Improving Product Quality And Reducing Costs With Automated Gasketing.

Automated Gasketing Technologies And Terms

The use of automated gasketing systems has increased dramatically during the past few years.

Automotive, appliance, electrical, construction and container manufacturers are finding these systems beneficial in applications ranging from automotive tail lights and side-glass sealing, to electrical enclosures, foam backbedding for windows and doors, and seals for appliance and electronic components.

While many manufacturers are aware of automated gasketing as an alternative to the manual application of pre-formed die-cut and foam tape gaskets, the details and exactly what makes them better for many gasketing operations, requires some explanation.

Some of the confusion lies in terminology. Let's clarify:

Automated gasketing is the robotic dispensing of sealant material directly on a component in the precise pattern and amount required.

Form-in-place gasketing is often used synonymously with automated gasketing.

Foam-in-place gasketing describes an automated gasketing process in which materials, mechanically combined with nitrogen, expand when dispensed, to create a durable lightweight gasket.

Simple And Complex Operations

Automated gasketing can be as simple as extruding a gasket on a conveyored part, or as complex as using a multi-axis reprogrammable robot to dispense sealant in an elaborate pattern.

Consistency And Repeatability

Automated gasketing provides improved consistency and repeatability. Identical gaskets are precisely formed and accurately placed on parts. Automation also increases speed, making production up to four times faster than labor-intensive manual application. Increases in productivity are possible without increasing the size of the work force.

Automated gasketing is also flexible. Materials and gasket configurations can be changed quickly and easily. This can be critical for manufacturers who make different parts or change designs frequently.

Material And Manpower Considerations

Automated gasketing results in improved quality as well as less material waste and reduced manpower requirements. Expensive die-cut gaskets can be broken, torn or glued down in the wrong position, resulting in rejected parts or additional time and rework. Automated gasketing eliminates these problems.

Automated gasketing also provides less obvious benefits. The ability to assure customers that a gasketed part will perform in a demanding application can provide manufacturers with a competitive edge.

Integrating Automated Gasketing Into Manufacturing Operations

Any operation that uses automation to produce multiple parts or part styles that

require one or more gaskets can potentially benefit by converting from manual application to automated gasketing.

Automated gasketing systems are designed around specific gasketing applications, and must encompass materials, dispensing equipment and automation equipment or robotics.

Application-specific Versatility

Form-in-place and foam-in-place both refer to automated gasketing techniques used with a full range of sealant materials, including high-performance silicones, urethanes and plastisols.

Solid formed-in-place materials produce relatively hard, high-durometer gaskets. Foamed materials produce softer, more pliable low-durometer gaskets. In many cases, a single material may meet the performance requirements of several different applications.

Advantages Of Foamed Materials

The recent growth and popularity of automated gasketing can be largely attributed to foam-in-place gasketing technology.

Foaming reduces material costs up to 80%, and forms more resilient gaskets.

Foam-in-place gaskets are created by mechanically combining flowable, solventless sealant materials with safe, inert nitrogen gas. The result is a homogeneous mixture which can be dispensed at ambient or elevated temperatures. As the mixture is dispensed, the gas expands to form a closed-cell foam.

In addition to the high-performance materials, standard silicones, urethanes, thermoplastics, butyls and other materials can be foamed-in-place.

Gasket durometer is controlled by adjusting the amount of gas in the mixture, from zero to 80%. Expanding gas increases the volume of sealant material to fill gaps and joints. In industries like automotive, where weight reduction is critical, foaming results in reduced material consumption and lighter-weight finished parts.

Foam-in-place gasketing systems feature digitally controlled operating mode and diagnostics. Optional equipment allows process information to be downloaded to typical spreadsheet programs, which allows tracking and analysis of material volume dispensed, material temperature, system pressure and other process parameters.

Return On Investment

Automated foam-in-place gasketing has proven effective in increasing productivity and lowering material and labor costs in numerous industries and applications. Reduced material, labor and inventory costs often allow automated foam-in-place gasketing systems to achieve system payback in less than one year. Aspects like improved part quality make it worth considering, even in situations where payback may take longer.