

# Flat cables can offer all-round benefits

When installing handling systems, there are many situations where flat cables can offer financial and operational benefits over traditional round cables. Paul Considine of Wieland Electric explains.

**A**t a time when it is important to source best value – in terms of both installation costs and ongoing life cycle costs – there is a strong case for taking a fresh look at the cabling that is used for conveyors and other handling systems.

In many projects, there are good reasons for using flat cable instead of traditional round cables, but very often the specifier is unaware of these benefits.

Based on many projects in the UK and continental Europe, it's reasonable to expect a 30% reduction in project planning costs, 70% savings in installation costs, and a further 70% saving on start-up costs by using flat rather than round cables.

From the outset, it's important to state that this is very much a matter of horses for courses. Flat cable is ideal for decentralised systems, but there will always be situations where a centralised system is the most appropriate configuration and round cable is the best option.

Where flat cable is appropriate, the benefits and costs savings accrue from several factors.

Not least of these is installation time. Flat cable can be laid out simply and tap-off points made quickly and easily by clamping on a connector and screwing it down for a plug-and-play connection. In contrast, round cable has to be cut, stripped and terminated at each tap-off point. The longer the cable runs and the more tap-off points there are, the greater the savings.

Taking this principle a step further, tap-off points can also be supplied complete with flying leads for connection straight to a motor starter. In fact, it is now possible to use a motor starter that clamps directly onto the cable, reducing installation time even further.

Another benefit of this plug-and-play approach is that the connections can be made by unskilled staff, as long they are checked later by a qualified electrician. In this way, it's possible to make maximum use of low-cost labour and reduce installation costs accordingly.

Of course, there is always a balance with such things. Flat cable is more expensive than round cable, so when choosing the most appropriate type of cabling, it is necessary to calculate all of the costs – not just the material costs. However, in most projects the installation costs represent around 80% of the total project cost, so any approach that reduces installation time is going to pay for itself quite quickly.

When making such calculations, it's also important to bear in mind that with centralised systems needing cable runs from each motor to the control panel, much more cable will be used, so the material cost differences become more significant.

In addition, most flat cables can include control wiring, so there is no need to carry out separate cabling for the controls.

As noted above, flat cable won't always be appropriate because there will be situations where the layout of the mechanical systems isn't suitable for providing the long runs where flat cable offers maximum benefits.

This raises another important point. Making the best use of flat cable requires a slightly different way of thinking and this needs to be incorporated from the early design stages. There aren't many situations where it would be cost-effective to replace an existing round cable system with flat cable without major reconfiguration of the mechanical systems.

For these reasons, the ideal situation is for the mechanical systems to be designed to make optimum use of flat cabling. Clearly, this requires the mechanical designers to appreciate the key differences between the two systems. Sometimes this involves a redesign of the mechanical systems and several major users are already doing this because of the benefits of flat cabling.

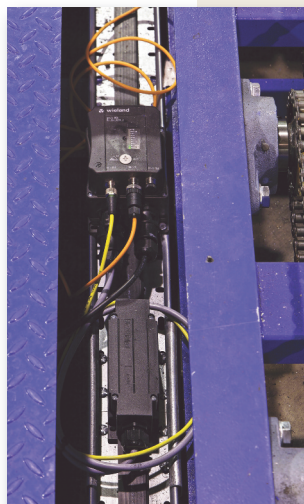
These benefits extend beyond the installation to the cost of ownership because maintenance costs are greatly reduced and any reconfiguration of the system is also much easier.



The flat cable and starter run under the assembly line at Nacco's forklift plant in Northern Ireland

## Conveying the attractions

Flat cabling has shown its potential on new conveyor line used to assemble electric forklifts at Nacco Materials Handling Group's plant in Craigavon, Northern Ireland. The 60m-long conveyor system comprises a variable-speed assembly line, and a fixed-speed pallet return line.



A complete assembly for a single motor point, showing an IDC tap-off junction box, the pluggable cable assembly and a motor starter.

The variable speed line allows pallets to be positioned precisely at workstations along the line. The return line, which runs under the assembly line, operates at a single speed, with a motor reverse facility in case of blockages.

The restricted height of the line demanded a low-profile installation. To help achieve this, the conveyor supplier, Lisburn-based Texam, used compact helical gearboxes and Wieland's low-profile gesis MCU motor starters. The starters are linked via AS-i into the Profibus system that controls the assembly line.

The cabling needed to be compact enough to fit in the single narrow channel that runs the length of the line. Wieland's podis flat cable system was simply rolled out into the channel. The incomer box and motor tap-off points were then screwed onto the cable and terminated by insulation displacement connectors. The starters and the motor feed cable were plugged into the tap-off boxes.

The flat cables were installed much quicker than would have been possible using standard round cables, more than offsetting the slightly higher price of flat cable.