

# SCREENS

Proper screening has a major effect on production, especially for pot plants that like shade. Two or more screens usually keep out excessive solar radiation. But even two screens enable three filter levels at maximum AND there is considerable delay in the effect. There is a solution to both problems: dynamic screens.

Ten years ago, textile expert Leo Jaspers designed a screen for a pot plant grower in Munich. "Greenhouse cultivation was entirely new to me at that time, but I was able to construct a screen with flexible thread so the material could be pulled apart. Thus you could pull open the entire screen, but you could also stretch the screen itself and thereby adjust the amount of solar radiation very quickly and seamlessly."

The nurseryman was enthusiastic, but both parties knew that the screen would have a very short lifespan. The flexible thread had broken down due to UV radiation after three months, and thus the project was stopped for several years while Leo focused on his daily work: textile applications in other industries.

Until he picked up the thread again, literally and figuratively, five years ago. "First I started studying greenhouse cultivation in more depth. What all happens there? What are the numbers associated with that? I visited nurserymen with the material I once used in that greenhouse

in Munich to gauge their reactions. And after some time I ended up at the WUR. Silke Hemming was enthusiastic about my idea, but she knew as well as I did that the first priority would be developing a UV-resistant thread."

Being a former DuPont employee, Leo is very familiar with the roads in the land of synthetic textiles, but it was still not easy to find a material that was flexible and strong as well as UV-resistant.

Leo: "The material I discovered is an elastic thread based

on silicones that at the time was only used for cosmetic medical applications. The material has a high degree of elasticity at a constant force. Tests proved that the thread would keep its required strength and elasticity for a minimum of five years under UV radiation. I started developing a screen with that thread and had it made by Penn-TS in Germany, an experienced textile manufacturer."

## SEAMLESS AND FAST

The first Penn-TS screen (four screens have been developed by now, which are commercially available from the second quarter of 2012) consists of aluminium coated tape with fluffy fibres in between that are knitted into the UV-resistant bicomponent polyester thread. The aluminium coating has strong anti-reflective properties and thus manages to keep out a high extent of solar radiation. The fluffy threads close off the screen even tighter. Leo: "When it is closed, you >>



In normal condition.

screen off 65% of the light, which is a very good performance. This is nice, but much more interesting yet is the flexibility of the thread, as this screen can be stretched 250 percent. This means you are only screening off 8% of the light when the material is fully stretched. Besides, you can vary infinitely between those 8 and 65 percentages, because the thread stretches continuously. Moreover, you only need a mere one and a half minute to change from completely closed to completely stretched, which is quick as lightning compared to conventional screens." And this has made the 'dynamic adjustment' concept a fact.

Leo: "Nurserymen can draw their own conclusions as to what the consequences are of this. You can control your screen quickly and accurately; you no longer have complete packages moving back and forth at the top of the greenhouse all the time; but there are also climatological advantages. Opening the greenhouse a crack is done at one spot, resulting in cold draft and sub-optimal air flow. Using our screen, you subtly pull all the strips a little bit apart. Thus your climate remains more homogeneous. I regularly hear that pot plant growers wait a long time before they close, open and change screens because of this agitation and these big differences. You have to wonder whether this is beneficial for your crop."

## THREADS ABOVE AND BELOW

Meanwhile, four types of cloth have been developed that differ from one another, especially as far as price and performance are concerned. The cheaper variants have less play in light exclusion and are made of simpler materials. In the meanwhile Leo is again completely engaged in developing new material, as he wants to end up with one type of screen.

"We also had our first shade screen tested for insulation capacity for good practice, and to my utter amazement our screen turned out to insulate better than an insulation screen from a major screen manufacturer. Then I thought: if this is already the case now, my screen can only get better. Soon I want to put one type of screen on the market that provides you with a wide range of excluding solar radiation, but at the same time allows you to retain the heat in the greenhouse. Nurserymen often

opt for the cheapest screen that fits well in their cultivation, but in practice they often change crops anyway. So if you buy a good screen once, you are still assured of the optimum properties of your screen when you change crops."

Leo describes a few ideas that will be tested in the near future. "Look, if you make those strips hollow, you increase your insulating capacity even more. Let us suppose that you can combine a shade screen with an energy screen. In that case you can do with at least two screens fewer. Just imagine how much money that saves you."

Since we are talking about prices anyway: they are competitive with the prices of the major screen manufacturers, according to Leo. But isn't the installation much more complicated? "It is not so bad," says Leo. "You can adapt a standard push-pull installation to my type of screen, but we are also looking at options to improve the way this works. For example, instead of rolling up the screen and thereby stretching it, you could also stretch threads above and below the screen that you pull up and let down. This stretches the screen more evenly and allows you to operate it even faster."

## FIRE CLASSIFICATION

The various Penn-TS screens comply with the B1 fire classification and thus form little soot or drops if they burn. "But I want to go for a higher fire classification," says Leo enthusiastically.

The Penn-TS cloth has not gone unnoticed. The parties meeting with Leo to see what they can do for one another include Priva and Leen Huisman.

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In stretched condition.

