

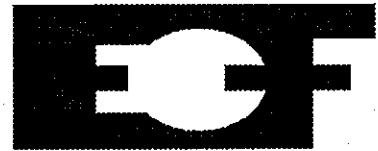
## Preparations for ECF9 on Schedule

All preparations for the 9th European Conference on Fracture (ECF9) that will be held in Varna (Bulgaria) from 21-25 September 1992, are running well. After the decision to change the venue of the conference to Varna, the deadlines for contributed papers was shifted to February 15 1992, to allow potential authors some extra time. This has worked, and the prospect is that the size conference will be comparable to earlier versions.

In the meantime the organizer, Prof. Stojan Sedmak and the chairman of the local organizing committee, Dr. Stephan Vodenicharov co-ordinated their preparations in order to create optimum conditions for a successful conference, both from a scientific and an organizational point of view. According to the new time schedule, the proceedings will still be printed in time and they will be available at the conference for all attendants. However, the schedule is tight and *all authors whose abstracts were accepted are asked to keep the deadlines* (full paper before June 1, revised papers before August 1). A further delay is not possible, so papers of authors who fail to meet these deadlines will not be printed in the proceedings. Almost 300 abstracts for contributed papers were accepted. In addition, several well-known specialists accepted to give a keynote lecture on the various topics covered by the conference. A list of these is given in the final announcement printed elsewhere in this Newsletter. Also, Prof. John Knott of Cambridge University (UK) accepted the invitation to give a plenary lecture on "Micromechanisms of fracture and the effects of material microstructure". So, the organizers have done everything within their possibilities to make the conference successful, and it is now to the attendants to realize this.

ECF9 will also be an important meeting for the ESIS organization. The ESIS council, with delegations from all member countries will meet to set the society's policy for the future. One important point on the agenda will be the election of a new President. The term of the present President, Dr. Hannes Larsson ends after a period of four years in which he guided the transfer of the European Group on Fracture into the European Structural Integrity Society, and several other important changes in the organization were effectuated. Also the term of three members of the Executive Committee ends this year. These are Dr. Czoboly (Hungary), Prof. Faria (Portugal) and Prof. Firrao (Italy). In addition, Mrs. Dr. Berger (Germany) has asked for replacement. A Nomination Committee is preparing the nomination of candidates for these positions, about which the Council will vote during the Varna meeting. Other important points that will be on the agenda of the Council meeting are the venue for ECF11 (ECF10 will be held in Berlin, Germany, 1994), and the membership of the republics that formed the former USSR. Also some (but not all) ESIS Technical Committees will use ECF9 to meet and discuss future activities.

### Farewell



### Welcome



European Structural Integrity Society

## ESIS has a new House-style

With this Newsletter the new house-style of ESIS is introduced. This took considerably more time than originally planned. This was mainly caused by the fact that designs that were made for a new logo were not accepted.

Finally, Mrs. Brigitte Beenen of the Graphical and Typographical design bureau Studio B in The Hague (NL) was asked and her design found approval. Based on this logo Mrs. Beenen also designed new letter paper, covers for ESIS reports and, last but not least, a new lay-out for this Newsletter.

With the introduction of our new house-style the transfer from European Group on Fracture to European Structural Integrity Society, which was accepted by the EGF Council during its meeting in Torino in 1990, is finished. From now on also the addition "formerly EGF" will no longer be used.

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# ESIS Technical Committee 6 on Ceramics

*Minutes of the 5th Meeting, November 26 and 27, 1991 at the facilities of Risø National Laboratory, Denmark*

Dr. Hansen, Head of Materials Department, Risø National Laboratory, welcomed 17 participants from 5 countries. He presented the work of the National Laboratory with the main areas energy, environment and materials, and more detailed of the Materials Department with the main areas material science (e.g. hot cells), mechanical engineering (e.g. structural mechanics, internal stresses, structures, high-temperature alloys, mechanical and non-destructive testing), materials technology (e.g. advanced technical ceramics, powder metallurgy, surface technology) and energy programmes.

Mrs. Bentzen from Risø National Laboratory gave an introduction to the Centre of Advance Technical Ceramics. The main projects are on development of process technologies for production of oxide-based ceramics, characterization and testing of ceramics components, development of new types of electroceramics based on niobates and similar compounds and information and education.

Nine papers been presented and discussed during the meeting:

*C. Møller, Risø National Laboratory, DK "A Study of Fatigue Crack Growth using SEM".*

He presented a video showing cyclic crack growth (constant loading amplitude) in Mg-ZrO<sub>2</sub> in a scanning electron microscope. The observation that cracks stop for a while in tetragonal phases, followed by crack deflection and branching and growth through zones with low phases was discussed.

*H.J. Schindler, EMPA Dübendorf, CH "On Estimation of Fracture Toughness of Brittle Materials by Flanking Tests".*

It has been experimentally found and theoretically confirmed that cracks near a surface will propagate parallel to this surface, if the load acting on the crack contains a compressive component parallel to it. Theoretically there exists a unique relation between the distance of the crack from the surface (i.e. thickness of the resulting flake), the compressive force and fracture toughness (plateau value in case of R-curve behaviour), providing a theoretical basis for estimating fracture toughness simply from the thickness of the flake. First experiments on brittle plastics showed promising results.

*Continued on page 4*

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# Deadline

## Copy for ESIS Newsletter 19 Summer 1992

The next ESIS Newsletter, nr. 19 (Summer 1992) is scheduled to be mailed before the end of August 1992.  
Deadline for copy is:

# August 1, 1992

Further investigations shall show the applicability on ceramics. The references which have been asked for are: Schindler, H.J., Sayir, M., *Int. J. Fracture* **25** (1984) 95-107; Cotterell, B., et al., *Int. J. Fracture* **29** (1985) 205-221; Thouless, M.D., et al., *Acta Metall.* Vol. **35**, No. 6 (1987) 1333-1341; Swenson, D., Kaushik, N., *Eng. Fracture Mechanics* Vol. **37**, No. 3 (1990) 641-651.

T. Hollstein, IWM Freiburg, FRG

"Assessment of Natural Defects in Tubes and Bars".

In order to analyse the prediction of the strength of ceramic components on the basis of the fracture mechanics concept and Weibull statistics, experimental strength investigations were performed on tubes and on bending and tensile bars of different sizes of the effective stressed volumes. According to fracture mechanics, the fracture toughness,  $K_{Ic}$ , determined on specimens with sharp cracks is in the same order of magnitude as the critical stress intensity factors,  $K_{Ic}$ , evaluated with the critical sizes of the fracture causing defects,  $a_c$ , and the failure stresses  $\sigma_c$ . A prediction of strength as a function of the effectively stressed volume of component-like specimens on the basis of the results of 4-point bend specimens and on Weibull Statistics seems to be possible provided that for the 4-point bend specimens optimal surface quality and strength values are achieved, which are not influenced by machining-induced defects.

A. Krell, IKTS Dresden, FRG

"Influence of Glass-phase Content on the Correlation between R-Curve Behaviour and Crack Growth Kinetics of ZTA Ceramics".

In zirconia-toughened alumina, both instability and subcritical crack growth are governed predominantly by transformation-induced microcracking for shorter ( $\approx 0.3$  mm) than for longer cracks. Therefore,  $K_I$ - $v$ -diagrams were closely related to the R-curves of different structures, and ranking with respect to crack resistance at instability ( $K_{Ic}$ ) or in the subcritical range gives the same dependence on the silica concentration for 0.2 - 1.3 wt-%. However, in the course of the R-curve, the quantitative effect of silica changes due to a direct impact of the grain boundary structures on phase transformation and microcracking.

T. Fett, KFK Karlsruhe, FRG

"Calculation of R-Curves from Bridging Stresses".

The influence of bridging stresses caused by friction interactions between the crack surfaces on the R-curve was calculated using the fracture-mechanical weight function method. It could be shown that for material specific bridging stress vs. COD relations the resulting R-curve cannot be independent on the loading type (tension, bending), the type of crack propagation (subcritical growth, stable crack extension) the initial crack size ... A procedure for the evaluation of bridging parameters from subcritical crack growth measurements was proposed. Finally, the influence of the bridging stresses on strength and lifetime of specimens with natural crack population was illustrated.

C. Frederichsen & H.W. Schou, Risø National Laboratory, DK  
"K<sub>Ic</sub> Testing of Notched Specimens (incl. R-Curve Techniques)".

They have tested three different methods to measure  $K_{Ic}$  in ceramics: chevron short rod, 4-point bending with controlled slow crack growth. The tests were carried out on two different ceramic materials: Yttrium-stabilized zirconia (3Y-TZP), magnesia-stabilized zirconia (9Mg-PSZ). The chevron short rod method was precise and gave good reproducible results with 3Y-TZP. The specimens of 9Mg-PSZ were porous, therefore the results were not reliable. The 4-point bending methods were not able to stop the crack from propagating in the 3Y-TZP material. In the 9Mg-PSZ material, both 4-point bending methods worked fine. They concluded from the tests that chevron short rod is the easiest and most reliable method.

M. Rombach, IWM Freiburg, FRG

"R-curve-effects in Si<sub>3</sub>N<sub>4</sub> - fracture-mechanical modelling and experimental results".

He developed a fracture-mechanical model which describes bridging effects and slow crack growth, only delivering a material-depending function for the R-curve effect. For a hot pressed silicon nitride, experimental results (in-situ experiments in the SEM) are modelled and lifetime estimations are carried out.

G. Schneider, MPI Stuttgart, FRG

"R-curve behaviour and strength variability".

A power law R-curve description was used to predict the strength variability of ceramic materials with a flaw size distribution,  $g(a)$ , of the form  $g(a) \sim a^n$ . The result gives an analytical expression for a higher Weibull modulus due to stable crack growth prior to failure. In addition, the effect on the strength variability of arbitrary R-curves was discussed.

#### Discussion on the Round Robin Activities of TC 6

The main topic of the discussions during the meeting was the Round Robin on fracture-toughness determination and measurement of subcritical crack growth. The procedure for fracture-toughness determination has been accepted. The main material to be tested by all participants will be Al<sub>2</sub>O<sub>3</sub>. Four other materials, HPSN, SiC, Y-ZrO<sub>2</sub> and Mg-ZrO<sub>2</sub> will be tested by at least three laboratories each to determine the material dependencies of the  $K_{Ic}$  procedures in addition. The test matrix has been established. The planning for machining of the specimens is in progress and the specimens will be distributed to the Round-Robin participants soon. Late participants are welcome, as far as specimens are available.

"Behaviour of cracks in ceramic/ceramic and ceramic/metal interfaces" has been chosen as main topic for the next meeting which will be held at INSA facilities, Villeurbanne (Lyon) France, on 8th/9th September, 1992. Abstracts on this topic or on the general topic of the Technical Committee should be submitted to one of the chairmen no later than 31st July, 1992.

Prospective participants who are not on the mailing list of the TC6 should contact one of the chairmen (see p.2).

## Dynamic Testing at Intermediate Strain Rates

The sixth meeting of this committee took place on November 1991 at NPL, Teddington. Twenty one delegates attended: ten from U.K., six from Germany, and one each from Italy, Belgium, Switzerland, Finland and France.

Bridget Hayes (Welding Institute) resigned as Chairperson, and she is succeeded by Hugh MacGillivray (Imperial College, London).

The following standards are being progressed:

1. Charpy V Notch Test Standard. This concerns the impact testing

of V notched specimens only.

The proposed standard is now in draft form and is being disseminated to committee members for comment.

2. Instrumented Pre-Cracked Charpy Test Standard. Similar to (1), but specimens are pre-cracked to allow for fracture mechanics characterisation. Existing methods of crack tip strain gauge, impact response curve and Dally approach are being compared.
3. Dynamic Tensile Test Standard. This will cover strain rates up to

$10^3 \text{ s}^{-1}$  and will be based on high rate servohydraulic testing machines. A draft standard has been developed and is being disseminated to committee members.

4. Dynamic R Curve Round Robin. This is currently being progressed.

A further area of work may be the standardisation of testing of sub-size Charpy specimens.

The next meeting will be at MPA, Stuttgart, 3 April 1992.

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## Spanish-French Meeting on Fracture

On April 1-3 1992 the Spanish Group on Fracture and the "Brittleness Fracture Commission of the Societ e Franaise de M tallurgie et des Mat riaux held a common meeting on fracture at Aiguablava in Catalonia.

There were 78 attendants. The French delegation numbered 18 and the participation of two Englishmen, one German and two Americans was noteworthy. Invited lectures were given by Prof. Shah from Northwestern University, Prof. Giui from Queen Mary College, Prof. Suresh from

Brown University, Prof. Bonfield from Queen Mary College and Prof. Franois from Ecole Centrale de Paris.

There were two parallel sessions. The papers were divided into metallic materials, non-metallic materials, experimental techniques, numerical methods and applications. They were gathered as "*Anales de Mecanica de la Fractura*" which can be obtained by writing the organiser of the meeting:

Professor Anglada  
Universitat Polit cnica de Catalonia  
ETSI Industriales  
Avda. Diagonal 647  
02028 Barcelona, Spain.

This meeting was an excellent opportunity to get to know each other and to start new co-operations. The marvellous organization in a most attractive place with all the luxury of a Parador helped to make this meeting an extremely successful event.

### A European Round-Robin

## Short Fatigue Crack Growth under Random Loading

The Structural Integrity Research Institute of the University of Sheffield (SIRIUS) is planning to initiate a European Round Robin on **Short Fatigue Crack Growth under Random Loading**.

Full details about the program are given in the ESIS Journal Fatigue & Fracture of Engineering Materials & Structures, Vol. 15 nr. 3.

It is planned that this activity will lead

to an international conference on this subject, and a book in the ESIS Publications Series, published by EMAS.

*Final Announcement*

# ECF9 - 9th European Conference on Fracture

## RELIABILITY AND STRUCTURAL INTEGRITY OF ADVANCED MATERIALS

**New Venue:** Varna - Bulgaria

**Date:** 21-25 September 1992

6

### Scope

The ECF9 will comprise invited plenary and keynote lectures, oral presentations and poster sessions of contributed papers about themes centred on "Reliability and Structural Integrity of Advanced Materials"

The main theme will be divided into the following subthemes:

1. Properties, processing, application and design of new materials;
2. Mechanical testing of smooth, notched and cracked specimens;
3. Crack initiation and growth, environment and temperature effects;
4. Defect, damage and fracture: testing and analysis;
5. Basic fracture mechanics concepts and parameters;
6. Material joints and joining procedures;
7. Aspects of material reliability and structural integrity;
8. Case studies and service failure analysis.

Invited keynote lectures will be given by

*D. François*

Damage mechanisms and damage mechanics in composite materials.

*K.J. Miller*

Biaxial and multiaxial fatigue

*H. Riedel*

Creep-(fatigue) crack growth

*M. Wnuk*

Damage tolerant design in non-linear fracture mechanics

*H. McHenry*

Fitness-for-Service

*M. Berkovic*

Numerical simulation of material behaviour

**K.-H. Schwalbe and M. Kocak**

Fracture mechanics of weldments

*I. Hrivnak*

Problems of materials processing and joining

*LM. Lobanov and V.A. Pivtorak*

Investigation of stress-strain state and inspection of weldments using holography

*W. Brocks*

Stable crack growth of surface cracks in components

An invited plenary lecture will be given by

*J.F. Knott*

Micromechanisms of Fracture and the effects of material microstructure

### The Venue

The ECF9 will be held in Varna, famous and beautiful summer resort on the Black Sea coast. Varna is well known for its beautiful coast ("Golden Sand Beach"), ancient monuments (Roman bath) and curative mineral springs. Varna is well connected with all parts of Europe by rail-road and air (there is an International Airport with frequent flights to most of the European major cities). The climate in late September is usually enjoyable with an average temperature of 20 °C. Accommodation will be available in international style hotels for US \$ 20-50 per day.

**Social Programme**

A full social programme for delegates and accompanying persons will be organized, including the banquet and tours to places of cultural, historical and local interest.

**Exhibition**

An exhibition of testing machines and equipment, technical publications and computer-aided-fracture mechanics will be organized. Prospective exhibitors are invited to contact the Conference Secretariat.

**Proceedings**

EMAS will publish the proceedings from camera-ready manuscripts in a style as in the previous conferences.

**Scientific Organization**

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European Structural Integrity Society

Pre-registration

**ECF9**

Varna, Bulgaria  
21-25 September, 1992

I wish to participate, please send full registration forms to:

Name : \_\_\_\_\_

Affiliation : \_\_\_\_\_

Address : \_\_\_\_\_

\_\_\_\_\_ Tel.: \_\_\_\_\_

\_\_\_\_\_ Fax: \_\_\_\_\_

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Send this form to **ECPD c/o Dr. A. Sedmak  
Kneza Mihaila 7/II  
11000 Belgrade, Yugoslavia**

# ESIS Technical Committee 10 on Environmentally Assisted Cracking

3rd Workshop meeting on  
"Fracture Mechanics Approach to Corrosion Assisted Cracking"  
NLR Laboratory, Marknesse, NL March 12, 1992

The 3rd workshop started at 9.00 a.m. and was attended by 20 persons (list of the participants see appendix A). After a welcome address and greetings from Mr. Larsson, president of ESIS, to the participants the workshop started with six contributions related to the application of fracture mechanics based techniques to investigate the SCC behaviour of structural materials. After lunch the results of the two panels "Future Test Standard" and "Fracture Control Guidelines for Environmental Assisted Cracking of Low Alloy Steels" were presented. The workshop ended after a discussion of possible future activities with a visit of the laboratories of NLR. The meeting closed at 5.00 p.m.

## Contributions

**L. Coudreuse**, Creusot-Loire Industrie, Le Creusot, F  
Use of fracture mechanics in the case of hydrogen charged materials

**K. Matocha**, Research Institute of VIKOVICE, CSFR  
Effects of temperature and dissolved oxygen content on fatigue crack growth of a bainitic nickel-molybdenum steel in PWR secondary water environment

**E. Maahn**, Institute of metallurgy, Techn. University of Denmark, DK  
Corrosion fatigue of stainless steel

**M. Ruscak**, Nuclear Research Institute, Rez, CSFR  
The influence of coolant on the SCC and CF of PWR austenitic steels

**P. Sajdl**, Power Engineering Department, Institute of Chemical Technology, Prague, CSFR  
Comparison between the simple computer model for strains and strain rates experienced by tapered specimens and finite elements method solutions

**R. Schellenberger**, MPA, Universität Stuttgart, FRG  
Details of the J-Integral testing facility of the MPA Stuttgart for high temperature water environment and results achieved

## Results - Further Activities

### Panel 1 "Future Test Standard"

W. Dietzel and P. Karjalainen-Roikonen presented the results of panel 1, "Recommendations for stress Corrosion Testing Using Pre-Cracked Specimens", a first draft of which was handed out to the participants.

The recommendations which got the official ESIS-number P4-92 D tries to merge elements of the standards ISO 7539/6, ASTM 399-90 and the ESIS recommendations PI-

90 with results from the literature in order to obtain an accelerated fracture mechanics based SCC test technique. In the vivid discussion it was concluded that the suitable displacement rate for an accelerated SCC test depends strongly on the investigated system. Apart from this there is also a lack of reliable data to determine this parameter. It was agreed upon that the further activities of this panel should be:

- Every participant should send comments and amendments related to the recommendation within 4 weeks after receiving the minutes.
- A round robin test, planned for the near future and consisting of two parts:
  1. One system investigated by all participants to qualify the recommendations and the laboratory standard.
  2. Two systems (stress controlled, strain generated) out of three different groups of materials (low alloyed steel <ferrite>, high alloyed steel <austenite>, non-ferrous metal <Al-alloy>) to improve the data base for a second draft of recommendations. Suitable systems should also be included in the comments sent by the participants.
- Proposals for a second draft will be presented at the next meeting.

The participants were divided into the groups of interest according to the different materials listed under point 2 (see appendix B). In case of more interested participants from outside the TC the chairmen will manage the additional deviation. Before the next meeting of the TC there will be at least two meetings of the panel. W. Dietzel will co-ordinate this work also in future, assisted by P. Karjalainen-Roikonen, C. Christensen and J. Struve. Help from other members of the TC and from interested people outside the TC will be most welcome.

### Panel 2 "Fracture Control Guidelines for Environmentally Assisted Cracking of Low Alloy Steels"

G. Gabetta gave an overview of the work of this panel. A copy of these guidelines was also distributed. Supplementary to panel 1, here the time dependence of the SCC process was pointed out. In the discussion of this panel the following further activities were agreed upon:

- Final remarks to the guidelines should be sent to G. Gabetta within 4 weeks after receiving the minutes.
- The paper will be published as an official ESIS-document in the same way as previously established "Fracture Control Guidelines for Stress Corrosion Cracking of High Strength Alloys".

Continued on page 9



### General

1. It was agreed upon to rename the TC 10 from "Corrosion Cracking" to "Environmentally Assisted Cracking"
2. Concerning panel I, H. Louis will contact the European Community in order to obtain information about the possibility to involve the planned round robin test in the Pre-Normative Research BCR programme. A draft-proposal, written by W. Dietzel and distributed to the participants, has already been presented in 1991 at the EC and will now be put into a suitable form for application by the chairmen. Deadline for BCR-proposals will be June 30, 1992. New guidelines will be available in about 4 weeks time from now. At present the financial situation of this programme is still unsatisfactory. The TC members will be informed about the progress of this project.

3. Future work of the TC 10 will also be focused on:
  - Application of elastic-plastic fracture mechanics to SCC testing techniques, especially in case of low alloy steels.
  - Make an attempt to define the typical terms in the fields of corrosion and fracture mechanics more exact in order to decrease the amount of misunderstanding between researchers in these two fields. The definitions used in the aerospace and nuclear industry could be the basis for this attempt. For the next TC meeting contributions related to this topic will be welcome.

The workshop meetings are to be continued on annual basis. The next meeting will be held at the facilities of the Nuclear Research Institute Rez near Prague, CSFR, on May, 13/14, 1993.

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### Subcommittee on

## Fatigue Loading Histories for Offshore Structures

### Response to Questionnaire

The Subcommittee on Fatigue Loading Histories for Offshore Structures issued a questionnaire to assess the level of interest in future work on standardised loading histories for fatigue testing relevant to offshore structures. Seven replies were received, from four different countries, and these are summarised below.

All 7 respondents agreed that there was a need for formal documents describing standardised loading histories, and issued by an organisation such as ESIS. All except one agreed that the organisation should arrange for the issue of implementations on magnetic media. Six respondents agreed that there is a need for a register of publicly available documentation and magnetic media for standardised fatigue loading histories for offshore structures. Existing standardised load histories for fatigue testing relevant to offshore structures are either generic in nature or primarily intended to represent tubular structures in the North sea. Three respondents suggested that load histories should be developed for other types of structure and areas, with the other four undecided.

Specific structures mentioned were the rack and pinion mechanism on jack-ups, and welded plate joints on topsides. One reply suggested the development of a 'concave spectrum' (this would be applicable to small diameter tubular members).

Versions of the Wave Action Standard History (WASH), for tubular structures in the North Sea, are already available on magnetic media. Opinion on whether a document describing WASH and its variants should be developed was divided, with three in favour, three against, and one uncertain.

Only one respondent could identify a possible source of funds to support future work on the development and documentation of standardised fatigue loading histories for offshore structures.

Anyone else who would like to complete the questionnaire is welcome to do so.

*Dr. L.P. Pook*

*Chairman, Subcommittee on Fatigue Loading Histories for Offshore Structures.*

### TCI Subcommittee on

## Round Robin on Local Fracture Criteria

Until now we have received

- 18 results for the numerical part;
- 9 results for the experimental part on cleavage fracture;
- 11 results for the experimental part on ductile fracture.

Some participants have sent a letter explaining that they have to further postpone the experimental part. How-

ever, for the EEC, this action must come to an end before the end of June.

We plan, with the BCR of the EEC, to organise a meeting in Brussels, probably the 26th May, 1992, in order to discuss the results before a final report is issued by the end of June.

*F. Mudry*

Call for Papers

# International Symposium on Mis-Matching of Welds

Performance of Strength Mis-Matched  
Welded or Bonded Joints

**Location:** GKSS-Research Center Geesthacht (Hamburg), Germany

**Date:** May 26-28, 1993

10

## Sponsored by:

**European Structural Integrity Society (ESIS)**  
**Deutscher Verband für Schweißtechnik (DVS)**  
**Deutscher Verband für Materialforschung und  
-prüfung e.V. (DVM)**

## Scope

The aim of the symposium is to identify and highlight the significance of the strength mis-match on fracture behaviour of welded joints. Application of fracture mechanics testing, failure assessment and numerical analysis of the mis-matched weld joints or bi-material interfaces will be emphasized. Papers will also be welcome on analysis of microstructure and residual stress developments at the bi-material interfaces.

**Mis-match '93** will be of interest to researchers and engineers from universities and industries who are working on the construction, operation and quality control aspects of welded or bonded bi-material structures.

## Symposium Themes

Papers on the following topics are sought:

- Fracture Mechanics of Bi-material Interfaces
- CTOD and J-Integral Testing of Mis-matched Joints
- Wide-plate and Component Testing
- Developments of Defects and Cracks due to Mis-match
- Numerical Analysis of Mis-matched Joints
- Microstructural and Residual Stress Aspects
- Failure Assessment Analysis
- Design Principles of Mis-matched/Bi-material Joints

## Call for Papers

Authors are invited to submit papers for oral or poster presentations at the Symposium and inclusion in the proceedings to be published, and are kindly requested to send 500 words extended abstracts with one or two key illustrations not later than **September 1st, 1992** to the Symposium chairman. The abstracts will be reviewed and authors notified of acceptance by **October 15th 1992**. Full papers will be rigorously reviewed for acceptance for the proceedings. English is required for abstracts, papers and oral presentations.

## Symposium Venue

The Symposium will be held at the GKSS Center Geesthacht. Geesthacht is a small town located in the South-East of Hamburg (30 km), by the side of the river Elbe.

## Organizing Committee

**Chairman** Prof. K.-H. Schwalbe

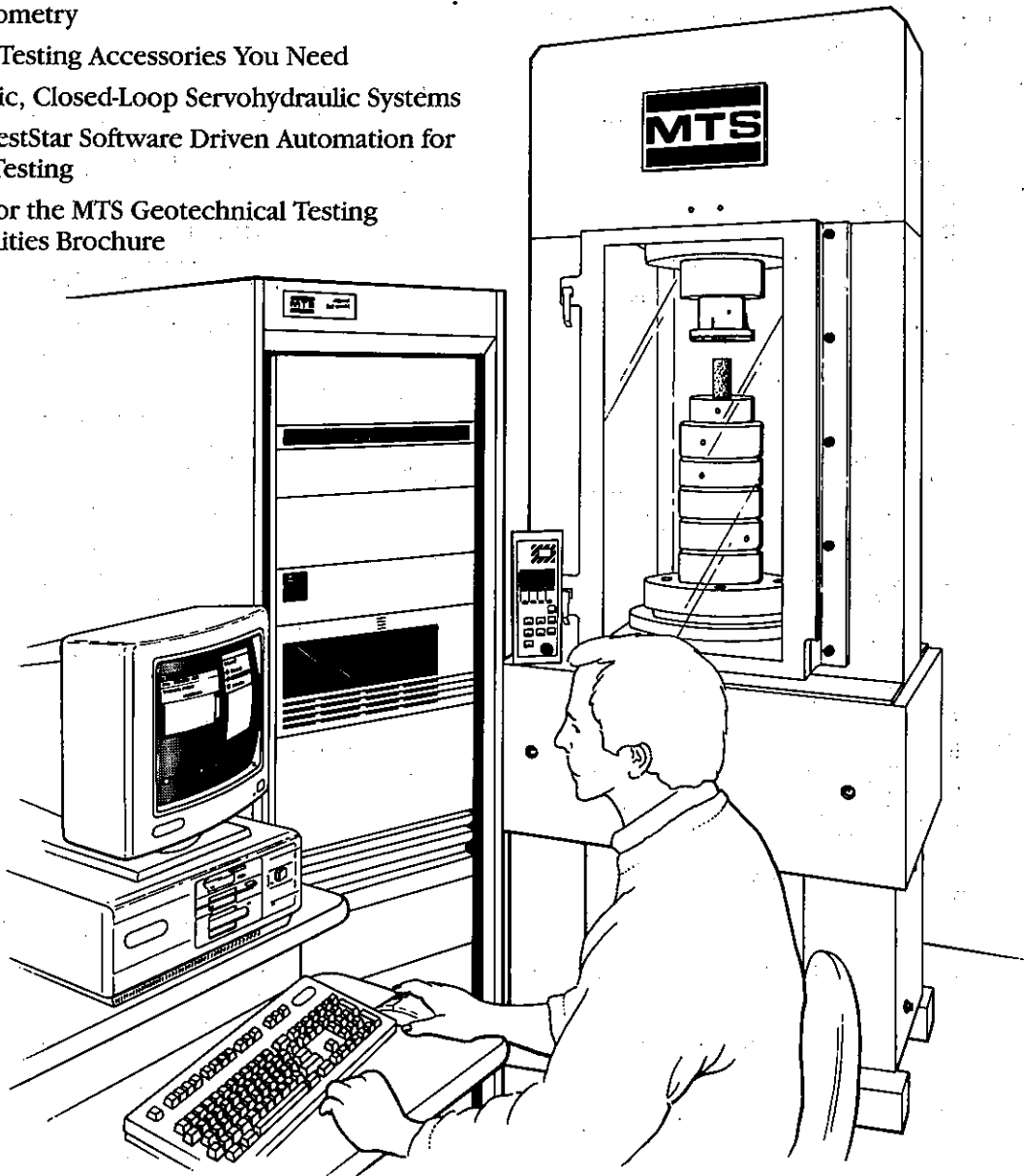
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# Agenda of Fatigue and Fracture Events

Agenda items are placed free of charge.  
Inform the editor about any meeting of interest to  
the readers of this Newsletter

## June 1-5, 1992

### 1st Int Conference on Fracture Mechanics of Concrete Structures

Location : Breckenbridge, Colorado, USA  
Organizer : Northwestern University  
Deadlines : Nov 1, 1991 - Abstract (1 page)  
Dec 15, 1991 - Notification of acceptance  
Feb 1, 1992 - Camera ready papers  
Inquiries : Dr. Z. Bazant  
Walter P. Murphy Professor of Civil Engineering  
Northwestern University  
Evanston, ILL 60208-3111, USA  
Tel 708/491-4025, Fax 708/467-1078

## June 2-5, 1992

### Int. Conference on Pipeline Reliability

Location : Calgary, Alberta, Canada  
Sponsor : CANMET, Energy, Mines and Resources, Canada  
Deadlines : May 1, 1991 - Abstracts (200 words)  
Nov. 1, 1991 - Full papers for review  
March 1, 1992 - Camera-ready man.  
Language : English, French (simult. transl.)  
Inquiries : Dr. R. W. Revie  
CANMET, Metals Technology Labs  
568 Booth Street  
Ottawa, Ontario K1A 0G1, Canada  
Tel. 613/992-1703, Fax 613/992-8735

## June 14-19, 1992

### 2nd Int. Offshore and Polar Engineering Conference

Location : San Francisco, CA, USA  
Deadlines : Aug 1, 1991 - Abstracts (300-400 words)  
Inquiries : ISOPE-92 San Francisco  
ISOPE, P.O. Box 1107  
Golden, Colorado 80402-1107, USA  
Tel 1-303-273-3673, Fax 1-303-420-3760

## June 15-17, 1992

### Symposium on Automation in Fatigue and Fracture Testing and Analysis

Location : Paris, France  
Sponsors : SF2M, SAE (France), ASTM E-9 (USA)  
Deadlines : March 18, 1991 - Abstracts (300-500 w)  
Inquiries : Claude Amzallag  
UNIREC-Centre Commun de Recherche  
BP 50-3254, Firminy, France, Tel. (33)77-403372

## June 22-27, 1992

### 3rd Int. Conference on Aluminium Alloys: Physical and Mechanical Properties

Location : Trondheim, Norway  
Organizer : NTH, SINTEF, Norway  
Deadlines : follows (March 1991)  
Inquiries : 3rd Int. Conference on Aluminium Alloys  
SINTEF Metallurgy, 7034 Trondheim, Norway

## June 30-July 2, 1992

### 24th National Symposium on Fracture Mechanics

Location : Gatlinburg, Tennessee, USA  
Sponsors : ASTM E-24  
Deadlines : July 30, 1991 - Abstract (300-500 words)  
April 30, 1992 - Full manuscripts  
Inquiries : Prof. J.D. Landes  
Univ. of Tennessee  
Dept. of Engineering Science & Mechanics  
310 Perkins Hall  
Knoxville, TN 37996-2030  
Tel. 615/974-7670, Fax 615/974-2669

## July 1-3, 1992

### Computer Aided Assessment and Control: Localized Damage

Location : Southampton, UK  
Organizer : Wessex Inst. of Technology, UK  
Sponsors : ESIS, ISBE  
Deadlines : Oct 27, 1991 - Abstract (300 words)  
Inquiries : Dr. M.H. Aliabadi  
Wessex Institute of Technology  
Computational Mechanics Institute  
Ashurst Lodge, Ashurst  
Southampton SO4 2AA, UK  
Tel (44)703 293223, Fax (44)703 292853

## July 6-9, 1992

### 4th Int. Conf. on "Structural Failure, Product Liability and Technical Insurance", SPT-4

Location : Vienna, Austria  
Organizer : TU Vienna  
Deadlines : Oct 31, 1991 - Abstracts (300 words)  
April 30, 1992 - Full papers  
Inquiries : Doz. Dr. H.P. Rossmannith  
Institute of Mechanics of TU Vienna  
Wiedner Hauptstr. 8-10/325  
1040 Vienna, Austria  
Tel (0222)58801-5514,5519 Fax (0222)5875863

## July 10, 1992

### Advanced Workshop/Seminar on Teaching and Education in Fracture and Fatigue - Analysis and Prevention

Location : Vienna, Austria  
Organizer : TU Vienna  
Sponsors : ESIS, ICF  
Inquiries : Doz. Dr. H.P. Rossmannith  
Institute of Mechanics of TU Vienna  
Wiedner Hauptstr. 8-10/325  
1040 Vienna, Austria  
Tel (0222)58801-5514,5519 Fax (0222)5875863

## September 7-10, 1992

### Materials for High Performance

Location : Birmingham, UK  
Organizer : Interdisciplinary Research Center in  
Materials for High Performance Appl., UK  
Deadlines : Nov. 1, 1991 - Abstracts  
Jan. 1, 1991 - Manuscript instructions  
March 31, 1992 - Manuscripts  
Inquiries : Prof. M.H. Loretto, IRC 92 Office  
The Univ. of Birmingham  
Edgbaston, Birmingham B15 2TT, UK  
Tel. (021)4145215, Fax (021)4143441

## September 7-11, 1992

### 13th Risø Int. Symposium on Materials Science: Modelling of Plastic Deformation and its Engineering Applications

Location : Roskilde, Denmark  
Organizer : Risø Nat. Laboratory  
Deadlines : Dec. 31, 1991 - abstracts (300 words)  
May 1, 1992 - papers (6 pages)  
Inquiries : The Secretariat  
13th Risø International Symposium  
Materials Department  
Risø National Laboratory  
PO Box 49, 4000 Roskilde, Denmark

# Agenda cont'd

## September 7-11, 1992

### 3rd International Conference on Low Cycle Fatigue and Elasto-Plastic Behaviour of Materials

**Location** : Berlin, FRG  
**Organizer** : DVM, Berlin, FRG  
**Deadlines** : May 1, 1991 - Abstract (1000 w, 2 fig)  
June 15, 1991 - Notification of acceptance  
Oct. 31, 1991 - Full manuscripts  
Jan 31, 1992 - Final acceptance notice  
**Inquiries** : Prof. Dr.-Ing. K.-T. Rie  
Inst. f. Oberflächentechnik und Plasmatechnische  
Werkstoffentwicklung, TU Braunschweig  
Bienroder Weg 53, 3300 Braunschweig, FRG  
Tel (0531)391-9402 Fax (0531)391-4577

## September 21-23, 1992

### Int. Symposium on Ultra High Temperature Mechanical Testing

**Location** : Petten, The Netherlands  
**Organizer** : High Temp. Mechanical Testing Committee  
CEC, Inst. of Advanced Materials, Petten, NL  
**Deadlines** : May 15, 1992 - Poster Abstracts (100-200 words)  
**Inquiries** : Dr. M. Steen  
JRC Petten  
P.O. Box 2, 1755 ZG Petten, The Netherlands  
Tel (+31)(0)2246-5271  
Fax (+31)(0)2246-3544

## September 21-25, 1992

### 9th European Conference on Fracture Mechanics (ECF9): Reliability and Structural Integrity of Advanced Materials

**Location** : Varna, Bulgaria  
**Sponsor** : ESIS  
**Deadlines** : Jan 31, 1992 - Abstract (300 words)  
June 1, 1992 - Full paper  
**Inquiries** : Prof. S. Sedmak  
Faculty of Technology & Metallurgy  
Karnegijeva 4, 11000 Belgrade, Yugoslavia  
Tel. (38)11-327796 or 325223, Fax (38)11-320847

## September 23-24, 1992

### Shallow Crack Fracture Mechanics Tests and Applications

**Location** : Cambridge, UK  
**Organizer** : The Welding Institute, Cambridge, UK  
**Deadlines** : Dec 13, 1991 - Synopsis (300 words)  
**Inquiries** : Tony Gray  
TWI, Abington Hall, Abington  
Cambridge CB1 6AL, UK  
Tel (44)223 891 162, Fax (44)223 892588

## October 5-7, 1992

### Int. Conf. on Corrosion-Deformation Interactions

**Location** : Fontainebleau, France  
**Organizer** : Electricité de France/Université de Lille  
**Sponsor** : ESIS et al.  
**Deadlines** : Dec 15, 1991 - camera ready ext. abstract  
July 1, 1992 - Full paper  
**Inquiries** : Prof. T. Magnin  
Université de Lille I  
Lab. de Métallurgie Physique  
UA CNRS Bâtiment C6  
59655 Villeneuve d'Ascq cédex, France  
Tel (33)20434944, Fax (33)20434040

## October 14-15, 1992

### Specialists Conference on Fatigue of Aircraft Materials, In honour of Prof. J. Schijve's retirement

**Location** : Delft, The Netherlands  
**Organizer** : Delft University, Delft, The Netherlands  
**Inquiries** : Mrs. A. de Bruin  
Congress Organisation/Aula  
P.O. Box 5020  
2600 GA Delft, The Netherlands  
Tel (+31)(0)15-781356  
Fax (+31)(0)15-786755

## October 15-17, 1992

### Int. Conf. on Bond in Concrete: From Research to Practice

**Location** : Riga, Latvia  
**Organizer** : CEB Task Group VII1, Riga Techn. Univ.  
**Deadlines** : Dec 1, 1991 - Abstract (200 w)  
June 30, 1992 - Full paper  
**Inquiries** : Prof. Felix Bulavs  
RTU, Kalku iela 1, Riga 226355, Latvia  
Tel 7 0132 612762, Fax 7 0132 212206

## November 9-13, 1992

### 2nd Int. Conf. on "Fracture and Damage of Concrete and Rock": FDCR-2

**Location** : Vienna, Austria  
**Organizer** : TU Vienna  
**Sponsor** : Austrian Fed. Economic Chamber  
**Deadlines** : March 31, 1992 - Abstracts (300 words)  
July 31, 1992 - Full papers  
**Language** : English, German (simult. transl.)  
**Inquiries** : Doz. Dr. H.P. Rossmanith  
Institute of Mechanics of TU Vienna  
Wiedner Hauptstr. 8-10/325  
1040 Vienna, Austria  
Tel (0222)58801-5514,5519  
Fax (0222)5875863

## November 16-17, 1992

### 2nd Symposium on Cyclic Deformation, Fracture and Non-destructive Evaluation of Advanced Materials

**Location** : Miami, Florida, USA  
**Sponsor** : ASTM Committee E-9  
**Deadlines** : Dec. 18, 1991 - Abstracts (250-300 w.)  
**Inquiries** : S.E. Groves  
Lawrence Livermore Nat. Lab.  
P.O. Box 508  
L-342 Livermore, CA 94550, USA

## November 16-17, 1992

### Symposium on Compression Response of Composite Structures

**Location** : Miami, Florida, USA  
**Sponsor** : ASTM Committee D-30  
**Deadlines** : Dec. 16, 1991 - Abstracts (250-300 w.)  
**Inquiries** : Dr. M.R. Mitchel  
Rockwell Int. Science Center  
1049 Camino dos Rios  
Thousand Oakes, CA 91360, USA  
Tel. 805/373-4450

## November 18-19, 1992

### Symp. on Accuracy of Load and Strain Measurements of Testing Machines

**Location** : Miami, Florida, USA  
**Sponsors** : ASTM E-28/E-9/E-24  
**Deadlines** : Nov 18, 1991 - Abstract (300-500 words)  
Sep 16, 1992 - Full manuscripts  
**Inquiries** : A. Perlov  
Instron Corp.  
100 Royal Street  
Canton, MA 02021  
Tel. 412/476-6223, Fax 412/476-5151

## November 19, 1992

### Symp. on Structural Integrity of Fasteners

**Location** : Miami, Florida, USA  
**Sponsors** : ASTM E-24  
**Deadlines** : Dec. 11, 1991 - Abstract (250-300 words)  
Sep 16, 1992 - Full manuscripts  
**Inquiries** : Dr. P.M. Toor  
IBettis Laboratory  
P.O. Box 79  
West Mifflin, PA 15122-0079  
Tel. 617/575-5479

# Agenda cont'd

**April 20-22, 1993**

**8th Int. Conference on Mechanics of Composite Materials - MCM-93**

**Location** : Riga, Latvia  
**Organizer** : Inst. of Polymer Mechanics  
Latvian Academy of Sciences  
**Deadlines** : April 15, 1992 - Abstracts (1 page)  
Sep. 15, 1992 - Full Manuscripts  
**Inquiries** : Prof. V. Tamuzs  
Inst. of Polymer Mechanics  
23 Aizkraukles iela  
Riga, 226006 Latvia  
Tel. (+97)(0)132-525705, Fax (+97)(0)132-551149

14 **April 20-22, 1993**

**Surface Treatment '93**

**Location** : Southampton, UK  
**Organizer** : Wessex Inst. of Technology  
**Deadlines** : June 15, 1992 - Abstracts (300 words)  
Dec. 15, 1992 - Final Paper  
Jan. 15, 1993 - Final Acceptance  
**Inquiries** : Mrs. Sue Owen  
Wessex Inst. of Technology  
Ashurst Lodge, Ashurst  
Southampton, Hants SO4 2AA, UK  
Tel. (+44)(0)703 293223  
Fax (+44)(0)703 292853

**May 4, 1993**

**Symposium on Case Studies for Fatigue Education**

**Location** : Adanta, Georgia, USA  
**Sponsor** : ASTM Comm. E-9  
**Deadlines** : May 4, 1992 - Abstracts (250-300 words)  
**Inquiries** : Prof. R. I. Stephens  
Mechanical Engineering Dept.  
The University of Iowa  
Iowa City, IA 52242, USA, Tel. 319/335-5682

**May 4-6, 1993**

**5th Symposium on Composite Materials: Fatigue and Fracture**

**Location** : Adanta, Georgia, USA  
**Sponsor** : ASTM Comm. D-30  
**Deadlines** : May 5, 1992 - Extended abstracts  
(1000-1500 words + Fig.)  
**Inquiries** : J.J. Ruschau  
Univ. of Dayton Research Institute  
300 College Park  
Dayton, OH 45469, USA, Tel. 513/252-6660

**May 5, 1993**

**Symposium on Special Applications and Advanced Techniques for Crack Size Determination**

**Location** : Atlanta, Georgia, USA  
**Sponsor** : ASTM Comm. E-24 & E-9  
**Deadlines** : May 5, 1992 - Abstracts (250-300 words)  
**Inquiries** : Dr. R.H. Martin  
Analytical Services and Materials Inc.  
MS 188E, NASA Langley Res. Center  
Hampton, VA 23665-5225, USA, Tel. 804/864-3482

**May 26-28, 1993**

**Int. Symposium on Mis-Matching of Welds: Performance of Strength Mis-Matched Welded or Bonded Joints - Mis-match '93**

**Location** : Geesthacht, Germany  
**Sponsors** : ESIS, DVS, DVM  
**Organizer** : GKSS-Research Center Geesthacht  
**Deadlines** : Sep. 1, 1992 - Abstracts  
Dec. 15, 1992 - Manuscripts for Review  
April 1, 1993 - Final Manuscripts  
**Inquiries** : Prof. K.-H. Schwalbe  
GKSS Research Center Geesthacht  
Institute for Materials Research  
2054 Geesthacht, Germany  
Tel. (49)4152-872501, Fax (49)4152-872534

**June 7-11, 1993**

**23rd Conference and 17th Symposium of the International Committee on Aeronautical Fatigue (ICAF)**

**Location** : Stockholm, Sweden  
**Organizer** : The Aeronautical Research Inst. of Sweden  
**Inquiries** : Dr. A.F. Blom  
The Aeronautical Research Inst. of Sweden  
Box 11021  
161 11 BROMMA, Sweden

**June 8-14, 1993**

**VIII International Conference on Fracture (ICF8)**

**Location** : Kiev, USSR  
**Sponsors** : Int. Congress on Fracture  
**Organizer** : Ac. of Sciences of the Ukrainian SSR  
**Deadlines** : April 30, 1992 - Camera ready manuscripts  
**Inquiries** : ICF8 Secretariat  
Karpenko Physico-Mechanical Inst. of the  
Academy of Sciences of the Ukrainian SSR  
5, Naukova St., 290601 LVIV, USSR

**June 29-July 1, 1993**

**25th National Symposium on Fracture Mechanics**

**Location** : Bethlehem, Pennsylvania, USA  
**Sponsors** : ASTM E-24  
**Deadlines** : June 30, 1992 - Abstract (300-500 words)  
**Inquiries** : Prof. F. Erdogan  
Dept. of Mechanical Engng. and Mechanics  
Building 19, Lehigh University  
Bethlehem, PA 18015  
Tel. 215/758-4099, Fax 215/785-5623

**July 7-9, 1993**

**Int. Conference on Structural Dynamics Modelling**

**Location** : Cranfield, UK  
**Organizer** : Dynamic Testing Agency (DTA)/NAFEMS  
**Deadlines** : Aug. 31, 1992 - Abstracts (200-500 words)  
Jan. 31, 1993 - Final papers  
**Inquiries** : Mr. Neil Harwood  
DTA Conference Office, NEL  
East Kilbride, Glasgow, Scotland G75 0Qu, UK  
Tel (+44)(0)3552-72363  
Fax (+44)(0)3552-72047

**November 17-18, 1993**

**2nd Symposium on Constraint Effects in Fracture**

**Location** : Fort Worth, Texas, USA  
**Sponsors** : ASTM E-24/ESIS  
**Deadlines** : Nov. 17, 1992 - Abstract (250-300 words)  
Sep. 17, 1992 - Final manuscripts  
**Inquiries** : Prof. A. Bakker  
Delft Univ. of Technology  
Materials Laboratory  
P.O. Box 5025, 2600 GA Delft, The Netherlands  
Tel. (+31)(0)15-785418 Fax (+31)(0)15-786730

**May 28-June 2, 1995**

**7th International Conference on Mechanical Behaviour of Materials - ICM7**

**Location** : The Hague, The Netherlands  
**Sponsors** : Int. Congress on Mech. Behaviour of Materials  
**Organizer** : ESIS/Delft University  
**Deadlines** : to be announced later  
**Inquiries** : ICM7 Scientific Secretariat  
c/o Prof. A. Bakker  
Delft Univ. of Technology  
Lab. for Materials Science & Technology  
PO Box 5025, 2600 GA Delft, The Netherlands  
Tel (31)15-785418, Fax (31)15-786730



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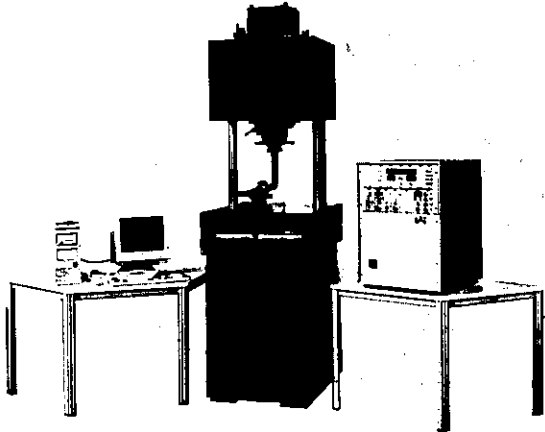
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# Resonant Testing Systems

for dynamic testing procedures in fatigue and fracture mechanics



From a handy Bending pulsator up to a 350 kN Resonant Testing Machine all feature the same advantages

- less testing time due to high operating frequency
- low energy consumption
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Our comprehensive SOFTWARE packages support tests in

- fatigue
- fatigue crack growth
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 Switzerland



## Newsletter and Membership Application Form

✓ the appropriate box(es):

Please send me the ESIS Newsletter free of charge (note that this is only required if you did not subscribe before, if your address has been changed, or if the address on the address label is in error)

Please register me as personal ESIS member. The membership fee is be payed by (please ✓):

the enclosed Eurocheque of Dfl 45,- (please do not forget your card number at the back-side)

charging my Eurocard (incl. Mastercard and Access) for Dfl 45,-

my card number is 5

Exp. Date

transfer of Dfl. 60,- to the ESIS bank account 10.42.10.753 at the RABO Bank, Barendrecht, NL, or by cheque payable to ESIS (Dfl. 15,- is added to cover bank charges)

Surname: \_\_\_\_\_ Initials: \_\_\_\_\_ Title(s): \_\_\_\_\_ Signature: \_\_\_\_\_

Affiliation: \_\_\_\_\_

Address: \_\_\_\_\_

Please return this form to:  
ESIS Office, attn. Prof. A. Bakker  
P.O Box 5025  
2600 GA Delft, The Netherlands

Organizations that wish to register 5 or more persons as ESIS personal member (20% reduction), or wish to receive information about ESIS Organizational membership should write to ESIS Office at the address alongside.

