



Forum of R&D  
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# Trends in Drying Research and Technology- Open Forum

- Already outlined in Plenary Lecture- also in Proceedings
- Focus on Math Modeling of dryers – necessarily equipment and product-specific
- Relatively little basic research- theoretical and experimental- on “drying”
- Academics follow “closed loop” approach



# Trends...

- Long service life of dryers encourages status quo
- Concept of life cycle cost for dryer selection is still not pervasive in industry
- No paradigm shift; slow ingestion of ideas by vendors/users
- Tendency to stick to “proven” technology deters industrial acceptance of radically new technologies
- RESULT? Little innovation and no really “destructive” drying technologies on the horizon now
- EXAMPLE? Superheated steam drying of paper- in principle, very attractive- yet, no takers so far!

# Trends...

- Complexity of new technology may deter acceptance despite major potential gains e.g. Condebelt process for linerboard or Impulse Drying of paper
- Long gestation period- 20 years for Condebelt- typically too long to sustain industry interest and funding of R&D!
- Superheated steam drying first proposed over 100 years ago! Innovation must be “timely”-not too far ahead of its time!



# TRENDS-contd

- Current trend in drying research: Closed Loop Academic research/publication (CLA)
- Little potential for successful/ cost-effective technology transfer to industry
- Desired trend: Interactive Industry- Academia Interaction (IAI)
- R&D problem arises from industrial experience, developed into a generic problem for basic research at university – generic part publishable while specific problem/solution may remain proprietary
- Applied research without industry support is not sustainable activity over the long haul

# A Suggestion.....

- Industry proposes viable, fundable R&D ideas on web
- Academics have ideas on how the problem may be tackled and submit proposals for evaluation
- If mutually agreeable, industry funds the project with a basic and an applied component- the former publishable in open domain
- Note difference from consulting activity, which makes no contribution to domain knowledge



# Potential hick-ups?

- Objectives and time scales of industrial R&D are widely different from those of academic research
- One is profit driven- the other is non-profit organization
- Industry typically wants results “yesterday”; academics happy of results trickle out “tomorrow”!
- Some adjustments are essential for mutual benefit- combine short term and long term objectives; not easy but doable!

# Closing remarks...

- See editorials in DRT on R&D, Innovation, University-Academia interaction
- Cooperative R&D will be cost-effective as industry is reducing R&D contribution to total basic knowledge base in USA-elsewhere situation may be worse
- Europe is showing signs of rising university-industry collaboration with industry funding
- Developing countries are also making contribution mainly in applied areas relevant to regional development
- **THANK YOU FOR YOUR ATTENTION**