

# 5 Keys to Optimizing Your Surface Treating Operations

Applications for surface treating continue to grow at a remarkable rate. From the ever expanding flexible packaging market to emerging technology sectors such as solar and batteries for electric vehicles, corona, flame and plasma technologies are being used to promote adhesion on all types of films and foils. Whether you are an industry veteran or new to surface treating, this article will provide you with insights on how to optimize your surface treating operations.



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# The 5 Keys to Optimizing Surface Treating Operations

## The 5 Keys:

1. Ensure your application specification is accurate before you invest.
2. Understand the value of system features included & not included.
3. Recognize that all films do not treat the same.
4. Conduct and interpret dyne tests appropriately.
5. Train your staff and keep them trained.

### **Ensure your application specification is accurate before you invest.**

Whether you are experienced with surface treating or involved in one of the many new applications for surface treating (EV batteries, solventless laminating and specially engineered films,) properly defining your application is step one. First, recognize that your surface treater supplier should be customizing the treater for your specific application. This is a great advantage for companies who consider their immediate needs with an eye on the future. The goal is to build in future proof features without paying for capabilities you'll never use.

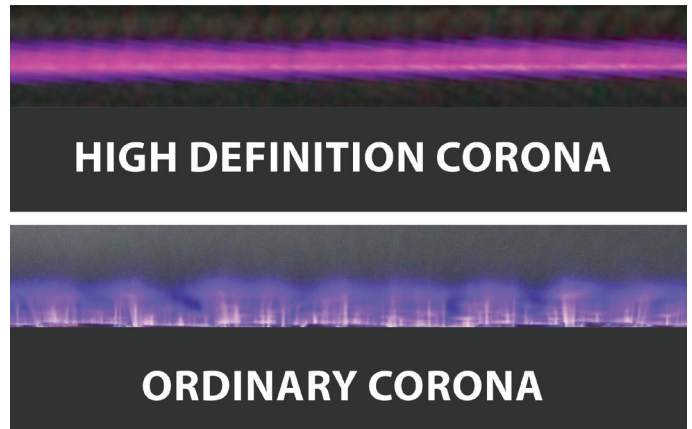
Here's an example. The ACME Company and the ZETA Company each have an immediate need for a 60-inch wide treater to treat polypropylene at 150mpm. The ACME Company tells the corona treater manufacturer that they may have to run 300mpm in the future. Doubling the line speed has a significant impact on the sizing of the corona treater. Not only is a larger power supply required, more electrode capacity is needed, larger ground rolls and greater exhaust requirements will result in a much higher initial system cost. The takeaway here is to use caution when building in future considerations that may never happen.

Meanwhile the ZETA Company knows their line will never run faster than 150mpm. However, they have an expectation that they may need to treat metalized film in the future. In this case, making sure the treater is capable of treating both types of films makes perfect sense. The difference in initial cost may be fractional and the additional flexibility positions the company for future applications.

### **Understand the value of system features included & not included.**

Once you have your application properly defined, pay special attention to what is included and not included in the proposals you receive. For example, having all of the specialty cables supplied will reduce your installation costs and save your team countless hours. That is a real savings to your bottom line.

It is also important to note that not all corona is created equal. A great example of this is Enercon's High Definition Corona, which features high-powered ceramic electrodes and a proprietary roll covering that combine to produce a smooth homogenous corona. (Image 2) The benefits of High Definition Corona are higher surface energies at lower watt densities, as well as insurance against backside treatment, pinholing and film wrinkling. Be sure to know what type of corona your next treater produces.



*Image 2*

### **Recognize that all films do not treat the same.**

Did you know that different types of films respond differently to corona? For example, a treatment level of 1.1 watt density yields very different results on PET compared to polypropylene.

In general, plastic films are chemically inert, have limited bonding sites and are hydrophobic. Surface contamination and film additives (which may rise to the surface) also affect a film's pretreated surface energy. Collectively, these factors determine the amount of power required to reach the surface energy levels required for successful adhesion.

Look at the chart (Image 3) provided that shares laboratory trial data comparing the surface treatment results of pretreated PP, PET and PS. All films were treated with a watt density of 1.1. You can see that the PS was very receptive to corona treatment and its dyne level increased from 36 to 60 dynes. The PET was somewhat responsive and an increase to 46 dynes was reached. The PP film, however, barely showed any increase. If a target of 44 dynes was needed, a higher watt density would need to be applied.

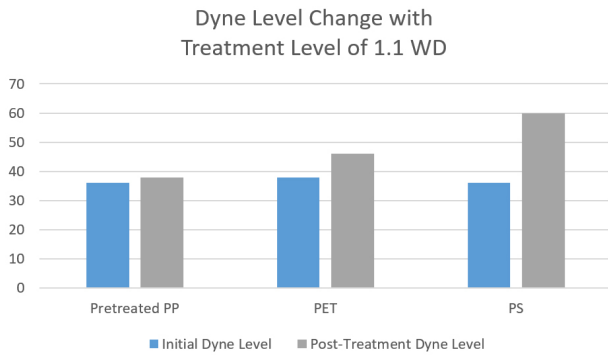


Image 3

The fact that films do not respond to the same treatment is important for several reasons. When specifying your application, the corona treater manufacturer needs to know what types of films you will be converting and what the additive loads will be. And, if you find yourself in the situation of getting unexpected treatment results on an application you've run before, verify with your film supplier that nothing has changed in their film recipe. Available on the Enercon website is a free educational webinar and in-depth tech paper on this topic.

**Conduct and interpret dyne tests appropriately.**

The effects of corona treatment on film are not visible to the eye. Therefore, various types of surface energy measurement techniques have been invented to measure changes in surface energy after treatment. The three most common tests use either dyne pens, dyne solutions with a cotton swab or dyne solutions with a Meyer rod (Image 4). When conducted and interpreted properly, these tests can be very valuable.

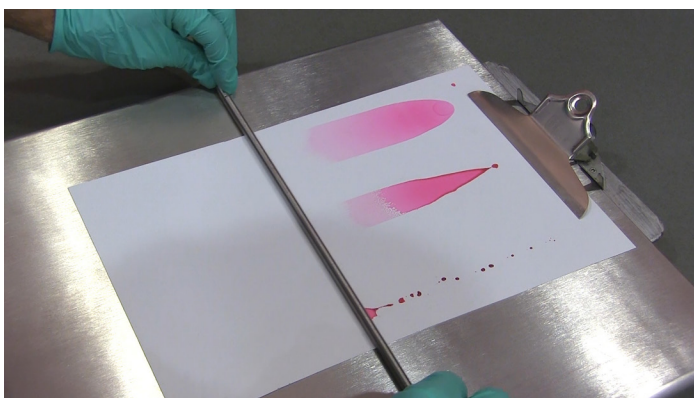


Image 4

So, what does "interpreted properly" actually mean? The first thing to know is that all dyne tests are subject to visual interpretation. This means that two people can look at the same tests and one can be confident that the result is 46 dynes

and the other 44 dynes. The takeaway here is to recognize that the exact number is not as important as the evidence of some degree of change from prior to treatment. Many converters get stuck in pursuit of a specific dyne result without actually testing if the treatment enables proper adhesion for their process.

Which brings us to a very important point: Dyne levels, or surface energy for that matter, do NOT guarantee adhesion. The purpose of surface treating is to provide a clean, optimized surface to improve the wettability of inks, coatings and adhesives. The entire adhesion process is dependent on many more variables than a substrate's surface energy.

Of course, all of the examples above do not even address issues that arise from dyne tests that are performed incorrectly or inconsistently. For information on best practices for conducting the dyne tests mentioned above, please visit Enercon's website for a free technical paper, video and webinar.

**Train your staff, and keep them trained.**

It's harder than ever to find good help and it can be even harder to retain them. With employees moving around from company to company, it is beneficial to have smart systems that can offer troubleshooting information and reminders (Image 5). For example, Enercon's latest power supplies offer integrated troubleshooting advice for high voltage faults, inability to generate corona and other situations. They also provide reminders for critical maintenance to ensure your systems are properly maintained to maximize uptime and prevent unexpected downtime. And, when you need additional support, these new systems use artificial intelligence to capture critical data. The data is available for USB download or through direct connections back to Enercon's support team.

With that being said, it is important to have one or two people on staff who are your go-to people when a surface treating application or operation issue arises. Enercon recently produced an educational webinar for people who are in this position. And as always, Enercon remote support is available 24/7.

**Conclusion**

To ensure the best experience with your surface treating operations, be sure to specify your application properly, appreciate the benefits of the features you invest in, understand that films respond to treatment differently, conduct your dyne tests properly and educate your employees so they are prepared to handle any situation that may arise. In addition, when you need assistance please contact Enercon. Learn more at [www.enerconind.com/web-treating](http://www.enerconind.com/web-treating). +1.262.255.6070