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Tunnel Tip #2

Start with accuracy, finish with quality

EFFECT OF REDEPOSITED OILS ON TUNNEL FINISHERS

Quite often Colmac receives calls from customers who have just installed a new damp-to-dry tunnel finisher where they have a two-fold problem. One is a blue smoke or haze that seemingly comes from the tunnel finisher. The other is a build-up of a sticky, brown-colored substance on the tunnel finisher walls and exhaust systems. These problems are related and are not caused by the new tunnel finisher. Changing from dry-to-dry to damp-to-dry processing brings the problem to attention.

The blue smoke and the build-up of the sticky, brown-colored substance on the walls and exhaust fans of tunnel finishers are one and the same. The smoke is the brown substance turned to vapor by the heat in the tunnel finisher.

Once the substance attaches itself to the walls and other components, it can be very difficult and time consuming to remove. Lint sticks to it, which causes a reduction in efficiency, and it may cause a fire hazard as well. But let's start at the beginning.

The brown-colored substance is the result of vaporized oils (from the garments) being recirculated in the airflow and condensing on the metal. These oils come from a redeposition problem in the wash wheel caused by a breakdown of the wash formula. Oils, grease, dirt and other impurities not held in suspension by the detergent in the wash formula were subsequently redeposited on the garments.

The problem is more pronounced in plants that wash coveralls, but shirts and pants are not free from redeposition possibilities. In fact, any industrial or linen rental plant is susceptible to

redeposition and the subsequent build-up of this substance in the tunnel finisher. This is why it is important to continually check wash formulas to see if they are up-to-par.

The type of heat source or the manufacturer of the finisher has nothing to do with the problem; it is simply a matter of getting the fabric hot enough to vaporize the oils. Normally, any temperature over 200°F will cause the vaporization.

Also, the problem was there before the change to damp-to-dry finishing was made; the vapors were going up the dryer stack prior to tunnel finishing. It is necessary to look at the problem with an open mind because it is the only way a solution can be implemented.

When washing dirty, greasy and oily garments, it is the wash formula's job to hold all of the impurities in suspension. To accomplish this task, it must be a properly balanced formula. If there is not enough detergent (or if the detergent is not the proper type), the water is not hot enough, or the water level is too high (thus diluting the detergent), the wash formula may break down.

When this happens, the detergent releases the excess impurities it can no longer support. The released oils and dirt are now freely floating around in the water and may go anywhere. Hopefully, this means down the drain. Unfortunately, the trip to the drain usually means being filtered through the garments first.

Polyester fiber is an oleophilic material; it loves oil and attracts it like a magnet attracts iron

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filings. The free oil in the water is therefore drawn to the surface of the polyester fibers and becomes redeposition.

The thin layer of oil on the fiber's surface may not be immediately recognizable unless the fabric is white. The coating is so thin it is not usually noticeable on colored shirts, coveralls and pants. It does dull the colors which usually goes unnoticed. The problem becomes visible when the garments reach the tunnel finisher.

Tunnel finishers normally operate in the temperature range of 280°F to 300°F which is more than enough to vaporize the oils. When this happens, the vapors become part of the recirculating air in the tunnel finisher. As the air continues to pick up more vapor, it becomes visible--usually as a blue smoke.

The vapor coming in contact with the metal walls gradually builds up into the brown-colored, sticky substance. The vapor exiting the tunnel goes out into the plant and/or up the exit exhaust stack where it sticks to the fan blades and the inside of the stack.

This substance will also build up on the blades of the main blower system causing a reduction of the airflow over the garments. This, in turn, reduces the quality of the finished garments and the drying capability of the tunnel finisher.

If there is the brown discoloration or a substance build-up on the fan blades on the exhaust fan or on the interior walls, the problem needs to be corrected. 