



Making the wheels of sustainability turn

Sarah Skinner, Managing Director and Co-founder of TCT-Europe Ltd, talks to PES once again, as we find out how the market for sustainable materials is developing in the solar sector and how recycled tyre rubber is being utilised.

PES: It's a pleasure to catch up with you and I'm looking forward to hearing more about TCT and your plans. How have things been developing since we last spoke?

Sarah Skinner: Thanks. It's been great to finally feel we are coming out of COVID-19. TCT as a Group, both in the US and Europe, has been able to get out and see customers.

Solar PV remains a key sector for us and growth here is being supported by the massive hike in energy prices. We are therefore extending our focus on recycled rubber components from flat roofs to include engineered rubber fittings for tiled, metal and in-roof systems.

PES: What are the key drivers for working with sustainable materials in the renewable energy sector?

SS: It is driven by two key factors. The first is the CO₂ saving of recycled rubber versus virgin synthetic rubber. There is significantly less energy used to make recycled rubber versus natural or synthetic rubbers.

The second is sustainability around new plastics and microplastics. New synthetic rubbers, like EPDM, SBR, etc. are just another form of plastic, whilst reusing and locking existing waste plastics up into long life product, is a key next step to greater sustainability.

PES: How focused is the industry, do you think, on seeking out recycled products? Are there obstacles in the way of more companies doing so?

SS: The customers for renewable energies are relatively early adopters and are



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therefore looking for system purity, as best it can be achieved. It is still slow but cost pressures and a growing awareness of the global impacts of waste, are both helping to drive industry to push for recycled products.

This is being picked up by the investment community, with funds like Scottish Enterprise and Innovate UK focusing on grant funding for sustainable materials. We need more investment and partnership opportunities from the large industry players to accelerate this.

PES: What are the key strengths and challenges of sustainable materials in general and recycled rubber in particular? How is TCT addressing these challenges?

SS: The key strength of recycled rubber derived from end-of-life (EOL) tyres is that it has a very high level of UV resistance, almost all of the properties of the original rubber are retained and it is immensely durable. It is also low cost and like all rubbers waterproof and flexible.

There is still a perception though, by some companies, that recycled material is lower grade. The key is to use materials that are 'fit

for purpose' and to understand their strengths and limitations. Hard virgin plastics are brittle outside and softer EPDM products have lower UV than our recycled tyre rubber and therefore degrade faster. Virgin synthetic injection moulded rubbers work best for very small parts like O-rings or for parts where very specific chemical properties are required.

One key area specific to solar and recycled rubber, is this ongoing perception that there is a possible migration of plasticisers between our rubber and PVC roof membranes. Interestingly this is not a concern for the same PVC membranes and recycled rubber material under HVAC equipment.

Over the past three years, TCT has seen some movement away from recycled rubber, to less durable EPDM and plastic alternatives, due to this perceived issue with plasticizer migration.

TCT is close to a breakthrough with regards to a low cost, moldable material that can be used on the base of our units on flat PVC roofs. This breakthrough with a European partner will allow our units to be used on all types of flat roofs.

PES: Can you give some examples of your solutions in practice?

SS: We build inverter feet and cable tray solutions for a range of companies including SMA, ESDEC and Sunpower and a range of roof blocks with embedded metal components and moulded mat products that work across the HVAC and solar sectors.

In parallel, we have built a larger modular recycled rubber barrier system for use in the military and are building sustainable packaging and building block materials.

PES: You've been operational in the US since 2004, launching in Europe relatively recently in 2018. How do the two markets differ and what are their similarities?

SS: I would say that Europe actually leads in the drive for and innovation around a lot of sustainable materials. Funding is also improving in Europe, although the size of investments in the US is generally still larger.

The US is more fragmented and trickier to sell into. Having a prototyping and manufacturing facility on the east coast of the US and in Europe is a bonus for our larger customers. Overall though TCT-Europe was set up to capitalize on 18 years of TCT Inc's US engineering experience in compression moulded recycled rubber.

That has allowed us to gain advantage for new

product ideas and collaborations in a largely traditional, compression moulded sector.

PES: Where is TCT Europe getting traction for its products?

SS: Our initial focus was on flat roof products, but extensive development here, coupled with learning on colouring, densities and embedding materials into our rubber components learnt from the traffic safety and military markets, has allowed us to expand into products for tiled, in-roof and metal roofs.

Our strength is in being able to engineer a very wide range of barrier products for use across the solar, wind, HVAC and logistics markets with new opportunities coming from customers looking to replace, or redesign, a range of more expensive plastic, metal and virgin synthetic rubber products.

PES: What assurance can you give that recycled needn't mean poorer quality?

SS: Recycled rubber is now a tried and tested material in the building, flooring, sports field and traffic safety markets and this is key to it being more widely accepted as a low cost, durable, flexible material in the energy market.

TCT-Europe is ISO9001 certified and all new products are tested extensively at the prototype stage by both TCT and its customers. New products also always have to fulfill their function better than any product they replace.

PES: What are the next engineering opportunities for recycled tyre rubber products?

SS: Fortune Business Insights states that the global market for rubber products in 2019 was around \$44 billion. They estimate that it will reach about \$52 billion by 2027. Of this, half is vehicle tyres and a further 15% is other automotive products.

General industrial products were \$5.2 billion estimated to increase to \$6.8 billion by 2027. So the industrial segment is outgrowing other segments.

PES: And for TCT? How are you tapping into these opportunities and what are your plans for the future?

SS: In Europe we have been very largely focused on the solar segment and, more recently, the military. As mentioned earlier we will continue to expand solar product offerings for tiled and metal roofs and use our extra moulded barrier material to make sure we can support customers with recycled rubber products for all types of flat roofs including PVC.

We are particularly interested in being a replacement material for existing virgin plastic components and leveraging our inhouse prototyping and ability to manufacture in Europe and the US, to bring more sustainable products to market.

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