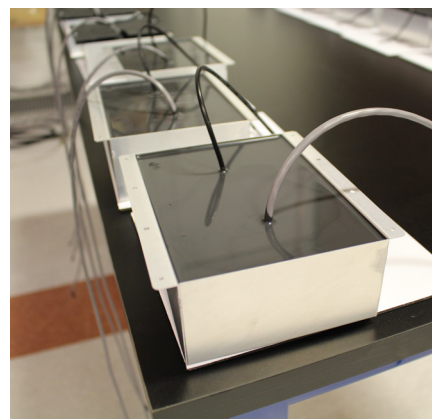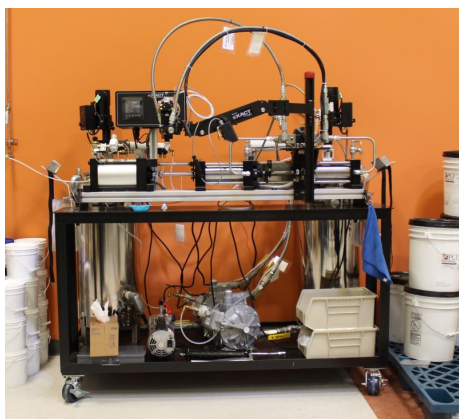# SOLAR POWER MODULE ENCAPSULATION

The EXACT Meter-Mix Dispensing System reduces waste and rework over a prior system used to encapsulate the solar panel of the Sentinel Solar Power System.

APPLICATION:

A Sentinel Solar Power Module of a SignalFire Wireless Telemetry System is waterproofed to operate in outdoor applications. Consisting of a solar panel with mounting bracket, battery and high-efficiency solar charger, the Solar Power Module is used to power both the Sentinel node and attached sensor as part of a SignalFire Remote Sensing System. (The SignalFire Remote Sensing System™ is a flexible radio networking system that seamlessly integrates analog and digital sensors through a network of nodes and gateways for remote asset management in a control room or Internet.)

When manufactured, the Solar Power panel of the system is encapsulated with 600cc of an on-ratio mix of a two-part silicone material. To improve throughput, SignalFire wanted a dispensing system that increased flow rate of silicone as modules moved along the production line.

PRODUCTS SUPPLIED:

* EXACT Model 9450 Single Acting Meter-Mix-Dispense System with 1800cc+ single stroke displacement capability
* Encoded feedback control package
* Articulating arm dispense valve positioning tool
* Full-featured mobile cart material conditioning unit accommodates future material processing from bulk storage drums

CHALLENGE:

A previous dispensing machine mixed but did not meter silicone material, resulting in inaccurate dispense amounts and frequent over and under filling that resulted in waste, rework and unnecessary spillage. SignalFire needed an upgraded dispensing system that served as an integral part of its facility expansion to increase plant efficiency and capacity.

The new dispensing system needed to meet current manufacturing specifications while addressing future production requirements. Existing production machinery could not scale for the forecasted production requirements.

SOLUTION:

Designed for dispensing a two-part formulation, the EXACT Model 9450 Single Acting Meter-Mix Dispensing System allocates the silicone in excess of 10cc per second, encapsulating the solar panel of the module at a maximum acceptable flow rate.

The process also involves the MMD system that meters and feeds both parts of silicone at precise ratios into the "static mixer". Here, the two parts are blended, then flow towards the dispense tip for distribution. The silicone is stored and drawn from bulk storage drums. A pump draws both materials into the MMD system where ratios are precisely measured.

EXACT
DISPENSING SYSTEMS

SOLAR POWER MODULE ENCAPSULATION

As the silicone cures at a rapid rate, the EXACT Dispensing System includes a PLAS (Pot Life Auto Shot) option that enables SignalFire to program in a purge shot to prevent the material from curing in the dispense system when idle.

"The controlled, small applications allow us to use faster curing material in areas which were not feasible with our previous unmetered equipment," explains Aaron Jones, Production Manager at SignalFire Wireless Telemetry. "Automated operations now allow operators to perform secondary tasks while the machine dispenses precise amounts of silicone to encapsulate modules for increased production efficiency. No-drip dispensing allows for better finished product presentation, a cleaner workspace, and an overall improved product quality and factory operation".

CONCLUSION:

SignalFire is extremely pleased with its capital purchase as the EXACT Meter-Mix Dispensing System overshot their expectations.

"Through its efficient management of silicone, the EXACT Dispensing System significantly reduces material waste that will provide SignalFire with a five-year payoff in return on investment," notes Jones. "We also added our Gateway Stick and a Modbus Stick to the assembly line to take advantage of the benefits of the dispensing system. In doing so, we further reduced material waste, lowering return on investment to just three years."