

---

## MINUTES OF 2002 BUSINESS MEETING EFCE WORKING PARTY ON DRYING

Magdeburg, Germany  
Thursday April 11, 2002, 10.30-12.30

### **Persons present:**

Dr. Catherine Bonazzi (F)  
Dr. Carl-Gustav Berg (FIN)  
Dr. Augerinos Dimitriades (GR)  
Prof. István Farkas (H)  
Dr. Iva Filkova (CZ)  
Dr.-Ing. Dietrich Gehrman (D)  
Dr. Ola Jonassen (N)  
Dr. Guido Kache (D)  
Dr. Ian C. Kemp (GB)  
Dr. Simon Lawton (GB)  
Dr. Zdzislaw Pakowski (PL)  
Dr. Hub Slangen (NL)  
Dr. Milan Stakic (YU)  
Dr. Stig Stenström (S)  
Prof. Czeslaw Strumillo (PL)  
Prof. Uwe Sundermann (D)  
Prof. Dr.-Ing. Evangelos Tsotsas (D)  
Dr. Henk van Deventer (NL)  
Dr. Ireneusz Zbicinski (PL)

### **Apologies received from:**

Dr. Odilio Alves-Filho (N)  
Dr. Julien Andrieu (Fr)  
Ir. Karl Anthonissen (B)  
Dr. ir. W. Jan Coumans (NL)  
Dr. Anders Hallström (DK)  
Prof. Dr. Gligor Kanevce (MAC)  
Prof. Dr. Markku Karlsson (FIN)  
Prof. Matthias Kind (D)  
Prof. Victor I. Konovalov (RUS)

Dr. Eli Korin (ISR)  
Prof. R. Lavie (ISR)  
Prof. Antonio Mulet Pons (E)  
Prof. Norvald Nesse (N)  
Dr. Georgios Raouzeos (CH)  
Prof. Michel Roques (F)  
Prof. George D. Saravacos (GR)  
Prof. Dr.-Ing. Ernst-Ulrich Schlünder (D)  
Dr. Alberto M. Sereno (P)  
Prof. Ingvald Strommen (N)  
Mr. Tom Taylor (GB)  
Prof. Radivoje Topic (YU)  
Prof. Roland Wimmerstedt (S)

### **No apologies received from:**

Prof. J. Bueno De Las Heras (E)  
Dr. Bojan Cermák (CZ)  
Mr. Bianchi Janetti Claudio (I)  
Prof. Anatoly A. Dolinsky (UKR)  
Dr. Ing. Roberto Faucitano (I)  
Dipl.-Ing. V. Gnielinski (D)  
Mr. Martin Gronlund (DK)  
Mr. Heikki Jaakkola (FIN)  
Prof. Dr.ir. P.J.A.M. Kerkhof (NL)  
Prof. D. Marinos-Kouris (GR)  
Dr. Ir. Gerrit Meerdink (NL)  
Prof. B.S. Sazhin (RUS)  
Dr. W. Schumann (CH)  
Mr. Christian Schwartzbach (DK)  
Dr. Ansgar Sorensen (DK)  
Prof. Dr. Dimitrije Voronjec (YU)

---

### **1. Opening remarks**

The Chairman, Ian C. Kemp, opened the meeting and expressed - on behalf of all attendants - his gratitude to Professor Evangelos Tsotsas and his colleagues at Magdeburg for making the practical arrangements and hosting the meeting. It was very welcome to see an informal Europe-wide technical meeting taking place again, after a lapse of some years, and to see a good number of delegates attending from

both industry and academia and offering interesting papers on a wide variety of subjects.

## **2. Minutes of previous meetings**

The minutes of the meetings at Noordwijkerhout (August 2000) and Karlsruhe (January 2001), which had been previously distributed, were noted and approved.

## **3. Matters arising from the minutes**

### **(a) Meetings**

The Chairman reviewed the past year since the Karlsruhe meeting. The planned technical meeting in September/October 2001 had had to be postponed for several reasons; the original hosts had had to drop out, and the proposed dates clashed with other events so that very few people expressed a willingness to attend. The Chairman thanked Ir Anthonissen and Prof Andrieu for their help in trying to arrange the meeting. It was good that it had finally been possible to find a date that allowed a good attendance.

It was agreed that these technical meetings were a good way of bringing together people who are active in drying, and of sharing news and scientific information. Further technical meetings should be arranged, preferably linked with meetings of other national organisations in Europe. In the last few years, three International Drying Symposia have been held in Europe (1996, 1998, 2000), but IDS will not return to Europe until 2006 (in Hungary). It therefore continues to be important to maintain and extend the good networking between drying researchers in Europe, and to increase the involvement of industry.

### **(b) Website**

The other major initiative which had been planned at the Karlsruhe meeting was the development of the Drying WP website. Sadly, this also had had to be postponed, because a major internal reorganisation in the IChemE (who were to host the site) had removed the people who would have developed and maintained it. After considerable uncertainty, the Chairman has been able to arrange that his current company will be able to host the website, although again reorganisations have caused some uncertainty and delay. He apologised to all members for the delays in getting the website running. (Since the meeting a further delay has occurred due to the takeover of Hyprotech by Aspen Technology Inc.)

The new website address is currently <http://www.software.aeat.com/proman/efce>, which will only be applicable in the short term. The address is expected to migrate to [www.processmanual.com/efce](http://www.processmanual.com/efce) in the longer term. (This has not yet occurred, due to the takeover, and the final address may change.)

The website will be fairly simple, concentrating on links to other useful websites in Europe (e.g. members' sites, IDS and national organisations) and worldwide, rather than presenting extensive information of its own (although contributions from

members will be welcome). A good example of a useful site to link to was Prof Pakowski's dryer manufacturers database; this avoids us having to produce duplicate information. Dr van Deventer pointed out that the [www.drying.net](http://www.drying.net) address is in use by Novem in the Netherlands. Meeting minutes and technical presentations could also be mounted on the website. The site could also include: contact details for WP members; a newsletter; forthcoming events; basic theory, and recommendations for best practice in nomenclature, terms and definitions (Prof. Pakowski has recently produced a nomenclature based on pictograms). A database could be considered for certain types of material with fairly standard properties, e.g. agricultural products and certain chemicals, or for functions such as equilibrium moisture content and sorption isotherms which are more dependent on the basic chemical nature of a material rather than its physical form. Profs. Pakowski, Tsotsas and Sereno may be able to contribute, and useful data is also available in books by Ginsberg, Iglesias and Marinos-Kouris (in Handbook of Industrial Drying). However, it would be unwise to include data such as drying kinetics, which can be highly dependent on the size, shape, porosity and upstream formulation process of the solid, and the type of equipment and its operating conditions.

All Working Party members are invited to contribute links to the website of their university or company, and are requested to provide links from their own websites where possible. Publicity of the work of the WP in their own country would be useful.

Delegates asked if the presentations from this meeting could be made available on the website. This was agreed, the Chairman also promised to distribute by e-mail any presentations sent to him by 26 April.

Full details of the suggested specification for the website are given in Appendix 2. Members' views are welcome on any changes or additional items required.

#### **4. Future direction**

The future direction of the group had been discussed in some depth at the Karlsruhe meeting in 2001. The Chairman circulated a suggested statement summarising the aims and objectives of the group, based on a similar definition for the Mixing WP. This was discussed extensively and some amendments were made. The list of activities was felt to be good, but ambitious, and it was not clear how the plans could be realised in practice. The final statement is attached as Appendix 1 of these minutes.

The basic strategy continues to be; to encourage dissemination of knowledge about drying (e.g. at technical meetings) and to assist networking in Europe. There are not many countries where there are sufficient people specifically interested in drying to form a national group. For example, the IChemE Solids Drying Subject Group in the UK is currently dormant; only France and Germany have active national drying groups. However, broader groups covering a wider range of disciplines (e.g. the Particle Technology Subject Group of the IChemE) are often viable in individual countries. The WPD can work with both types of group and encourage both national and international attendance at their meetings.

The question was raised; "What is our future vision for drying?" A recent editorial of Drying Technology gave the vision of Larry Genskow (Procter and Gamble US) for 2010. He included emerging technologies, novel drying, nanoparticles,

microchemical processes, and water recovery for possible reuse. It has been suggested also that drying must become more integrated with other parts of the overall process to give a holistic approach, linking with particle design and product engineering.

## 5. Future meetings

Although the Working Party only needs to have one business meeting a year, it was agreed that it would be appropriate to sponsor and encourage additional technical meetings or conferences, especially where these cover a subject of special interest to a sub-group of the WP. The Chairman expressed his thanks that an increasing number of national groups and societies have offered to host meetings. For example, Dr Gehrman proposed a joint meeting with the German drying group, and it was suggested that this could concentrate particularly on pharmaceutical drying and batch drying. Dr Gehrman will take this suggestion back to the group with a view to a joint meeting in 2004 or 2005. Likewise, the organisers of the 2<sup>nd</sup> Nordic Drying Conference in Copenhagen offered the possibility of hosting a WP meeting, and AFSIA in France have previously indicated their willingness to hold a WP meeting alongside one of their annual meetings which usually take place in March. It was agreed that these meetings provided excellent opportunities for additional meetings of the WP, even where these were not designated as the official business meeting for that year.

The 2003 business meeting should preferably take place in Crete, in accordance with the previously discussed proposal by Prof Saravacos, if it was possible to include a non-food session for general participants. (Note: Prof Saravacos agreed this, and the conference will now have two parallel streams on Food Dehydration and General Drying, and may be renamed EUDrying03). However, an informal progress meeting of the WP could also take place in Copenhagen if the conference organisers were prepared to provide a room. Because of the high costs of attendance, it is not proposed to include WP business meetings with ECCE or other major international congresses in the next couple of years, although we will encourage attendance at the ECCE congresses and support the inclusion of sessions on drying. It was also pointed out that the late September date for ECCE-4 (Granada 2003) was inconvenient for many delegates as it was after the start of the university term in several countries.

The WPD will be very happy to publicise meetings on drying in any member country, and to encourage attendance at such meetings. The WPD also welcomes invitations to hold business/technical meetings in conjunction with an existing conference on drying or a related subject. However, if the WPD Business Meeting is to be included in these meetings, the following criteria should be met:

- WPD members must be able to attend free of charge for the Business Meeting only. (A fee reduction for the rest of the meeting would also be welcomed).
- At least one day of technical presentations of general interest should be included, (preferably in English) so that all members can justify their attendance.
- The meeting organiser should arrange registration and accommodation for delegates.

Apart from the Business Meeting, the WPD may hold Special Meetings or Progress Meetings during the year to assist collaboration. These meetings will preferably be

held during an existing meeting or conference which is already being attended by a significant number of WPD delegates. (For example, the meeting at Karlsruhe in 2001 aligned with the final QUID project meeting, or brief meetings during an IDS taking place outside Europe).

The next IDS in Europe has been confirmed as being in Budapest in summer 2006, coordinated by Prof. Istvan Farkas. IDS 2002 is in Beijing and IDS 2004 in Brazil. For IDS 2002 in China, it was agreed that it would probably be good to organise an informal meeting during the conference of WP delegates who are attending. Also ECCE-5 will be held in 2005 in Glasgow, Scotland, UK, in conjunction with the World Chemical Engineering Congress.

## **6. International collaborative projects and EU funding**

The drying projects submitted in 2001 to the EC by various group members (Prof. Sereno, Prof. Alves-Filho and Prof. Kind) had regrettably all been unsuccessful in attracting EC funding.

Dr Bonazzi pointed out that the EC Framework 6 details were now available and that there is a strong emphasis on networking projects to develop “centres of excellence”. The Drying Working Party should be in a very strong position, because of the good existing links between members both within and beyond the EC. However, an expression of interest is needed by June. Framework 5 is about to close (in mid April). The major need is for someone who would be prepared to act as coordinator for any proposal to be put forward. The Chairman pointed out regrettably that he would be unable to fulfil this role, as his employer is a commercial company which does not qualify for standard EC funding (and has since been taken over by a US company). Delegates were asked to consider if they would be prepared to coordinate a proposal or could suggest anyone who could do so. (Note: Professor Tsotsas later agreed to co-ordinate the Expression of Interest for networking and Professor Kind the Eol for a technical project, both of which were submitted to the EU before the June deadline).

It was pointed out that other collaborative projects are currently active in the EU, for example the SPIN industrially-based applied research project, represented at this meeting by Dr Slangen and Dr Gehrman. The Chairman agreed, and emphasised his desire to see industrial and academic partners collaborating together wherever possible. Prof Strumillo stated that the Copernicus collaboration over the last few years had led to a useful database on novel drying methods.

## **7. Dates of forthcoming meetings**

Dr Ola Jonassen, head of the SINTEF dewatering laboratory in Norway and representing Prof Ingvald Strommen, presented minutes of the 1<sup>st</sup> Nordic Drying Conference in June 2001 and details of the forthcoming 2<sup>nd</sup> Nordic Conference in Copenhagen in 2003. He also gave details of SINTEF's new status as a Marie Curie official training site for European researchers; grants are available for doctoral studies.

Other meetings:

IDS 2002, Beijing, China. 27-30 August 2002.

CHISA 2002, Prague, Czech Republic. 27-30 August 2002. (No drying session on this occasion due to the clash with IDS)

AFSIA annual meeting, Paris area, March 2003.

2<sup>nd</sup> Nordic Drying Conference, Copenhagen, 26-27 June 2003.

EU Drying 03 / European Food Dehydration Conference, Crete, 3-4 September 2003.

ECCE-4, Granada, Spain, 21-25 September 2003.

## **8. Membership of the WP – Delegates and Guests**

### Changes to delegates:

Dr Catherine Bonazzi and Dr Patrick Ferlin have been appointed as official French delegates, replacing Prof Roques and Dr Sagi respectively, and joining Prof Andrieu, who replaced Prof Bimbenet last year.

Prof. Antonio Mulet Pons has been officially appointed as an additional delegate for Spain.

Dr. Iva Filkova with regret announced her retirement as one of the longest-standing members of the Working Party, as there is currently little involvement in drying research in the Czech Republic. The Working Party thanked her for her major contributions over the years.

Dr. Jan Coumans has moved to a new post in the University of Eindhoven and is therefore withdrawing as a delegate. The Working Party thanks Dr Coumans for his excellent work over the years, including three productive years as Chairman from 1993 to 1996.

Dr. Werner Schumann has withdrawn as a Swiss delegate; no replacement has been appointed.

Dr. Anders Hallstrom has moved to a new job and has withdrawn as a Danish industry delegate.

### Guest participation:

Several people attended this WP business meeting as guests: Dr Carl-Gustav Berg (FIN), Dr. Augerinos Dimitriades (GR), Dr Ola Jonassen (N), Dr. Simon Lawton (UK), Dr. Hub Slangen (NL), Dr. Henk van Deventer (NL) and Dr. Ireneusz Zbicinski (PL), plus members of the Magdeburg faculty who had organised the meeting, Prof. Uwe Sundermann (D) and Dr. Guido Kache (D). Further guests also attended the following technical meeting.

### Mailing list:

An updated address list of all members and guests of our WP is attached with these minutes.

Members are requested to check that their entry is correct and supply any missing details (phone, fax, e-mail etc) to the Chairman. Guests who do not wish to remain on the list should also notify the Chairman.

Members without a current e-mail address on the list are particularly requested to supply this, as this is the fastest and most convenient method of communication with the group for general matters. Only official minutes and other major items will be sent by post.

---

Currently (July 2002) there are 55 members on the mailing list: 22 delegates, 6 industry delegates, 1 personal member, 20 guests, 3 industry guests and in addition 3 EFCE-officers.

The Chairman pointed out that his 3 year term of office comes to an end in 2003 and that a successor would be needed. The obvious time for an election and handover would be the Crete meeting in September.

### **9. Closure of the meeting**

The Chairman thanked delegates for their valuable contributions and closed the meeting at 12.30.

### **10. List of Actions from the meeting**

#### **ACTIONS FOR THE CHAIRMAN:**

- (a) Write and distribute minutes of the meeting, by e-mail where possible, otherwise by normal post
- (b) Ensure that the website is completed and operational, and circulate details
- (c) Distribute presentations from the technical meeting by e-mail (8 received)
- (d) Investigate the possibility of funding thematic networks on drying under EU Framework VI, with Prof Tsotsas and Prof Kind
- (e) Provide assistance as necessary to Prof Saravacos in organising the 2003 WP meeting in Crete, and look at possibilities for additional small-scale networking between WP members e.g. at IDS Beijing 2002, Copenhagen 2003, ECCE Granada 2003.

#### **ACTIONS FOR ALL WORKING PARTY MEMBERS:**

- (f) Check address list on receipt, and provide e-mail and website address, phone and fax numbers to the Chairman where he does not already have these or where they are incorrect
- (g) Confirm willingness to have contact details publicised on the website
- (h) Supply contact details of national organisations involved in drying, including website address, to the Chairman
- (i) Publicise the Drying Working Party and website address in their country
- (j) Provide a short description of their group and its work, for the website (optional, but useful free publicity!)
- (k) Consider what contribution they could make to supplying knowledge for the website, giving names of useful links, providing terms and definitions etc.

Ian C. Kemp  
Chairman of WP on Drying  
July 2002

---

## **APPENDIX 1: REVISED STATEMENT OF AIMS AND OBJECTIVES FOR EFCE WORKING PARTY ON DRYING**

Aims and Objectives of the EFCE-WPD:

- to promote science, technology and education in solids drying in EFCE member countries and worldwide;
- promotion of interaction between academia and industry, to allow improvement of drying science and technology and encourage applications in industry of the latest scientific models and discoveries;
- international exchange of knowledge and experience, between scientists as well as between scientists and practising engineers;
- information exchange about the main trends in research on drying performed by the EFCE member countries, i.e. countries having delegates in the WPD;
- information about conferences and meetings held or planned to be held in those countries, and other major international conferences (e.g. International Drying Symposia);
- information about activities of national working parties on drying of the EFCE member countries;
- contribute to the definition of standards, nomenclature, recommended techniques and other good practice in drying;
- provision of links to other important sources of information on drying and related subjects;
- any other activities leading to the development and promotion of drying technologies.

Drying is defined here as: producing a dried solid by removal of liquid by evaporation, through supply of heat. (Drying through mechanical forces, e.g. by centrifuges, or by non-thermal processes, e.g. osmotic dehydration, is excluded, as is drying of materials other than solids, e.g. gases; but processes which do not begin with a solid feed, e.g. spray drying, are included.)

Drying can be treated as a unit operation, or as part of material processing (e.g. papermaking).

## **APPENDIX 2: REVISED SPECIFICATION OF WEBSITE FOR EFCE WORKING PARTY ON DRYING**

To be hosted by Hyprotech UK Ltd (a subsidiary of Aspen Technology Inc) on the Process Manual website

Temporary address: [www.software.aeat.com/proman/efce](http://www.software.aeat.com/proman/efce)

Future address: [www.processmanual.com/efce](http://www.processmanual.com/efce) (provisional)

Main access route: via the Drying technical area of the Process Manual website

External access routes:

- by links from EFCE main website, Dechema, IChemE and other national organisations
- by links from other drying related sites, e.g. Prof. Pakowski (Lodz), Prof. Mujumdar (Singapore)
- from spiders searching the web for drying related information.

## **Front Page (Drying WP Homepage)**

To contain:

- EFCE logo (umbrella and title)
- Statement of basic aim and purpose of the Working Party
- Chairman's name and e-mail address (and photo?)
- Index of the basic structure of the website
- Link back to Process Manual main website and Drying section.

## **Information about the Working Party**

History of the WP

Aims and objectives of the WP

Current chairman – contact point

List of members' names – see below for more detailed link

Group photograph(s) from Karlsruhe (and previous meetings if available)

Minutes of business meetings – link to section 3

Presentations from technical meetings – link to section 3

Courses on drying – link to section 4.

## **Recent Meetings – Records and Presentations**

Minutes of Business Meetings (Word document files)

Agendas from Business Meetings (Word document files)

Presentations from Technical Meetings (Powerpoint files)

## **Future Events**

Forthcoming EFCE WPD business meetings

Forthcoming EFCE WPD technical meetings

International Conferences related to drying e.g. IDS, Nordic Drying Conference

Meetings of National Groups and Working Parties e.g. AFSIA

## **News**

Current news on drying

Interesting news or summaries of articles; a working party newsletter with contributions from various members or groups throughout Europe?

## **Useful Links to other Websites**

Hyprotech and the Process Manual

EFCE, National Organisations and Drying Groups

Other useful sites: IDS, Mujumdar, Manufacturers database, etc.

## **Useful Technical Information on Drying**

Will be broken down by type of information e.g. general (including Process Manual), selection, equipment, courses, consultancy, problem-solving