



# NEWS

1st Quarter 2009

## Surface Treating Technology

Visit Enercon on the web for the latest developments in surface treating technology: [www.enerconind.com](http://www.enerconind.com)

### inside

2

#### Technical Paper



Properly defining atmospheric plasma, air plasma and chemical corona

3

#### Technically Speaking



Save money and time when installing your next corona treater

4



#### Did you know?

Changing electrodes can yield undesirable results

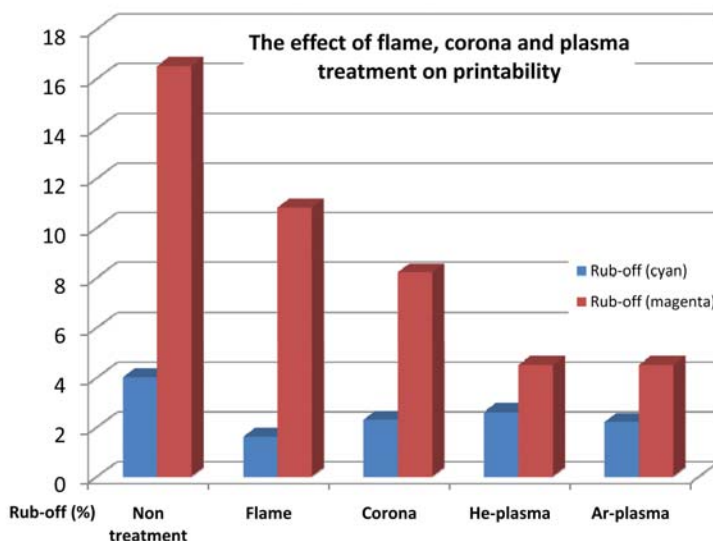
#### Applications

Solar Communications prints with Enercon's High Definition Corona

## Independent research confirms Atmospheric Plasma benefits

A new technical paper presented by Tampere University of Technology at the 2008 TAPPI PLACE Conference in Portsmouth, Virginia, USA confirms atmospheric plasma surface treatment benefits

The paper titled "The Influence of Atmospheric Plasma Treatment on Digital Print Quality of Extrusion Coated Paper" studies the influence of corona, flame and atmospheric plasma surface treatments compared relative to their effects on the surface properties of extrusion coating and, furthermore, on digital print quality.



Atmospheric Plasma treatment produces the lowest rub-off value which improves printed images' abrasion resistance.

The chart above is an excerpt from this paper which compares these processes relative to enhancing printability of toner to LDPE coated paperboard.

continued on page 2

## Rave reviews for new power supply designs

Enercon's new power supply designs use the latest technology to reduce cost and improve productivity.

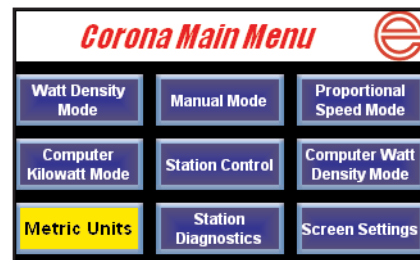
**Installation:** options such as watt density control are built into a single interface reducing installation time

**Operation:** menu driven screens guide operators through set-up and operation

**Communication:** optional network connectivity support multiple protocols

**Troubleshooting:** fault logging and station diagnostics are standard with these models.

For more information on these new designs please e-mail us at [info@enerconind.com](mailto:info@enerconind.com)



The PLC controlled touch screen option is fully programmable for your specific requirements.



The Compak™ 2000 Deluxe incorporates options into a common interface.

**Enercon Industries**  
Menomonee Falls, WI USA  
Aylesbury, Bucks, UK  
[info@enerconind.com](mailto:info@enerconind.com)  
[www.enerconind.com/treating](http://www.enerconind.com/treating)

**The power of "e"**  
Technology. Expertise. Service. Personnel.

# Research confirms surface treating benefits of atmospheric plasma

(continued from page 1)

The specific conclusions of the study are as follows:

- Surface treatments clearly increase surface energy of PE-LD coated paperboard by oxidising its surface.

- Argon plasma is the most effective method based on the contact angle measurements.

- Also surface analysis with ESCA clearly shows the oxidising effect of all surface treatments. Plasma treatments are more effective than traditional flame and corona.

- Plasma treatments are generally speaking more effective compared to corona. Same or even higher effect can be achieved with 50% lower efficiency compared to corona and flame.

- All surface treatments evidently improve toner adhesion, which is very important in packaging applications. Plasma treated surfaces have the lowest rub-off values.

- The effects on print mottle are not yet advantageous. Some more development work is clearly needed with the treatment uniformity in order to improve print evenness. However, compared to corona and flame, plasma treatments are more uniform giving more even print with lower print mottle, and hence better visual quality.

As additional evidence mounts relative to the superior adhesion performance benefits of atmospheric plasma technology for specific applications, this author will make these application results known so the converting industry can leverage atmospheric plasma's dynamic surface effects.

# Atmospheric plasma, chemical corona and air plasma: Clearing up Misunderstandings and Misrepresentations

**Comparative contact angle measurements for surface treatment technologies**

Polymer Type	Advancing Contact angle before treatment	After N2 Vacuum Plasma	After N2 Atmospheric Plasma	After N2 Chemical Corona	After Air Corona
Polypropylene	110°	48°	50°	66°	76°

**Note:** All post-treatment contact angle readings conducted at the same watt density.

The term “atmospheric plasma” is creating a buzz throughout the main stream converting industry. The promise of higher dyne levels, longer lasting dyne levels, superior adhesion performance, grafted surface chemistry and an ability to apply variable chemistry to adapt to ever changing application requirements are benefits worthy of converters’ attention.

As atmospheric plasma surface modification technologies become more mainstream, potential users of these technologies in the printing, coating and laminating industries can be confused by “mixed-messaging” that some surface treatment equipment suppliers are using to ride the wave of atmospheric plasma technology’s popularity. Today the terms atmospheric plasma, chemical corona and air plasma are being recklessly interchanged.

### The 4th State of Matter

It is true that the ‘4th state of matter’ can be achieved at both high and low temperature and pressure. It can also be asserted these plasmas consist of free electrons, ions, radicals, photons and other species. However, it is non-thermal plasmas, and particularly non-thermal – atmospheric pressure plasmas which are best suited for continuous surface pretreatment of substrates within the converting industry.

To further clarify, corona discharges are not absolute plasmas. Although a corona discharge can be regarded as an atmospheric pressure plasma discharge, the

surface modification provided by conventional corona discharges are exceedingly one-dimensional compared to gas phase atmospheric pressure plasmas which can offer an expanded range of surface modifications, both physically and chemically.

Atmospheric plasma systems are not enhanced corona discharge treating systems. The treatment attributes of atmospheric plasma systems were originally developed with low pressure vacuum plasma systems as the guide. The capabilities of a vacuum plasma system far exceed those of a corona system.

Eight years ago Enercon embarked on a development project to determine if the results achievable with vacuum plasma systems could be replicated with atmospheric plasma systems for high speed converting applications. Extensive research and development led to the development of a system which optimizes dielectric, surface etching and surface modification characteristics of an atmospheric plasma surface treating system in a manner similar to vacuum plasma treatment systems.

**Want more technical info?**

Request your free copy of Rory Wolf’s new technical paper: **“Clearing the air on atmospheric plasma surface treating systems”**

e-mail us at [info@enerconind.com](mailto:info@enerconind.com)

# Corona Treating installation planning saves money and time



Tom Gilbertson  
VP Application  
Engineering

An accurate cost assessment of any piece of converting equipment ought to include a review of installation cost.

Proper planning will eliminate avoidable variables that create project delays, allow

installation costs to soar, and weigh heavily on your peace of mind.

Many Enercon customers are quite proactive in working with our engineers to ensure the installation of their new Enercon power supply and corona treater is as fluid as possible.

One simple, but effective technique is to request a wiring harness for the system interlock and power output. Enercon calls this option Sure Connect™. Customers who have tried this option now make it a requirement on every order. First we'll cover the specifics of Sure Connect™ and then review the benefits in greater detail.

## Sure Connect™ Interlock cables

Enercon will provide interlock cable pre-wired to the treater station. Your electrician should use a separate cable

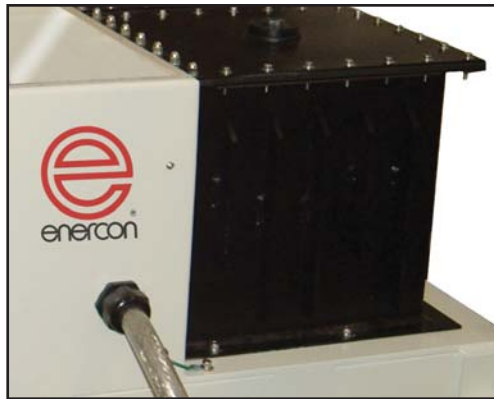


Sure Connect™ includes control wiring for interlocks and any additional items such as remote control.

tray for control wiring and ensure that the cable tray entrance is located as close to the interconnection terminal block as possible.

## Sure Connect™ Output Power Cables

Enercon will provide specially shielded cables at a length predetermined by your team. This cable is delivered securely hard-wired to the high voltage transformer input terminal block. All connectors and materials meet Enercon's strict guidelines for optimal safety and performance.



Sure Connect™ provides shielded cables to ensure optimal performance.



Cable connections to the power generator are made easy. Shielded cables are clearly labeled for the terminal block with individual terminal numbers and ferrule connectors for easy termination.

## Sure Connect™ Benefits

Both your engineering team and your hired electrician will save time installing your next corona treater and that will save your organization money. Consider these time savers:

- Sourcing of specialty cable for high voltage applications eliminated
- Pre-labeled connections speed the



Pre-planning installation scenarios helps ensure a smooth installation and start-up.

installation process and make it virtually impossible to improperly connect wiring

- Reducing the time you require an electrician reduces installation costs
- Your system will be tested at the Enercon factory with the same cables for quality assurance.

## Power supplies simplify installation

Enercon's newest Compak™ 2000 Deluxe and Compak™ 9000 operator interfaces will further simplify your installation experience. Both systems integrate options such as watt density and station diagnostics into a common interface which reduces wiring and headache of determining where to mount additional interface boxes.

## Sure Connect™ Start-up Promise

We're so confident that Sure Connect™ will make your installation a success we're committing to a special promise for those customers that take advantage of this option.

Should you need any on-site assistance relative to Sure Connect™ we will dispatch a service technician to your facility for on-site troubleshooting. You will not incur any service charges for this additional support. If you have any questions regarding Sure Connect™ please contact me.

## e Applications

### Solar Communications expand horizons with High Definition Corona



Solar Communications of Naperville, IL is featured in a recent edition of Converting Magazine. Their addition of wide-web, flexographic printing combined with proprietary, film-demetalization capabilities, is enabling them to rapidly expand its production horizons into the world of flexible-packaging converting.

To promote adhesion on their new Flexotecnica N8G press the company added an Enercon High Definition Corona treater with a Compak 2000 power supply featuring watt density control.

### 2009 Industry Events

#### RadTech UV/EB West

February 17-18

Los Angeles, CA (R. Wolf presenting)

#### TAPPI PLACE

##### Flexible Packaging Summit

April 28 - 30

Columbus, OH USA

#### FTA Forum & Info\*Flex

May 3, 2009 - May 6, 2009

Orlando, FL

#### TAPPI European PLACE Conference

May 18-20

Budapest, Hungary

### TO CONTACT US:

Enercon Industries Corporation  
Menomonee Falls, Wisconsin  
Tel: 262/255-6070  
info@enerconind.com

Enercon Industries Limited  
Aylesbury, Bucks, United Kingdom  
Tel: 44 1296 330542  
info@enerconind.co.uk

Website:

[www.enerconind.com/treating](http://www.enerconind.com/treating)

© 2009 Enercon Industries Corp.

## e Did you know?

### Electrode and roll interaction key to ensuring optimal corona treating performance

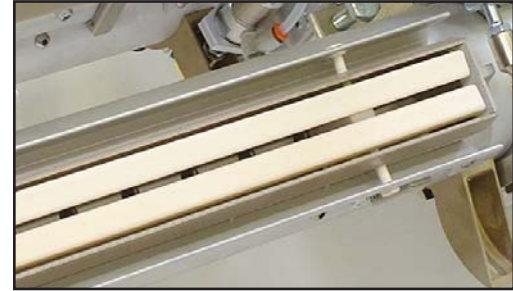
To ensure consistent treatment it is critical to optimally configure the electrode, ground roll and power supply for the application.

Substituting a different dielectric roll, electrode or power supply can disrupt the engineered balance of the components and produce undesirable results.

Think of the choices you have when it comes to selecting tires for your car. You would not put racing tires on a vehicle you will be taking off-road. Likewise components such as roll coverings and electrodes have specific dielectric properties that work together to optimize performance.

The proprietary combination of Enercon's Universal roll covering and high powered ceramic electrodes are combined the result is High Definition Corona. Substituting a different roll covering or electrode will not produce the same results.

Its important to point out that Enercon manufactures several types of



**To ensure optimal performance make sure you are using the electrodes specifically designed for your system.**

ceramic electrodes that share the same housing. If you have multiple systems in your facility you should check with Enercon's customer service department to ensure you do not mix electrode styles as an assortment of undesirable results can occur including: insufficient treatment levels, inconsistent treatment levels and premature electrode failure.

For more information on properly identifying and using Enercon electrodes contact our customer service department at [info@enerconind.com](mailto:info@enerconind.com) or (262) 255-6070.



[www.enerconind.com/treating](http://www.enerconind.com/treating)

**Surface Treating Technology**

1st Quarter 2009

Enercon Industries Corporation  
W140 N9572 Fountain Boulevard  
PO Box 773  
Menomonee Falls, WI 53052-0773

**ADDRESS SERVICE REQUESTED**

PRSR STD  
US POSTAGE  
**PAID**  
Milwaukee, WI  
Permit No. 1