



The Pvaxx pallet produced by rotationally moulding its Siluma PE/sand composite

Pvaxx sets sights on pallets

Pvaxx, a material science and technology company headquartered in Bermuda, has developed a foamable polymer composite comprised of a high loading of silica sand in polyethylene.

The Siluma material uses the company's proprietary "unifier" that has been applied in the production of pallets with a polyethylene outer layer and a Siluma foam core. The company plans to start production and sale of these pallets in March 2007 from a new headquarters and production site in the Jebel Ali Free Zone in Dubai, United Arab Emirates.

The plan is to manufacture at a rate of 1.5m pallets a year. Further production facilities will be added in various parts of the world through a Territorial Manufacturer and Distributor (TMD) programme, the company says.

The TMDs will manufacture using a rotational moulding processes that the company says "transforms traditional batch production into continuous flow techniques, effectively doing for rotational moulding what Henry

Ford did for car manufacture".

The machines have been designed by Persico. The Air-mech consortium based in Bahrain, made up of Metals of Bahrain, INMA and Pvaxx Industries, will make the 35-tonne machines that are capable of producing one pallet in a little more than a minute. Pvaxx says conventional rotational moulding machine rates would be around one pallet every 40 minutes.

Pvaxx has its eye on a world-wide annual pallet sales market valued at more than €15m, where the cost of wood is increasing and opening up opportunities for alternative materials.

The product as developed for production on the Persico machinery is a 1200 by 800 by 150mm pallet composed of upper and lower polyethylene parts, each containing the special Siluma foam core material.

The equipment designed by Persico measures 12m by 8m by 5m and produces the pallets with 16 CNC moulds, eight each for upper and lower parts. A special extraction system is used

A view of the special Siluma sand reinforced PE core of the Pvaxx pallet



to provide capacity to make 1,000 pallets per day on a 24 minute cycle time. Systems with 32 drop boxes are used for both the PE and Siluma foam core materials. The moulds in the system are all equipped with automatic venting, automatic filling plugs and temperature sensors.

Rota Design in the UK has been involved in the design of the Pvaxx pallets and used finite element analysis (FEA) to provide a basic risk assessment so that customer and design engineer could verify critical structural elements prior to prototyping, production of tooling and manufacture.

An analysis of a digital model of the pallet and material parameters enabled typical results that provided an indication of areas of potential failure under load.

Pvaxx data presently specifies up to 4,500kg for a 1200 by 1000 by 160mm palette on flat ground and up to 1,500kg for the pallet on a fork-lift truck or 1,000kg in racking.

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Energy saving initiative

A Europe-wide energy saving project aimed at plastics rotational moulders that will also improve final product quality was launched in November last year.

Financed by the European Commission, the Micromelt project aims to reduce energy costs by 70% and reduce processing cycle times by 50%. It also plans to improve part quality through the development of retrofittable microwave tool heating and an internal mould cooling system.

Research is being led by Pera in the UK, an international network of technology development and industry centres, and is supported by Queen's University, Belfast in Northern Ireland, and applied research centre the Fraunhofer Institute, Germany.

Results of the project will be distributed through the trade associations involved and these will retain intellectual property rights jointly. These include the British Plastics Federation (BPF), the Association of Rotational Moulding Central Europe (ARM-CE) and the Association of Rotomoulders of Ireland (ARMI).

Philip Law, BPF director of public and industrial affairs, said: "The Micromelt project will help develop the competitive position of rotational moulding in relation to other processes."

A number of companies will provide support and expertise for the project including: the Balmoral Group, SPI Play, Tecni-form, Gisip AB, Ernst Reinhardt, Frigel Firenze and Sturdy Products.

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