Guest editorial: Adhesive Engineering and Technology

Although dating back to the very origin of mankind, the use of adhesives began penetrating the industrial world only at the turn of the twentieth century with the discovery of synthetic adhesives. Fostered by the continuous introduction of new products with improved performance and added mechanical appeal, adhesive practice has kept developing ever since. Now it has grown into a mature technology serving the needs of the entire industrial spectrum from the huge aerospace and car manufacturers down to the tiniest appliance workshop.

The possible use of adhesives in a new design as a companion to or a substitute for classical joints should always be considered on both technical and economic grounds. Based on modern adhesives, light, stiff and economic constructions can be fabricated from a variety of materials without the blemishes caused by conventional assembly methods. Furthermore, together with mechanical strength and stiffness a number of extra benefits come along free. These include sealing action, electrical and thermal insulation, corrosion and fretting resistance, to mention but a few.

Of course adhesives are not a panacea. Considerable concern surrounds key aspects like fatigue strength, thermomechanical worthiness, durability in aggressive environments, tolerance for poor surface preparation and others. However, many of the major limitations have been or are being overcome by ongoing development of new product formulations, effective surface treatments, reliable analysis tools and accurate testing methods. As a result, the classical reluctance of the designer to see adhesives as an engineering option is steadily breaking down, and where it still persists it can be traced more to prejudice than to judgement.

The present issue introduces the readership to this well established but frequently overlooked technology. Without meaning to be exhaustive, the content is focused on the potentials and the shortcomings of adhesive usage in industry, with particular regard to structural and assembly areas.

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June 1999