

Transport Track & Protect



As wind turbines get bigger and bigger, transporting them and their components from factories to their final destinations becomes an equally bigger challenge. And it is not just the actual transportation that is an issue. With more and more parts on the road all over the world, the logistics becomes increasingly complex – and as such, can cost you a lot.

So, let's optimize your transportation and reduce your costs. You have come to the right place.



Holistic approach to wind turbine transportation

At Polytech, we decided to take a holistic approach to transportation. We work closely with wind turbine and blade manufacturers to design and produce solutions that perfectly match the geometry of each individual structure. With over 25 years of experience in materials, we can provide wind turbine generator (WTG) component interfaces in exactly the right material for every single part – meeting your requirements on friction, compression, shear loads, UV resistance, and thermal properties.

We test all our solutions extensively according to international standards at our accredited testing laboratory. And to prove their durability and reliability in action, we have also extensively tested our solutions in the field.

Safe transport is essential - but we also need to look at the overall picture. That is why we consider the whole supply chain and provide you a solution, where you have complete control and overview of all your transport equipment globally.

Your strategic partner in wind turbine transportation

As a full-scope supplier, we have all the expertise and processes in-house. We are here for you from idea generation to full delivery. And together with your team, we form a strategic

partnership to provide you a safe, reliable, cost-efficient, and sustainable solution for your wind turbine transportation project.

All the transport solutions you need – under one roof

We have four main transport equipment and solutions for you in the wind sector:

- WTG component interfaces in polyurethane (PUR)
- Universal storage frames with replaceable interfaces
- Global repair and refurbishment services of your transport equipment
- Polytech Insight™ - Logistics Monitoring System

The WTG component interfaces, and storage frames give you complete protection and preservation of your turbine components during transport and storage. Our global repair and refurbishment services ensure that your transport frames are always in a perfect

working condition when they are returning to your site. And our Polytech Insight™ - Logistics Monitoring System gives you all the information you need to manage your transport equipment assets, wherever they are.





Protection, Storage, and Refurbishment

Protection starts with the material

We have 25 years of in-house material expertise in working with PUR and other relevant materials used in the wind industry. Using the right material can significantly cut your costs. It will not only protect your turbine components much better before, during, and after transportation, but it will also last much longer than cheaper, low-quality materials that are not fit for the purpose. So, your overall costs in the long term will be much lower - and so will your CO₂ footprint.



Rapid prototyping. Fast delivery. Perfectly matched geometry.

As a full-scope supplier, we have all the specialists and processes in-house. This also means we move from idea generation to prototyping in two weeks. And from there, full delivery is just a stone's throw away.

By understanding your challenges, we work - often closely with your own experts - to pro-

vide you custom-made solutions that meet your requirements. Once we establish the perfect material and design for your needs, we use a variety of molding technologies to develop the interfaces and frames that will perfectly match your components' structures.

Tested and validated to ensure complete protection

All our transport equipment and solutions are tested extensively at our accredited testing laboratory to ensure optimal friction, com-

pression, shear loads, and bonding. And of course, we carry out all these tests according to the latest ISO and ASTM standards.

WTG component interfaces and storage frames for full protection and traceability

Our PUR interfaces are UV-resistant, have a high thermal resistance, and can be made with built-in fire retardancy to give your components extra protection. They have built-in RFID (radio-frequency identification) chips that allow unique ID numbers for each pad with 100% traceability.

Our storage frames have a universal size, and you can use them for storing towers, blades, and nacelle parts. They come with exchangeable PUR interfaces and are easy to store and transport.





Repair and refurbishment service – so your equipment is always ready

Inspection of your transport equipment is essential to ensure that they keep protecting your turbine components during transport and storage. You need a transparent inspection, where you can follow the whole process and see the inspection results directly. Combine that with an integrated repair and refurbishment service, and you have complete overview and control of all your assets and budget.

This is what you get with our repair and refurbishment service.

We offer a digitalized inspection framework, where our team records the observations and pictures of your transport equipment in an on-line inspection form. These inspection forms are linked to the individual equipment units with a unique ID.

Circularity and recyclability

All our PUR interfaces are 100% recyclable at Polytech. We have invested heavily in ensuring minimum harm to the environment and full circularity across our polyurethane products through mechanical grinding and chemical recycling (solvolytic) of PUR. Therefore, all our WTG interfaces are 100% recyclable upon being returned to a Polytech facility. And if you add the global repair and refurbishment services to your package, we will automatically recycle the PUR interfaces when we replace them during service.

All interfaces can be made with a mix of virgin, recycled and reused material to ensure a lower CO₂ emission – while still meeting your material requirements and specifications.

Your added value at a glance

- Safe, reliable, long-lasting, and cost-effective solutions
- Designed to match the geometry of the individual structure perfectly

The digital framework allows you to directly see the inspection results and follow the whole process. And if your equipment needs repair or refurbishment, we take care of everything, including replacement parts and paintwork.

There will be no unforeseen delays or expenses during transport. You can trust that the equipment you receive at your factory is in a ready-to-use state – and ready to protect your components.



Samples of
1 virgin polyurethane
2 chemically-recycled polyurethane
3 mechanically-grinded polyurethane

- 100% recyclability ensuring circularity and a lower CO₂ emission
- Global repair and refurbishment services to ensure operational equipment
- Short time-to-market

Polytech Insight™ – Logistics Monitoring System

A milestone in wind turbine transportation

We developed Polytech Insight™ – Logistics Monitoring System specifically for the wind industry – and as such, it is the first of its kind. We focused on solving all your major logistical challenges in the wind sector, such as your overspend on transport equipment, low utilization of equipment or lack of global asset overview.

But now you can leave these challenges behind. The Polytech Insight™ – Logistics Monitoring System gives you crucial (and real-time) data on your equipment transport, and a platform for detailed asset management.

Utilization - See if your equipment is in use

When you move your turbine components around the world, it is difficult to know where

things are. And more importantly, to know whether the components are still in transport or have been unloaded at the destination site.

That is why, one of the key elements of our Logistics Monitoring System is its utilization feature (patent-pending). The utilization feature allows you to see where your transport equipment is, and if they are in use (i.e., if it is

still carrying your turbine equipment or not). With this information, you get a faster return loop from the site, increase the utilization of equipment, so you spend less on purchasing new ones.

Humidity – Track humidity levels during transport or storage

The system can also monitor humidity levels in your turbine components and will send you an alarm if the thresholds are exceeded. This way you can ensure that the moisture levels

never exceed the specifications of the critical components, such as switchgears or electrical cabinets, during transport, storage, or operation.

Install in 2 minutes and monitor forever

Installation and roll out of a new system have never been simpler or easier. All you need is the Logistics Monitoring Hub (this is the hub that records all the data), glue, a measuring tape, and a mobile phone.

The Logistics Monitoring Hub has a built-in magnet that makes it very easy to install it on steel structures and other components. Once you have found a suitable location for the device, you apply the glue and install it on the transport equipment.



Circularity

Making your wind turbine transportation convenient, traceable, and sustainable.

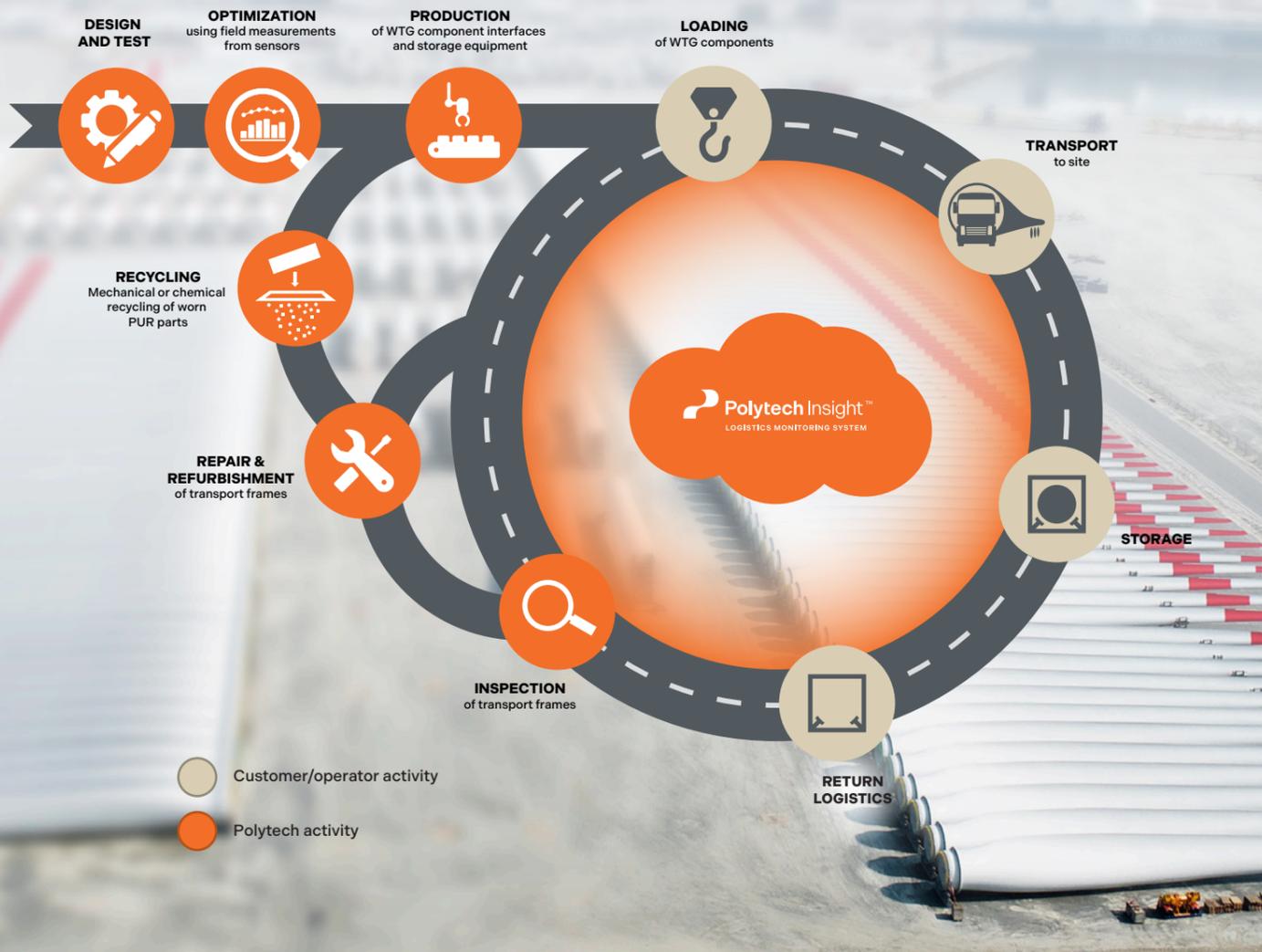
When your custom-made, tested, and validated WTG component interfaces and storage frames leave our production, they embark on a circular journey. They start with protecting your turbine components during loading, transport, installation, and storage. Once they have done their job, they return for inspection – a crucial step to ensure that they are ready to be used again, fully protecting your transported assets.

Our team inspects your transport equipment, repairs and refurbishes them if needed, and sends them back to you for their next big job. And if during the service we find worn-out PUR parts, we will recycle these and integrate them into new products with the

same material quality. As such, they will carry on their circular journey and reduce your overall CO₂ footprint.

Get the overview and transparency of this journey with our Polytech Insight™ Logistics Monitoring System. Monitor your transport equipment's location and availability. Monitor the humidity in your transported components. And monitor the inspection and service of your turbine equipment.

Let's optimize your wind turbine transportation with circularity in mind.



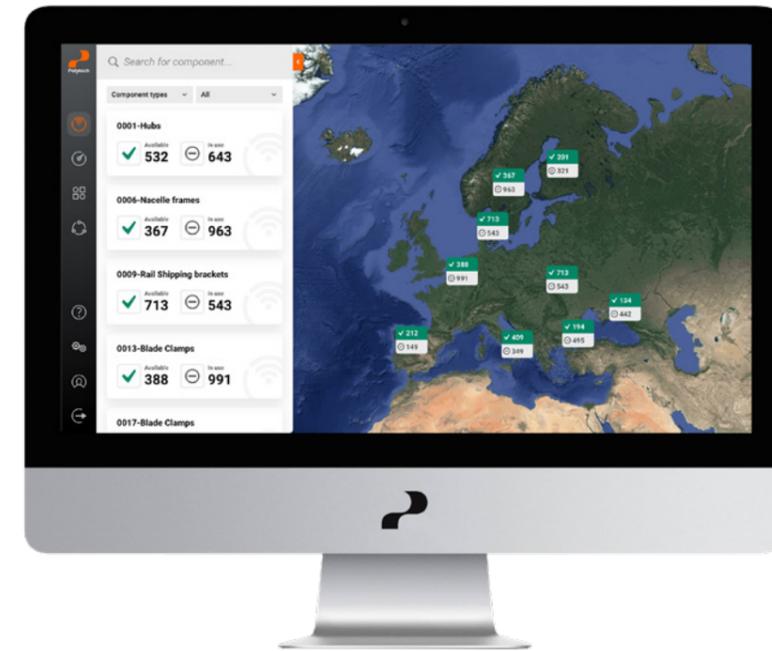
By scanning the QR code on the device, you will be guided through our online system that will help you create the transport unit and the related turbine component that it carries. All this will take around two minutes.

We also offer guidance and on-site training to help you find the most suitable location to install the Logistics Monitoring Hub. And once installed, you can monitor your logistics data right away.

Polytech Insight™ - access all the data you need. Anytime. Anywhere.

The Logistics Monitoring System gathers all the crucial data you need: location, date and time, utilization status. It even records special events, such as shocks (g-force) or low battery levels and measures the humidity in critical parts of your transported turbine components.

You can easily access all this data through the Polytech Insight™ platform, where you can control the location of all your equipment and its logistics history. The platform also generates automated notifications and alarms, so you will always know what is going on with your assets and can save time on monitoring.



Asset management at its best

By using our Polytech Insight™ platform, the data quickly becomes key information. You can minimize the quantity of transport equipment needed to be manufactured, moved, and serviced. You can better control your repairs and project allocation using the utilization feature. The traceability improves the prediction of transport dates, through which you can optimize your temporary import fees. And the incident notifications allow you to take

early measures. Also, if you use our global repair and refurbishment services, you can see whether the transport equipment has already been inspected and is ready for use.

And the result of all this? Significant reductions in your logistical and operational costs.

Sustainability across the whole value chain

When you have the overview of all your assets and equipment usage, you no longer need to waste your resources on (re)ordering unnecessary transport equipment. And as such, you will instantly reduce your CO₂ footprint by producing less waste and using less steel.

With better utilization of equipment, you also optimize your logistics and can plan better. No more wasted kilometers on the road.

And the fact that you can replace the batteries in the monitoring hub (a feature that is patent pending) ensures that you can reuse the solution again and again. Now this is what we call Wind for life™.

Your added value at a glance

- Up to 20% better utilization of your transport equipment, resulting in 20% reduction in your capital expenditures
- Considerable savings on your overall logistics costs from optimized asset management, customs fees, and planning
- Significant reduction of your CO₂ footprint

Contact

Are you interested to learn more about our transport track and protect, or need more customized transport solutions for your project? Then contact our Sales team at polytech.com/contact

