# Dual-Dry® TNV

## Integrated Air Flotation Dryer & Oxidizer

*High Performance for Commercial Printing*


The Dual Dry® TNV is the proven answer to the demanding needs placed on heatset printers by the increased use of: light-weight paper, uncoated paper, heavier ink coverage, lower web tensions, higher press speeds and ultra-wide web widths. These parameters all require superior web handling and process efficiency.

*The bottom line is process knowledge*

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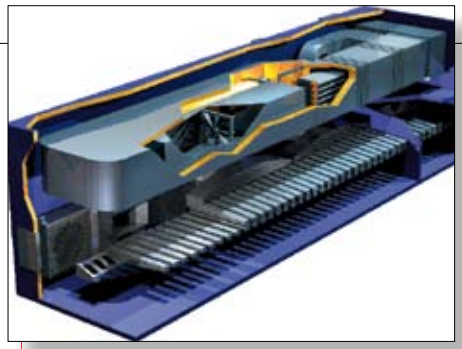
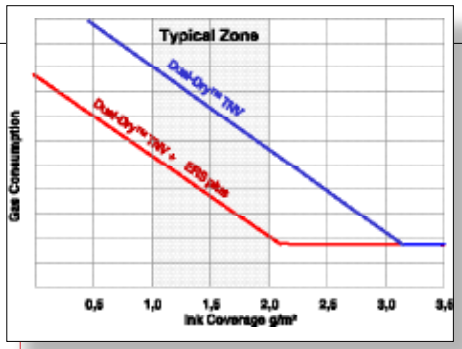


*Dual-Dry TNV's proven technologies deliver the industry standard for functional and economic performance of integrated drying and air pollution control*

*Innovation N° 1: Dual-Dry air nozzle system combines two air bars, one dedicated for web handling and the other for heat transfer*




*Innovation N° 2: The optional available exhaust reduction system ERSplus significantly reduces gas consumption*

### Performance Benefits of Dual-Dry® TNV

- High-quality printed products with low waste
- Dual-Dry® system for high lateral web stability without web touching
- Proportional length of each zone for maximum process quality
- Integrated oxidizer for VOC environmental compliance
- Low energy consumption with 65% efficiency exchanger and optional Exhaust Reduction System ERSplus
- Digital exhaust control
- Automatic paper temperature control
- Temperature profiles depending on paper grade
- Simple operation eliminates operator errors
- PLC with diagnostic assistance and modem
- High reliability and low maintenance
- No condensate formation in the dryer, marking on chills or folder
- Minimum number of components, standard commercial burner

### Lower Operating Costs

Two major criteria are environmental VOC compliance and reduction of total operating costs by improving functional performance :

- Prevention of waste from all causes is an absolute priority
- Minimize press downtime for any reason
- Reduce consumption of gas and electricity
- Lower gas consumption: integrate very high efficiency (65%) oxidizer heat exchanger and optional exhaust reduction system ERSplus

The Dual-Dry TNV answers all these operating criteria with proven technologies. Optimum dryer performance begins with air bar efficiency which has been revolutionized by MEGTEC's Dual-Dry air nozzle system that ensures an extraordinarily stable web without any marking and reduces total energy consumption. Other key process features include optimum zone proportions, automatic paper temperature control depending on paper grade.

Production results over several years confirms the reliable superiority of these technologies. MEGTEC has been responsible for most of the major advances in heatset drying and oxidation technologies and has vast experience in thermal air management with over 10,000 dryer and oxidizer installations. The Dual-Dry TNV is the result of the synergies between MEGTEC's US and European R&D teams to combine technologies and experience to deliver the global industry standard for functional and economic performance.

### Dual-Dry® Air Bar System

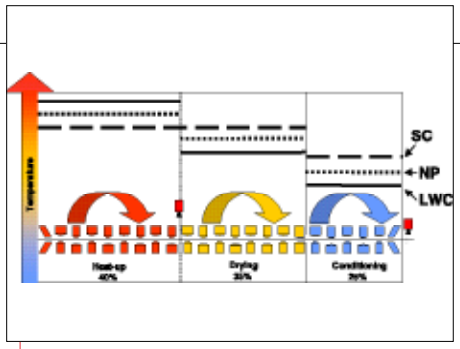
Optimum dryer performance begins with air bar efficiency. The combination of heat transfer and web support functions in a single nozzle design will always be a compromise. MEGTEC's innovation has been to separate these two functions into separate air bars. The patented Dual-Dry air nozzle system demonstrates a significant advance in performance to ensure an extraordinarily stable web without any marking, even in the longest and widest dryers. In addition, the efficiency of heat transfer has been increased to lower energy consumption.

### Exceptional Web Stability

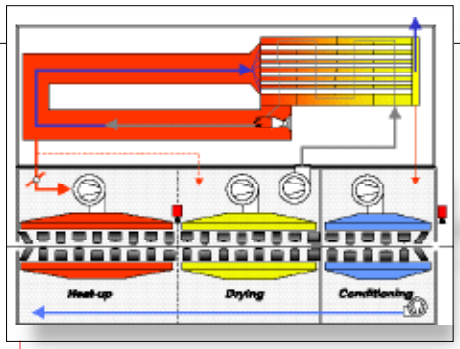
The Dual-Dry system uses a combination of hole air bars to deliver high heat transfer and Hi-Float® air bars to provide optimum web support even with an air pressure reduced by half. The system creates a slight sine wave in the web to inhibit edge curl, flutter or web touching, and it provides a flatter web path for high lateral web stability (± .118 inches; ± 3 mm). Its performance in demanding production conditions demonstrates optimum flotation clearance even with heavy ink coverage on light weight papers at low web tension. Dampened air knives at dryer entry and exit help center the web and control fresh air entering the dryer.

### VOC Environmental Control

The Dual-Dry TNV's integrated oxidizer ensures compliance to the strictest environmental regulations using thermal recuperative technology. Solvent-laden air from the dryer exhaust passes through the stainless steel tube and shell heat




*Innovation N° 3: Optimum zone length and special temperature profiles for each paper grade increase drying performance and reduce waste*




*DD TNV process principle*

*Heavy-duty design for long life with minimum maintenance*

exchanger into the combustion chamber where solvents are converted into harmless substances. The purified hot air is returned to the dryer to heat up the web providing most of the energy required for drying. Gas consumption is further reduced by the passage of hot air through the high efficiency heat exchanger before it is exhausted into the atmosphere.

## Low Total Energy Consumption

Dual-Dry air bars considerably reduce electricity used in operation. Energy is further economized by the low web exit temperature, automatic paper temperature profile and digital exhaust controls depending on production speed. The integrated oxidizer features a high efficiency (nominal 65%) heat exchanger to significantly reduce energy consumption.

## Optional: Exhaust Reduction System ERSplus

This optional system significantly reduces the exhaust rate of Dual-Dry TNV dryers with integrated oxidizer, allowing the burner to operate at minimum fire at many production conditions. Energy savings of over 50% are possible in specific production cases.

## Optimal Zone Proportions

The Dual-Dry TNV dryer uses the three-zone process concept. MEGTEC's unique design ensures that proportions of each zone are optimal irrespective of dryer size. This is essential to attain peak process efficiency and flexibility for all speeds and papers.

**Heat-up zone:**
Reaches the defined temperature under maximum demand conditions to rapidly start solvent evaporation. (Temperatures are measured and controlled at the exit of this zone to ensure highest temperature attainment is measured at the most reliable point to control the overall process.)

**Evaporation zone:**
Maintains web temperature and exhaust solvents at end of the zone (at the point of highest concentration). Room air enters the dryer through the web slots and make-up air damper to compensate for the volume of exhaust air.

**Conditioning zone:**
Patented seal bars at the entry minimize solvent migration into this zone where extraction of residual solvent continues as the paper temperature is reduced (web exit temperature is 200 to 260°F (90-125°C). The zone features temperature control and fresh air infeed to avoid condensate formation.

## Automatic Paper Profiles

Each paper grade has its own drying characteristics. Traditionally, only the web set point temperature has been adjusted to each paper grade. However, MEGTEC's research and field testing in co-operation with press, ink and paper suppliers shows that drying performance increases when the dryer zones are optimally profiled. MEGTEC has combined these pre-selectable temperature profiles with the proven automatic paper temperature control, which features an internal pyrometer at the end of the first zone. The PLC optimizes temperature profiles in all zones to match changing printing conditions (press speed, dampening, paper weight and paper grade). This easy-to-use system requires only adjustment for ink coverage and thereby eliminates operator errors, allows faster make ready, ensures consistent print quality, reduces paper waste and energy consumption.

## Communication and Control

The Siemens S7 PLC provides communication and interface with the press control system. The user-friendly operator interface displays operating status and provides fault diagnosis. A modem is standard for remote troubleshooting and a weekly monitoring service is available for diagnosis and preventive maintenance.

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### High Reliability and Low Maintenance

The design eliminates condensate formation and provides a constant seal between the air bars and headers. Other features include a single burner and a minimum number of components, along with easy maintenance access. Construction features include advanced metallurgy and rugged manufacturing to ensure years of dependable operation.

### Simple Installation

Electrical cabinets are mounted on the dryer which is pre-wired, pre-piped and factory tested for fast commissioning. Most sizes are delivered in a single piece to further reduce installation time.

### Options

| |
|---|
| Energy reduction system ERSplus |
| Energy recovery |

### Dual-Dry Range

All MEGTEC dryers share the same high performance Dual-Dry air nozzle technology.
The wide range of models allows the optimum selection of a dryer to match operating requirements.

| Functions | Pollution control | Drying zones | Conditioning zone |
|---|---|---|---|
| Dual-Dry III | __ | 3 | Air conditioning zone |
| Dual-Dry TNV | Integrated recuperative | 3 | Air conditioning zone |
| Dual-Dry RTO | Integrated regenerative | 3 | Air conditioning zone |

### Standard Features for Dual-Dry® TNV

| | |
|---|---|
| Maximum web speed | 3350 fpm (17 m/s) |
| Maximum paper web widths | 40, 51, 55, 58, 69, 80 inches<br>(1020, 1270, 1530, 1700, 2040 mm) |
| Configurations | Horizontal, single or double web |
| Web direction | Left hand or right hand configuration |
| Primary heat exchanger | Stainless steel tube design, nominal efficiency 65% |
| Clean gas values | Hydrocarbon < 38 ppmv as C1, CO < 80 ppmv, N0x < 50 ppmv |
| Single burner, versions | Natural gas, butane, propane or LPG |
| Air nozzles | Patented Dual-Dry air bars for maximum web stability and high heat transfer |
| Control | PLC with modem |
| | Internal pyrometer (IR) at end of first zone |
| | Automatic temperature profile control to all zones function of paper grade |
| | Automatic digital exhaust control |
| | Blanket wash interface |
| Doors | Vertical automatic web-up doors |
| Electrical power | 460V/3/60Hz Soft start motors |
| Fans | Plug type for supply, recirculating and integrated exhaust |
| Norms and safety | Conforms to NFPA, FM, UL standards |