Blastman Robotics Ltd

FOUNDRIES

Built for Blasting

www.blastman.com

CUSTOMER EXPERIENCES

“Our Blastman equipment is for blast cleaning, which is what Siempelkamp stands for in cast parts: fast, reliable, highly efficient and top-quality results. By using special blasting robots, such work is not only carried out more quickly and safely, but also cheaper and with higher quality.”

Dr Geier’s, Siempelkamp, Germany

FOUNDRIES

Blasting is the prevailing method when it comes to the cleaning and surface treatment of castings. This roughcast blasting is often a two-stage process. The workpiece is first completely cored and desanded by blast cleaning. Then the deburring and grinding takes place. Finally, surface preparation is finished by blasting the workpiece again to achieve desired cleanliness and compression of the cast surface.

Manual blasting is a tedious and not an entirely harmless process because the workers are exposed to very high levels of physical stress, a dangerous work environment, as well as noise and dust. This is especially true when blasting large castings, such as rotor hubs for wind turbines or engine blocks of large ships. With fully automatic robots, specially developed for blasting, such work is not only faster and safer but also cheaper. The finished quality is also tremendously better and constant all around the workpiece. The multi-axis Blastman robots are able to reach every corner of the blast room and clean the workpiece entirely. Blastman robots can be operated fully automatically or driven as a manipulator from a cabin. These two options do not rule out each other, meaning that the appropriate operation method can be selected according to process requirements.

The advantage of a blasting robot is that it follows the shape of the casting fully automatically. The robot also targets hard-to-reach areas directly, ensuring high and constant quality; independent of human influences and errors, or the over blasting of wheel machines. In addition, high blasting pressures of up to 10 bar and blast media velocities of up to 200 m/s.

Peening is also an important part of blasting cast parts. During casting, negative residual stresses remain in the workpiece. These negative stresses are typically turned into positive stresses through shot peening. Shot peening itself is an intricate process. Negative stresses are turned positive through abrasive speed and abrasive size and shape. Robot blast cleaning provides much higher abrasive velocities than manual or wheel blasting. This, combined with the ability to use all available abrasives on the market, causes robotic blast cleaning to turn negative stresses positive as a by-product of the process.

In blast cleaning, abrasive particles as small as possible should be used, for they reach higher speed and higher area of coverage. Thus, the casting is not only cleaned faster but receives also a finer surface structure. Additionally, small particles have a lower consumption rate because they do not break so fast. The abrasive particle shape is also a decisive factor. Due to the higher removal rate, angular particles (grit) are generally better for blast cleaning than rounded ones (shot). Large and spherical particles are mainly used for surface compression and for castings with complex shapes where shadow areas can be better reached by a more defined rebound. Many foundries use a mix of medium-sized grit and round shot particles. This way the process gets the best of both abrasive types.

In order to limit the wear, wheel machines must mainly use large rounded particles. On the other hand, blast robots can use all types of abrasives in all particle sizes and shapes. This, combined with higher abrasive velocity, allows for increased efficiency with lower maintenance costs. Finally, the robot is also used to clean the castings of abrasives and dust with compressed air after the blasting process.

EISENGIESSEREI TORGELOW GmbH

Torgelow, Germany

BACKGROUND

Eisengiesserei Torgelow GmbH is one of the biggest hand molding gray cast iron and ductile iron foundries in Europe. Having modern casting and production technology the company is able to produce effectively heavy and complex castings.

Having heard about Blastman technology the company decided also to upgrade their manual blasting to state of art robot blasting.

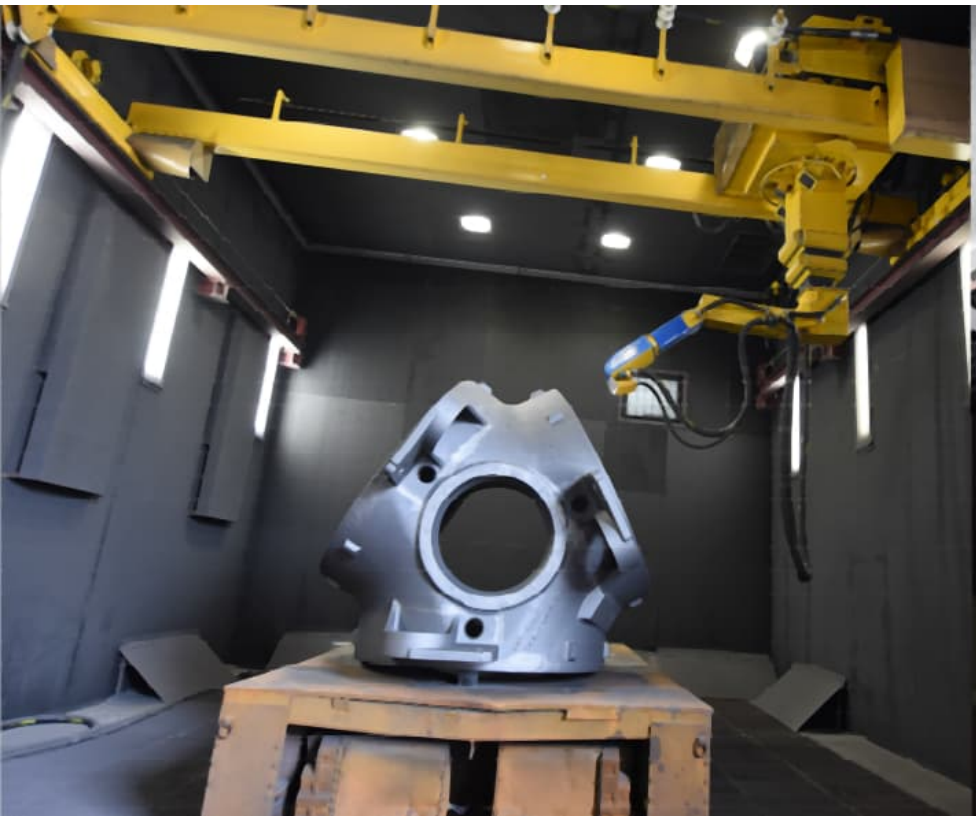
The **EGT** is one of the largest European hand molding foundries with a capacity of 8,000 t / month. It supplies finished components made of gray and ductile iron with a blank weight up to 115 t and provides other services such as modeling, simulation creation and engineering.

OBJECTIVES

Target was to robotize their manual blast room since blasting large castings manually is ineffective.

There was a need to use a robot by programs and additionally manually by joysticks for touch up blasting.

Touch up blasting is needed since possible casting failures are hidden and can be found after a robot blasting process. The old transport wagon was planned to be retained.



Blastman Robotics Ltd

CASE STUDY

EISENGIESSEREI TORGELOW GmbH

Torgelow, Germany

SOLUTION

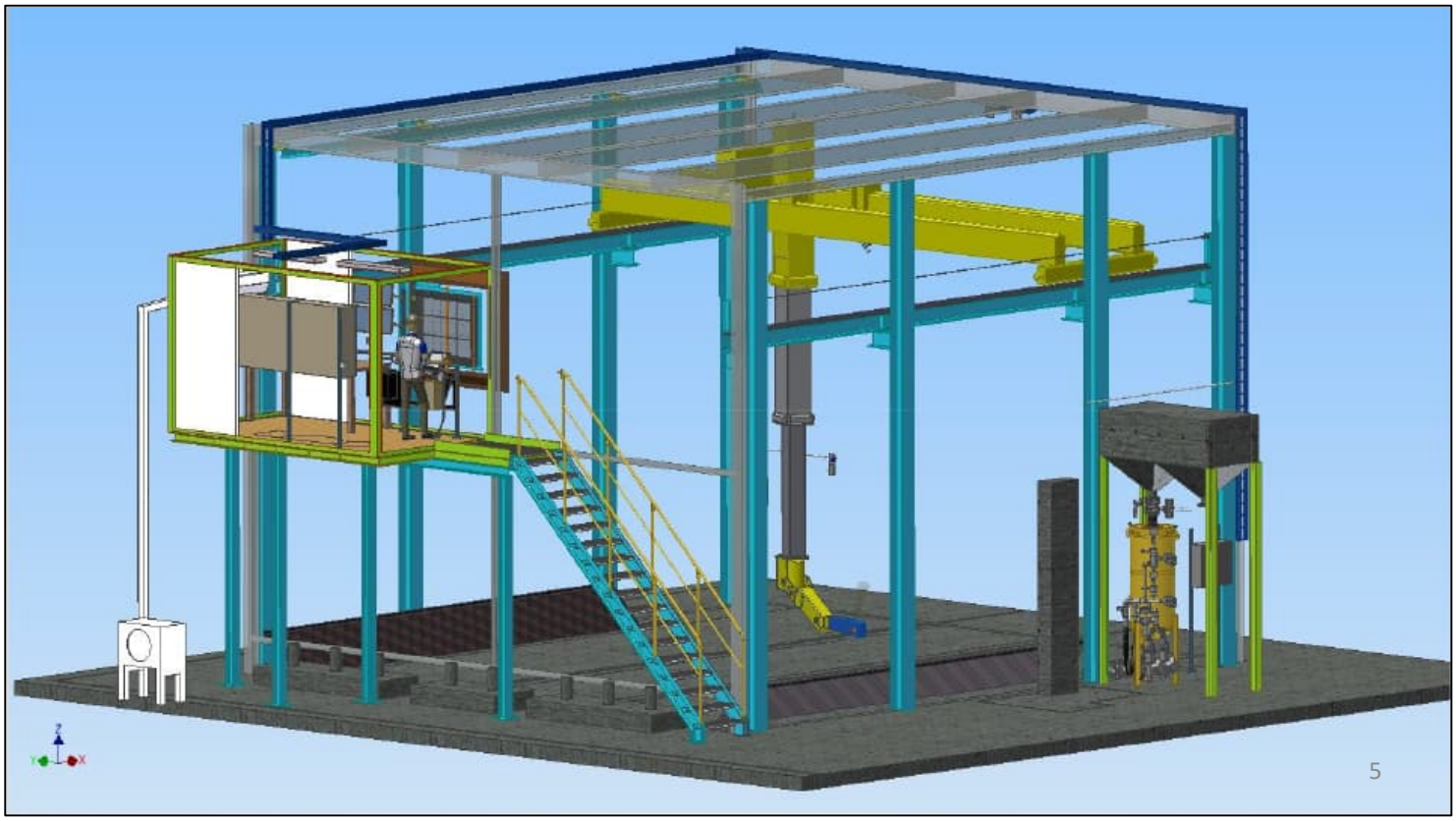
The blast room was robotized by one Blastman B20S robot equipped with a camera system and a control room for touch up blasting.
The blast room was equipped with robot rails.
The old recycling and ventilation system was integrated for robot operations and a new Blastman double chamber blast pot for continuous operations was included in the scope. The old transport wagon was integrated in the system.

RESULTS

The robotized blast room works perfectly both in automatic and manual operations. The manual touch up blasting is easy due to excellent visibility from the control room located well above the floor level and a supporting camera system to check the cleaning result in detail from short distance.

TECHNICAL INFORMATION

Nozzle diameter	19 mm
Number of nozzles/robot	1
Blasting pressure	7 bar
Abrasive	Steel grit
Degrees of freedom	8
Programming	Point-to-Point or Teach-In
Operation mode	Automatic or manual



MAN ENERGY SOLUTIONS

Augsburg, Germany

DELIVERY IN 2022

Blastman B20S robot

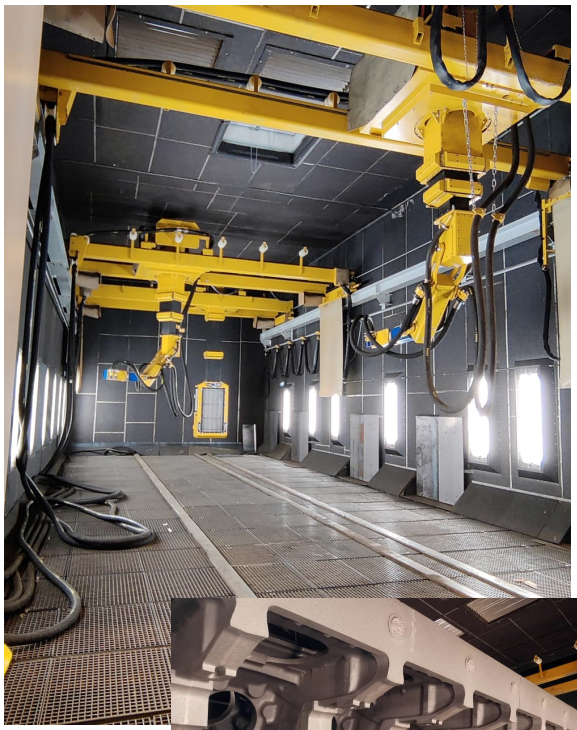
Blastman B20CS robot

2 x BP1400 blast pots

Blastman Studio

Blastroom

Transfer car



OBJECTIVE

Automate blast cleaning

Improve quality and efficiency

Improve health and safety of operators

PROCESS INFORMATION

Workpiece

- Many kind of engine blocks

Workpiece condition

- Fresh cast, rust grade A-B

Pressure

- 10 bar

Abrasive

- Mix grit/shot

Nozzle / robot

- 4 x 19 mm

Efficiency

- 4 x 27,5 m3/min

Typical manual blasting efficiency

- 32h/block

Cleanliness

- Sa 2,5

VALMET FOUNDRY

Jyväskylä, Finland

DELIVERY IN 1997

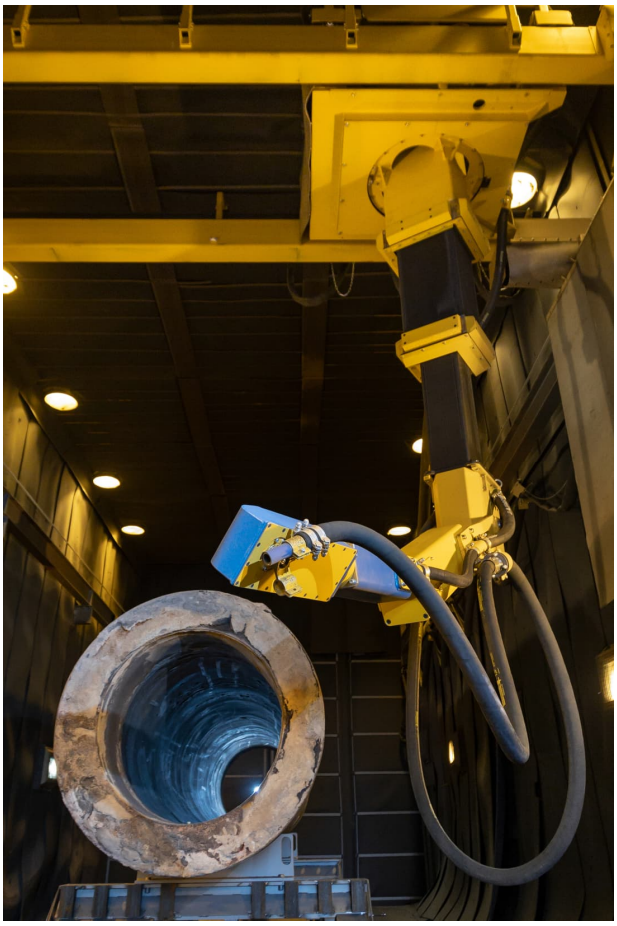
Blastman B20C robot

Blast chamber

DELIVERY IN 2022

Blastman B20S robot

Blastman BP100 blast pot



OBJECTIVE

Automate blast cleaning

Improve quality and efficiency

Improve health and safety of operators

PROCESS INFORMATION

Workpiece

- Large casted paper mill parts

Workpiece condition

- Fresh cast, rust grade A-B

Pressure

- 8 bar

Abrasive

- Steel grit

Nozzle / robot

- 1 x 16 mm

Efficiency

- 4h/block

Typical manual blasting efficiency

- 32h/block

Cleanliness

- Sa 2,5

JIANGSU GANGRUI CHANGZHOU

Hangzhou, China

DELIVERY IN 2021

Blastman B20S robot

Blastman Studio

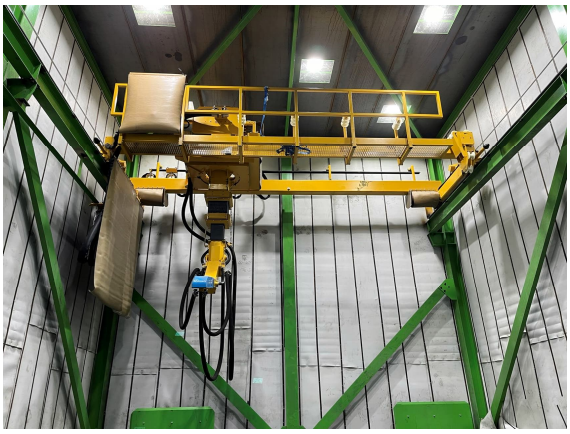
BP1100

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

CATERPILLAR MAPLETON

Mapleton, USA

DELIVERY IN 2021

Blastman B20S robot

Control room

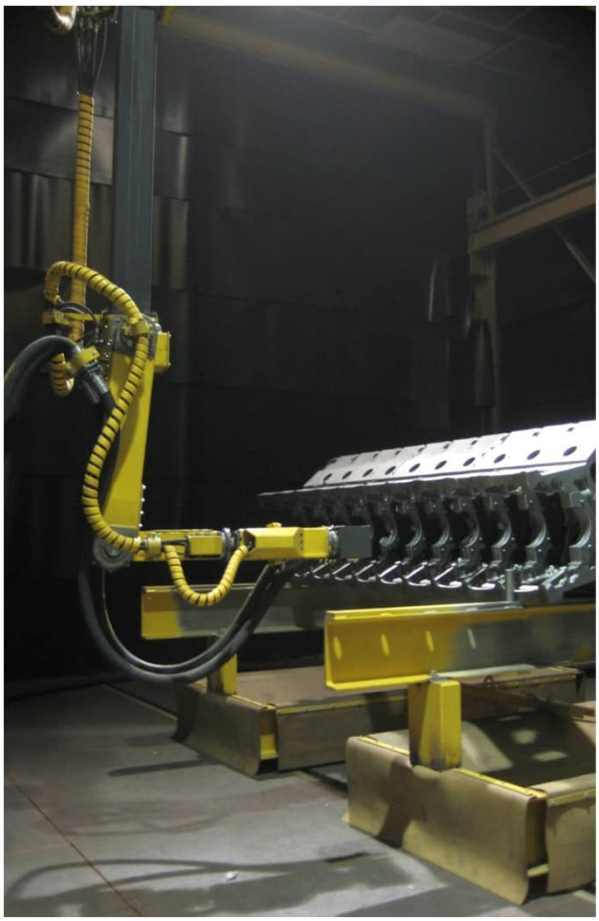
Transfer car

DELIVERY IN 2008

Blastman B20 robot

Blast chamber

Transfer wagon



OBJECTIVE

Automate blast cleaning

Improve quality and efficiency

Improve health and safety of operators

PROCESS INFORMATION

Workpiece

- Diesel engine blocks/castings

Workpiece condition

- Fresh cast with agglomerated sand

Pressure

- 8 bar, 6 bar

Abrasive

- Steel grit/shot

Nozzle / robot

- 2 x 19 mm

Efficiency

- 2h/block

Typical manual blasting efficiency

- 16h/block

Cleanliness

- Sa 2,5

SIEMPELKAMP GIESSEREI

Krefeld, Germany

DELIVERY IN 2019

Blastman B20CX robot

BP1100 blast pot

OBJECTIVE

Automate blast cleaning

Improve health and safety

Improve quality and efficiency of blast cleaning

"Our Blastman equipment is for blast cleaning, which is what Siempelkamp stands for in cast parts: fast, reliable, highly efficient and top-quality results. By using special blasting robots, such work is not only carried out more quickly and safely, but also cheaper and with higher quality."

Dr Geier's, Siempelkamp, Germany

PROCESS INFORMATION

Workpiece

- XXL castings up to 200 tons unit weight

Workpiece condition

- Fresh cast with agglomerated sand

Pressure

- 10 bar

Abrasive

- Mix steel grit and shot

Nozzle / robot

- 2 x 19 mm

Efficiency

- E.g. up to 100 m2/h for a large cylinder crankcase

Typical manual blasting efficiency

-E.g. up to 10 m2/h for a large cylinder crankcase

Cleanliness

- Sa 2,5

EISENGIESSEREI TORGELOW GmbH

Torgelow, Germany

DELIVERY IN 2015

Blastman B20S robot

Blastman BP1100 blast pot

Camera system

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-B

Pressure

- 7 bar

Abrasive

- Steel grit

Nozzle / robot

- 1 x 19 mm

Efficiency

- 1,5-2h/block

Typical manual blasting efficiency

- 10 – 15h/block

Cleanliness

- Sa 2,5

FONDERIE MORA S.P.A.,

Gavardo, Italy

1st DELIVERY IN 1996

Blastman B20C robot

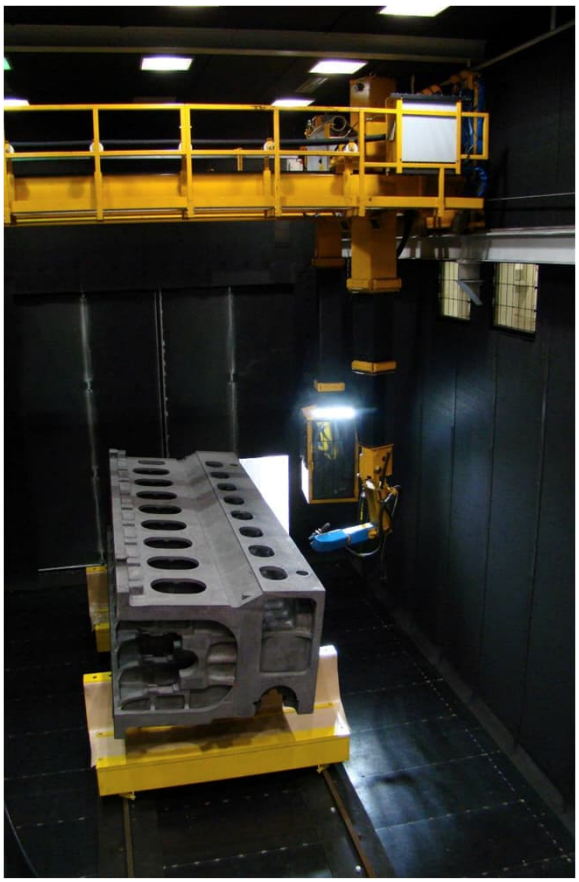
Blast chamber

BP350 blast pot

2nd DELIVERY IN 2013

Blastman B20C robot

Blastroom renovation



OBJECTIVE

Automate blast cleaning

Improve quality and efficiency

Improve health and safety of operators

PROCESS INFORMATION

Workpiece

- Cast diesel engine blocks

Workpiece condition

- Fresh cast, rust grade A-B

Pressure

- 9 bar

Abrasive

- Mix of steel shot and grit

Nozzle / robot

- 2 x 19 mm

Efficiency

- 4h/block

Typical manual blasting efficiency

- 32h/block

Cleanliness

- Sa 2,5

SUOMIVALIMO (COMPONENTA)

lisalmi, Finland

DELIVERY IN 2009

Blastman B20 robot

BP350 blast pot

Control room

Transfer wagon

OBJECTIVE

Automate blast cleaning

Improve quality and efficiency

Improve health and safety of operators

PROCESS INFORMATION

Workpiece

- Diesel engine blocks, gear boxes and other heavy casting

Workpiece condition

- Fresh cast, rust grade A-B

Pressure

- 8 bar

Abrasive

- Steel grit

Nozzle / robot

- 1 x 19 mm

Efficiency

- 30min/block

Typical manual blasting efficiency

- 5h/block

Cleanliness

- Sa 2,5

GIESSEREI KIEL

Kiel, Germany

DELIVERY IN 2008

Blastman B20 robot

Blast chamber

2 BP350 blast pots

Transfer wagon

OBJECTIVE

Automate blast cleaning

Improve quality and efficiency

Improve health and safety of operators

PROCESS INFORMATION

Workpiece

- Cast diesel engine blocks and other heavy casting

Workpiece condition

- Fresh cast, rust grade A-B

Pressure

- 8 bar

Abrasive

- Steel grit

Nozzle / robot

- 2 x 19 mm

Efficiency

- 4h/block

Typical manual blasting efficiency

- 32h/block

Cleanliness

- Sa 2,5

CATERPILLAR MAPLETON

Mapleton, USA

DELIVERY IN 2008

Blastman B20 robot

Blast chamber

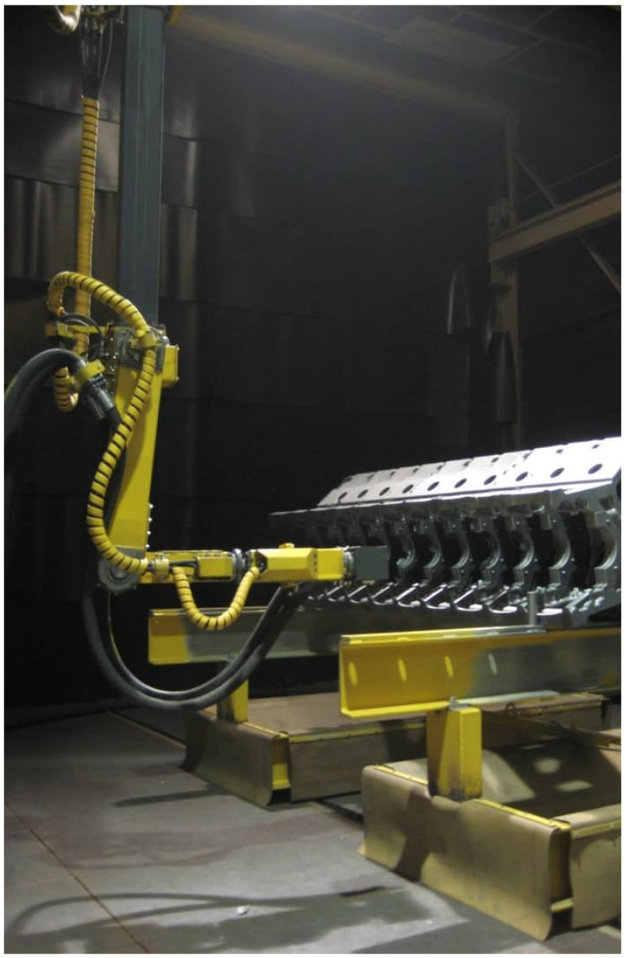
Transfer wagon

OBJECTIVE

Automate blast cleaning

Improve quality and efficiency

Improve health and safety of operators



PROCESS INFORMATION

Workpiece

- Diesel engine blocks

Workpiece condition

- Fresh cast, rust grade A-B

Pressure

- 8 bar

Abrasive

- Steel grit

Nozzle / robot

- 2 x 19 mm

Efficiency

- 2h/block

Typical manual blasting efficiency

- 16h/block

Cleanliness

- Sa 2,5

FRIEDRICH WILHELMS-HÜTTE

Mülheim an der Ruhr, Germany

DELIVERY IN 2008

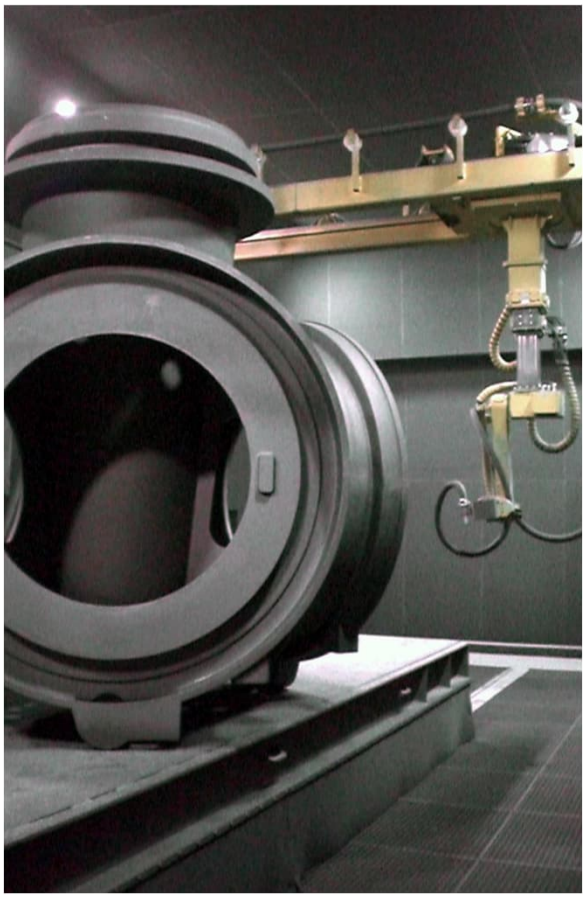
Blastman B20 robot

OBJECTIVE

Automate blast cleaning

Improve quality and efficiency

Improve health and safety of operators



PROCESS INFORMATION

Workpiece

- Diesel engine blocks, gear boxes and other heavy casting

Workpiece condition

- Fresh cast, rust grade A-B

Pressure

- 8 bar

Abrasive

- Mix Steel grit and shot

Nozzle / robot

- 1 x 19 mm

Efficiency

- 4h/block

Typical manual blasting efficiency

- 32h/block

Cleanliness

- Sa 2,5

ALSTOM POWER Sp. z o.o

Elblag, Poland

1st DELIVERY IN 1998

Blastman B20C robot

Blast chamber

BP350 blast pot

2nd 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

- Cast turbine parts

Workpiece condition

- Fresh cast, rust grade A-B

Pressure

- 8 bar

Abrasive

- Steel grit

Nozzle / robot

- 1 x 19 mm

Efficiency

- 2h/block

Typical manual blasting efficiency

- 16h/block

Cleanliness

- Sa 2,5

VESTAS CASTINGS

Guldmedshyttan, Sweden

DELIVERY IN 2005

Blastman B20C robot

BP350 blast pot

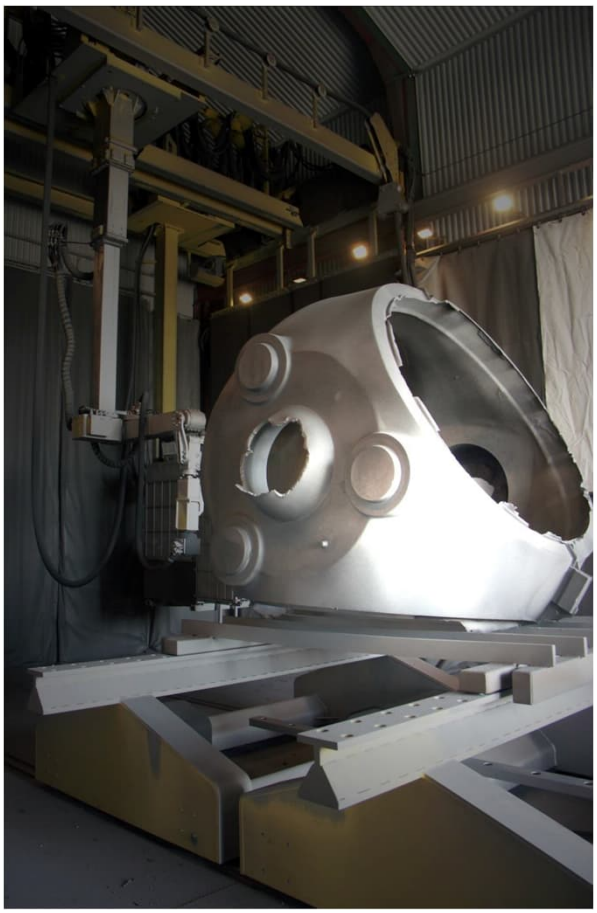
Blast chamber

OBJECTIVE

Automate blast cleaning

Improve health and safety

Improve quality and efficiency of blast cleaning



PROCESS INFORMATION

Workpiece

- Cast wind turbine parts

Workpiece condition

- Fresh cast, rust grade A-B

Pressure

- 10 bar

Abrasive

- Steel grit

Nozzle / robot

- 1 x 19 mm

Efficiency

- 1h/block

Typical manual blasting efficiency

- 10-16h/block

Cleanliness

- Sa 2,5

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