

# Renewables

Courtesy of MHI Vestas Offshore Wind



## Wind Energy Fasteners

Helping to Power the Future



**cb** Quality is our Hallmark<sup>®</sup>

# Manufacturing and supplying wind energy fasteners for on-shore & off-shore wind farms



We are a well-established global company with an enviable pedigree as a manufacturer of industrial fasteners.

We are a major player in the global fastener market with a portfolio of 'blue-chip' customers and a reputation for quality, service and product innovation. With established operations in UK, China and USA, we have a global vision and a commitment to mutual support and growth with customers in all our key market sectors.

## ***The Wind Turbine Market***

We have serviced the wind turbine market for more than 25 years, long before it became an integral part of the global energy supply.

The manufacture and provision of high quality, safety critical fasteners with the ability to operate in some of the most hostile environments in the world has gained us an unrivalled reputation in the wind turbine marketplace.

A good understanding of this specialist market, in-house technical expertise and the manufacture of first-class products makes us an excellent choice for the supply of fasteners to this demanding market.

All of this is backed by tangible quality and an extensive and industry accredited product range.

## ***Product Ranges***

We currently service all aspects of the wind turbine market, providing a range of fasteners, both standard and customer bespoke for:

- Foundation
- Tower Construction
- Blade to Hub
- Nacelles
- Off-shore Transition Pieces

Our extensive range allows wind turbine manufacturers to 'single source' all their fastener requirements with all the advantages that this brings.

## **Our Market Advantages**

- Established brand for safety critical applications
- Long-standing expertise within the wind turbine market
- Wind industry specific technical knowledge
- Extensive product range
- Superior testing facilities
- TUV Nord certification
- ISO 9001, ISO 14001 & OHSAS 18001 certifications
- Proactive product development
- Cost competitive
- Business and production facilities ideally suited to the wind turbine marketplace

Tower Bolting



Foundation Fixings



Blade to Hub Studs



Nacelle Bolts & Studs



Off-Shore Transition Piece Bolting & Studding



# Foundation Fixings

We manufacture a range of anchor fasteners designed specifically for wind turbine towers.

The studs are manufactured from high tensile steel ranging in diameter from M24 to M64 in property classes up to 10.9.

We offer various corrosion protection systems, including metal spraying of the exposed shank.

Studs can be fitted with heat shrink or rigid plastic debonding sleeves, allowing uniform stressing of the anchor bolts after they have been cast into the concrete foundation of the tower. The studs are colour coded for batch traceability.

Information on tensioning equipment and loading can be supplied with the order.

Various fabricated 'one piece' cradles can also be supplied to customer specifications.

## EUROPEAN MANUFACTURING

Diameter: M24 to M64  
Length: up to 5m long  
Strength: Property class 8.8 and 10.9.

## NORTH AMERICAN MANUFACTURING

### ASTM Series

Diameter: 0.75" to 3.50"  
Length: up to 50' long  
Grade: ASTM-A615 Grade 75, 90, 100  
& ASTM-A722 Grade 150

## ASIAN MANUFACTURING

Diameter: M24 to M64  
Length: up to 7m long  
Strength: Property class 8.8 and 10.9.

Plastic sleeves



Colour-coded studs



Heat shrink sleeves



Anchor cage assembly



Installed anchor cage



# Tower Construction



For standard 'flange-jointed' tower design, we possess full TUV Nord approval for the manufacture and supply of EN 14399-4 products in hot-dip galvanized finish in accordance with ISO 10684.

Sizes range from M16 to M80.

We can also offer various special fastener assemblies to suit customer's requirements for other forms of tower designs such as lattices.

We offer friction control of the nuts through our in-house lubrication.

In addition, we manufacture and supply ASTM A490M bolts, ASTM A563M 10S nuts and ASTM F436M washer assemblies, which can be supplied with zinc flake coatings in accordance with ISO 10683.

Bolt, nut and washer assembled for ease of installation



Stacked tower bolting assemblies



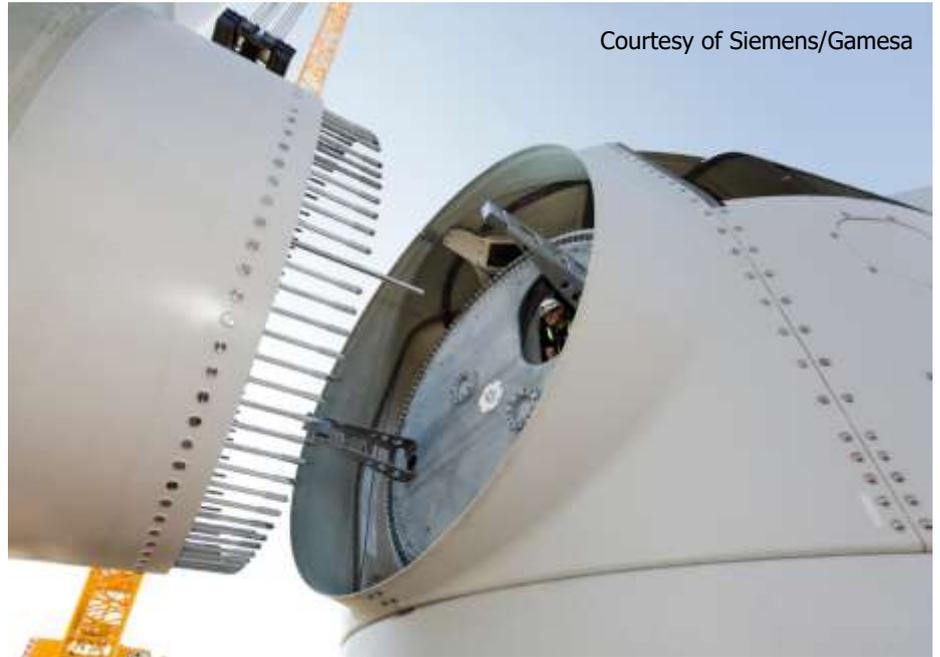
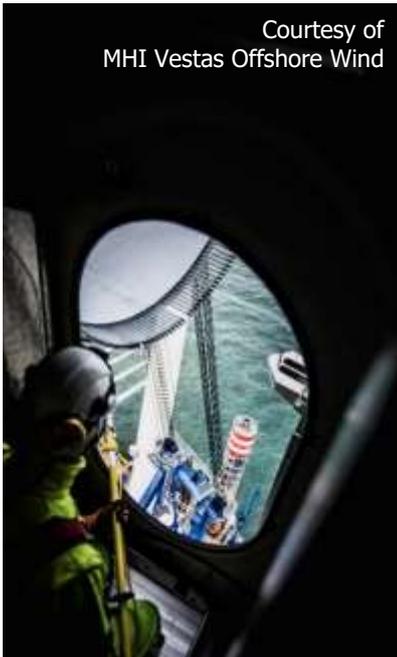
Selection of tower bolting assemblies



Galvanized bolting to ISO 10684



# Blade to Hub Studs



We manufacture a range of studs suitable for 'blade-to-hub' connections, including scant shank (thread roll effective diameter) and waisted studs.

Diameters range from M20 to M48 and in property classes 8.8 and 10.9, or in accordance with customer special requirements.

Customised to customer specifications



Drilled for installation



In-house coating to ISO 10684



Hexagonal recess



Wide range of designs and finishes



Extensively tested to our high-quality standards



# Nacelle Bolts & Studs

ISO 4014 / 4017 Bolts



Bolts to suit all applications



We manufacture a range of ISO 4014 bolts in diameters M16 to M72 plus a range of ISO 4017 setscrews in property classes 8.8, 10.9 and 12.9 or in accordance with special requirements.

As part of our innovative capabilities, we also offer a range of machined studs designed to customer specifications.

In addition, we also manufacture a range of special studs in diameters M16 to M100 and in property classes 8.8 and 10.9

Manufactured to customer designs



Inside a wind turbine nacelle unit



Nylon protected



Zinc flake coating



# Off-Shore Transition Pieces

M72 fine pitch bolting assembly



Packed to customer specifications



Courtesy of Siemens Gamesa Renewable Energy S.A.



We manufacture up to M80 bolting and studding assemblies for off-shore transition pieces in accordance to DAST-Directive 021.

Our fastening systems for HV bolting assemblies are nominal size M72.

The application of the M72 HV-bolt fittings is in accordance with DIN 18800-1 and DIN 18800-7.

M72 Transition Piece Stud



Courtesy of MHI Vestas Offshore Wind



Packed in rust proof bags



# Protective Coatings

## IN-HOUSE COATING FACILITY

We offer a wide range of coating finishes that meet the highest expectations of the industry.

Zinc flake coatings of Delta or Geomet in accordance with ISO 10683 can be provided on bolts in property class 8.8, 10.9 or 12.9, and their associated nuts and on studs in property class 8.8 or 10.9, and their associated nuts.

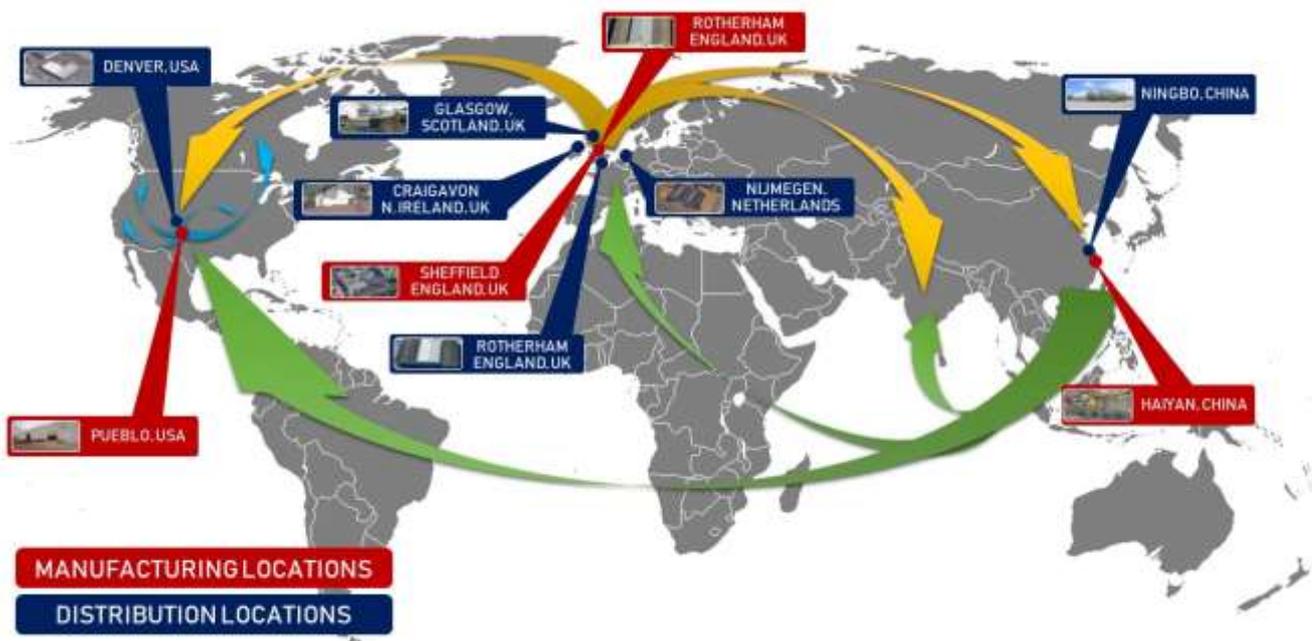


One of our Zinc Flake coating plants



# Global Logistics Network

Utilising our global logistics network helps provide a single source 'total supply solution' to all major markets around the world, servicing global customers with an efficient distribution and manufacturing system



## QUALITY & TESTING FACILITIES

### Our Commitment to Quality

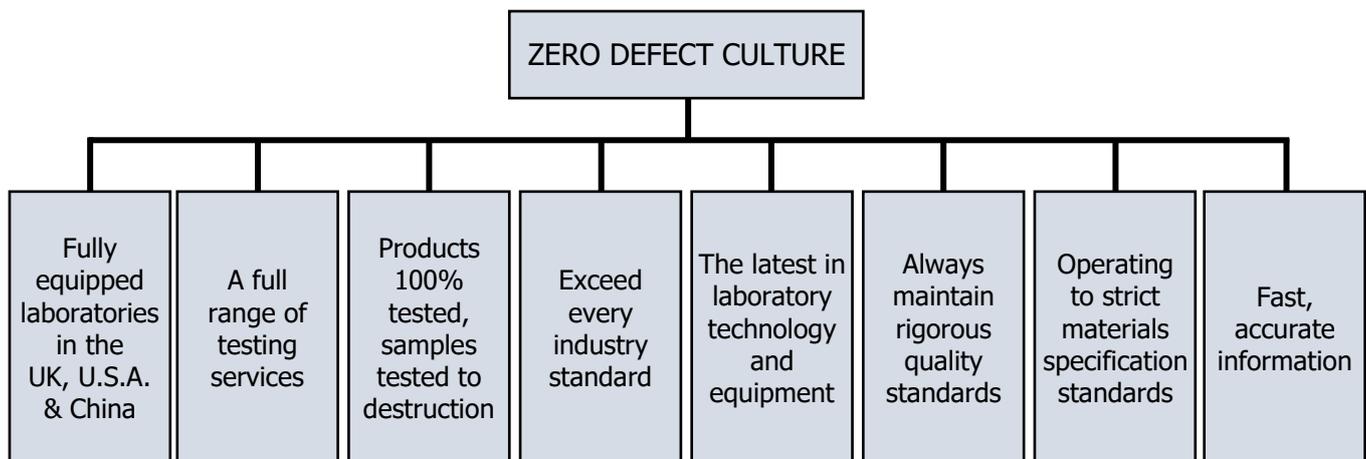
We have an enviable reputation for product quality, which is of paramount importance to our customers. Many of the fasteners we manufacture and supply are safety critical and must function in the most rigorous environments.

Controls are rigid and because our fasteners are manufactured 'in-house' the highest standards and specifications can be guaranteed. Those fasteners that are manufactured elsewhere are extensively audited throughout their manufacturing processes and systems.

Further testing is carried out at the goods receipt stage at the 'in-house' testing facility for compliance with order instructions. All suppliers are regularly monitored to ensure that the same high standards are maintained.

### Working Towards a Zero-Defect Culture

We operate a robust, controlled quality system maintaining traceability of products from their initial source of supply, into stock, right through to despatch to the customer.



### Testing Equipment

- Charpy Impact Testing Machine
  - Tensile Testing Machine capable of testing a full size bolt up to M72, 10.9
  - Torque 'V' Tension testing equipment capable of testing bolts up to M80
- NDT Testing includes:
- Magnetic Particle Inspection (MPI)
  - Liquid Penetrant
  - Remote Visual Inspection (RVI)
  - Salt Spray testing equipment (this measures corrosion in accordance with ISO 9227 and ASTM B177)
  - Positive Material Identification (PMI)
  - Rockwell Hardness testing
  - ARL Optical Emission Spectrometer
  - Micro Hardness Testing
  - Pressure Testing
  - Threaded Gauges

We are proud to have supported the world's leading wind manufacturers for over 25 years





Fasteners for Safety Critical Applications

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