



The Sixth
International
Conference
on Shot Peening

ICSP⁶

September 2 - 6, 1996
San Francisco, California USA

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Fairmont Hotel
San Francisco, California USA

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■ The ICSP conferences, held every three years at various international venues, provide a forum for the presentation and discussion of technical, scientific and academic papers related to the shot peening process. Previous conferences were held in Paris, France in 1981; Chicago, USA in 1984; Garmisch-Partenkirchen, Germany in 1987; Tokyo, Japan in 1990; and Oxford, England in 1993.

Attendance at ICSP⁶ will allow delegates an unparalleled opportunity to meet and discuss technical issues with an international cross section of shot peening experts and researchers as well as equipment and media manufacturers.

The venue chosen for ICSP⁶ is the historic Fairmont Hotel in the heart of San Francisco atop Nob Hill. Built in 1906, the Fairmont is the epitome of style and grandeur with a reputation of exacting standards of quality and service. It features breathtaking views of the entire Bay area.



Presentation of Papers at ICSP⁶

■ Applications

FLAVENOT, JEAN-FRANCOIS
CETIM/CENTER TECHN IND MEC, FRANCE
Shot Peening of Metal Matrix Composites Influence of the Residual Stresses and Surface Finish

HASHIMOTO, DR. MUNETOH
SUMITOMO HEAVY INDUSTRIES, LTD., JAPAN
Effect of Shot Peening and Heat Treatment on Endurance Limits of Austempered Ductile Cast Iron Gears

HASHIMOTO, DR. MUNETOH
SUMITOMO HEAVY INDUSTRIES, LTD., JAPAN
Improvement of Surface Durability of Case-Carburized and Hardened Gear by Shot Peening and Barrelling Processes

KOPP, DR.-ING R.
INSTITUT FOR BILDSAME FORMEBUNG, GERMANY
1/4 Tank Bulkhead Segment for the European Ariane 5

LEMAIRE, E.
ELECTRICITE DE FRANCE, FRANCE
Shot Peening to Prevent Intergranular Corrosion of Ferritic Stainless Steel

MENIGAULT, J.
SOLIAC, FRANCE
Improving the Fatigue Behaviour of Stiffener/Lower Flange Bridge Beams

OBATA, MINORU
TOSHIBA CORPORATION, JAPAN
The Effect of Shot Peening on Residual Stress and Stress Corrosion Cracking for Austenitic Stainless Steel

RAUTARAY, S.K.
CENTER INST OF AGRICUL ENGINEER, INDIA
Shot Peening to Reduce Fatigue and Wear in Tillage Implements

SALKO, DJOZIC
GSKG SAVSKA I, CROATIA
The Core of Vertical Electric Generator What is for Shot Peening

SALKO, DJOZIC
GSKG SAVSKA I, CROATIA
The Protection of the Propellers Blades Surfaces by the Shot Peening

SHARMA, DR. M. C.
MAULANA AZAD COLLEGE OF TECH., INDIA
Shot Peening in Preventing Coal Bunker Failure

TORREGLIANI, ENNIO
POMETON S.P.A., ITALY
Peening Media: Influence of Different Parameters of Peening Steel Shot Produced by an Italian Company Leader in this Field

■ Equipment

BAIKER, STEFAN
BAIKER AG, SWITZERLAND
High Efficiency with CNC Shot Peening Plants

KIRK, DR. DAVID
COVENTRY UNIVERSITY, ENGLAND
Developments in Interactive Control of Shot Peening

KOPP, DR.-ING R.
INSTITUT FOR BILDSAME FORMEBUNG, GERMANY
Shot Velocity Measurement

■ Material Behavior

AMOZOUVI, K. F.
AECL RESEARCH, CANADA
Effect of heat treatments on the relief of residual stresses and recrystallization behaviour of shot-peened Zr-2.5Nb pressure tube material

CHARDIN, H.
ECOLE DES MINES DE PARIS, FRANCE
Modeling the Influence of the Impact Energy Dispersion on the Evolution of the Residual Stress Profiles vs. Time in Shot-Peening

DORR, T.
TECH UNIVERSITY OF BRANDENBURG, GERMANY
Influence of Stress Gradient on Fatigue Behavior of Shot Peened Tmetal 1100

DORR, T.
TECH UNIVERSITY OF BRANDENBURG, GERMANY
Effect of Shot Peening on Residual Life of Fatigue Pre-Damaged 2024 Al

HAMIDI, T.
Behavior of Shot Peened Welded Steel Under Cyclic Loading

HERZOG, R.
The Significance of Almen Intensity for the Generation of Shot Peening Residual Stresses

IIDA, DR. KISUKE
MEIJI UNIV, MECH. ENGRG. DEPT., JAPAN
The Relation Between Work-Softening and Strain-Induced Transformation Produced by Shot Peening and Grit Blasting for Austenite Stainless Steel

JILES, D.C.
IOWA STATE UNIVERSITY, USA
Evaluation of Surface Modifications in High Strength Steel

KORZYNSKI, MIECZYSLAW
RZESZOW TECHNICAL UNIVERSITY, POLAND
Some Properties of WT1-3 Titanium Alloy After Ball Peening

KYRIACOU, DR. S.
CANFIELD UNIVERSITY, ENGLAND
Investigation of the Effects of Shot Peening on Partially Fatigued Notched Components

MARTIN, U.
INSTITUTE / PHYSICAL METALLURGY, GERMANY
Characterization of the Defect Depth Profile of Shot Peened Steels by Transmission Electron Microscopy (TEM)

NAKONIECZNY, ALEKSANDER
INSTITUT OF PRECISION MECH., POLAND
Residual Stresses, Microstructure and Fatigue Behavior of Carburized Layers before and After Shot Peening

PEIGE, SHAO
HARBIN INST OF TECHNOLOGY, CHINA
Quantitatively Analyses about the Effect of Shot Peening on Fatigue Limit of 300M Steel with a New Concept of Internal Fatigue Limit

RAHMATTALLAH, HUSSEIN B.
UNIVERSITY OF JORDAN, JORDAN
Effect of Shot Peening on Stress Corrosion Cracking (SCC) 7075-T6 Aluminium Alloy

SOLLICH, A.
Optimization of the Fatigue Strength of Heat Treated Steels as a Consequence of an Optimum State of the Surface and Subsurface Layers After Shot Peening

WOHLFAHRT, PROF. H.
INSTITUT SCHWEISSTECHNIK, GERMANY
Optimization of the Fatigue Behaviour of Welded Joints by Means of Shot Peening-A Comparison of Results on Steel and Aluminium Joints

■ Media

EDWARDS, PETER
BRITISH AEROSPACE AIRBUS LTD., ENGLAND
A Comparison of the Effect of Peening Using Cut Wire and Cast Steel Shot on the Fatigue Performance

GILLESPIE, BOB
PREMIER SHOT COMPANY INC., USA
Image Analysis of Shot Peening Media

SICOTTE, JASON
ASSOCIATED SPRING/BARNES, USA
Effect of Broken Shot on residual Stresses and Fatigue Life

■ Processing

BAILEY, PETER G.
GE AIRCRAFT ENGINES, USA
Full Assurance Shot Peening of Aircraft Gas Turbine Engine Components

BARKER, BILL
PRECISION AUTOMATION INC., USA
Shot Peening Enhanced Control System (SPECS)

EDWARDS, PETER
BRITISH AEROSPACE AIRBUS LTD., ENGLAND
The Effect of Variations in Coverage on Fatigue

HAPP, MARVIN
GENERAL ELECTRIC, USA
Almen Strip Variability - A Statistical Treatment

KIRK, DR. DAVID
COVENTRY UNIVERSITY, ENGLAND
A Comparison of Shot Peening and Needle peening for the Development of Curvature and Residual Stresses

MASON, CHARLIE
MENASCO AEROSPACE LTD., CANADA
The Practical use of Statistical Process Control and Computer Monitored Equipment in the Shot Peening Process

SHARMA, DR. M. C.
MAULANA AZAD COLLEGE OF TECH., INDIA
Design and Development of Key Parts of Pneumatic Ball Peening Systems

■ Residual Stress

CAMMETT, DR. JOHN
4.3.4.1. U.S. NAVY/NAVAL AVIATION DEPOT, USA
Thermal Relief of Residual Stresses in Two Steels

HOLZAPFEL, H.
INSTITUT FUR WERKSTOFFKUNDE I, GERMANY
Relaxation Behavior of Shot Peening Induced Residual Stresses in AISI 4140 Due to Quasistatic Uniaxial Loading at Elevated Temperatures

HOLZAPFEL, H.
INSTITUT FUR WERKSTOFFKUNDE I, GERMANY
Stability and Relaxation Behaviour of Shot Peening Induced Residual Stresses in AISI 4140 During Bending Fatigue

IIDA, DR. KISUKE
MEIJI UNIV., MECH. ENGRG. DEPT., JAPAN
The Change of Residual Stress Distributions Produced by Shot Peening Under Fatigue Test

JILAI, RU
INSTITUTE OF AERONAUTICAL MATR., CHINA
Investigation on the Shot Peening of Ren'e 95 Powder Superalloy

MULLER, DR. ECKEHARD
KRAEMER & FREUND, GERMANY
Residual Stress Profiles and Stress Reduction under Dynamic Load of Stress Peened Torsions Bars

SCHULZE, VOLKER
INSTITUT FUR WERKSTOFFKUNDE I, GERMANY
Relaxation of Shot Peening Induced Residual Stresses in Quenched and Tempered Steel AISI 4140 Due to Uniaxial Cyclic Deformation

TOSHA, KATSUJI
MEIJI UNIVERSITY, JAPAN
Variation of Residual Stress Measured by Several X-Ray Projection Area for Peened Surface

■ Theory/Mechanics

ABYANEH, DR. M.Y.
COVENTRY UNIVERSITY, ENGLAND
Fundamental Aspects of Shot Peening Coverage Control: Part One Formulation of Single and Multiple Impacting

ABYANEH, DR. M.Y.
COVENTRY UNIVERSITY, ENGLAND
Fundamental Aspects of Shot Peening Coverage Control: Part Two Simulation of Single And Multiple Impacting

ABYANEH, DR. M.Y.
COVENTRY UNIVERSITY, ENGLAND
Fundamental Aspects of Shot Peening Coverage Control: Part Three Coverage Control Versus Fatigue

GAO, W.
MECASURF LABORATORY/ENSAM, FRANCE
A Correlation of the Almen Arc Height with Residual Stresses in Shot Peening Process

FATHALLAH, DR. RAOUF
LABORATOIRE DE MECANIQUE, TUNISIA
Prediction of Plastic Deformation and Residual Stresses induced by Shot Peening in Metallic Parts

JIANZHONG, ZHANG
XIAN JIAOTONG UNIVERSITY, CHINA
Fatigue Crack Propagation Behaviors in Shot Peened Layer of Metals

LE GUERNIC, YVES
METAL IMPROVEMENT COMPANY, FRANCE
Shot Peening Parameters Selection Assisted Peenstress Software

LOMBARDO, DALE
GE CORPORATE R AND D, USA
The Reality of Shot Peen Coverage and Dimple Interactions

WATANABE, YOSHIHIRO
TOYO SEIKO CO., LTD., JAPAN
Simulation of Residual Stress Distribution on Shot Peening

Presentation of Papers is subject to change.

Note: Only the primary author is listed. For more information, use the Internet at <http://www.shotpeener.com> for access to a list of authors and their abstracts.

Leisure Activities at ICSP⁶

You will be given plenty of time to explore San Francisco during ICSP⁶. The following are just a few of the exciting things to see and do in this wonderful city.



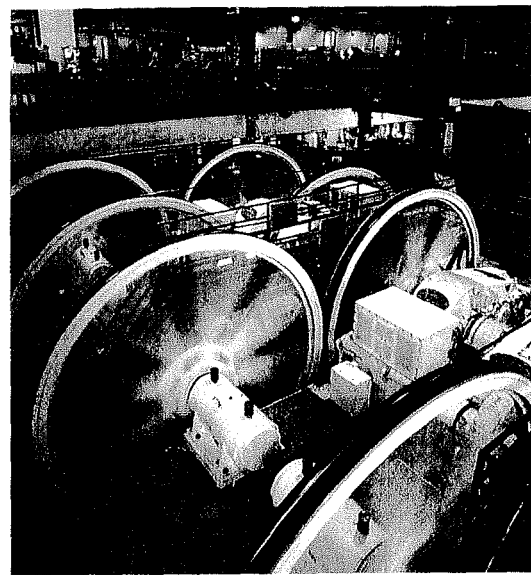
■ The famous cable cars are the only *moving* National Historic Landmark in the United States.



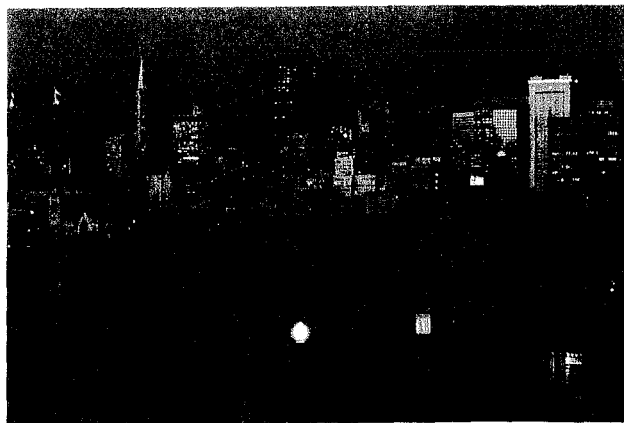
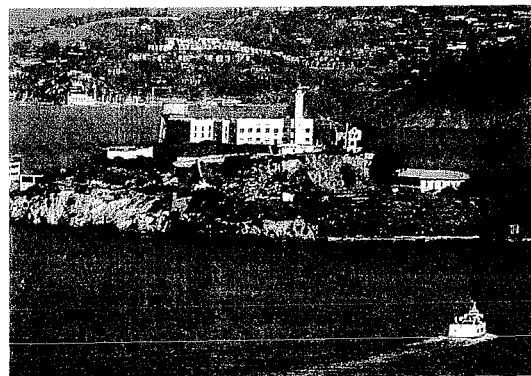
■ You can enjoy seafood at its freshest in San Francisco. In fact, food lovers love this city; it has more restaurants per capita than any other city in the United States.

■ San Francisco has mild weather all year. Temperatures seldom rise above 70 degrees or fall below 40 degrees. San Francisco often has fog. Sweaters, rain gear and light jackets are recommended for the conference.

■ The most famous — or most infamous — place in San Francisco is Alcatraz. Tours are available of this former federal prison that had the motto: *maximum security, minimum privilege.*



■ The winding machinery that pulls the 56,000 ft. of ever-moving cable on which San Francisco's cable cars depend for their movement, can be seen in action at the Cable Car Museum.



■ San Francisco is easily accessible — its international airport links you to every country in the world.

■ *The Painted Ladies.* San Francisco's famous Victorian homes as viewed from Alamo Square park.

■ There are 43 hills in San Francisco, making for some steep streets. Bring comfortable walking shoes to the conference!

For an ICSP⁶ registration form, please call Electronics Inc. at **(219)256-5001** or use the Internet at <http://www.shotpeener.com>