



Solent Composite Systems



SmartMould

Wind Energy Hamburg

May 2006

Wind Industry Trends

- Reduced turbine unit costs - €/megawatt
 - Greater output - blade/mould/day
 - Increasing length >40metre
 - Quality and accuracy
 - Noise reduction
 - Faster time to market
 - Environmental & Safety compliance
- ➔ **Demand for blade cost reduction**



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SCS Response

- Rotor **B**lade **M**anufacturing **S**ystem
- Fully Integrated Design - SmartMould™
- Single Point Lifting & Turning Hinge
- Accurate Closing Feature
- Bespoke Lightweight Frame
- Advanced Process Control

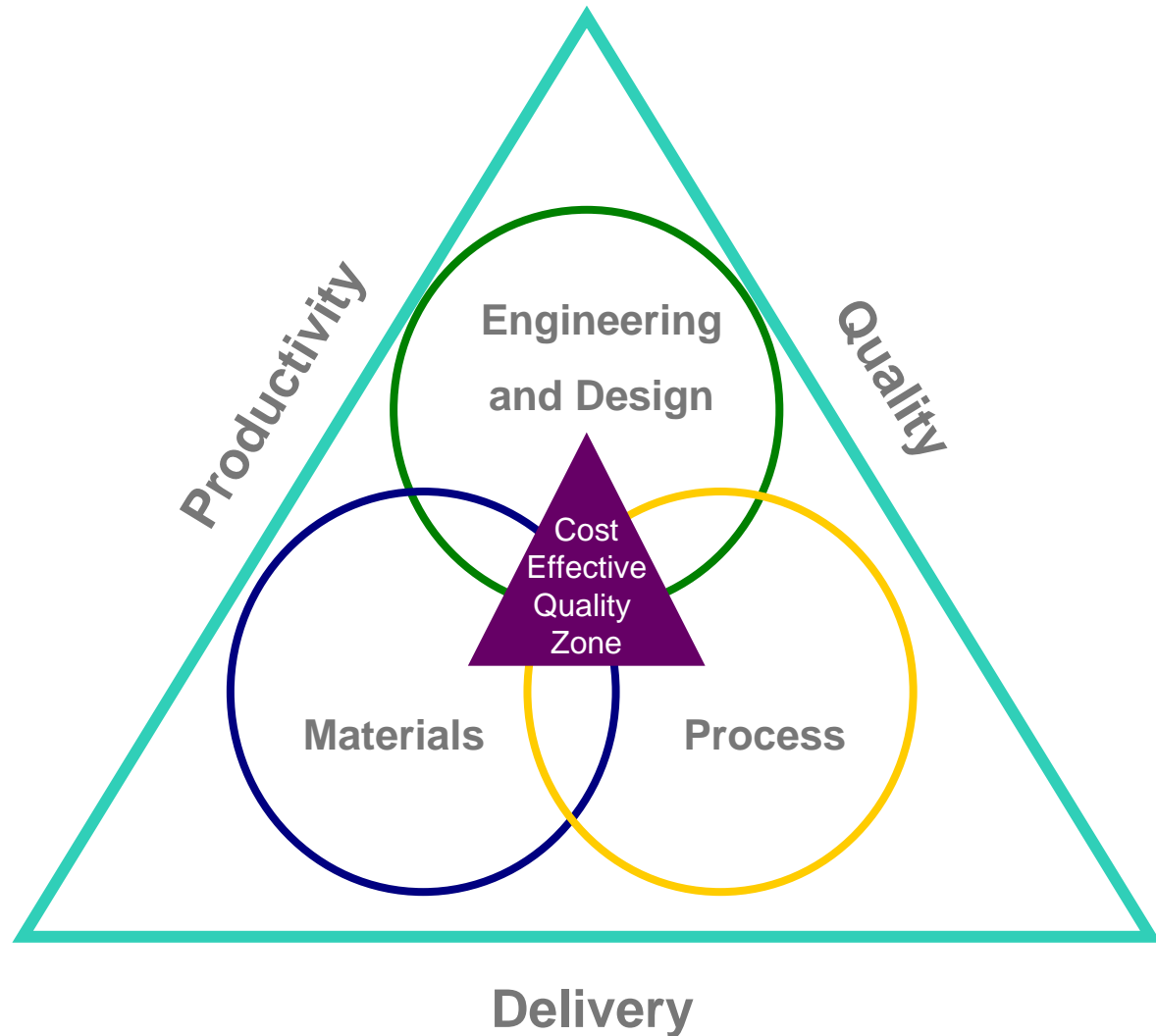
➔ **Cost Effective Solution**

RBMS

Dedicated Design, Development & Delivery



RBMS™ Mould Concept



Smart Approach

Robust Accurate Mould Technology

Composite Materials Knowledge

Process Application and Control

Engineering and Design

Integrate Supply Chain to Deliver:

- Cost effective quality
- Reduced risk
- Accelerated timing

.....**For Intelligent Blades**



SmartMould™ Delivers

Cost reduction by.....

- € Engineering and Design Innovation
- € Precision and Accuracy
- € Reduced Rework and Finishing
- € Rigorous Project Management
- € Quality and Safety
- € Minimum Downtime
- € Maximum Productivity
- € Reduced Investment



Solent Composite Systems



SmartMould™ Features

SmartLift
SmartJoint
SmartHinge
SmartPlug
SmartShell
SmartHeat
SmartFrame
SmartVac
SmartCare



→ Cost reduction designed in



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SmartLift™

SmartLift™ - Single point lift & turn at root and tip providing rapid and reliable manoeuvrability with balanced centre of gravity-precision closure coupled with low maintenance.

SmartJoint
SmartHinge
SmartPlug
SmartShell
SmartHeat
SmartFrame
SmartVac
SmartCare



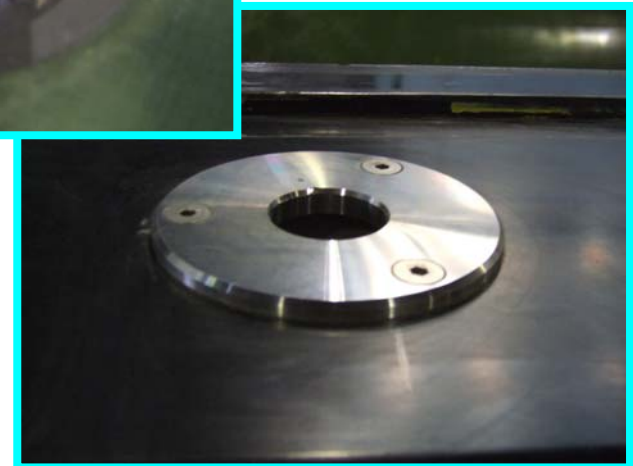
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SmartJoint™

SmartJoint™ - Precision seamless mould joining and self-alignment mechanism, permitting faster mould setup, edge control and lower finishing costs.

- SmartHinge**
- SmartPlug**
- SmartShell**
- SmartHeat**
- SmartFrame**
- SmartVac**
- SmartCare**
- SmartLift**



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SmartHinge™

SmartHinge™ - High safety, low maintenance, self aligning root and tip rotation mechanism that allows fast mould closure, providing positive web contact and minimal glue gaps of 5mm.

SmartPlug
SmartShell
SmartHeat
SmartFrame
SmartVac
SmartCare
SmartLift
SmartJoint



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SmartPlug™

SmartPlug™ - Robust, accurate and smooth modular plug, CNC cut from CAD blade model that is easily assembled into a vacuum-tight structure for mould infusion.

SmartShell
SmartHeat
SmartFrame
SmartVac
SmartCare
SmartLift
SmartJoint
SmartHinge



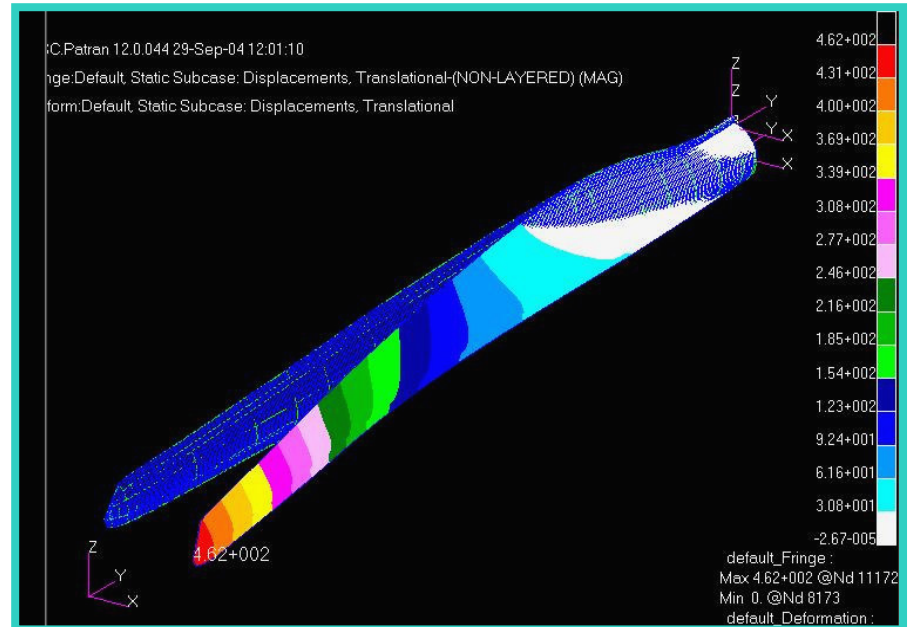
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SmartShell™

SmartShell™ - FEA modelled laminate structure with close tolerance uniform surface finish for maximum vacuum integrity, profile accuracy and optimum curing regime.

- SmartHeat
- SmartFrame
- SmartVac
- SmartCare
- SmartLift
- SmartJoint
- SmartHinge
- SmartPlug



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SmartHeat™

SmartHeat™ - Bespoke design FEA heat cycle simulation with PC controlled zoned electrical heating system providing variable curing management with built-in safety features.

SmartFrame
SmartVac
SmartCare
SmartLift
SmartJoint
SmartHinge
SmartPlug
SmartShell



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SmartFrame™

SmartFrame™ - FEA engineered range of durable high stiffness structural steel framework designs giving choice of minimum height or minimum weight.

SmartVac
SmartCare
SmartLift
SmartJoint
SmartHinge
SmartPlug
SmartShell
SmartHeat



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SmartVac™

SmartVac™ - Fast, clean, low emission, closed mould system permitting dry set up of laminate and controlled vacuum consolidation yielding consistent blade weight and form.

SmartFrame
SmartCare
SmartLift
SmartJoint
SmartHinge
SmartPlug
SmartShell
SmartHeat



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SmartCare™

SmartCare™ - Ongoing preventative maintenance service package offered with every SmartMould and RBMS system incorporating regular inspection, monitoring and operator training.

SmartLift
SmartJoint
SmartHinge
SmartPlug
SmartShell
SmartHeat
SmartFrame
SmartVac

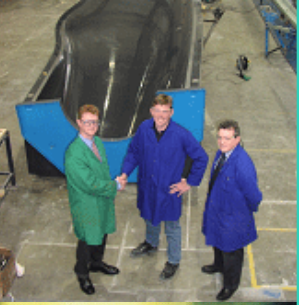


Solent Composite Systems



Cost Effective Production

- Integrated approach
 - Innovative design
 - Advanced process control
 - Built-In Quality and Safety
 - Reduced re-work and finishing
 - Low maintenance
 - Reduced capital investment
- ➔ **Savings up to 30%**



SCS - Europe's Preferred Mould Partner

- Complex Moulds and Performance Components
- Innovative Engineered Composite Solutions
- Durable Design Integrity
- Superior Technology
- Completion On Time and On Budget
- Leading Quality and HSE Standards

'We develop and deliver leading edge composite solutions for highly demanding applications'



SCS Delivers

- Engineering and Design Expertise
 - Advanced Composites Technology
 - World Class Quality
 - Health, Safety and Environment
 - Rigorous Project Management
 - Built on Time
 - Built to Budget
- ➔ **SmartMoulds for Intelligent Blades**



Solent Composite Systems

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