

Difficult soling materials need different and sometimes toxic solvent-based primers. A machine is now available which avoids this by using UV light and ozone.

A new green technology for soling materials

The primers used on almost all non-leather soling materials have many limitations. For example, an outsole primer based on TCCA gives the best results in a solution of solvents such as Mek or Ethyl Acetate. Drawbacks are a limited pot life, white soles that can yellow and bonding that is sometimes not stable or uniform. With water-based adhesives—especially when based on polyester—test results are poor after hydrolysis. Hydrolysis agents do not solve the problem and only cover it for a limited period. Changing test conditions does not work either, which is why some companies no longer test.

A solvent-based and UV-curing primer must still be used for optimum results on EVA or pylon. Critical points here are handling and production control. Yellowing, distortion or shrinking of the sole can also occur. In some instances a solvent-based primer will be required for optimum bonding. Nylon materials, unfortunately, need toxic solvent-based primers. All these materials use different primers without optimum or stable results. This new system appears to solve these problems.

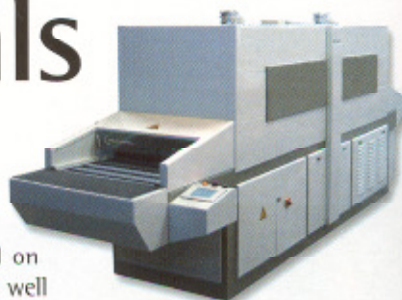
Marketed as Tack Treat 3000 by Tack-Service, based in Xanten, Germany, the process begins by adjusting a control manual which uses specialised software to collate all the conditions reflected in the material to be treated. Continuous treatment can begin after 10 minutes with the soles loaded on to the conveyor belt and removed at the end by hand. Around 400–500 pairs can be treated per hour and the treatment lasts up to six months on uncovered soles. It is said to be unlimited if the treated soles are suitably protected.

After the treatment adhesive coating, painting or bonding within six months with PU adhesive + 5% UNI-DUR hardener can be carried out. The adhesive can be solvent- or water-based, initial bonding is said to be above requirement and final bonding results are a material failure. So far excellent results have been obtained with SBS, SBS light, SBR, TR outsoles, EPDM, nylon, latex, EVA and Pylon. Materials like polyethylene or Polypropylene cannot be treated effectively.

The current machine is able to process material up to 110cm wide and a further version of 300cm capacity is being planned. Maximum height for three-dimensional products is 10cm, though again, a special version is also under consideration. The machine uses fully sealed-in UV-light (electro magnetic waves) and Ozone—none is detectable outside the machine—to fully treat the materials under process.

This new technology also raises the possibility for new materials based on EPDM to be bonded, as well as claiming many other advantages:

- no solvents or chemicals
- material and sole retain original properties without marks or yellowing
- no pollution or special ventilation
- no toxic waste
- ozone layer is not effected
- solvent use is extremely reduced
- bonding is uniform, stable and always over requirement
- no chloride products like TCCA are used
- completely automatic and can be ISO certified
- bonding remains stable over the time the material is in use
- costs are low



Results obtained using this method

Material	Adhesive / Force (KN/m)	
SBS	SB / 8.7	WB / 9.1
SBA light	SB / 7.2	WB / 9.9
SBR	SB / 6.9	WB / 9.3
Latex	SB / 12.0	WB / 14.5
PVC	SB / 13.0	WB / 10.0
NBR	SB / 11.0	WB / 7.5
EPDM	SB / 12.0	WB / 11.0
Nylon	SB / 10.0	WB / 7.9
EVA/Pylon	SB / 4.4	WB / 4.1

SB = Solvent base adhesive + 5% Uni-Dur E 2002 ARFE
or + 5% Uni-Dur E 1001 RN

WB = Water base adhesive
Uni-Bond WB 7100/EM 8
+ 5% Uni-Dur WB 7075

The patented technology used in this process has been developed by the Spanish company Celme. Tack-Service has distribution rights for Germany, Austria and Switzerland and has recently opened a service centre where difficult materials can be treated as a service to the shoe and plastics industries. To protect the technology in Asia service centres managed by Tack-Service are scheduled to follow. 