

## DC Drive upgrade significantly reduces downtime and increases production and product quality on the Gravure line at the Laura Ashley / Texplan's Newtown Site



**A £100K Variable Speed DC Drive upgrade project replaces an existing troublesome DC control system, resulting in increased production and reduced downtime on the Texplan / Laura Ashley Gravure wallpaper line in Newtown, Powys.**

Texplan's roots began during the 1960's at a factory in Carno, Mid Wales. A purpose-built factory was opened in Newtown in the 1980's, expanding production capabilities of home furnishing products. During the 2000's production was consolidated onto the Newtown site.

Texplan Manufacturing Ltd became a wholly owned subsidiary of Laura Ashley Holdings PLC in 2001. Since that time, Texplan has worked with a breadth of brands and retailers, upholding the same principles of value and quality that the company was founded on over 60 years ago.

The machine is used for long run, high speed wallpaper production, using the 'Gravure' printing process. The line consists of a twin turret loading station with flying splice, a common line shaft drive for the seven impression cylinders at the print stations, entry and exit nip stations for tension control.

There is an inspection table section for quality control, and finally a twin turret rewind and unloading station along with other ancillary equipment.

Drives and Automation were asked to replace the existing control system due to their expertise in process line control and retrofit experience. The existing obsolete DC drive system was becoming problematic due to poor documentation, reliability and problems with the control of the Payoff Turret drives. These problems were causing significant loss of production especially during changeover.

### Gravure Line Drive System Technical Details

- Control Techniques Mentor MP four quadrant DC Converters
- Siemens Simatic ET200 PLC processor (CPU 1510SP-1 PN), with Profinet communications links to each of the Mentor MP converters
- Siemens Simatic KTP1000PN Basic 12" touch screen HMI
- Pilz PNOZ hardwired emergency stop system



Control Panel During Commissioning



Control Panel Sections

Drives and Automation Ltd provided a complete drive control solution including the drive and PLC control panel suite. The original DC Motors for the main lineshaft, entry nip roll, exit nip roll, and the two rewind take-ups are controlled by a set of new Control Techniques Mentor MP DC converters mounted within this new control panel. The operation and supervision of these DC converter modules is undertaken by a Siemens PLC system with a ProfiNet communications network.

The main PLC control system is provided by a SIMATIC ET200SP module which contains an integrated CPU 1510SP-1PN central processor together with a set of local analogue and digital I/O modules.

The PLC also controls the infeed turret, rewind turret and the hydraulic pumps, by means of DOL motor starters, together with the control of the impression rolls and the reel loading/unloading and splicing operations.

The PLC system interfaces with the existing operator control stations at the following locations:

- **Infeed Turret** - Pushbutton station for reel loading operations.
- **Unwind Frame** - Infeed Control Station for infeed splicing operations.
- **Exit Frame** - Main Control Station for operation of the main line and rewinds, together with rewind reel changeover/splicing operations.
- **Rewind Turret** - Pushbutton station for reel unloading operations.

The system is also interfaced to the existing inspection table control system which is physically positioned on the line between the exit frame and the rewind stand. This system has its own Allen Bradley PLC system and two DC converters which control the entry and exit rolls on the inspection table. An analogue reference signal from the new PLC system provides the line speed. An analogue signal is received back from the inspection table control system to indicate the actual speed of the tables exit roll and hence provide the reference for the rewind stand.

The main PLC and Drive panel is also fitted with an HMI panel which displays both status and operational data, together with indication of alarm conditions and diagnostics.

Under an 'engineers' level the HMI panel may also be used to set-up and configure various operational parameters to adjust the performance of the machine if necessary.

Mentor MP is Control Techniques' 5th generation DC drive. It's one of the most advanced DC converters available giving optimum performance and flexible system interfacing capability. The Mentor MP drive allows the user to maximize motor performance,

enhance system reliability and interface digitally with modern control equipment using Ethernet and fieldbus networks.

The new system is far more reliable than the previous DC control system and scrap production has been significantly reduced due to the improved machine control. John Kerr, Site Engineer at Texplan, said: "We were really pleased that we managed to complete the upgrade project within budget and with only minor disruption to production. The machine is performing much better, scrap reduced significantly, fault finding much improved and improvements to the operator controls have helped to reduce set up time. This couldn't have been achieved without the help of everyone involved including Drives and Automation Ltd who were the principle contractor on the project."

Steve Lambert, Business Development Manager - Distribution of Nidec / Control Techniques said: "Drives and Automation are part of our System Integration network who we know, following introduction to a project, can be left on their own. With their years of experience with the CT product we knew the customer would be left in safe hands"

Drives and Automation (DnA), based in Chesterfield, provide a comprehensive system design, control system manufacture and project management service for new and retrofit control systems. Working alongside machine builders or end users, we provide systems encompassing AC and DC drives, PLC systems and turnkey project solutions.

#### Problem Solved

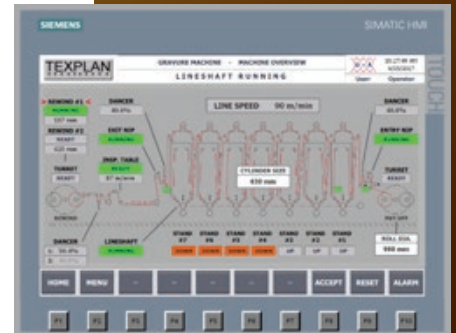
- Existing drive control system difficult to maintain
- Control system obsolete and unreliable
- No spares available
- Extended downtime and loss of production
- Expensive to maintain

#### Solution

- More efficient DC drive solution
- Machine safety improved
- Existing DC motors retained
- Control system now reliable and supportable
- New PLC / HMI Machine Control
- Improved machine diagnostics
- Comprehensive documentation provided

#### Benefits

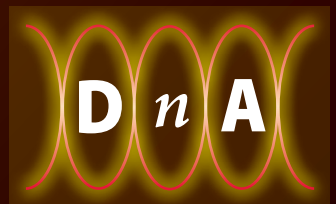
- Downtime Reduced
- Production Increased
- Easy to Maintain and Fault Find
- Easy to Support
- Scrap reduced



HMI Home Screen



The Finished Product



## Drives and Automation

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