

# How To Prevent Winter Static



By Dr. Kelly Robinson  
Contributing Editor

Static becomes worse in the winter when the humidity decreases. Now is the time to do important preventive maintenance, when an “ounce of prevention is worth a pound of cure.” Here is my Static Prevention Checklist. I’m sure you can add items that are important to your operations.

If your HVAC system has a humidifier, service it according to the manufacturer’s instructions. Keeping the relative humidity sufficiently high is the best way to avoid winter static.

Take good care of your ionizers because they are your workhorses for keeping static levels low. Ionizer output decreases when dust and debris collects on

the ionizing points. Follow the manufacturer’s recommended cleaning procedure. Usually, the procedure is to clean the ionizer points using a soft brush. Replace worn static brushes, tinsel, and ionizing strings with new ones. These passive devices are inexpensive and replacing them annually is a good practice.

Measure the distance from each ionizer to the film surface. Follow the manufacturer’s recommendations. Typically, active ionizers should be located from 2–6 in. from the film surface. Tinsel and ionizing string should be located between 0.5 in. and 2 in. from the surface. Depending on your application, static brushes can be located between 0.5 in. and all the way to contacting the surface.

The roller, belt, and guide surfaces that touch your products should be properly maintained because your product accumulates a little static charge every time it touches one of these surfaces. Tribocharging is a surface phenomenon. A thin layer of grease, dirt, or other contaminant on the surfaces can increase tribocharging greatly. To restore good static performance, clean the surfaces.

“Tacky rollers” (cleaning rollers) are a special case because dust, debris, and contaminants are intended to accumulate

on the roller surface. Maintain these rollers according to the manufacturer’s recommendations.

The rubber or polymer coverings on drive, nip, cleaning, spreader, and lay-on rollers often are static dissipative. Electrical conductivity degrades with time. Measure and record the electrical resistivity of these rollers. Replace the roller if resistivity has increased beyond the manufacturer’s specifications.

Static is worse when the film slips and slides over low-wrap rollers. Check the bearing drag using a simple spin-down test as described in “Web Lines: The Spin on Idler Roller Testing,” by Timothy J. Walker, *PFFC* June 2008. The spin-down test itself is simple:

- ▶ Drive the roller to a given speed.
- ▶ Measure the roller speed.
- ▶ Note the speed and start the stop watch.
- ▶ Measure the time until the roller stops.

Keep a log of the spin-down times for each of your low-wrap rollers. Shorter times indicate increased risk of static from bearing drag. If the time is too short, replace the roller bearings.

Films that track poorly or weave have many problems, including higher static from film slipping over rollers. Solve this by aligning rollers. Similarly, bowed rollers also can generate high static from film slipping over the roller. Check the bow and make sure it is no higher than needed.

Nip rollers and lay-on rollers can generate high levels of static caused by the high pressure contact. Check the engagement pressures and nip gaps to make sure that the contact pressure is no higher than necessary.

Maintain film tensions within the range for good conveyance to minimize static. If the tension is too high, the contact pressure between the film and roller surfaces is higher than necessary, which can cause higher static. Low tension that causes the film to lose traction and weave can cause high static because the film slips and slides over rollers.

Finally, achieving good wound roll integrity with an appropriate winding tension profile also minimizes static. Cinching causes static when the outer surface of one lap slides over the inner surface of the adjacent lap. Winding tension that is too high causes contact pressure between the film laps that is higher than necessary.

Prevent winter static with good maintenance. Reliable operation during the winter months will be your just reward.

PFFC



Static Prevention Checklist	
	Service the humidifier in your HVAC system.
Ionizer Care	Clean ionizers and verify that they are working properly.
	Replace static brushes, tinsel, and ionizing string.
	Measure the distance from each ionizer to the film surface to verify that each is located within specified limits.
Rollers & Transport Belts	Clean the surfaces of rollers, transport belts, and guides.
	Clean or restore the surfaces of “tacky” (cleaning) rollers.
	Measure and record the electrical resistivity of belts and polymer-covered rollers. Be sure that the resistivities have not increased beyond specified limits.
	Measure and record the spin-down time of low-wrap rollers.
	Change the roller bearings if the time is too short.
	Check roller alignment.
Process Adjustments	Set the curvature on bowed rollers within specified levels.
	Set nip roller and lay-on roller engagement pressures within specified levels.
	Check that film tensions are within specified levels.
	Verify that the winding stockroll tension profile is as specified.