the metabolism of other drugs has not been investigated. Effect of Other Drugs on the Pharmacokinetics of Clonazepam: Literature reports suggest that ranitidine, an agent that decreases stomach acidity, does not greatly alter Clonazepam pharmacokinetics. Fluoxetine does not affect the pharmacokinetics of Clonazepam. Although clinical studies have not been performed, based on the involvement of the cytochrome P 3A family in Clonazepam metabolism, inhibitors of this enzyme system, notably oral antifungal agents, should be used cautiously in patients receiving Clonazepam. The CNS-depressant action of the benzodiazepine class of drugs may be potentiated by alcohol, narcotics, barbiturates, nonbarbiturate hypnotics, antianxiety agents, the phenothiazines, thioxanthene and butyrophenone classes of antipsychotic agents, monoamine oxidase inhibitors and the tricyclic antidepressants, and by other anticonvulsant drugs. Carcinogenesis, Mutagenesis, Impairment of Fertility: Carcinogenicity studies have not been conducted with Clonazepam. The data currently available are not sufficient to determine the genotoxic potential of Clonazepam. To provide information regarding the effects of in utero exposure to Clonazepam, physicians are advised to recommend that pregnant patients taking Clonazepam enroll in the NAAED Pregnancy Registry. This can be done by calling the toll free number , and must be done by patients themselves. Information on this registry can also be found at the website <http://> The effect of Clonazepam on labor and delivery in humans has not been specifically studied; however, perinatal complications have been reported in children born to mothers who have been receiving benzodiazepines late in pregnancy, including findings suggestive of either excess benzodiazepine exposure or of withdrawal phenomena see WARNINGS: Mothers receiving Clonazepam should not breastfeed their infants. Safety and

effectiveness in pediatric patients with panic disorder below the age of 18 have not been established. Clinical studies of Clonazepam did not include sufficient numbers of subjects aged 65 and over to determine whether they respond differently from younger subjects. Other reported clinical experience has not identified differences in responses between the elderly and younger patients. In general, dose selection for an elderly patient should be cautious, usually starting at the low end of the dosing range, reflecting the greater frequency of decreased hepatic, renal, or cardiac function, and of concomitant disease or other drug therapy. Because Clonazepam undergoes hepatic metabolism, it is possible that liver disease will impair Clonazepam elimination. Sedating drugs may cause confusion and over-sedation in the elderly; elderly patients generally should be started on low doses of Clonazepam and observed closely.

**Adverse Reactions** The adverse experiences for Clonazepam are provided separately for patients with seizure disorders and with panic disorder. The most frequently occurring side effects of Clonazepam are referable to CNS depression. Others, listed by system, including those identified during postapproval use of Clonazepam are:

**Hair loss, hirsutism, skin rash, ankle and facial edema**

**Gastrointestinal:** Anorexia, coated tongue, constipation, diarrhea, dry mouth, encopresis, gastritis, increased appetite, nausea, sore gums

**Genitourinary:** Dysuria, enuresis, nocturia, urinary retention

**Hematopoietic:** Anemia, leukopenia, thrombocytopenia, eosinophilia

**Hepatic:** Hepatomegaly, transient elevations of serum transaminases and alkaline phosphatase

**Musculoskeletal:** Muscle weakness, pains

**Miscellaneous:** Dehydration, general deterioration, fever, lymphadenopathy, weight loss or gain

**Neurologic:** Abnormal eye movements, aphonia, choreiform movements, coma, diplopia, dysarthria, dysdiadochokinesis, "glassy-eyed" appearance, headache, hemiparesis, hypotonia, nystagmus, respiratory depression, slurred speech, tremor, vertigo

**Psychiatric:** Confusion, depression, amnesia, hallucinations, hysteria, increased libido, insomnia, psychosis the behavior effects are more likely to occur in patients with a history of psychiatric disturbances. The following paradoxical reactions have been observed: Chest congestion, rhinorrhea, shortness of breath, hypersecretion in upper respiratory passages

**Panic Disorder:** Adverse events during exposure to Clonazepam were obtained by spontaneous report and recorded by clinical investigators using terminology of their own choosing. Consequently, it is not possible to provide a meaningful estimate of the proportion of individuals experiencing adverse events without first grouping similar types of events into a smaller number of standardized event categories. In the tables and tabulations that follow, CIGY dictionary terminology has been used to classify reported adverse events, except in certain cases in which redundant terms were collapsed into more meaningful terms, as noted below. The stated frequencies of adverse events represent the proportion of individuals who experienced, at least once, a treatment-emergent adverse event of the type listed. An event was considered treatment-emergent if it occurred for the first time or worsened while receiving therapy following baseline evaluation.

**Chapter 2 : Clonazepam - FDA prescribing information, side effects and uses**

*Pulse Duration Effects during NMES MUSCLE & NERVE April the MVCs and before the stimulation. A maximum of 5 test trains were used for each pulse duration.*

Box , Heraklion, Crete, Greece Received 15 September ; Revised 13 December ; Accepted 13 December Recommended by Wolfgang Kautek The feasibility of laser cleaning for the removal of a variety of surface deposits from fragments of real wall paintings from the monumental cemetery of Pisa using Nd: Multianalytical investigations of the samples from irradiated surfaces of fragments were carried out in order to characterize the original and added materials and to detect any laser-induced alterations; analysis included scanning electron microscopy SEM , Fourier transform infrared spectroscopy FTIR , laser-induced breakdown spectroscopy LIBS , pyrolysis-gas chromatography-mass spectrometry PY-GC- MS , and gas chromatography-mass spectrometry GC-MS. The presence of nitrocellulose and pure lead contaminations on the surface of the samples has been identified. Assessment of the laser cleaning has highlighted the importance of the optimization of laser parameters, specifically pulse duration and fluence at the specified wavelength. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

**INTRODUCTION** investigations of the photothermal reactions on polymer-based materials have been studied in a variety of model systems The use of lasers to selectively remove unwanted materials [9, 10] and on varnishes [11]. However, cleaning using ultra-short laser pulses is com- a variety of materials have been reported and include stone, plicated and not yet well defined [12] and such sources are of varnished icons and paintings, metals, and paper [2, 3]. Most impor- investigated various laser wavelengths Er: The aim of this work is to assess the feasibility of cal modifications, or otherwise compromise the integrity of the use of laser cleaning for the removal of surface deposits the original material. Laser-induced pigment alterations have from fragments of real wall paintings from the monumental been indicated as problematic in various studies of the clean- cemetery of Pisa using Nd: In addition, in- renaissance, is considered one of the finest Italian wall 2 Laser Chemistry 1 cm 1 cm a b Figure 1: Images under visible radiation of a fragment 1 and b fragment 2. The exterior under the microscope and samples were taken and prepared wall paintings were exposed to inevitable fluctuations in in cross-section for examination using optical and scanning temperature and humidity; their condition is further compli- electron microscopy. Second World War damage led to fire, which caused further con- 3. Samples tamination of the surface of the paintings with ash, soot, and molten lead from the roof. The fragments which are patterns of surface dirt. The fragments choosen for the laser painted over a red background come from decorative sec- cleaning investigations were systematically studied for a thor- tions of the painting and contain a floral motif and creeping ough characterization of the contaminant and original paint vine leaf, as shown in Figure 1. Laser instrumentation on the substrate, organic material was analyzed six months after laser irradiation tests. The fundamental frequency at nm of the following Nd: YAG laser systems at various pulse durations has been 2. The precious fragments of the wall paintings from the mon- En. Further, samples were prepared in cross-section pulses up to mJ and ps duration. Microdestructive analysis was carried ns, and ps. Pyrolysis-silylation gas energy density values as well as a variable number of pulses. The application of organic material before the laser treatment; following laser water as a wetting agent has also been considered. Selected cleaning, the ablated material was analyzed to assess possi- tests are reported in Table 1. Finally, and fragment 2. Cross-section from fragment 2. YAG laser pulse dura- over it a very thin white layer is present. Below the red paint, tion ca. The gating pulse applied paintings. The SEM-EDX analysis of the shiny metal spot, to the intensifier was delayed  $\hat{\epsilon}$  ns with respect to the particularly apparent in the back scattered electron image is laser pulse and has a temporal width of  $\hat{\epsilon}$  ns [17, 18]; reported in Figure 3 together with the LIBS spectrum. Moreover, LIBS provided elemental confirmation of red and 4. Characterization of the materials ment. As a further example of the characterization of the inor- The diagnosis of the constituents of works of art is of primary ganic materials found in the fragments, in Figure 5 the SEM-importance before starting the laser cleaning; the fragments EDX analysis of the thick grey crust found on top

of the of the wall painting were covered with surface deposits and red-ochre layer is given: A careful investigation of 4. Organic material the inorganic materials was performed by cross-section analysis of the fragments under the microscope, SEM-EDX, and The thin white layer observed as an opaque layer over the LIBS analysis, while the characterization of the organic material and their degradation products was carried out using widespread on the surface of fragment 1, but also material and their degradation products was carried out using widespread on the surface of fragment 1, was further identified- FT-IR, PY-GC-MS, and GC-MS. A comparison of the spectrum with that of the naturally aged reference 4. Inorganic material material nitrocellulose, seen in Figure 6, indicates strong similarities between the compounds. The semitransparent A representative cross-section is shown in Figure 2. The composite adhesive nitrocellulose was likely applied to the painting in complexity is evident, a deposit of a metal is visible on the surface conservation treatments dating to Fragment 2, SEM-EDX of the crystal of calcium sulphate outlined in red in the electron image corresponding to the area indicated in white on the cross-section analysis of the superficial crust. However these products have been found only in trace Transmittance a. The main problem Nitrocellulose reference related to the laser cleaning of these wall paintings is not only their compromised condition and the complexity of Figure 6: Fragment 2, FT-IR spectra of the white patina. In fact, the most specific pyrolysis product of cellulose thick encrustation, and metallic lead is particularly problematic is levoglucosane, the anhydro-sugar of glucose. More- atic since all materials are well attached to the upper pigment over, the PY-GC-MS investigation of the binding media of layers, and are widely distributed on the surface of both fragments- the wall painting has indicated the presence of pyrrole, a specific- ments. Laser parameters employed of the percentage of amino acids of the proteinaceous fractions in the cleaning tests on fragments 1 and 2 are reported in tions collected from fragments 1 and 2 see Figure 8. More- Table 1, together with brief observations of the laser cleaning over, the study of the lipidic fractions shows the presence of results after evaluation under the binocular microscope. D Ion D Abundance Abundance Pyrrole Fragment 1, pyrogram of the superficial crust. However, an optimal removal test 2. A spot test 0. Following ablation, the 2 surface film becomes detached and lifts from the surface of the fragment without removing any pigment particles, and Figure 8: PCA of the amino acids percentage content of the proteinaceous fraction of samples from fragments 1 and 2. Additionally, with the ps laser, the superficial patina has been completely removed as confirmed by the PY-GC-MS analysis of a 4. Removal of the white surface patina sample from fragment 2 taken of the area following cleaning, in which no traces of the surrounding nitrocellulose were The thin white patina appears to have been successfully re- found. The especially sensitive technique hence confirms the moved from fragment 1 with all the laser systems, as visible complete removal of the surface coating from the sample. Laser parameters adopted in the cleaning tests on fragments 1 and 2 and laser cleaning results the abbreviations outside of the parentheses indicate the following: Within parentheses, the area treated with the laser is given and corresponds to C: YAG laser 4 Figure 9 b 0. YAG laser ps 7 Figure 9 c 0. However, in spot number 1 1. With the ps laser, instead, removal of lead the molten lead from the roof likely caused pigment alteration- was quite satisfactory see Figure 11 c , 0. The predominant pulse at higher fluences. Therefore 3 pulses, see Table 1 for more detailed laser parameters. In clearly altered Figure 12 c. The best results were obtained with the laser of of Pisa were determined. Wetting of the ation in condition, state of conservation, thickness, and type surface with aqueous solutions before applying the radiation of contaminant and restoration materials, it is impossible to was found to enhance the cleaning. In addition, the novel application- specify optimal conditions for laser cleaning of the entire application of ultrashort pulses of ps duration to the cleaning of fragments. In fact, tests illustrate the necessity to optimize wall paintings was considered with very encouraging results, 10 Laser Chemistry 5 6 7 3 mm Figure Zafiropp- to the substrate, with fluences lower than 0. Finally, mi- of Artworks, pp. Georgiou, and cleaning of wall paintings. Materials Science and Processing, vol. This work was performed at the Ultraviolet Laser Facility [10] G. The third author is supported with a fellowship vol. The authors fully acknowledge- Laser Cleaning, B. Cooper, Laser Cleaning in Conservation: An Introduction, [14] M.

**Chapter 3 : Effects of Pulse Duration and Current on EDM Process of Allegheny Ludlum D2 Tool Steel**

*The normalized threshold vs duration curves display almost identical trends for a fold range of frequencies (from to kHz). The thresholds at 2 ms pulse duration are approximately 24% higher than at long pulse durations, and they settle to within 4% of their asymptotic values for durations longer than 20 ms.*

References [1] Snoyes, R. Effect of sic and rotation of electrode on electric discharge machining of Al-sic composite. Journal of Materials Processing Technology, 3 , A note on surface roughness prediction model in machining of carbon steel by PVD coated cutting tools., Electrical discharge machining EDM is one of the earliest non-traditional machining processes. EDM process is based on thermoelectric energy between the work piece and an electrode. There are various types of products which can be produced by using the EDM such as dies and moulds. Today many parts used in aerospace and automotive industry and also final processes of surgical components can be finished by EDM process. A simple and easily understandable model was proposed for predicting the relative importance of different factors composition of the steels and Electro Discharge Machining processing conditions in order to obtain an efficient pieces. A detail application on the tool steels machined by EDM was given in this study. This model is based on thermal, metallurgical and mechanical and also in situ test conditions. It gives detail information on the effect of electrochemical parameters on the surface integrity and sub-surface damage of the material Heat Affected Zone, HAZ , the level of residual stresses, and the surface texture. This approach is an efficient way to separate the responsibilities of the steel maker and machining process designer for increasing the reliability of the machined structures. The aim of this study is to construct a diverse process of electrical discharge machining EDM in gas media, and then the new developed machining approach was used to investigate the effects of machining parameters on machining characteristics. Firstly, the feasibility of the EDM in gas media was established with consecutive electrical sparks generated within the machining gap. Moreover, the main machining parameters such as peak current, pulse duration, machining polarity, and gas media supply conditions like air compressed pressure were varied to evaluate the effects on machining characteristics of SKD 61 mold steel in the developed EDM process. The surface morphology of machined surface was observed by a scanning electronic microscope SEM to determine the influences of EDM discharge energy on surface integrities. From the result shown in experiments, the material removal rate MRR increased with peak current, pulse duration, and air pressure. In addition, the electrode wear rate EWR went up with peak current at first, and then attained a peak value with extending the pulse duration and the air pressure, but the EWR declined with further increasing of the pulse duration and the air pressure. Furthermore, the integrities of the machined surface revealed dramatically rough features when the peak current was set at high value. While the pulse duration was further extending, the surface integrities of the machined surface exhibited a smoothed trend obtained by EDM in gas media. Consequently, the developed technique of EDM in gas media possesses the potential of promoting machining performance, reducing environment impact, and extending the EDM applications. Electrical Discharge Machining EDM is one of the most widely used non conventional machining processes for removing material from workpiece by means of a series of repeated electric discharges. This process is now one of the main techniques used in die production and has good accuracy and precision with no direct physical contact between the electrodes so that no mechanical stress is exerted on the workpiece. Electrical discharge milling ED-milling is an emerging technology where a cylindrical tool electrode follows a programmed path in order to obtain the desired shape of a part. The current investigation aims to optimize the process parameters during EDM milling of stainless steel by using copper electrode. The selected input parameters used for the study are voltage, rotational speed of the electrode and feed rate while the responses are material removal rate MRR , electrode wear ratio EWR and surface roughness Ra. Response surface methodology is used in the study. The experimental design is formed by using design expert software. Yun Hai Jia Abstract: The electrode material is playing the very important role in the electrical discharge machining. Two kinds of electrode materials common used in EDM are compared and analyses similarities and differences in structure and physical characteristics. Combined with PcBN tool machining tests, from the

electric discharge machining efficiency, electrode wear, tool surface quality, tool surface degenerating layer, machining results are in analysis and comparison, and then different electrode materials machining technics in electrical discharge machining process are summarized. Muhammad Zulhisham Ahmed Zaki, M. In this study, investigations have been conducted with surface finish at different discharge energy output. It was found that the surface characteristics are dependent mostly on the discharge energy during machining. The fine finish electrical discharge machining requires minimization of the discharge energy supplied into the gap. In addition, the surface finish was found to be influenced greatly by the electrical and thermal properties of the electrode material.