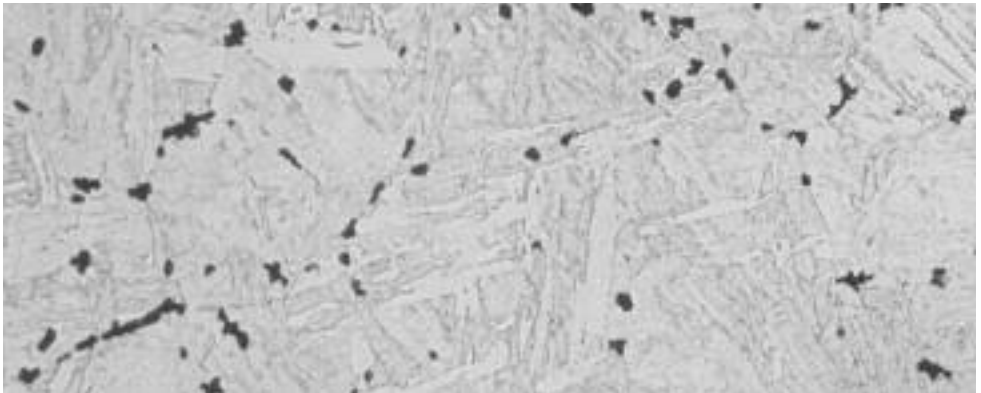


 **Fourth Announcement**
Provisional Programme

2nd International
ECCC Conference

**Creep & Fracture in High Temperature
Components – Design & Life Assessment**

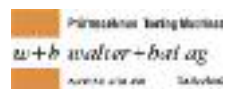


Empa, CH-8600 Dübendorf
AKADEMIE, Überlandstrasse 129

April 21 – 23, 2009



Coordination: www.etc1.co.uk
Host: www.empa.ch



The European Creep Collaborative Committee (ECCC) is the leading voice of European experts on subjects relating to creep, representing the views of alloy producers, plant manufacturers and end-users. Since 1991, ECCC has been engaged in the co-ordination of Europe-wide creep data generation, collation and assessment activities, with the aim of pooling national data resources to provide the optimum basis for creep strength values for European Product and Design Standards. Properties are considered for a range of low and high alloy ferritic, martensitic and austenitic steels, and for nickel base alloys. ECCC is an industry led grouping currently comprising 45 organisations from 16 European countries. Work undertaken in three major EC supported projects has resulted in the development and open publication of: i) extensive ECCC Guidelines covering creep property data generation, collation and assessment methods, and ii) peer reviewed Creep Property Data Sheets. ECCC Data Sheets are based on the largest possible collations of multi-cast, long duration test data, comprising not only existing results gathered by mutual exchange from a variety of sources but also new results from ECCC test programmes. The timing of the 2nd ECCC Conference provides an opportunity to critically appraise the state-of-the-art concerning design and life assessment issues relating to creep and fracture in high temperature components and to appraise developments since the 1st ECCC Conference in London, 2005.

■ Conference Introduction

Changes in the operating conditions of high temperature plant in many industrial sectors have determined the need to fully exploit advances in knowledge relating to the creep and fracture behaviour of the engineering materials which they employ. Increased competition and cost awareness in combination with the imposition of environmental regulations have had a significant impact on technological requirements for power-generation, petro-chemical, process and waste-incineration plant, and the drive-units for land-based and aero-spatial transport. These trends have given rise to a sharp interest in improving output, performance, efficiency and reliability. An important consequence of this situation has been, and continues to be, the development of new advanced high temperature materials that can operate under more extreme conditions of temperature and stress. It has also meant a drive for the development of less conservative design codes based on more sophisticated methodologies involving state-of-the-art uni-axial and multi-axial creep strain and ductility concepts. As for the first conference, ECCC has joined forces with key experts from North America, Japan and elsewhere to promote this event and to bring together engineers and researchers from around the world to present and discuss the latest developments in all aspects of creep behaviour of high temperature industrial materials and components; the aim being to consolidate existing knowledge and to identify future work items requiring attention by the high temperature community.

Conference Schedule

	TUESDAY	WEDNESDAY	THURSDAY	
08:30	Akademie Registration <i>08:15 start on Day 1</i> S-00a Joint Session (Chair: G. Merckling) Welcome Hald (Keynote)	Akademie S-00b Joint Session (Chair: S.R. Holdsworth) Abe (Keynote) Masuyama (Keynote) Bendick et al (S-08)	Akademie S-09c Martensitic Steels (Chair: D. Gianfrancesco) Hasegawa et al Kasl et al Bauer et al Mayr et al	Forum Chriesbach (C20) S-10b Testing (Chair: K. Kimura) Kleisov & Dedov De Bruyker et al Poggio et al Loveday & McCarthy
09:15 10:00	Refreshments S-01 Nuclear (Chair: W. Hoffelner) Raj et al Haehner & Hurst Tonti & Baylac Kim et al Grossejan et al Hoffelner & Chen	Refreshments S-07 Physical Damage (Chair: Ogata) Allen Rantala et al Sakai et al Storesund et al Daga et al	Refreshments S-11 Nickel Base Alloys (Chair: S. Chandra) Cipolla et al Tsang et al Yamamoto et al Carmi et al Krishna et al Muller et al	S-12 Defect Assessment (Chair: A. Klensk) Auerkari et al Dean Webster et al Holdsworth & Mazza Wasmer et al Dogan et al
12:30	LUNCH	LUNCH	LUNCH	
13:30	S-03 Life Assessment (Chair: P. Auerkari) Auerkari et al Bagaviev et al Holmström et al Jauhainen et al Cosso & Servetto Wilks et al	S-08a Data Assessment (Chair: E. Wilshire) Spindler et al Bullough & Norman Fèher et al Holdsworth et al Kim et al Zhao et al	S-00c Final Joint Session (Chair: T.J. Kern) Viswanathan (Keynote) Parker & Coleman (S-03) Sawada et al (S-06) Wilshire (Keynote) Closure (Kern)	
15:30	Refreshments S-04 Creep-Fatigue (Chair: A. Tontli) Ogata Bindra et al Giroux et al Hyde et al Poggio et al Friedmann	Refreshments S-08b Data Assessment (Chair: M.W. Spindler) Fookes et al Kostenko et al Penny & Kohlhöfer Sinha & Sinha Brear et al Sandström & Jin	Refreshments S-00c Final Joint Session (Chair: T.J. Kern) Viswanathan (Keynote) Parker & Coleman (S-03) Sawada et al (S-06) Wilshire (Keynote) Closure (Kern)	
16:00	S-05 Austenitic Steels (Chair: J. Shingledecker) Caminada et al Okada et al Shingledecker Takeyama et al Vlasak et al Voicu et al	S-07b Data Assessment (Chair: K. Kimura) Hyde et al Brett Nonaka et al Komazaki et al Kubushiro & Yoshizawa Dobes et al	Refreshments S-09b Martensitic Steels (Chair: J. Hald) Di Gianfrancesco et al Kimura et al Brett Magnusson & Sandström Maruyama et al Naumenko & Altenbach Muneke et al (S-05)	
18:00 18:30	POSTER SESSION and RECEPTION	CONFERENCE DINNER		

Presenters are kindly requested to load their presentations onto the session computer in the half hour period preceding their allocated session

The duration of Keynote presentations is 35 minutes (including questions)
 The duration of all other presentations is 20 minutes (including questions)
 A strict time schedule will be maintained by the chairman of all sessions

■ List of Papers

■ KEYNOTE PRESENTATIONS

J. Hald (S-00a)

TUD (Denmark)

Status of the martensitic 9-12% Cr steels

F. Abe (S-00b)

NIMS (Japan)

Heat-to-heat variation in long-term creep strength of some ferritic steels

F. Masuyama, T. Tokunaga, N. Shimohata, T. Yamamoto & M. Hirano (S-00b)

Kyushu Inst. Technol. (Japan)

Comprehensive approach to creep life assessment of martensitic heat resistant steels

R. Viswanathan, J. Shingledecker, J. Hawk & S. Goodstine (S-00c)

EPRI (USA), ALSTOM (USA)

Effect of creep in advanced materials for use in ultra-supercritical coal power plants

B. Wilshire & M. Bache (S-00c)

Swansea University (UK)

Cost effective prediction of creep design data for power plant steels

■ S-00 PAPERS PRESENTED IN SINGLE SESSIONS

W. Bendick, L. Cipolla, J. Gabrel & J. Hald (ex-Session S-08)

SZMF (Germany), CSM (Italy), VRC (France), TUD (Denmark)

New ECCO assessment of creep rupture strength for steel grade X10CrMoVNb9-1 (Grade 91)

J. Parker & K. Coleman (ex-Session S-03)

Structural Integrity Associates (Canada), EPRI (USA)

Life management issues for creep strength enhanced ferritic steels

K. Sawada, M. Fujitsuka, M. Tabuchi & K. Kimura (ex-Session S-06)

NIMS (Japan)

Effects of microstructural change and oxidation on creep behaviour of P23/T23 steels

■ S-01 NUCLEAR

B. Raj, K. Rao, M.D. Mathew, K. Laha & B.K. Choudhary

Indira Gandhi Centre for Atomic Research (India)

An overview of the creep research and application in sodium cooled fast spectrum reactors

P. Haehner & R.C. Hurst

JRC (Petten)

Materials qualification for next generation nuclear reactors

A. Tonti & G. Baylac

ISPESL (Italy)

Creep related issues for Generation IV nuclear reactor

■ List of Papers

W-G. Kim, S-N. Yin, G-G. Lee, Y-W. Kim & S-J. Kim

KAERI (Korea), Pukyong Nat. Univ. (Korea)

Oxidation behaviour and creep strength prediction of Alloy 617 for a very high temperature gas-cooled reactor

C. Grosjean, D. Poquillon, J-C. Salabura & J.M. Cloué

Areva (France), CIRIMAT (France)

Innovative creep device and analysis method applied to cladding tubes in Zirconium alloys

W. Hoffelner & J. Chen

PSI (Switzerland)

Creep problems in advanced nuclear plants

■ S-02 WELDS

D. Jandova, J. Kasl & V. Kanta

Skoda Vyzkum (Czech)

Influence of substructure on creep failure of P91 steel weld joints

C. Petry & E. Gariboldi

EDF (France)

PdM (Italy), Experimental characterisation and modelling of the creep properties of a P92 steel weldment

Z. Zhang, G. Holloway & A. Marshall

Metrode (UK)

Properties of T/P92 steel weld metals for ultra super critical (USC) power plant

M. Yaguchi, T. Ogata & T. Sakai

CRIEPI (Japan)

Creep strength of high chromium steels welded parts under multiaxial stress conditions

M. Tabuchi, H. Hongo, K. Sawada, & Y. Takahashi

NIMS (Japan), CRIEPI (Japan)

Effect of boron on creep strength of high Cr steel welds

V. Vodarek, Z. Kubon & R. Foret

Vitkovice (Czech), VUT (Czech)

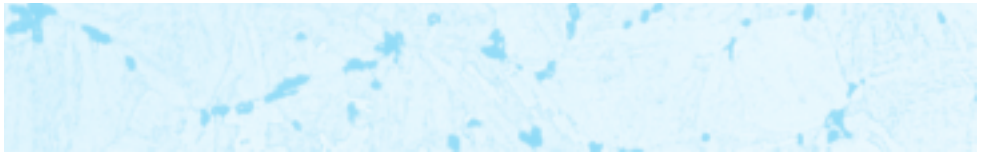
Creep properties and microstructure of P23/P91 heterogeneous welds

■ S-03 LIFE ASSESSMENT

P. Auerkari, J. Rantala, J. Salonen, A. Laukkanen, S. Holmström & T. Kinnunen

VTT (Finland)

Effect of defects on low temperature creep life of OFP copper



A. Bagaviev, S. van Meegdenburg & T. Siwczak

E.ON (Germany)

Remaining life assessment of an in-service exposed high pressure valve casing

S. Holmström, J. Rantala, K. Kolari, H. Keinanen, A. Laukkanen, J. Veivo & O. Lehtinen

VTT (Finland), Fortum Power & Heat (Finland)

Life prediction of weld repair for steam mixer

P. Jauhainen, S. Yli-Olli, A. Nyholm, P. Auerkari, J. Salonen, O. Lehtinen & S. Mäkinen

VTT (Finland), Fortum Power & Heat (Finland), Helsinki Energy (Finland)

Impact of oxidation on creep life of superheaters and reheaters

G. Cosso & C. Servetto

Ist. Italiano d. Saldatura

Application of the Omega method (API 579-1/ASME FFS-1) to the life assessment of a service exposed component

G.W. Wilks, M. Specht & E. Rincorn

Lemont Refinery(USA)

Remaining life assessment of refinery coker furnace tubes using Omega simulations

■ S-04 CREEP-FATIGUE

T. Ogata

CRIEPI (Japan)

Creep-fatigue damage and life prediction of low alloy steels

L. Binda, S.R. Holdsworth & E. Mazza

Empa (Switzerland)

Influence of prior fatigue deformation on creep properties of 1CrMoV

P.F. Giroux, F. Dalle, M. Sauzay, G. Perez, I. Tournié, V. Rabeau, J. Malaplate & A.F.

Gourgues-Lorenzon

CEA (France), CdM/M Paris (France)

Mechanical and microstructural stability of P92 steel under uniaxial deformation at high temperature

C. Hyde, W. Sun & S.B. Leen

Univ. Nottingham (UK)

Cyclic thermo-mechanical material Modeling and testing of 316 stainless steel

E. Poggio, S. Corcoruto & E. Vacchieri

Ansaldo (Italy)

Microstructural degradation of a cast Ni-based superalloy after creep, LCF and TMF tests

V. Friedmann

Fraunhofer Inst., Freiburg (Germany)

Damage behaviour of nickel-based transition welds under cyclic thermomechanical loading

■ List of Papers

■ S-05 AUSTENITIC STEELS

S. Caminada, G. Cumino, L. Cipolla, A. Di Gianfrancesco, Y. Minami & T. Ono

Tenaris (Italy), CSM (Italy), Tenaris (Japan)

Creep properties and microstructural evolution of Austenitic TEMPALLOY steels

H. Okada, M. Igarashi, K. Ogawa & T. Osuki

Sumitomo (Japan)

Improvement of creep strength in austenitic steel with a large amount of phosphorus

J. Shingledecker

EPRI (USA)

Creep-rupture performance of 0.07C-23Cr-45Ni-6W-Ti,Nb austenitic alloy (HR6W)

M. Takeyama, N. Takata & T. Matsuo

Tokyo Inst. Technol. (Japan)

Design concept and creep properties of advance austenitic heat resistant steels strengthened by intermetallics

T. Vlasak, J. Hakl, P. Novak & P. Clarke

SVUM (Czech), Corus (UK)

Creep properties of wrought austenitic BGA4 steel

R. Voicu, J. Lacaze, E. Andrieu, D. Poquillon & J. Furtado

CIRIMAT (France), Air Liquide (France)

Creep behaviour of HP-40 alloy modified with a low level of Nb

■ S-06 LOW ALLOY STEELS

J. Orr & D. Robertson

ETD (UK)

Low alloy steels: The foundation of the power generation industry

L. Binda, S.R. Holdsworth & E. Mazza

Empa (Switzerland)

The exhaustion of creep ductility in 1CrMoV steel

R. Wu, J. Storesund & K. Borggreen

KIMAB (Sweden)

Creep properties of weld repaired low alloy heat resistant CrMo and Mo steels at 540 °C

K. Kucharova, V. Sklenicka, M. Svoboda, J. Douda & J. Cmakal

Acad. Sci. (Czech)

Creep behaviour and microstructure of 2.25%Cr1.6%W steel

P.F. Morris, A.P. Backhouse & P.D. Clarke

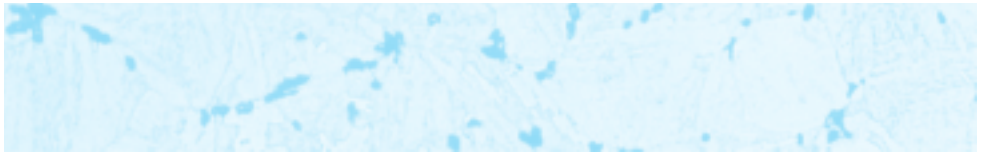
Corus (UK)

Optimisation of the long-term service performance of Durehete 1055 bolting steel

I. Steller, W. Bendick, T-U. Kern, K. Maile, M. Monsees & A. Scholz

German Collaborative Creep Committee

60th anniversary of the German Creep Committee



■ S-07 PHYSICAL DAMAGE ASSESSMENT

D. Allen

E.ON (UK)

A hardness-normalised model of creep-rupture for P91 steel

J. Rantala, J. Salonen, A. Laukkanen, S. Holmström, P. Auerkari, S. Haapajoki, S. Makinen & D. Dean

VTT (Finland), Fortum Power (Finland), British Energy (UK)

Creep damage evolution in 0.5CrMoV steel: Implications for expected life and inspections of steam lines

T. Sakai, T. Ogata & M. Yaguchi

CRIEPI (Japan)

Creep void growth simulation based on grain boundary local stress analysis

A. Epishin, T. Link, H. Klingelhöffer, B. Fedlich & P.D. Portella

TU Berlin (Germany), BAM (Germany)

Creep damage mechanisms of single-crystal nickel base superalloys

J. Storesund, T. Thunvik, W. Zang, U. Andersson-Frejd, A. Eklund, H. Bjurström & A. Taflin

Inspecta (Sweden), AF-Process (Sweden)

Creep failures below limit temperatures for creep design

R. Daga, G. Bandyopadhyay, M.K. Samal, B.K. Dutta & A.K. Mohindru

NTPC (India), BARC (India)

Identification of critical location using on-line damage monitoring system and quantification of creep damage under surveillance programme

■ S-08 DATA ASSESSMENT

S.L. Spindler, A. Baker & M.W. Spindler

British Energy (UK)

Creep rupture data analysis of the 0.5Cr0.5Mo0.25V Type IV zone

C. Bullough & M. Norman

ALSTOM (UK)

The PD6605 creep rupture data assessment procedure – an appraisal of it's application 10 years on

A. Fehér, S. Linn, M. Schwienheer, A. Scholz & C. Berger

IfW Darmstadt (Germany)

A graphical-interactive software for identification of creep equation parameters

S.R. Holdsworth, E. Gariboldi, S. Holmström, A. Klenk, G. Merckling, M. Schwienheer & M.W. Spindler

ECCC

A review of multi-regime creep-rupture modelling

■ List of Papers

S-J. Kim, Y-S. Kong, W-T. Jung & W-G. Kim

Pukyong Nat. Univ. (Korea), KAERI (Korea)

Statistical aspect of short-term creep rupture time and its life prediction

J. Zhao, D. Li & Y. Fang

Dalian Univ. Technol. (China)

Z parameter and its application on reliability prediction of creep rupture life

A.J. Fookes, S.X. Li, D.J. Smith & M.W. Spindler

Univ. Bristol (UK), British Energy (UK)

Stress relaxation during dwells for creep and fatigue cycling of Type 316H stainless steel at 550°C

Y. Kostenko, G. Schwass & K. Naumenko

Siemens (Germany), Martin-Luther-Universität (Germany)

Creep analysis of power plant components from 1%CrMoV and 10%CrMoV steels

R.K. Penny & W. Kohlhöfer

Cape Peninsula Univ. Technol. (S. Africa)

Practical methods for creep assessments: Data extrapolation and crack propagation

N.K. Sinha & S. Sinha

Inst. For Aerospace Res. (Canada), Univ. Alberta (Canada)

Predicting rate sensitive yield stress using primary creep equations involving delayed elasticity

J.M. Brear, M.T. Whittaker & B. Wilshire

SES (UK), Swansea Univ. (UK)

Creep fracture of centrifugally-cast HK40 tube steel

R. Sandström & L-Z. Jin

Royal Inst. Technol. (Sweden)

Modified Armstrong-Frederick relation for handling back stresses in FEM computations

■ S-09 MARTENSITIC STEELS

J-H. Baek, W-G. Kim, T-K. Kim, J-H. Kim, S-H. Kim & C-B. Lee

KAERI (Korea)

Creep and microstructure of 9Cr-0.5Mo-2W-V-Nb-B steels for a SFR fuel cladding

L. Cipolla, H.K. Danielsen, J. Hald, D. Venditti, A. Di Gianfresco & S. Tiberi Vipraio

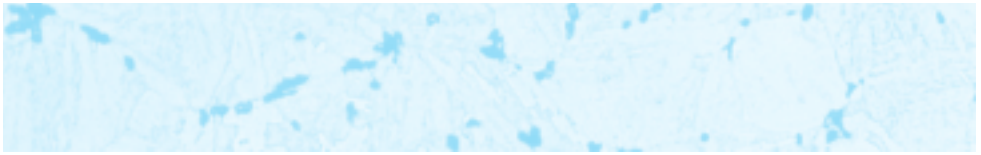
CSM (Italy), TUD (Denmark)

Investigation of Z-phase formation in a 12%Cr model alloy

C. Panait, W. Bendick, A. Fuchsmann, A.F. Gourgues-Lorenzon & J. Besson

Centre des Matériaux, Mines Paris (France), SZMF (Germany)

Study of the microstructure of the Grade 91 steel after more than 100 000h of creep exposure at 600°C



G. Qin, S.V. Hainsworth, P.F. Morris, P.D. Clarke, A.P. Backhouse & A. Strang

Leicester Univ (UK), Corus (UK)

TEM studies of microstructural evolution in creep exposed E911

T. Tokunaga & F. Masuyama

Kyushu Inst. Technol. (Japan)

Phase transformation behaviour of creep-strength enhanced 9%Cr steels

F. Vivier, A-F.Gourgues-Lorenzon, J. Besson, C. Petry, Y. de Carlan, Y. Lejeail,

S. Dubiez-Le Goff

Centre de Matériau, Mine Paris (France)

Metallurgical properties and creep behaviour of a Grade 91 steel base metal and weldment after short-term exposure at 500°C

A. Di Gianfrancesco, L. Cipolla, D. Venditti, S. Neri & M. Calderoni

CSM (Italy), Terni (Italy)

Long term creep behaviour and microstructural stability of FB2 (CrMoCoB) steel trial rotor

K. Kimura, Y. Toda, H. Kushima & K. Sawada

NIMS (Japan)

Creep strength of high chromium steel with ferrite matrix

H. Magnusson & R. Sandström

Royal Inst. Technol. (Sweden)

Growth of creep cavities in 12%Cr steels

K. Maruyama, H.G. Armaki, M. Yoshizawa & M. Igarashi

Tohoku Univ. (Japan), Sumitomo (Japan)

Cr concentration dependence of overestimation of long term creep life in strength enhanced high Cr ferritic steels

K. Naumenko & H. Altenbach

Martin-Luther-Universität (Germany)

Modeling of stress range dependent creep and damage for the structural analysis

S. Muneki, H. Okubo & F. Abe (ex-Session S-05)

NIMS (Japan)

Creep property of carbon and nitrogen free high strength new alloys

Y. Hasegawa, M. Sugiyama & K. Kawakami

Nippon Steel (Japan)

Type IV damage mechanism due to the microstructure weakening in the HAZ of a multi-layer welded joint of the W containing 9%Cr ferritic creep resistant steel

J. Kasl, D. Jandova & V. Kanta

Skoda Vyzkum (Czech)

Development of microstructure of weld joint of P92 steel after creep testing

■ List of Papers

M. Bauer, A. Klenk & K. Maile

MPA Stuttgart (Germany)

Experimental and numerical investigations on the behaviour and assessment of martensitic welds

P. Mayr, F. Méndes Martin, M. Albu & H. Cerjak

TU Graz (Austria)

Correlation of creep strength and microstructural evolution of a boron alloyed 9Cr-3W-3Co,V,Nb steel in as-received and welded condition

■ S-10 TESTING

T.H. Hyde, W. Sun & S.J. Brett

Univ. Nottingham (UK), RWE (UK)

Some recommendations on the Standardization of impression creep testing

S.J. Brett

RWE (UK)

Small scale sampling and impression creep testing of aged 0.5CrMoV steam pipework systems

I. Nonaka, A. Kanaya, S. Komazaki & K. Kobayashi

Tohoku Univ. (Japan), Kyushu Electric Power (Japan), Muroan Inst. Technol. (Japan), Chiba Univ. (Japan)

Activities of micro sample creep testing working group in Japan

S. Komazaki, T. Kato, Y. Kohno & H. Tanigawa

Muroan Inst. Technol. (Japan), JAEA (Japan)

Small punch creep properties of welded joint of high Cr ferritic steel

K. Kubushiro & H. Yoshizawa

IHI (Japan)

Creep life evaluation of low-alloy steel weldment by small punch method

F. Dobes, K. Milicka, J. Sobotka & Z. Kubon

Acad. Sci. (Czech), Vitkovice (Czech)

Application of small punch tests in estimation of properties of heat affected zone

M. Klevtsov & A. Dedov

Tallinn Univ. Technol. (Estonia)

Condition assessment of power plant components operating under creep by testing of miniature specimens

E. De Bruycker, S. Huysmans & J-P. Keustermans

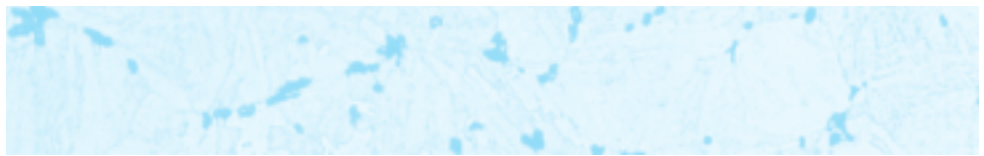
Laborelec (Belgium)

Stress relaxation testing as an alternative to conventional creep rupture testing

E. Poggio, S. Corcoruto, G. Merckling & E. Vacchieri

Ansaldo (Italy), RTM BREDA (Italy)

Residual mechanical properties of ex-serviced cast superalloys for gas turbine blades/vanes



M. Loveday & P. McCarthy

Beta Technology (UK)

ISO 204: The new creep testing standard

■ **S-11 Ni-BASE ALLOYS**

L. Cipolla, M. Calderoni, A. Di Gianfrancesco, L. Foroni, R. Montani, O. Tassa & D. Venditti

CSM (Italy), Terni (Italy), Foroni (Italy)

Mechanical and microstructural qualification of IN718 forged disc

J. Tsang, R.M. Kearsey, P. Au, S. Oppenheimer & W. Cao

Nat. Res. Council (Canada)

The effect of composition and microstructure on the fatigue and creep-fatigue behaviour of Allvac 718plus alloy

M. Yamamoto, J. Shingledecker, C. Boehlert, T. Ogatta & M. Santella

CRIEPI (Japan), ORNL (USA)

Microscopic evaluation of creep-fatigue interaction in a nickel base alloy

A. Cammi, S. Concari, & C. Rinaldi

CESI Ricerca (Italy)

Creep properties of new and aged nickel based alloy for gas turbine blades by means of small punch testing

R. Krishna, S.V. Hainsworth, S.P.A. Gill, A. Strang & H.V. Atkinson

Leicester Univ. (UK)

Microstructural evolution in creep exposed IN617

F. Müller, A. Scholz, C. Berger & R-U. Husemann

IfW Darmstadt (Germany), Hitachi (Germany)

Influence of cold working on creep and creep rupture behaviour of materials for super-heater tubes of modern high-end boilers and for built in sheets in gas turbines

■ **S-12 DEFECT ASSESSMENT**

P. Auerkari, A. Baker, D. Dean, B. Dogan, J. Ewald, E. Gariboldi, S.R. Holdsworth, A. Klenk, F. Müller, A. Scholz, S. Sheng & M. Speicher

ECCC

ECCC recommendations on creep crack initiation assessment

D. Dean

British Energy (UK)

Prediction of creep crack incubation in Type 316H specimens using the R5 time dependent failure assessment diagram and the two criteria diagram

■ List of Papers

G.A. Webster, Davies, R.P. Skelton, K. Nikbin & D. Dean

Imperial College (UK), British Energy (UK)

Determination of creep crack growth incubation periods in Type 316H stainless steel

S.R. Holdsworth & E. Mazza

Empa (Switzerland)

Using the results of creep crack incubation tests on CrMoV steel for predicting long time behaviour

K. Wasmer, K. Nikbin & G.A. Webster

Empa (Thun), Imperial College (UK)

A sensitivity study of creep crack growth in plates to reference stress formulae

B. Dogan, K. Nikbin, M. Tabuchi & D. Dean

VAMAS

Comparison of creep crack growth data of weldments – A VAMAS round robin

■ POSTERS

A. Belyakov, R. Kaibyshev, V. Dudko, V. Skorobogatykh & I. Schenkova

(see Session S-09 in proceedings for paper)

Bolgorod State Univ. (Russia)

Effect of heat treatment and creep on microstructure of a 9%Cr steel

J.M. Brear (see Session S-02 in proceedings for paper)

Stress Engineering Services (UK)

Stress relief embrittlement – revisited

L.O. Bueno

Fed. Univ. Sao Carlos (Brazil)

Creep behaviour of virgin and service exposed 1Cr-1/2Mo steel, Part 1 –

Characterisation of properties and data parameterisation

L.O. Bueno

Fed. Univ. Sao Carlos (Brazil)

Creep behaviour of virgin and service exposed 1Cr-1/2Mo steel, Part 2 –

Analysis based on the Theta methodology approach

P. Fateh & O. Akhter (see Session S-03 in proceedings for paper)

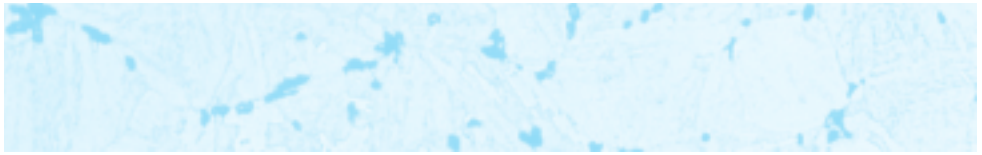
Fauji (Pakistan)

Exceptional life extraction from primary reformer tubes through the use of monitoring methods

J.P. Fernandes & E. Dias Lopes (see Session S-03 in proceedings for paper)

ISEL (Portugal), ISQ (Portugal)

Evaluation of simulation and component life assessment of high pressure superheater applied to heat recovery steam generators



M. Filippini, S. Foletti & G. Pasquero (see Session S-11 in proceedings for paper)

PdM (Italy), Avio (Italy)

High temperature stress relaxation and combined cycle fatigue tests of superalloys for gas turbine blades

H.C. Furtado, I. Le May & L.H. de Almeida (see Session S-02 in proceedings for paper)

CEPEL (Brazil), COPPE/URFJ (Brazil)

Damage at dissimilar metals joint in superheater and reheater in boiler of electric power plant

A. Klenk et al

ECCC

Recommendations on the assessment of welds and derivation of weld strength factors

D. Knowles, K. Buchanan & M. Kral (see Session S-03 in proceedings for paper)

Shell (Holland), Quest (New Zealand)

Condition assessment strategies in centrifugally cast HP steam reformer tube alloys

M. Lomozik (S-02)

Institut Spawalnictwa (Poland)

The influence of multiple thermal cycles on simulated HAZ's toughness in P91 steel – Microscopic analysis

P. Magnusson, J. Chen, T. Rebac & W. Hoffelner (see Session S-01 in proceedings for paper)

PSI (Switzerland)

Creep of a g-TiAl alloy after He-implementation using small sample

C. Mende, E. Heits, A. Schulz, H.J. Bauer & A. Wanner

(see Session S-03 in proceedings for paper)

Karlsruhe Univ. (Germany)

Acoustic emission testing of highly loaded combustor liner tiles of gas turbines

J. Okrajni (see Session S-04 in proceedings for paper)

Silesian Univ. Technol. (Poland)

Thermo mechanical fatigue of power plant components

W. Qijiang

BaoShan Iron & Steel (China)

Effects of Co addition on microstructure and creep rupture properties of a 12%Cr heat resistant steel

M. Radosavljevic

Empa (Switzerland)

Inductive heating system allowing active feedback control of the temperature distribution along the testpiece gauge section

F.F.M. dos Santos, B.R. Cardoso, H.C. Furtado & L.H. de Almeida

(see Session S-03 in proceedings for paper)

CEPEL (Brazil), COPPE/UFRJ (Brazil)

High temperature strain gauge performance

■ List of Papers

I.A. Shibli (see Session S-03 in proceedings for paper)

ETD (UK)

Development of non-destructive life assessment techniques for P91 thick and thin section components

K. Sing, C.R. Prasad & M. Kamaraj (see Session S-03 in proceedings for paper)

BHEL (India)

Evaluation of microstructural changes in forged and cast low alloy steels under ageing and creep conditions

D. Sulaiman, H. Li, M. Drew & D. Dunne (see Session S-09 in proceedings for paper)

Univ. Wollongong (Australia), ANSTO (Australia)

Simulation of HAZ Microstructures in P91 Steel using Dilatometric and Gleeble Techniques

A. Tonti & G. Augugliaro (see Session S-03 in proceedings for paper)

ISPESL (Italy)

The use of X-ray diffractometry for inspection on creep operated pressure equipment

J. Trzeczczynski (see Session S-03 in proceedings for paper)

Pro Novum (Poland)

Remote diagnostic systems for assessment of thermo-mechanical equipment of power plants

J. Trzeczczynski & W. Murzynowski (see Session S-03 in proceedings for paper)

Pro Novum (Poland)

On-line diagnostics of steam pipelines operated in creep conditions

J. Vojvodic-Tuma, R. Celin, D. Mketic & F. Vodopivec (see Session S-02 in proceedings for paper)

Inst, Metals Technol. (Slovenia)

Investigation of the effect of carbide precipitates density on the resistance of welds to accelerated secondary creep

J. Vekemann & S. Huysmans (see Session S-02 in proceedings for paper)

Belgian Welding Inst. (Belgium)

Laborelec (Belgium), Cold weld repair of T91

S. Yamada, M. Yaguchi & T. Ogata (see Session S-09 in proceedings for paper)

CRIEPI (Japan)

Observation of microstructural change in creep damaged 9% and 12%Cr steel weld joints

A. Zielinska-Lipiec, W. Bendick, T. Kozeil, B. Hahn & A. Czyska-Filemonowicz (see Session S-09 in procs. for paper)

AGH Univ. (Poland)

SZMF (Germany), V&M (France), Effect of creep deformation at 625oC on microstructure development of VM12 steel

■ Conference Organisation

■ Organisation

Organised by: European Creep Collaborative Committee
Co-ordinated by: European Technology Development, UK
Hosted by: Empa, Swiss Federal Institute for Materials Testing and Research

■ Conference Organising Committee

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Prof. A Pineau	Ecole des Mines	France
Prof. R Sandstrom	SIMR	Sweden
Prof. B Wilshire	Swansea University	UK

Venue

The conference will be held in the Akademie of Empa, the Swiss Federal Institute for Materials Testing and Research, located in Dübendorf, close to Zürich.



■ Directions

■ To Dübendorf by road

Details of the main road connections to EMPA (Dübendorf) are shown in Map 1. The local road connections are shown in Map 2.



■ To Dübendorf by public transport

General

If you are likely to make at least 6 journeys by public transport during your stay in the Zürich Airport/ Zürich City/ Dübendorf area, it may be worth buying a 6-journey, 1 hour ticket for Zones 10/21 at the airport. These can be used on buses and trains, and save having to look for a ticket machine at the start of every journey.

It is important to make sure that, before each journey, you stamp such a ticket in the orange boxes for the purpose (located on the buses or station platforms).

The best source of Swiss public transport time table information is on <http://fahrplan.sbb.ch>. The Swiss public transport system is extremely reliable, and It is invariably possible to make all connections indicated by the timetable.

Directions

From Zürich Airport to Zürich Main Station

There is a frequent train service from the airport to the main station in Zürich City Centre. For more detailed information see <http://fahrplan.sbb.ch>.

From Zürich Airport to Dübendorf (Sonntal Hotel and Railway Station)

For those staying in Dübendorf, it is unnecessary to first travel from the airport to Zürich. There is a direct bus (No.759) which goes to Dübendorf Bahnhof (Railway Station), and which stops outside the Sonntal Hotel on the way.

To find the airport bus station, follow the signs for Regionalbus.

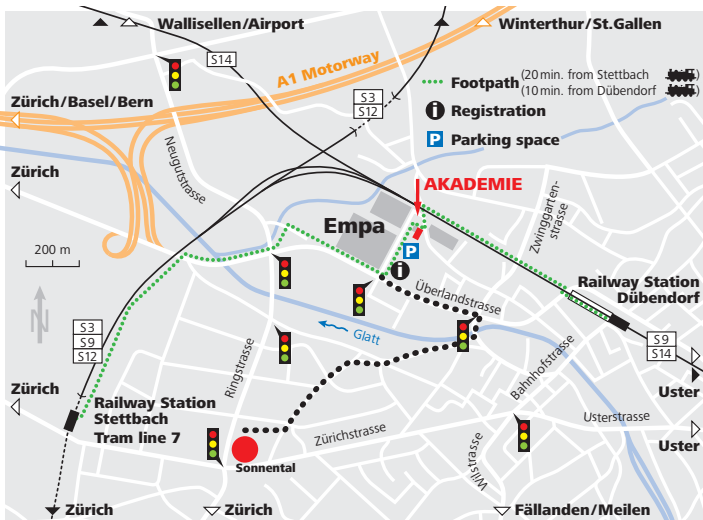
It is also possible to travel by rail via Zürich Main Station (see details of connections from Zürich below). However, the journey to the Sonntal Hotel is easiest by bus.

From Zürich Main Station to Dübendorf Railway Station

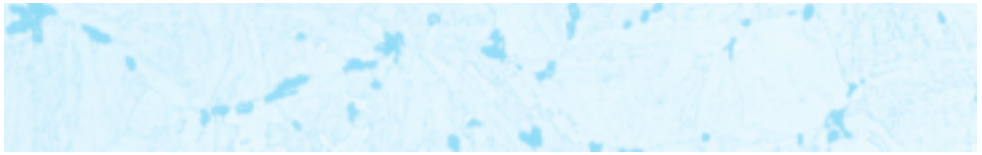
There is a train connection approximately every 15 minutes from Zürich Main Station to Dübendorf Railway Station, provided by 2 train services, i.e. S9 and S14.

The S9 departs from Platform 23/24 at 28 minutes past and 2 minutes to the hour (Journey time: 10 minutes).

The S14 departs from Platform 54 at 12 minutes past and 18 minutes to the hour (Journey time: 13 minutes).



Map 2



■ Directions to the Empa AKADEMIE

From Sonnentel Hotel

The Sonnentel Hotel is on the corner of Ringstrasse and Zürichstrasse (see Map 2).

The direct way to the EMPA-Akademie via Ringstrasse is currently not advised because of the ongoing major civil engineering construction work. There are a number of alternatives.

By foot, following the black dotted route in Map 2, takes approximately 15-20 minutes.

By Bus, take the No.760 to Stettbach Railway Station, and then the No.796 (direction Brütisellen) to EMPA. The No.796 leaves Stettbach at 1 minute past and 29 minutes to the hour. Alternatively, take the No.760 to Dübendorf Station (direction Gfenn), cross over to the north side of the Station, and catch the No. 796 (direction Stettbach) to EMPA.

By Taxi

From Dübendorf Railway Station

The options to get to EMPA from Dübendorf Railway Station are shown in Map 2.

By foot, walk to the far north east end of platform 3 (taking the 2nd, final exit to road level). At the bottom, turn right in the sub-way, and then left along the footpath in a north easterly direction (on the north side of the railway line), i.e. the green dotted route in Map 2, signposted EAWAG. The footpath crosses over a road, and after approximately 5 minutes (from the Station), there is a sub-way to the left back underneath the railway line. After passing through the sub-way, take the first turning on the right, and then the first turning to the left. The EMPA Restaurant and the Akademie are immediately on the left.

By Bus, take the No. 796 (direction Stettbach) from the north side of the Railway Station. This bus stops outside EMPA. The No.796 leaves Dübendorf Station at 14 minutes past and 16 minutes to the hour.

By Taxi

■ Conference presentation locations

The registration and conference office, the three joint sessions, and one of each of the parallel sessions, will be located in the [Akademie \(blue building in Map 3\)](#). Lunches on all three days will be provided at this location. The Conference Dinner will be held in the Restaurant next to the Akademie.

The second of each of the parallel sessions, and the poster session and reception on Tuesday evening will be located in the [EAWAG Forum Chriesbach \(red building in Map 3\)](#). Coffee breaks on Wednesday will also be held at this location.

It will take approximately 3-5 minutes to walk between the Akademie and Forum Chriesbach (i.e. between sessions).

■ Registration and Accommodation Details

Please copy and post / fax / email completed Registration Form to:

ETD, 6 Axis Centre, Cleeve Road
Leatherhead, Surrey KT22 7ND, UK
Tel: +44 1372 363111/2
Fax: +44 1372 363222
Email: registration@etd1.co.uk

■ Registration Fee

Figures are in GBP

Delegates 600
Authors 550 Please put **X** in appropriate box

Registration Fee covers conference proceedings, coffee, lunches and conference dinner.

■ Accommodation

Information on accommodation in the vicinity of the conference venue (Dübendorf) and in Zürich will be provided on registration

■ Sponsorship and Product Publicity Possibilities

For sponsorship and product publicity possibilities (exhibition/wallet service, etc.) please contact ETD at:

enquiries@etd1.co.uk,
Tel: +44 1372 363111
Fax: +44 1372 363222

■ Conference Timetable

21. April:	Registration from	08:15
	First session start	09:15
22. April:	First session start	08:30
23. April:	First session start	08:30
	Conference finish	15:30

■ Registration Form

Registration Fee is to be paid into the
UK Pound Sterling or Euro bank accounts given below.

For payment in Pound Sterling: A/C Name: European Technology Development; Bank:
Nat West Bank; A/C No: 26096625; Sort Code: 60-12-36

For payment in Euros: A/C Name: European Technology Development; Bank:
Nat West Bank, A/C No: 01/08061181, Sort Code: 60-12-36. Please ask ETD for equivalent
Euro amount at enquiries@etd1.co.uk, or Tel: + 44 1372 363111. With your payment, please
quote reference «ECCC Creep Conf. 2009» and name of delegate.
Please state below how and when Fee will be paid:

Credit Card Payment: Payment can be made using Visa, Mastercard, Switch, JCB,
American Express, etc. (except Diners Club). For security reasons please provide the following
information (only by fax or post).

Credit card number:

Card expiry date:

Signature:

■ Information required for your badge:

Delegate Title and Name:

Organisation:

Position:

Address:

Tel:

Fax:

Email:

Please put **X** in relevant box

I will attend the conference as

a Delegate

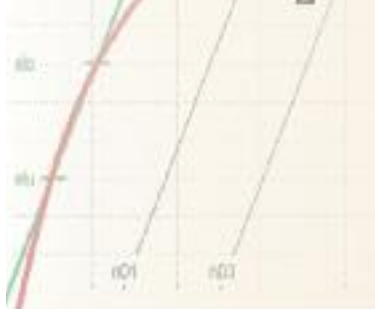
an Author

Title of paper:

Testing Machines for Static and Dynamic Materials and Component Testing

- Hydraulic and Electromechanical Universal Testing Machines
- Servohydraulic Testing Systems for Advanced Dynamic Materials and Component Testing
- Creep, Relaxation and LCF Testing Machines
- Pendulum and Drop Weight Impact Testers
- Modernisation of Existing Testing Machines
- Static and Dynamic Hydrostatic Testing Systems up to 10'000 bar
- Actuator Systems for Civil, Structural and Architectural Testing
- Building Materials Testing Machines
- Customized Testing Systems
- Accredited Service and Calibration Laboratory

w+b



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