THE DEVELOPMENT AND TRANSFER OF ADHESIVES TECHNOLOGY AT PERA

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1. ABSTRACT

PERA the Melton Mowbray based Research and Technology Centre, have displayed an ongoing commitment to increasing the exploitation of adhesives bonding within the UK and European industry.

Through their close links with industry and a series of surveys amongst current and potential end users, PERA have identified the three main problems in encouraging industry to exploit fully the benefits of this joining medium

Companies currently lack the confidence to exploit adhesives successfully due to :-

- **DESIGN** - the absence of accessible, user friendly design theory, procedures and software.

- **MANUFACTURING** - the absence of reliable, quality validated automation technology to handle high volume products.

- **RELIABILITY** - the absence of any form of on-line, real time NDT for joints.

PERA's impressive programme of technology development and research recently completed, is to be consolidated with four new projects and a comprehensive Europe-wide dissemination programme.

PERA's most recently completed projects focus their 10 years of background research in the areas of :-

- **DESIGN** - ADENG. The development of design procedures, software and databases for general engineering applications.

- **MANUFACTURING** - ADPROC. The development of an automation application technology for bonded assemblies, including the
The new projects will complete the development and transfer of this essential technology to industry.

**DESIGN**
- **ADENG II.** The development of design procedures, software and databases for high performance, high durability applications.
- **ADCAD.** The development of a dedicated adhesives CAD system to complement currently available CAD hardware and software.

**MANUFACTURE**
- **ADPROC II.** The completion of the fully automated/validated bonding concept with on-line surface preparation, the quantification and identification of adherend contamination, and the closed looping of bead form production.

**RELIABILITY**
- **BoNDTest.** The development of on-line NDT equipment able to respond in real time within production environments.

By the mid 1990's PERA's current initiatives will have provided European industry with the tools to exploit adhesives bonding successfully on a scale likely to generate a major competitive edge for the community as a whole.

Further information on the completed projects shows the potential advantages of automatic control of adhesive processing allied to automatic non destructive inspection with particular reference to improvement and consistency in quality of production. Other potential advantages, such as consistent and predictable output levels, reduction in direct labour content, and lowering of exposure of personnel to health and safety hazards, are also readily apparent.

With respect to the design aspects of PERA's work creating adhesive joints for engineering applications is no longer an art form calling for a trial and error approach with necessarily high margins of error.

The information available, and the way in which it can be presented, can now give the designer the knowledge that he has the facilities to devise a joint based on readily available scientifically substantiated data, and from this knowledge, the confidence to design with a high level of precision, joints to meet the exacting requirements of current industrial and commercial demands.