

## ***Sustainability: The Best of Both Worlds***

**By Norm Davieau and Tim Howlett  
Alpha Wire**

The prominent buzzword in the Material Handling industry today is undoubtedly “sustainability.” However, merely relegating it to buzzword status almost does a disservice by distracting from the tangible benefits of sustainability. Fewer materials, lower energy bills, and cleaner integration of components are all realized gains that, directly and indirectly, affect the infamous bottom line. Nevertheless, implementing sustainable initiatives requires an in-depth understanding of what technologies are available and how to integrate them into your system. This article focuses on how wire and cable fit into sustainable designs for material handling equipment.

In *Packaging Digest’s* “Packaging Trends 2010” report<sup>1</sup>, sustainability is mentioned as a prominent trend that aligns well with lean initiatives. Furthermore, the report breaks down sustainability into five categories: utility conservation, source reduction, recycled content, recyclability, and renewable materials. For the purposes of this article, we will focus exclusively on utility conservation and source reduction as these are the key areas for increased efficiency and cost reduction.

### **Utility Conservation**

Utility conservation, at the risk of oversimplification, refers to using only as much energy as is required. The most effective way of accomplishing this is through a Variable Frequency Drive (VFD) system. The primary purpose of a VFD system is to convert electrical energy into mechanical energy in a very controlled manner. It does so by taking 480v 3-phase AC power and sending it directly through a rectifier to convert to DC power. After passing through the rectifier, the power is stored on a DC bus for later delivery to the inverter section of the drive. Once there, the power is switched on and off several thousand times per second prior to being sent to the motor at the specific frequency required to meet the speed and torque requirements of the process or system. Although the number of rectifiers impact drive cost, it also drives efficiencies and performance.

The capabilities enabled by implementation of a VFD system include:

- All current VFD system configurations are designed for interoperability.
- Onboard capabilities within a drive system easily allow for system add-ons.

- Sensors and interface devices are readily available to meet expansion needs without costly installation and programming downtime.
- A drive may also be used to control the process temperature, pressure, and flow without the need for a separate set of controls.
- A soft start may not be needed to deal with inrush currents.
- System communication between the VFD drive controller and the rest of the factory floor up to the enterprise level is enabled via remote access Industrial Ethernet IP interface.

Tangibly speaking, the aforementioned benefits will lead to lower energy costs and reduced maintenance and downtime. What's more, VFD systems allow for a greater level of process accuracy and continuous process control due to the matching load requirements and line speed. As a result, output levels will be higher. Currently, VFD systems support a diverse range of applications through any number of industrial protocols, such as airport baggage handling, beverage manufacturing, high speed carpet and textile lines, and elevators.

VFD systems present a different set of requirements for its cable components. To address these, Alpha Wire's line of 3- and 4-conductor VFD cables contain the following attributes:

- Cross-linked Polyethylene (XLPE) insulated conductors to withstand difficult electrical conditions in a drive system, including harmonics, power distortions, inrush currents, excessive heat, and potential corona and common mode noise.
- Contains all components necessary to meet noise and grounding issues in all system configurations.
- Symmetrical/uniform design and construction for an improved capacitance profile that meets the needs for longer cable runs.
- All VFD cables are heavily shielded for use in high horsepower applications where the ground path is critical and the potential for harmful electrical conditions is more likely.
- 3-Conductor VFD cable has a smaller diameter and greater flexibility.
- Suitable for NEMA 6 and IP 67 environments.

### Source Reduction

Source reduction occurs where components and/or constructions with multi-functional qualities are used in several different capacities. Whereas previously each component would perform just one task, now one component can do various jobs and replace other components. The benefits of this are plentiful:

- Lower cost – fewer components will invariably cost less and likely use less energy.
- Greater efficiency – unused capacity decreases and more component controls can be centralized.
- Neater construction – will help when making repairs or adding on to existing system.
- Smaller footprint – less components often enables a size reduction the overall system.

Alpha Wire's Industrial Series products feature uniform constructions with similar performance attributes that allow for cross- and multi-functionality. The common stranding and compound characteristics support a majority of industrial environments and match up to all major connector suppliers. Series SF Flexible Servo Cable, Series XM Flexible Control Cable, and Industrial Series Motor Supply Cable all can be used in short run (under 50 feet) drive applications and are compatible with servo and variable frequency drives. Moreover, all are suitable for NFPA 79 requirements.

As the aforementioned examples prove, sustainability is more than a current trend in material handling. It is imperative to fully understand your suppliers' entire product offering and capabilities to maximize your own. Achieving the dual benefits of cost reduction and increased output is possible through smarter, more capable components.

<sup>1</sup> *Packaging Digest*, 2010. "Packaging Trends 2010." Oak Brook, IL.