



Protezioni
Elaborazioni
Industriali

PRESS RELEASE BIMU2010
September 2010

AEROSPACE TECHNOLOGY IN MACHINE TOOLS A powerful innovation at moderate cost

PEI Srl is presenting the first-time preview of Ceramix at the BIMU. Ceramix is a protective belt for all types of machining that is unparalleled on the world market owing to its innovative features. The company upholds the research and development aptitude that has always typified it.

UNPARALLELED ON THE MARKET

PEI Srl, leader in the field of machine tool covers, is at the 2010 BIMU in Milan 5-9 October (Pav. 11, Stand F47) with all of its extensive catalogue, proving once again that it is the only company in the sector in Europe that offers all types of technologies in the field of covers:

roll-up rollers, apron covers, thermic-welded covers with and without plates, wipers and telescopic steel covers.

The PEI group, made up of another three companies in addition to the parent company, invests significant resources in Research and Development, as the design and execution of Ceramix shows. It is the new, revolutionary protective belt that brings together light weight, flexibility, easy installation with a high degree of protection that until today could be achieved only using much bulkier, heavier and expensive products.

Michele Benedetti, Innovation and Development Manager of the Bologna, Italy company, comments: *"We work in a sector in which machine tools quickly evolve, and the protection system must follow this trend as well. We are trying to anticipate this technical evolution with continuous innovations. This time it is a polymer fabric with outstanding performance used to make a roll-up belt that is lightweight while at the same time resistant to both abrasion and the high temperatures developed in machining, both dry and with lubricating coolant. It is not the first time that our strong commitment to innovation leads us to presenting an unparalleled product on the market."*

A DEMANDING CHALLENGE

If until yesterday the machine tools were somewhat specialised in their applications, today almost always the same machine can work in different conditions depending on the tool used, both dry and with lubricating coolant. To meet the increasing demands for flexibility, the same machine must be able to ensure re-tooling in the shortest amount of time possible in view of the ever smaller and ever more diversified lots.

Finding a cover material that at the same time meets so many requirements that often conflict with each other was not easy, as Benedetti explained. *"Until now the problems were separate. The polyurethane belts were adapted to machining with lubricating coolant, light and relatively resistant, but unsuitable for high temperatures. When there were chips in dry conditions, the aluminium apron covers or covers with steel plates were used. In any case, these were rather demanding products in terms of both cost (apron covers) and structure (covers), requiring an upper guide that could not always be fitted on the machine. The roll-up cover would be preferable because it can work cantilevered as well, with just one support, as it is kept taut by the coiler. In any case, the aluminium apron cover also involves considerable weights and occupied space. An intermediate solution that PEI could offer before developing Ceramix is Steelband, a steel-covered polymer belt. However, neither is this solution exactly low-cost in view of the many phases required in its construction. It is necessary to join two*

P.E.I. Protezioni Elaborazioni Industriali S.r.l.

Società unipersonale del Gruppo PEI Italia Srl

Via Torretta, 32 - 32/2 - 40012 Calderara di Reno (Bologna) ITALY

Capitale Sociale € 1.000.000 i.v. - C.F.: 02894991203 - P.IVA 02894991203

Tel.: +39 051/6464811 - Fax: + 39 051/6464840 e-mail: info@pei.it



Protezioni
Elaborazioni
Industriali

heterogeneous materials like metal and plastic having different expansion coefficients, different planarities, etc. This "sandwich" also become rather rigid in rolling up. It is a highly effective protection against hot chips, but mechanisms of a certain power are needed to guarantee its sliding movement. Diameters, occupied space and costs also in this case are not comparable to a simple belt."

LIGHT, FLEXIBLE, RESISTANT

The true significant improvement arrived with Ceramix. The new product can be used advantageously in the situations described above. It is a roll-up cover with functional weights, occupied space and features very similar to those of a normal polyurethane belt. Actually, in many cases it is possible to replace it without further adjustments with the previous thermoplastic belts. What's more, strength and sturdiness are added to all of its positive characteristics. The part exposed to the chips is made up of tiny ceramic elements bound to the polymer. "It is not a simple added film. We have developed an actual revolutionary and innovative compound. It constitutes the belt. Examination under the microscope reveals a grid of ceramic particles that protect their own compound against the aggressive effects of the chips. The polyurethane-based polymer guarantees all of the chemical and physical properties, particularly lightness and flexibility, crucial in order to be able to roll it and unroll it with ease. This highly technological solution can be used on any machine tool, whether it is working dry, with coolant lubrication, or in a combined situation."

As for heat resistance, it is necessary to distinguish between the instantaneous contact temperature and that of continuous use. The dry machined chip detaches at temperatures of many hundreds of degrees. Then if there are sparks, a thousand degrees are reached. Remembering that Ceramix has to work vertically or head-on, PEI ensures that the presence of the ceramic mesh lets the belt resist the instantaneous contact with the burning chip. There is no transfer of heat such as to damage the compound. The chip bounces on the belt, the point of contact immediately cools and there is not damage. In the case of continuous resistance to the temperature, the limit is obviously lower, about 300 degrees. It is however an excellent value, and much higher than that of the working environment of the machine tool and of the other traditional covers made of simple thermoplastic material.

The problem of low temperature is less critical, but however relevant, because the material could become fragile. In this case as well the compound can work up to a temperature (-25°C) far away from the ambient temperature.

AN IDEA DEVELOPED BY TWO

As has already occurred in many cases for new materials, the spin-off in the industrial field arrives from the sectors in which cost is by tradition non a significant condition. Those industries are aerospace and military. If the technologies developed in those sectors can be advantageously applied to trade as well, the transfer is completed successfully.

The compound that Ceramix is based on has been developed by a historic PEI supplier with whom the Bologna, Italy group has had a close business relationship in many fields of chemistry for many years. For some time we have looked for a flexible, strong and lightweight material. Following a study phase, an exclusive agreement for producing this new type of belt in the machine tool cover sector was signed.

Benedetti stated in conclusion, "Being able to make this agreement was a success for us because in these cases in which technology is so 'pioneering',

P.E.I. Protezioni Elaborazioni Industriali S.r.l.

Società unipersonale del Gruppo PEI Italia Srl

Via Torretta, 32 - 32/2 - 40012 Calderara di Reno (Bologna) ITALY

Capitale Sociale € 1.000.000 i.v. - C.F.: 02894991203 - P.IVA 02894991203

Tel.: +39 051/6464811 - Fax: + 39 051/6464840 e-mail: info@pei.it



Protezioni
Elaborazioni
Industriali

the result is not at all foregone. The idea was developed through strict co-design between the technical offices. We were therefore able to develop a product that also offers the advantage of competitiveness on the price. Actually, its production involves large amounts of material and the cost can be kept competitive thanks to the fact that PEI has a European dimension such as to ensure adequate volumes. The plants need lengthy and meticulous adjustment, otherwise its construction is impossible. To be able to access these materials, a minimum production volume that only a large group like PEI can face is necessary. We believe that our new Ceramix can quickly become a success on the market because it is a powerful innovation at moderate cost, exactly what the sector requires at a time when cost reduction is being rewarded."

The Ceramix belts have already been tested on many machine prototypes owned by PEI's most prominent and prestigious customers, as is customary for such strong innovations. The "recipe" of the compound remains an industrial secret.

ABOUT PEI

Innovation, quality and competitive sale prices are PEI's leading values in designing and building covers for machine tools.

The complete range of covers for machine tools, including a large number of types, is assisted by a group of expert designers for each product and it can meet the needs of every customer. Customers find a strategic partner in PEI, able to supply high added value.

PEI works directly with the leading machine tool manufacturers worldwide on a co-design basis to create a perfectly optimised product that is "packaged" to measure for every problem that has to be solved.

P.E.I. Protezioni Elaborazioni Industriali S.r.l.

Società unipersonale del Gruppo PEI Italia Srl

Via Torretta, 32 - 32/2 - 40012 Calderara di Reno (Bologna) ITALY

Capitale Sociale € 1.000.000 i.v. - C.F.: 02894991203 - P.IVA 02894991203

Tel.: +39 051/6464811 - Fax: + 39 051/6464840 e-mail: info@pei.it