

Q4 | Newsletter 2015



IN THE MIX



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2KM CASE HISTORY....

TABLE EDGING

Polyurethane gives us innovative new solutions



Overview:

Somethings we take for granted, we see them day by day but never question how they came into being. Once upon a time edging strips were glued into place around table tops to give a more aesthetic feel to the finished product and allowing coloured edges to match or compliment the table top.

Problems with dirt retention and loss of adhesion led to a revision of how to produce affordable, solid and good looking edging. Polyurethane was introduced as a moulded edge. A moulded profile allows for complex shaping, diverse colour options and a completely integrated interface with the wood substrate, creating a hermetical seal preventing the build of bacteria and resisting the ingress of moisture. Some of the complicated shapes that are attainable using a moulded process are unimaginable with a 'stick on' edge, this in itself pushes the boundaries of new designs and ever more complex products.

You will see these edges everywhere today but very few will contemplate the technology behind these everyday items.

2KM offer innovative solutions:

Working with key industry leaders, 2KM have developed machinery that ensures the quality production of table edging, whilst allowing for the diverse range of colours and product specifications available to the moulder to be utilised easily.

Using independently driven, precision gear pumps linked to flow meters, 2KM accurately control the ratio tolerances demanded by today's Polyurethane products. Using large pumps at slower motor speeds also allow

for filled products to be dispensed without excessive wear and loss of ratio tolerance.

2KM have worked with material suppliers and table edge moulders to develop the latest range of Process Gear Mix units. Separating pigments from the base Polyol and injecting this into the mixing stream, allows for the selection of colours without changing the base materials. Multiple pigment pots, allow for the instant selection of colours without disrupting production time.

The mixing of the chemical components has also been revised. 2KM use the latest Servo drive motors linked to direct drive disposable mixing tubes, this ensures that the materials get all the mixing that current systems demand and without the noise associated with typically pneumatic alternatives. As well as a clear reduction in noise levels for the operatives, a Servo drive allows for faster speeds of rotation to be achieved and coupled with speed controls, allows the correct mixing to be achieved, even on the trickiest of filled products.

Even the mixers themselves have been cleverly designed, with a screw section at the top of the rotary mixer designed to reduce pressure on the seal components, ensuring a longer life for the serviceable components. The paddle elements beyond this have proved very efficient in mixing materials that have traditionally been problematic, ensuring repeatability of quality.

The number of Table Edge profiles, even in one factory, is huge and new designs are introduced all the time, so any machine has to be able to respond to the individual requirements of any given moulding. Small or large, the material quality is paramount and with the 2KM Process Gear Mix Table Edging machines, control is given to the Table Edger to produce consistent product, whatever the size or shape of the moulding required.

Results:

New products, processes and a demanding desire to come up with new and exciting products, makes sure that the table edging sector will continue to push boundaries. 2KM's understanding of materials, processes and machines has allowed them to produce units able to cope with the diversity of today's material and production demands. 2KM will be there to face future changes, working in partnership to make sure quality and process is never compromised.

2KM have reviewed the machines with the industry leaders and have 'evolved' the Process Gear Mix units to suit demands with an eye on ease of use and ease of maintenance.

2KM are proud to have been at the forefront of the industry changes and the challenges that this has brought about, so next time you see an edged table product, see if you can work out how it was done.... It's a challenge in itself.

E-Flow System Gives Control of Viscous Silicones

Overview:

2KM first got in touch with the UK's largest producer of flexible wave guide systems with respect to supplying a metering system for filled 10:1 silicones. They were coating a flexible component with Rubber to give it some surface protection.

The initial machine supplied was a SilcoStar 922 system. This was hydraulically operated and had the capability of supplying the viscous material direct from 205 litre drums, to the locally produced moulds, via a hand held mixer head which utilised disposable static mixers.

The systems featured pigment injection which coloured the clear Liquid Silicone Rubber to the required black colour.

As the product being produced was flexible and the moulds rigid, the end user started to get variation in coating thickness. This was counted by pre-moulding spacers onto the product body. These require a 1cc shot of material. The 922 being a constant flow system and hydraulically driven suffered a lag issue as the drive motors reacted to a drop in pressure. This lag resulted in variations in mix ratio, shore hardness and hence product quality.

Solution:

The SilcoStar E-flow system was selected from the range of Liquid Silicone Rubber metering systems to meet the requirements of dispensing 1 to 2 grams of pigmented, standard materials directly from 205 litre drums. The client had 3 standard, Hydraulically driven LSR supply systems but small shot variations occurred.

After visiting the customer and discussing the application with 2KM's technical centre the E-flow was selected from the range. This system uses a servo driven, linear actuator to power the metering pumps. The servo motor gives high torque at low speeds and hence can hold the system in a steady state, ready for the next shot. The two drive motors are electronically linked and fitted with linear transducers ensuring the system meters at a 100:100 ratio and the application rate can be in grams per minute.



The E-flow shares the common SilcoStar format of a piston metering pump fitted to a flat follower plate on a twin post ram arrangement allowing the material to be metered directly from the 205 litre drum. The end users feedback on material wastage and pump air bleed were understood and incorporated into this systems layout. With the servo drive each pump can be driven individually and the air release after drum change air purge to break the seal when the container is empty is all now automatic with the incorporation of a 3 way valve mounted on the follower plate. The positioning of a cup holder is also a feature that prevents droplets of material falling into the drum after bleeding.

The E-flow is controlled by the latest version of 2KM developed operating systems based around Lenze operating software. This innovative system incorporates the drive for the motors as well as looking at metering and pressure control to give an operator friendly interface with easy to use metering features. These features include the barrel emptying system, this uses information from the barrel level control sensors to calculate the correct mix ratio. This ensures the drums empty together vastly reducing the amount of waste material seen on standard metering system fixed ratio units.

Results:

The operating system allows the cells management to set the flow rate and shot size quickly and easily. Once set the unit will repeat the application with the control system maintaining application pressure, injection speed, ratio to empty the system together as well as metering in a pigment to give the correct blended system for the moulding.

All in all the E-flow development has provided the end user with a robust metering system that frees up the exiting metering units to fill the mould in tandem, increasing production and removing a bottle neck from the LSR manufacturing process.



Potting a high voltage switch assembly with epoxy resin

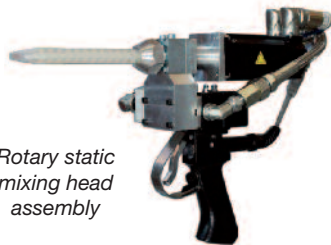
Overview:

2KM were approached by an international D.C. contactors and disconnecting switch company, who required a reliable method to dispense a fixed volume of homogenously mixed, highly filled epoxy resin.

Solution:

After studying and numerous in-house trials of the materials and application, the system found to be most suitable for this application was based on a version of our successful Process

Gear Mix range that is manufactured at our facility in Bromsgrove. The system utilises precision gear pumps to apportion the materials and these are directly coupled to inverter controlled, geared AC motors. The two motor drives are linked electronically



Rotary static mixing head assembly

and once this ratio is set it will hold the relationship throughout output range. The electrical link is via a potentiometer enabling the system to be adjusted to dispense other materials or to compensate for any specific gravity variations.

The main features of the system designed for this application included:

Vacuum degassing to the A side:

The material is fully degassed within the vessel, prior to dispense, to ensure a bubble free pot is achieved.

Pressure feed: Once degassed, the material within the 'A' side vessel was pressurised, this will help to prevent 'cavitation' of the resin within the pump.

Electrically controlled agitation:

Electric, low speed agitation (stirring) to the 'A' side vessel, this helps to ensure the resin remains homogenous and prevents sedimentation of the fillers suspended within the resin.

Full system heating:

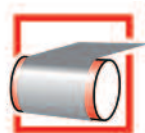
Electronically controlled heating was applied to the 'A' side vessel, the pump and trace heating to the hose, to help lower and maintain a consistent viscosity of the resin.

Results:

During our in-house trials and rigorous testing it was ascertained that the resin would not fully cure when mixed using a standard static mixer, therefore, a pneumatically controlled rotary static mixer was used in its place, to aid the mixing process and to ensure the material cures fully.



Bonding



Coating



Composite



Spraying



Moulding