Blastman Robotics Ltd

ENERGY

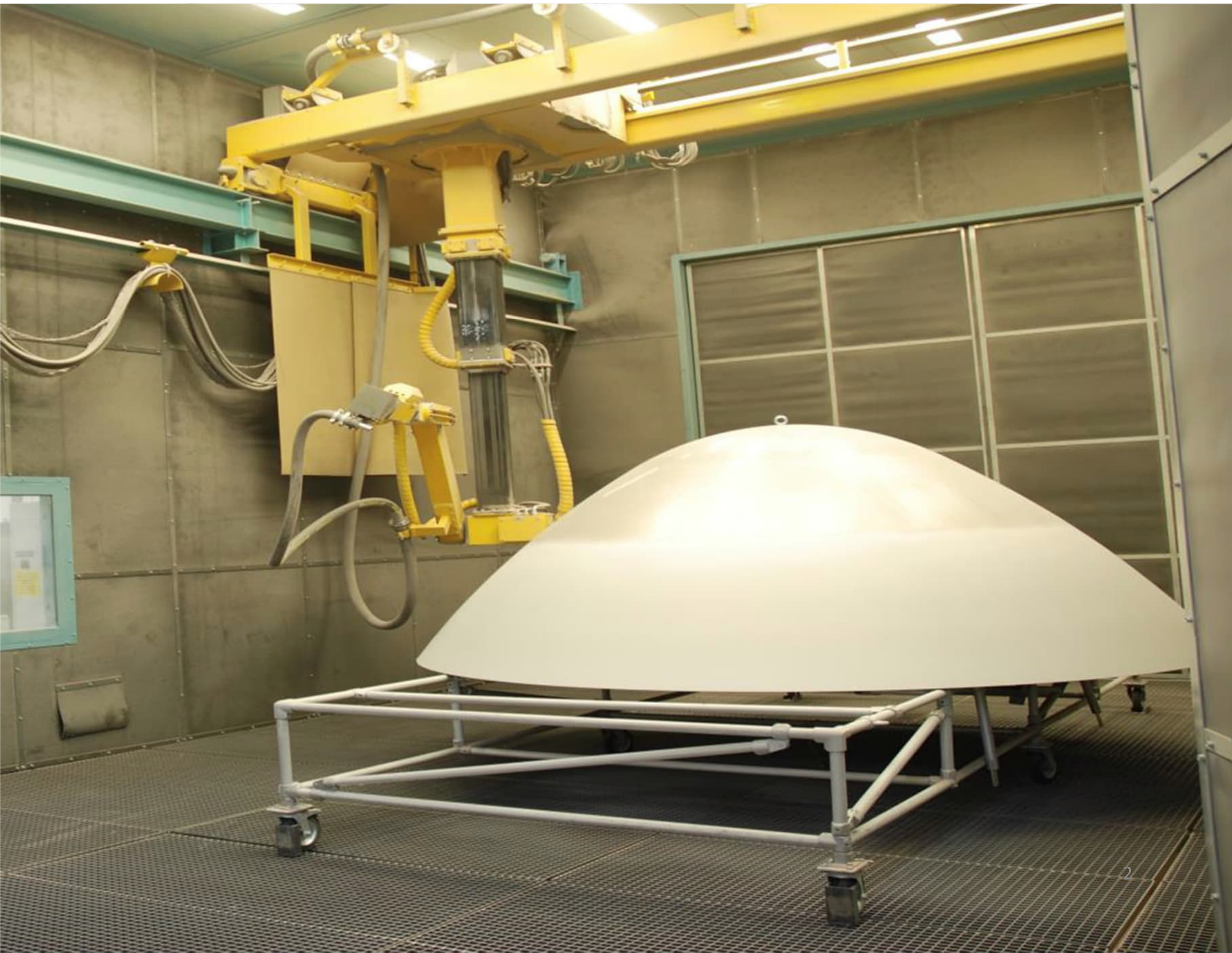
Built for Blasting

www.blastman.com

CUSTOMER EXPERIENCES

“The Blastman robotic blasting machine produces a continuous, uniform and high quality blast. Blastman products have a robust design that can withstand the extreme requirements of blasting.”

Rudolf Seefeldt, Enercon, Germany



ENERGY INDUSTRY

The energy industry is a very wide industry with lots of different machinery. The machinery can vary from transformer casings to windmill tower sections and hubs. The manufacturing methods of these workpieces can also be very different. Transformer casings are welded together whereas windmill tower hubs are cast. The common thing between these products is that they require high-quality surface treatment.

The need for high-quality surface treatment arises from the fact that all these workpieces need to be coated in some way. For windmill towers, the coating is used to protect the tower from corrosion as it is placed outdoors. For transformer casings, the need arises from corrosion protection and the fact that any oxides in the final product can have serious consequences when the transformer is taken into operation. Often these workpieces require very high surface preparation prior to coating. A typical requirement is Sa 2,5 (SSPC-SP10) and some workpieces even require the highest level of Sa 3 (SSPC-SP5).

Quite often manufacturers are required to give warranties for the coated surface. The warranty costs for repairing installed equipment can be very high and 80% of all coating failures are a result of poor surface preparation prior to coating. Therefore, the surface quality needs to excellent, so that the manufacturer can comfortably stand behind the promised warranty.

ENERGY INDUSTRY

Reaching these high cleanliness requirements by manual blasting is very time consuming and inefficient. Manual blasters are prone to fatigue and according to research the efficiency and quality of blasting decrease during the day with manual blasters. These create process-related costs and production delays. Quite often blast cleaning is also the bottleneck of the surface treatment process.

Additionally, process safety is a key factor in blast cleaning. Manual blasting is a tedious and dangerous job. Manual blasters change their job often and it is very hard to find workers to do the job. The large size of the workpieces also means that the workers have to climb ladders and scaffolding to reach all around the workpiece. This creates a risk for falling and tripping and workplace accidents are quite common for manual blasters.

Blastman robots are used worldwide to blast clean various workpieces in the energy industry, including transformer casings, windmill tower hubs, and windmill tower sections. Robots are capable of blast cleaning very complex workpieces, with high efficiency, through 8 different movement axes. Blastman robots can move the blasting nozzles all around the workpiece, eliminating the need for ladders and scaffolding. For simple geometries, such as a windmill tower sections, simpler 4 axis robots are used. The process efficiency for these tower sections can be as high as 300 m2/h. The efficiency of the robots is generated by large nozzles and high pressures used in the process. A Blastman robot can be equipped with two 19 mm nozzles. the large nozzle diameters allow for more abrasives to impact the workpiece. The pressure used in robotic blast cleaning is as high as 10 bars. This provides the abrasive with a velocity of around 200 m/s, which is approximately twice as high as with wheel blasting.

Blastman Robotics Ltd

CASE STUDY

ENCERCON

Metalldesign Magdeburg GmbH, Magdeburg , Germany
Metalltechnologie Aurich GmbH, Aurich, Germany

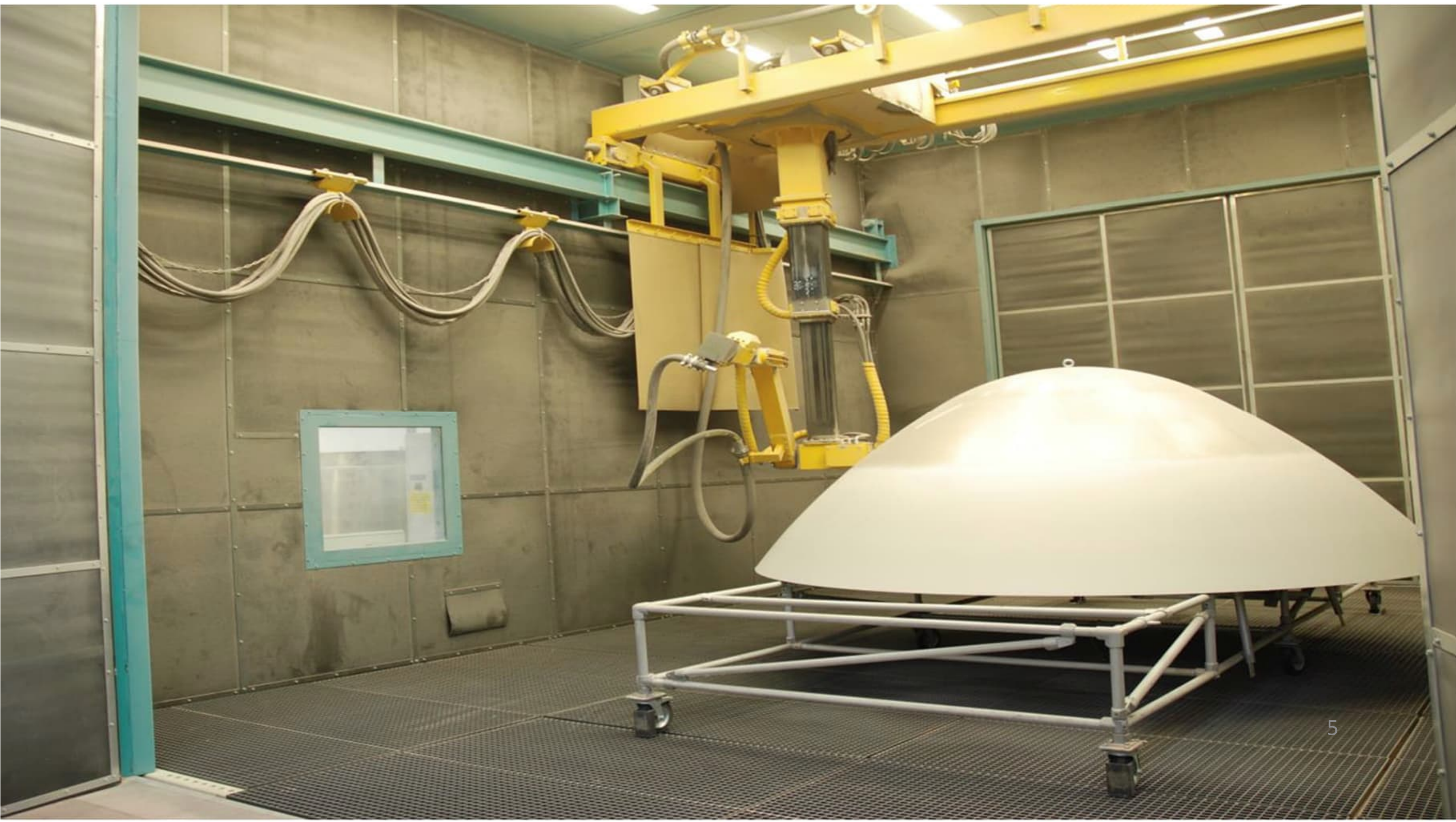
BACKGROUND

As a follow up to Blastman´s successful delivery of two Blastman B12 robots for EWP Windtower Production AB in Sweden Enercon invested in two B20 robots for its daughter companies in Aurich and Magdeburg in Germany.

OBJECTIVES

Target was to treat the surface of wind turbine generator housings made of aluminum sheet. It was required to reach a homogeneous matt surface without a need for further surface treatment.

With more than 22,000 wind turbines installed in over 30 countries **ENERCON** is recognized as one of the leading manufacturers at the international level. Research and development, as well as production and sales are constantly evolving.



CASE STUDY

ENERCON

Metalldesign Magdeburg GmbH, Magdeburg , Germany
Metalltechnologie Aurich GmbH, Aurich, Germany

SOLUTION

The solution is to blast clean the housings with fine aluminum oxide abrasive.
The blast cleaning is made automatically by a Blastman B20 robot using 19 mm nozzle.

RESULTS

As a result of automatic blast cleaning a fine homogeneous matt surface is created within targeted cycle time. No manual repair work because of unblasted or overblasted areas is needed.

“The Blastman robotic blasting machine produces a continuous, uniform and high quality blast. Blastman products have a robust design that can withstand the extreme requirements of blasting.”

Rudolf Seefeldt, Enercon, Germany

TECHNICAL INFORMATION

Nozzle diameter	19 mm
Number of nozzles/robot	1
Blasting pressure	5 bar
Abrasive	Corundum
Degrees of freedom	8
Programming	Point-to-Point or Teach-In
Operation mode	Automatic

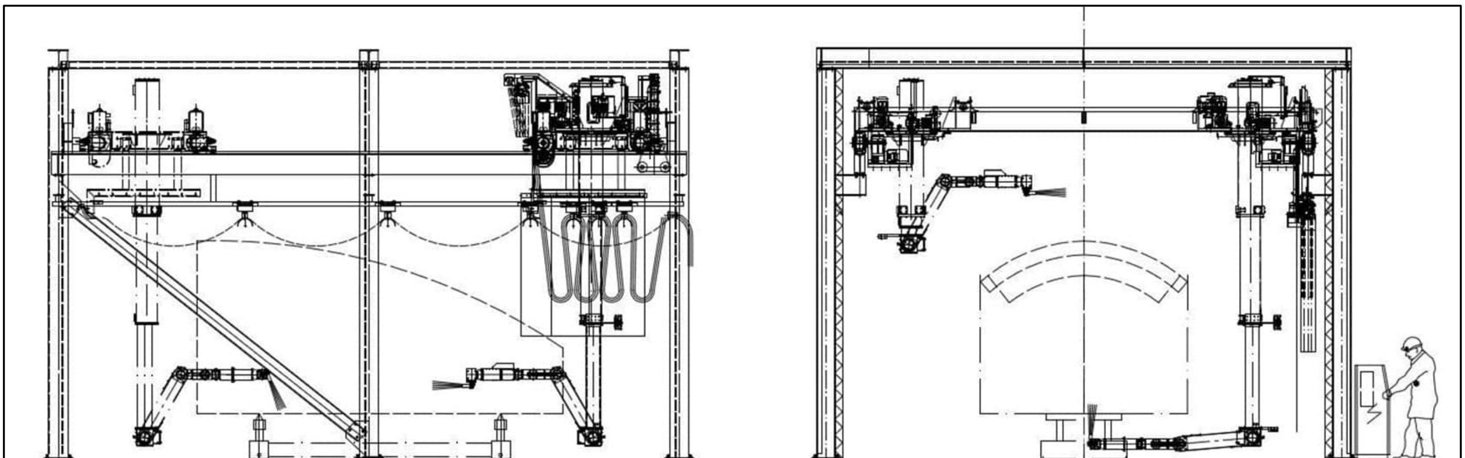


ABB HITACHI

Chongqing, China

DELIVERY IN 2023

Blastman B20CS G4 robot

2 x Blastman B16XS G4 robots

3 x Blastman BP1100 blast pots

2 x Blastman studio

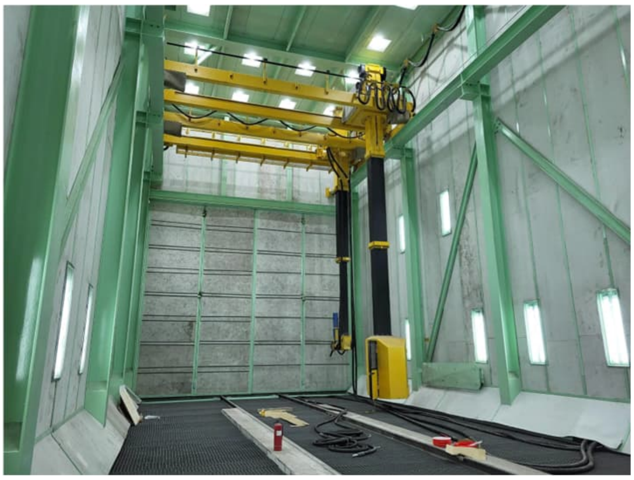
2 x booth cameras

OBJECTIVE

Automate production

Improve quality and efficiency

Improve health and safety of operators



PROCESS INFORMATION

Workpiece

- Transformer cars and parts

Workpiece condition

- Rust grade A-B

Pressure

- 5 - 10 bar

Abrasive

- Steel grit

Nozzle / robot

- B20CS 2 x 19 mm,
- B16XS 1 x 19mm/robot

Efficiency

- 75 m²/h

Typical manual blasting efficiency

- 10 - 15 m²/h

Cleanliness

- Sa 2,5

AKER SOLUTIONS

Verdal, Norway

COMPLETE DELIVERY IN 2022

Blastman B20S G4 robot & blast pot BP1100

Blastman B20ML manlift

Blastroom, abrasive handling system & full scraper floor

*"**Aker Solutions** sent the first RFQ to Blastman Robotics in November 2020. Until we signed the contract in September 2022, we had a number of meetings and correspondence. During this time and process, we have learned that Blastman Robotics is a highly competent and professional player in this market.*
Blastman Robotics has taken part in the development of the line in an active and professional way, presented ideas, and proposed solutions with a focus on robots and automation in the production line to meet Aker Solutions' requirements and overall goal with this investment.
During the delivery and installation face, Blastman Robotics showed a high grade of professionalism. All from the transport of the equipment to Verdal to Blastman Robotics representatives on-site here in Verdal. The installation face has worked flawlessly. The contractual startup date of the blasting section was reached, and further training of our personnel did work out as planned."

-Hans Haugberg, Project Procurement Manager, Aker Solutions

OBJECTIVE

Automate production

Improve quality and efficiency

Improve health and safety of operators
Energy savings

MES integration
Industry 4.0 compliancy

PROCESS INFORMATION

Workpiece

- Large steel structures

Workpiece condition

- New production

Pressure

- 7 bar

Abrasive

- Steel grit

Nozzle / robot

- 1 x 16 mm

Efficiency

- 80m^2/h

Typical manual blasting efficiency

- 10 m^2/h for a similar process

Cleanliness

- Sa 2,5

EEW GROUP

New Jersey, USA

DELIVERY IN 2022

Blastman B12S robot

BP1100

Blastman Studio

2 x booth cameras

Hose break monitoring

OBJECTIVE

Automate production

Improve quality and efficiency

Improve health and safety of operators

PROCESS INFORMATION

Workpiece

-Blast cleaning monopiles for offshore foundation

Workpiece condition

- New workpiece rust grade B-C

Pressure

- 8 bar

Abrasive

- Steel grit

Nozzle / robot

- 2 x 19 mm

Efficiency

- 167,5m^3/h

Typical manual blasting efficiency

- 10-15 m^2/h/person

Cleanliness

- Sa 2,5

WINDAR

Aviles, Spain

1st DELIVERY IN 2021

Blastman B12S G4 robot

BP1400 blast pot

Parametric programming software

2nd DELIVERY IN 2022

Blastman B12S G4 robot

2 x BP1400 blast pot

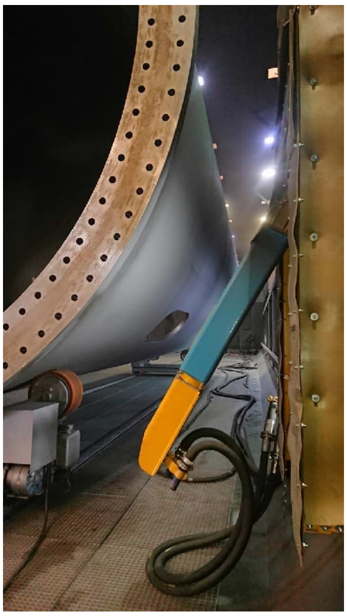
Parametric programming software

3rd DELIVERY IN 2023

Blastman B12S G4 robot

BP1400 blast pot

Parametric programming software



OBJECTIVE

Automate production

Improve quality and efficiency

Improve health and safety of operators

PROCESS INFORMATION

Workpiece

- Windmill towers

Workpiece condition

- New work piece, rust grade A

Pressure

- 8 bar

Abrasive

- Steel grit

Nozzle / robot

- 2 x 16 mm

Efficiency

- 140 - 160m^2/h

Typical manual blasting efficiency

- 15-20 m^2/h/person

Cleanliness

- Sa 2,5/Sa 3

JIANGSU GANGRUI CHANGZHOU

Hangzhou, China

DELIVERY IN 2021

Blastman B20S robot

Blastman Studio

BP1100

OBJECTIVE

Automate blast cleaning

Improve quality and efficiency

Improve health and safety of operators

PROCESS INFORMATION

Workpiece

- Blast cleaning wind energy castings

Workpiece condition

- Cast sand and Rust grade B-C

Pressure

- 8 bar

Abrasive

- Grit

Nozzle / robot

- 1 x 16 mm

Efficiency

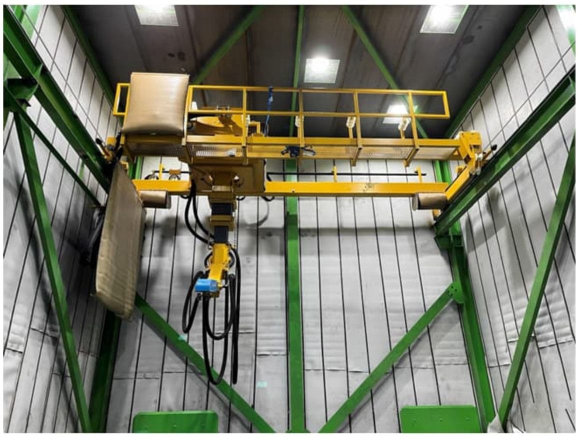
- Hub 4MW/55min

Typical manual blasting efficiency

- 32h/block

Cleanliness

- Sa 2,5



LACKIEREREI SBV KLAUS WESSLING

Geeste, Germany

DELIVERY IN 2021

Blastman B20S robot

BP1100

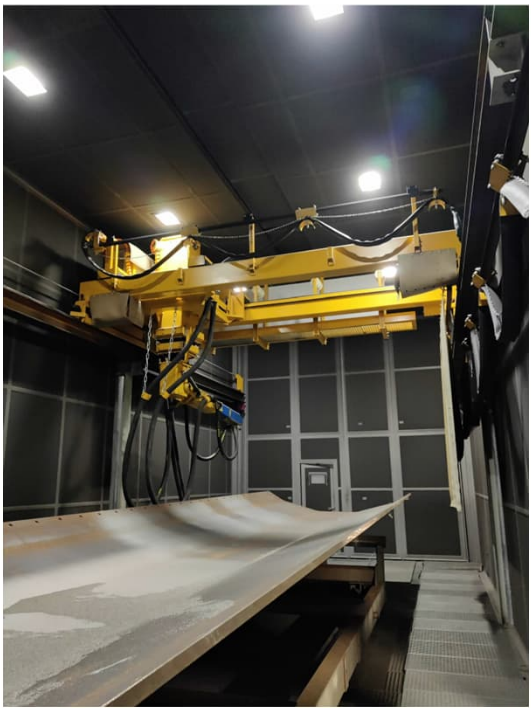
Blastman Studio

OBJECTIVE

Automate blast cleaning

Improve quality and efficiency

Improve health and safety of operators



PROCESS INFORMATION

Workpiece

-Blast cleaning wind tower sections

Workpiece condition

- Rust grade A-B

Pressure

- 6 bar

Abrasive

- Steel grit

Nozzle / robot

- 2 x 16 mm

Efficiency

- 160m^2/h

Typical manual blasting efficiency

- 10-15 m^2/h/person

Cleanliness

- Sa 2,5

HAIZEA WIND S.L

Bilbao, Spain

DELIVERY IN 2021

Blastman B12S G4 robot

BP1100 blast pot

Parametric programming software

OBJECTIVE

Automate blast cleaning

Improve quality and efficiency

Improve health and safety of operators

PROCESS INFORMATION

Workpiece

- Windmill towers

Workpiece condition

- New work piece, rust grade A

Pressure

- 8 bar

Abrasive

- Steel grit

Nozzle / robot

- 2 x 16 mm

Efficiency

- 1 nozzle = 100m^2/h and 2 nozzles = 140 160m^2/h

Typical manual blasting efficiency

- 15-20 m^2/h/person

Cleanliness

- Sa 2,5

TBEA

Shenyang, Tianyang, Hengyang, Xinjiang, China

DELIVERIES IN 2009, 2011, 2012, 2020

Blastman B20CS robot BP1100

Blastman Studio Scraper floor

Abrasive handling Ventilation

Blast room design

OBJECTIVE

Automate blast cleaning

Improve quality and efficiency

Improve health and safety of operators

PROCESS INFORMATION

Workpiece

- Power transformers

Workpiece condition

- New work piece, rust grade A

Pressure

- 8 bar

Abrasive

- Steel grit

Nozzle / robot

- 2 x 16 mm

Efficiency

- 75 m^2/h

Typical manual blasting efficiency

- 10-15 m^2/h/person

Cleanliness

- Sa 2,5

E-TOWERS

Glogow. Poland

DELIVERY IN 2020

2 x Blastman B12S robot

2 x BP1400 blast pot

Parametric programming software

OBJECTIVE

Automate blast cleaning

Improve quality and efficiency

Improve health and safety of operators

PROCESS INFORMATION

Workpiece

- Blast cleaning wind mill towers

Workpiece condition

- New production, rust grade A

Pressure

- 8,5-9 bar

Abrasive

- Steel grit

Nozzle / robot

- 1 x 19 mm

Efficiency

- 100 - 110 m^2/h

Typical manual blasting efficiency

- 15-20 m^2/h/person

Cleanliness

- Sa 2,5/ Sa 3

ARCOSA Inc.
(TRINITY STRUCTURAL TOWERS)

Newton, Iowa

DELIVERY IN 2018

Blastman B12 robot

OBJECTIVE

Automate blast cleaning

Improve quality and efficiency

Improve health and safety of operators

PROCESS INFORMATION

Workpiece

- Wind tower sections/frames

Workpiece condition

- New production, rust grade A

Pressure

- 8-10 bar

Abrasive

- Steel grit

Nozzle / robot

- 2 x 19 mm

Efficiency

- 150 – 250 m^2/h

Typical manual blasting efficiency

- 15-20 m^2/h/person

Cleanliness

- Sa 2,5

EISENGIESSEREI TORGELOW GmbH

Torgelow, Germany

DELIVERY IN 2015

Blastman B20 robot

BP1100 blast pot

Camera system on robot arm

OBJECTIVE

Automate blast cleaning

Improve quality and efficiency

Improve health and safety of operators

PROCESS INFORMATION

Workpiece

- Wind tower castings

Workpiece condition

- Fresh cast, rust grade A

Pressure

- 7 bar

Abrasive

- Steel grit

Nozzle / robot

- 1 x 19 mm

Efficiency

- 1,5 – 2h/block

Typical manual blasting efficiency

- 10 - 15 h/block

Cleanliness

- Sa 2,5

CS WIND

Windsor, Canada

1st DELIVERY IN 2011

2 x Blastman B12 robots

2nd DELIVERY IN 2013

Blastman B12 robot

OBJECTIVE

Automate blast cleaning

Improve quality and efficiency

Improve health and safety of operators

PROCESS INFORMATION

Workpiece

- Wind tower castings

Workpiece condition

- New production, rust grade A

Pressure

- 11 bar

Abrasive

- Steel grit

Nozzle / robot

- 2 x 19 mm

Efficiency

- 340 – 550 m^2/h

Typical manual blasting efficiency

-15-20 m^2/h/person

Cleanliness

- Sa 2,5

SMULDERSPROJECTS BELGIUM N.V.

Hoboken, Belgium

DELIVERY IN 2009

Blastman B12 robot with long arm

BP350 blast pot

OBJECTIVE

Automate blast cleaning

Improve quality and efficiency

Improve health and safety of operators

PROCESS INFORMATION

Workpiece

- Wind power towers

Workpiece condition

- New production, rust grade A

Pressure

- 7 bar

Abrasive

- Steel grit

Nozzle / robot

- 1 x 19 mm

Efficiency

- 100 - 150m^2/h

Typical manual blasting efficiency

-15-20 m^2/h/person

Cleanliness

- Sa 2,5

MARTIFER ENERGIA S.A.,

Oliveira de Frades, Portugal

DELIVERY IN 2009

Blastman B20 robot with long arm

BP350 blast pot

OBJECTIVE

Automate blast cleaning

Improve quality and efficiency

Improve health and safety of operators

PROCESS INFORMATION

Workpiece

- Large steel wind turbine parts

Workpiece condition

- New production, rust grade A

Pressure

- 8 bar

Abrasive

- Steel grit

Nozzle / robot

- 1 x 19 mm

Efficiency

- 120m^2/h

Typical manual blasting efficiency

- 10-15 m^2/h/person

Cleanliness

- Sa 2,5

ALSTOM POWER Sp. z o.o

Elblag, Poland

1 st DELIVERY IN 1998

Blastman B20C robot

Blast champer

BP350 blast pot

2 st DELIVERY IN 2008

Blastman B20C robot

BP350 blast pot

OBJECTIVE

Automate blast cleaning

Improve quality and efficiency

Improve health and safety of operators

PROCESS INFORMATION

Workpiece

- Large steel wind turbine parts

Workpiece condition

- New production rust grade A

Pressure

- 6 bar

Abrasive

- Steel grit

Nozzle / robot

- 1 x 16 mm

Efficiency

- 80m^2/h

Typical manual blasting efficiency

- 20 – 25 h/block

Cleanliness

- Sa 2,5

METALLDESIGN MAGDEBURG GmbH & METALLDESIGN AURICH GmbH

Germany

DELIVERY IN 2008

Metalldesign Magdeburg GmbH

Blastman B20 robot

BP350 blast pot

Metalltechnologie Aurich GmbH

Blastman B20 robot

BP350 blast pot

OBJECTIVE

Automate blast cleaning

Improve quality and efficiency

Improve health and safety of operators

PROCESS INFORMATION

Workpiece

- Aluminum wind turbine parts

Workpiece condition

- New production

Pressure

- 5 bar

Abrasive

- Garnet

Nozzle / robot

- 1 x 19 mm

Efficiency

- 70 – 120 m²/h

Typical manual blasting efficiency

- 10 – 15 m²/h/person

Cleanliness

- Sa 2,5

FRIEDRICH WILHEMS-HÜTTE

Mülheiman der Ruhr, Germany

DELIVERY IN 2008

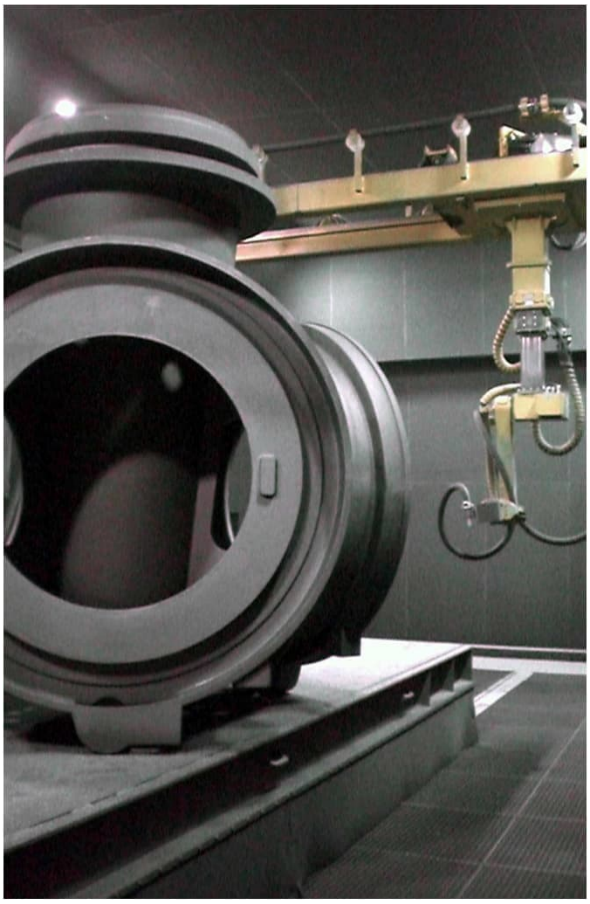
Blastman B20 robot

OBJECTIVE

Automate blast cleaning

Improve quality and efficiency

Improve health and safety of operators



PROCESS INFORMATION

Workpiece

- Large wind power castings and diesel engine blocks

Workpiece condition

- Fresh cast, rust grade A

Pressure

- 7 bar

Abrasive

- Steel grit

Nozzle / robot

- 1 x 16 mm

Efficiency

- 80 – 150 m^2/h

Typical manual blasting efficiency

- 20 - 25 $m^2/h/block$

Cleanliness

- Sa 2,5

EWP WINDTOWER PRODUCTION AB

Malmö, Sweden

DELIVERY IN 2008

2 Blastman B12 robots

2 BP350 blast pot

OBJECTIVE

Automate blast cleaning

Improve quality and efficiency

Improve health and safety of operators

PROCESS INFORMATION

Workpiece

- Wind turbine towers

Workpiece condition

- New production, rust grade A

Pressure

- 8 bar

Abrasive

- Steel grit

Nozzle / robot

- 1 x 16 mm

Efficiency

- 150-250 m^2/h

Typical manual blasting efficiency

- 15-20 $m^2/h/person$

Cleanliness

- Sa 2,5

VESTAS CASTINGS

Guldmedshyttan, Sweden

DELIVERY IN 2005

Blastman B20C robot

BP350 blast pot

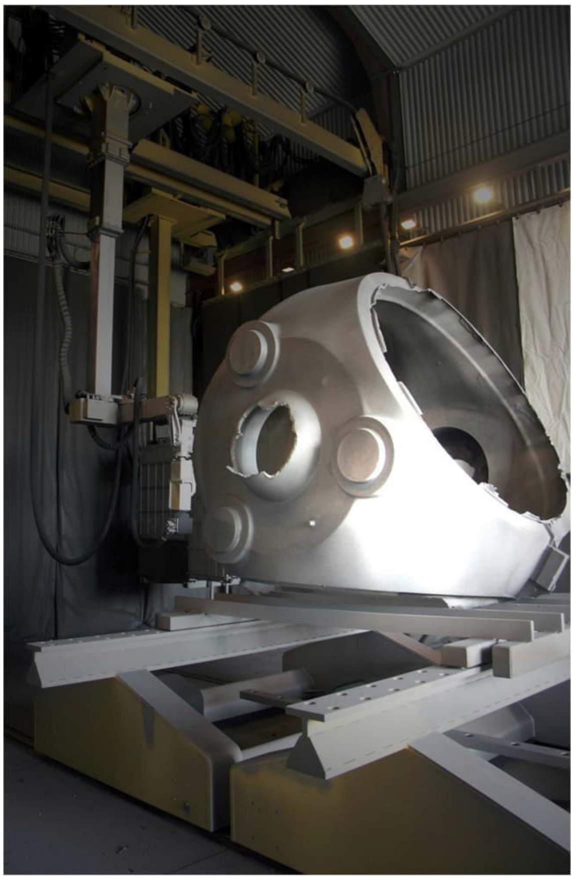
Blast chamber

OBJECTIVE

Automate blast cleaning

Improve quality and efficiency

Improve health and safety of operators



PROCESS INFORMATION

Workpiece

- Cast wind turbine parts

Workpiece condition

- Fresh cast, rust grade A

Pressure

- 10 bar

Abrasive

- Steel grit

Nozzle / robot

- 1 x 19 mm

Efficiency

- 100 – 200 m^2/h

Typical manual blasting efficiency

- 10 – 15h/block

Cleanliness

- Sa 2,5

ABB POWER TRANSFORMERS AB

Ludvika, Sweden

1st DELIVERY IN 1989

Blastman B20C robot

2nd DELIVERY IN 2016

Blastman B20C-S robot

Blast vessel

Blastroom improvements

3rd DELIVERY IN 2017

Blastman B20ML manlift

Picture taken from 25 years old robot right before retirement.

OBJECTIVE

Automate production

Improve quality and efficiency

Improve health and safety of operators

PROCESS INFORMATION

Workpiece

- Transformer cases

Workpiece condition

- New production, rust grade A-B

Pressure

- 8 bar

Abrasive

- Steel grit

Nozzle / robot

- 1 x 19 mm

Efficiency

- 70 – 250 m^2/h

Typical manual blasting efficiency

- 5-10 m^2/h for a similar process

Cleanliness

- Sa 2,5

Blastman Robotics Ltd
Kiertorata 17
FI-90440 Kempele
FINLAND

Tel. +358 20 7418 140
info@blastman.com

www.blastman.com