Blastman Robotics Ltd

PASSENGER COACHES

Built for Blasting

www.blastman.com

CUSTOMER EXPERIENCES

”We chose Blastman who seemed to us the most advanced company in robotic technology for sand blasting process. We were finally convinced that the product was suitable for our project and particularly appreciated Blastman's technical and human qualities in all steps from the studies to the start of the installation and final commissioning. The simplicity of use and robustness of the product were determining factors to choose the solution and the principal benefits for the users. Also, the efficient system interface with the robot allows us to save time and increase productivity. The Blastman team gives us the key to implement a solution that meets our needs. For more than seven years, we have been working with Blastman on the automation of the sand blasting process for new railway contracts. Blastman has proven to be the adequate partner for its remote and field services. We appreciate Blastman's skills and reactivity and we'll continue to work with them on new automation projects in the future."

Philippe Hallard, Bombardier,Crespin

“Our production efficiency increased by a total of 40% with the Blastman solution. The actual payback time has been two years and four months.”

Sébastien Marino, Bombardier, France

“We are already operating with the third generation Blastman robots. Maintenance costs are low, even though we use the robots in three shifts.“

Andre Sunke, Alstom, Germany

CUSTOMER EXPERIENCES

"We imported a set of automatic sand blasting robot from Blastman for blast cleaning the surface of aluminum car body in 2016. The operation of the equipment is stable, and the efficiency is high. It has greatly reduced the labor forces on the manual sand blasting and protect them from the harsh sandblasting environment.
We are satisfied the operation and production of the Blastman automatic robot equipment."

CRRC Zhengzhou Rail Transit Co., Ltd

"In order to continue enhancing Bombardier car finishing facilities and to release human from harsh work environment, we became the first railcar manufacturer in China to realize robot blasting of interior and exterior of the car bodies by choosing Blastman as a turnkey delivery partner.
Blastman blast robot has been continuous under operation and cleaning bodies of passenger coaches since December 2010. Robot plant has met our requirement by providing high surface quality and the capacity of 8hours per car body. Blastman service team provides fast and efficient support to keep robot perform reliably. Blastman is a valued partner within our organization. "

Bombardier Sifang (Qingdao) Transportation Ltd

PASSENGER COACHES

Painting quality of passenger coaches is very critical because the car is directly exposed to transport and weather conditions when in operation. The exterior paint job gets hit by stones, dust, and sand constantly, damaging the paint and possibly peeling poorly adhered sections. The interior coating cannot be neglected either. The paint protects the interior from corrosion and the visual appearance of the train car is important to passengers.

A mechanically strong paint film also prolongs the lifetime of a passenger coach. Often manufacturers are required to give a warranty for the paint job. To ensure the coating lasts for a long time, proper surface treatment prior to painting is required. Additionally, proper surface treatment reduces the number of reclamations, resulting from the poor paint job, made by the end customer.

Blast cleaning is the most prominent method used in the railway industry to prepare surfaces for painting. Because of the high requirements of the paint job, the quality of the blast cleaning process needs to be at a very high level. High and constant quality is difficult to achieve by manual operation. Blastman robots blast clean the exterior and interior of passenger coaches completely automatically. This ensures high quality and even finish. This translates directly into better paint adhesion and visual appearance of the finished product. Blastman robots can be used for either the production of new passenger coaches or the repair of passenger coaches in use.

Process efficiency is also a critical factor since production lead times for passenger coaches can be very short. Blastman robots can use up two 19 mm nozzles and pressures to 10 bars. The size of the passenger car also affects process efficiency. Manual blasters typically need to use manlifts, ladders, or other equipment to reach the top parts of the car. Blastman robots use telescopes and vertical carriages to move the nozzles to a high position. This way the need for any other lifting equipment is eliminated in the blast room. Additionally, manual blasters spend a significant portion of their working time dragging and pulling and moving around the train car. With robotic blasting, this process stage is completely removed increasing process efficiency by minimizing the time abrasive is not shooting out the nozzle.

Blast cleaning itself is a very demanding job for anyone. Manual blasters change their job quite easily and the availability of labor is low. This is creating issues for manufacturers throughout the industry. Switching to an automated robotic process greatly improves workplace safety and worker motivation. This ensures that workers remain in the company for a longer time, which reduces the need for new requirements. Also, the know-how of blast cleaning stays in the company.

Passenger coaches are typically made of three different materials: steel, aluminum, or stainless steel. Sometimes one car is made of all three materials. This means that the abrasive used in the process is often aluminum oxide or some other non-ferrous material. This rules out the use of wheel blasting, because the abrasive materials used are so hard and fine that the maintenance costs of the wheel are very high. Robotic blasting, in its essence, is the same process as manual blasting, with the exception of human labor. Therefore, all abrasives materials can be used with robotic blasting.

Blastman robotic solutions provide stability and productivity into the industry, where lead times can be short. By applying automated blasting technology into their processes, companies can secure the performance of their manufacturing line and provide standard high quality to, particularly demanding customer base.

Blastman Robotics Ltd

CASE STUDY

CRRC GUANGDONG CO.,LTD

Jiangmen, Guangdong, China

BACKGROUND

CRRC Guangdong is a national key manufacturing base for intercity EMU and the first complete passenger coach manufacturing base in Guangdong province of China with modern automatic technology applied into the line of manufacturing.

On the basis of experience in automation the customer had a clear picture of the possibilities to use Blastman robots for blasting in China.

CRRC GUANGDONG CO., LTD is mainly engaged in manufacturing and maintenance of rolling stocks and relevant industrial services as well as Import and export businesses of rolling stocks.

OBJECTIVES

The requirement was to blast clean automatically and completely exterior surfaces and essential interior surfaces of various passenger coaches with given speed.

CRRC GUANGDONG CO.,LTD

Jiangmen, Guangdong, China

SOLUTION

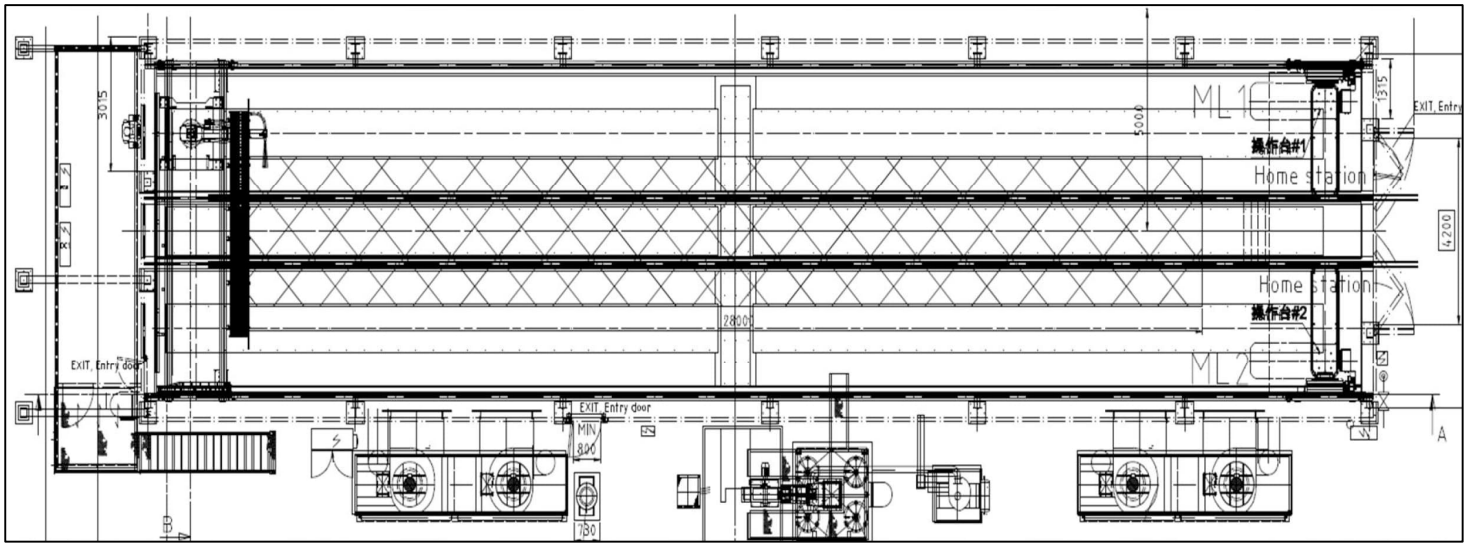
The blast room is equipped with one Blastman B20S robot and 2 x B16MLG manlifts. The robot arm is equipped with two 16 mm blast nozzles. Manlifts are used for inspection and occasional manual blasting. Blastman also delivered the abrasive handling system, ventilation, as well as the blast chamber. Blastman blasting system is applicable with offline programing tool, which allows operator making robot blasting system off-site and meanwhile improves the availability and efficiency of the robot dramatically.

RESULTS

The required roughness and cleanliness were reached in given cycle time and only some internal areas need manual touch up.
Due to optimized operation and programming of the robot the required surface roughness and cleanliness Sa 2 ó have been achieved.

TECHNICAL INFORMATION

Nozzle diameter	16 mm
Number of nozzles/robot	2
Blasting pressure	7 bar
Blasting rate	2,5 hours per car
Abrasive	Corundum
Degrees of freedom	8
Programming	Point-to-Point / Offline
Operation mode	Automatic



CRRC ZHUZHOU LOCOMOTIVE CO., LTD

Hunan Zhuzhou Shifeng, China

DELIVERY IN 2023

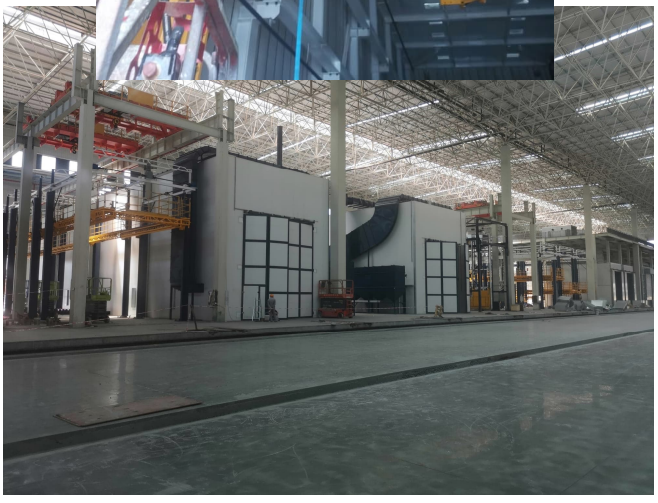
4 x Blastman B20S G4 robots

4 x B16ML manlifts

4 x BP1100 blast pots

4 x manual blast pots

4 x booth camera



OBJECTIVE

Automate blast cleaning

Improve quality and efficiency

Improve health and safety of operators

PROCESS INFORMATION

Workpiece

- Blast cleaning passenger coaches

Workpiece condition

- New production, rust grade A-B

Pressure

- 6-8 bar

Abrasive

-Corundum

Nozzle / robot

- 2 x 16 mm per/robot

Efficiency

- 200 m2/h

Typical manual blasting efficiency

- 10 m^2/h per worker for a similar process

Cleanliness

- Sa 2,5

DI ENVIRONNEMENT – 2ND LINE

Chalindrey, France

DELIVERY IN 2021

Blastman B20S robot

Blastman BP1100 blast pot

Blastman Studio

Abrasive handling and ventilation

OBJECTIVE

Automate blast cleaning

Improve quality and efficiency

Improve health and safety of operators

PROCESS INFORMATION

Workpiece

- Decommissioned passenger coaches

Workpiece condition

-Thick existing insulation layer with asbestos

Pressure

- 9 bar

Abrasive

- Steel grit

Nozzle / robot

- 1 x 19 mm

Efficiency

- 12/h per coach

Typical manual blasting efficiency

- 10 m^2/h per worker for a similar process

Cleanliness

- Sa 2,5

STADLER VALENCIA

Valencia, Spain

DELIVERY IN 2020

Blastman B20S robot

Blastman BP1400 blast pot

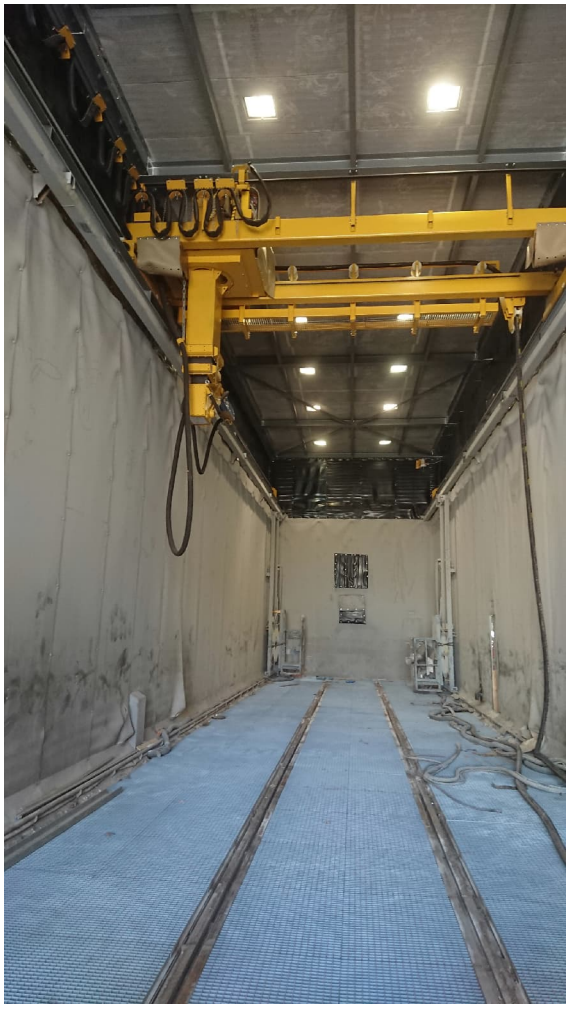
Abrasive handling upgrade

OBJECTIVE

Automate blast cleaning

Improve quality and efficiency

Improve health and safety of operators



PROCESS INFORMATION

Workpiece

- Passenger coaches

Workpiece condition

- New production, rust grade A-B

Pressure

- 8 bar

Abrasive

- Aluminium oxide

Nozzle / robot

- 1 x 16 mm

Efficiency

- 3,5 hours per car ~ 150 m^2/h

Typical manual blasting efficiency

- 10-15 m^2/h per worker for a similar process

Cleanliness

- Sa 2,5

DI ENVIRONNEMENT – 1ST LINE

Chalindrey, France

DELIVERY IN 2020

Blastman B20S robot

Blastman BP1100 blast pot

Blastman Studio

Complete blast room

OBJECTIVE

Automate blast cleaning

Improve quality and efficiency

Improve health and safety of operators

PROCESS INFORMATION

Workpiece

- Decommissioned passenger coaches

Workpiece condition

-Thick existing insulation layer with asbestos

Pressure

- 9 bar

Abrasive

- Steel grit

Nozzle / robot

- 1 x 19 mm

Efficiency

- 12/h per coach

Typical manual blasting efficiency

- 10 m^2/h per worker for a similar process

Cleanliness

- Sa 2,5

CRSC

Changsha, China

DELIVERY IN 2017

Blastman B20S robot

2 x Blastman B16ML manlifts

Blast chamber designs

OBJECTIVE

Automate blast cleaning

Improve quality and efficiency

Improve health and safety of operators

PROCESS INFORMATION

Workpiece

- Passenger coaches

Workpiece condition

- New production, rust grade A-B

Pressure

- 8 bar

Abrasive

- Aluminium oxide

Nozzle / robot

- 2 x 16 mm

Efficiency

- 3,5 hours per car ~ 150 m^2/h

Typical manual blasting efficiency

- 10-15 m^2/h per worker for a similar process

Cleanliness

- Sa 2,5

BOMBARDIER TRANSPORTATION

Derby, United Kingdom

DELIVERY IN 2017

Blastman B20S robot

Blastman BP1100 blast pot

Offline programming software

Control room

Camera system

OBJECTIVE

Automate blast cleaning

Improve quality and efficiency

Improve health and safety of operators

PROCESS INFORMATION

Workpiece

- Passenger coaches

Workpiece condition

- New production, rust grade A-B

Pressure

- 8 bar

Abrasive

- Stainless grit

Nozzle / robot

- 1 x 19 mm

Efficiency

- 120 m^2/h

Typical manual blasting efficiency

- 10-15 m^2/h per worker for a similar process

Cleanliness

- Sa 2,5 / Sa 3

STADLER

Bussnang, Switzerland

DELIVERY IN 2017

Blastman B20S robot

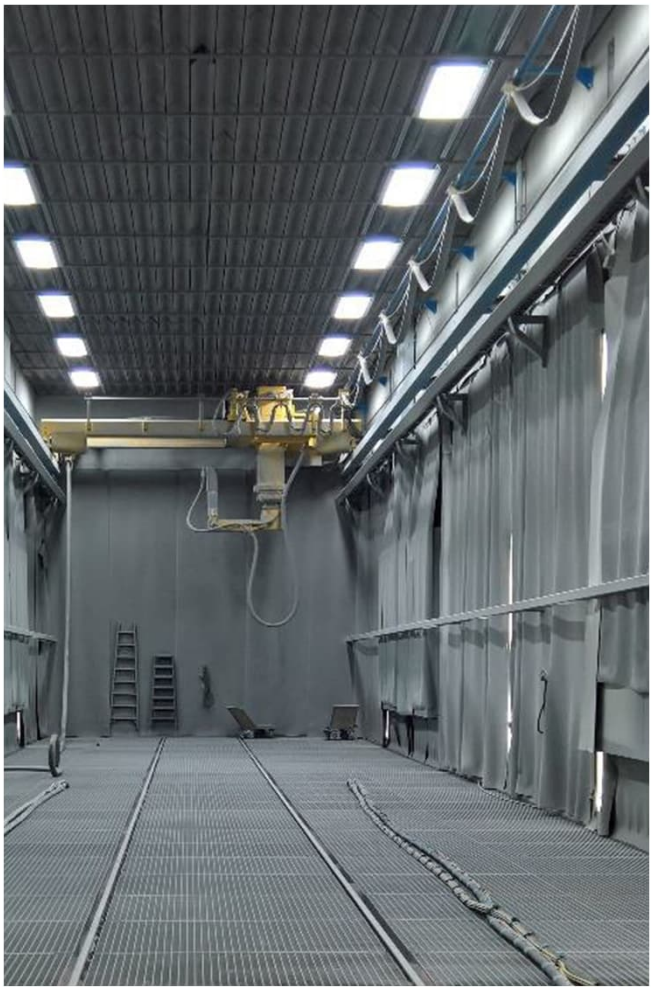
Blastman BP1100 blast pot

2 x Blastman B16ML manlifts

Offline programming software

Blast room modification design

Abrasive handling update



OBJECTIVE

Automate blast cleaning

Improve quality and efficiency

Improve health and safety of operators

PROCESS INFORMATION

Workpiece

- Passenger coaches

Workpiece condition

- New production, rust grade A-B

Pressure

- 7,5 bar

Abrasive

- Aluminium oxide

Nozzle / robot

- 2 x 16 mm

Efficiency

- 2,5 h for car exterior ~120 m^2/h

Typical manual blasting efficiency

- 10-15m^2/h per worker for a similar process

Cleanliness

- Sa 2,5 / Sa 3

BOMBARDIER TRANSPORTATION

Wroclaw, Poland

DELIVERY IN 2016

Blastman B20S robot

Blastman BP1100 blast pot

4 x Blastman B16ML manlifts

Blast chamber and inspection chamber

2 x abrasive handling

2 x ventilation system

OBJECTIVE

Automate blast cleaning

Improve quality and efficiency

Improve health and safety of operators

PROCESS INFORMATION

Workpiece

- Passenger coaches

Workpiece condition

- New production, rust grade A-B

Pressure

- 8 bar

Abrasive

- Aluminium oxide

Nozzle / robot

- 2 x 16 mm

Efficiency

- 8 h per car

Typical manual blasting efficiency

- 10-15 m^2/h per worker for a similar process

Cleanliness

- Sa 2,5 / Sa 3

RANDON S/A IMPLEMENTOS E PARTICIPACOES

Caxias do Sul, Brazil

DELIVERY IN 2015

2 x Blastman B20S robot

2 x Blastman BP1100 blast pot

Abrasive handling

Offline programming software

OBJECTIVE

Automate blast cleaning

Improve quality and efficiency

Improve health and safety of operators

PROCESS INFORMATION

Workpiece

- Passenger coaches

Workpiece condition

- New production, rust grade A-B

Pressure

- 8 bar

Abrasive

- Steel grit

Nozzle / robot

- 2 x 19 mm per robot

Efficiency

- 300-500 m^2/h

Typical manual blasting efficiency

- 10-15 m^2/h per worker for a similar process

Cleanliness

- Sa 2,5 / Sa 3

CRRC NANJING PUZHEN

Nanjing, China

DELIVERY IN 2013

Blastman B20S robot

Blast room modification

Abrasive handling

OBJECTIVE

Automate blast cleaning

Improve quality and efficiency

Improve health and safety of operators

PROCESS INFORMATION

Workpiece

- Passenger coaches

Workpiece condition

- New production, rust grade A-B

Pressure

- 8 bar

Abrasive

- Aluminium oxide

Nozzle / robot

- 2 x 16 mm

Efficiency

- 3 hours per car ~150 m^2/h

Typical manual blasting efficiency

- 10-15 m^2/h per worker for a similar process

Cleanliness

- Sa 2,5 / Sa 3

CHENGDU XINZHU

Chengdu, China

DELIVERY IN 2013

Blastman B20S robot

2 x Blastman B16ML manlifts

OBJECTIVE

Automate blast cleaning

Improve quality and efficiency

Improve health and safety of operators

"We imported a set of automatic sand blasting robot from Blastman for blast cleaning the surface of aluminum car body in 2013. The operation of the equipment is stable, and the efficiency is high. It has greatly reduced the labor forces on the manual sand blasting and protect them from the harsh sandblasting environment.
We are satisfied the operation and production of the Blastman automatic robot equipment."

CRRC Zhengzhou Rail Transit Co., Ltd

PROCESS INFORMATION

Workpiece

- Passenger coaches

Workpiece condition

- New production, rust grade A-B

Pressure

- 6,5 bar

Abrasive

- Aluminium oxide and steel grit

Nozzle / robot

- 2 x 16 mm

Efficiency

- 3 hours per car ~150 m^2/h

Typical manual blasting efficiency

- 10-15 m^2/h per worker for a similar process

Cleanliness

- Sa 2,5 / Sa 3

BOMBARDIER

Crespin, France

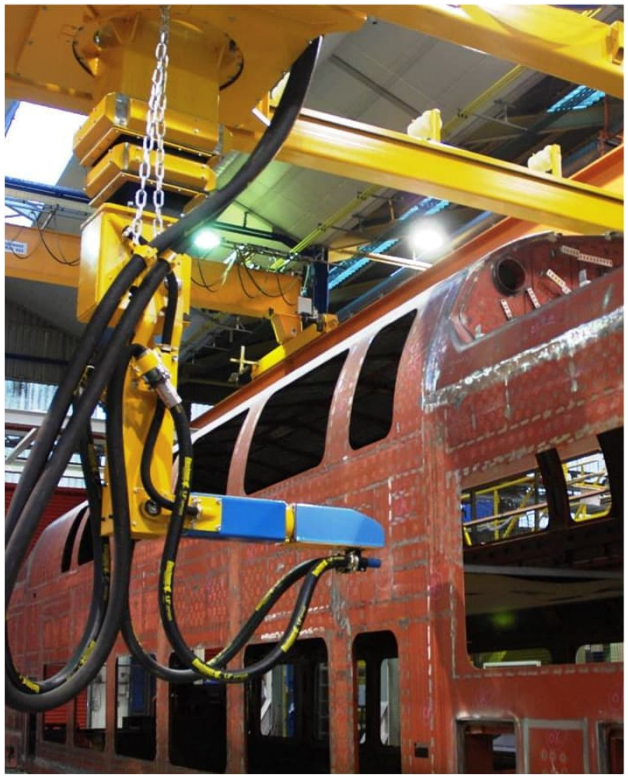
DELIVERY IN 2013

Blastman B20S robot

2 x Blastman B16ML manlifts

2 x Blastman BP350 blast pots

Robot programs



"Our production efficiency increased by a total of 40% with the Blastman solution. The actual payback time has been two years and four months."

Sébastien Marino, Bombardier, France

OBJECTIVE

Automate blast cleaning

Improve quality and efficiency

Improve health and safety of operators

PROCESS INFORMATION

Workpiece

- Passenger coaches

Workpiece condition

- Primary coated workpieces

Pressure

- 7 bar

Abrasive

- Aluminium oxide

Nozzle / robot

- 2 x 16 mm

Efficiency

- 70-100 m^2/h

Typical manual blasting efficiency

- 10-15 m^2/h per worker for a similar process

Cleanliness

- Sa 2,5 / Sa 3

CSR GUANGDONG, CHINA

CSR Rail VehicleCo., Jinagmen

DELIVERY IN 2012

Blastman B20S robot

2 x Blastman B16ML manlifts

OBJECTIVE

Automate blast cleaning

Improve quality and efficiency

Improve health and safety of operators

PROCESS INFORMATION

Workpiece

- Passenger coaches

Workpiece condition

- New production, rust grade A-B

Pressure

- 6,5 bar

Abrasive

- Aluminium oxide

Nozzle / robot

- 2 x 19 mm

Efficiency

- 4 hours per car ~ 150 m^2/h

Typical manual blasting efficiency

- 10-15 m^2/h for a similar process

Cleanliness

- Sa 2,5 / Sa 3

CRRC NANJING PUZHEN

Nanjing, China

DELIVERY IN 2011

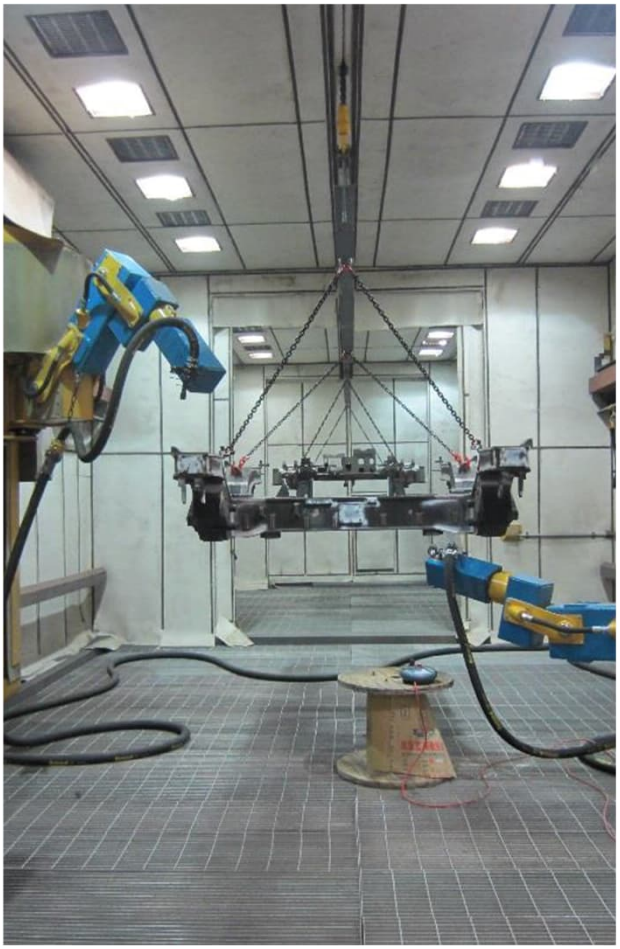
2 x Blastman B16S robots

OBJECTIVE

Automate blast cleaning

Improve quality and efficiency

Improve health and safety of operators



PROCESS INFORMATION

Workpiece

- Boogie frames for passenger coaches

Workpiece condition

- New production, rust grade A-B

Pressure

- 7 bar

Abrasive

- Steel grit

Nozzle / robot

- 1 x 16 mm per robot

Efficiency

- 2 bogie frames per hour

Typical manual blasting efficiency

- 10-15 m^2/h for a similar process

Cleanliness

- Sa 2,5 / Sa 3

CSR QINGDAO, CHINA

CSR Qingdao Sifang Co.

DELIVERY IN 2011

Blastman B20 robot

2 x Blastman B16ML manlifts

Abrasive handling

OBJECTIVE

Automate blast cleaning

Improve quality and efficiency

Improve health and safety of operators

PROCESS INFORMATION

Workpiece

- Passenger coaches

Workpiece condition

- New production, rust grade A-B

Pressure

- 6 bar

Abrasive

- Aluminium oxide

Nozzle / robot

- 2 x 16 mm

Efficiency

- 3,5 hours per car ~ 150m^2/h

Typical manual blasting efficiency

- 10-15 m^2/h per worker for a similar process

Cleanliness

- Sa 2,5 / Sa 3

BOMBARDIER

ČeskáLípa, Czech Republic

DELIVERY IN 2011

Blastman B20 robot

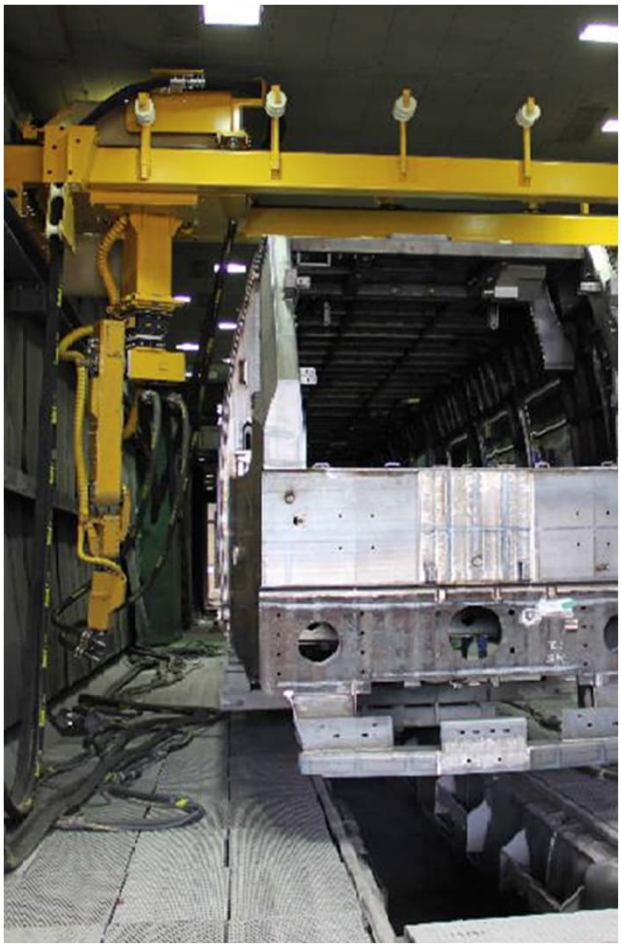
Blastman BP350 blast pot

OBJECTIVE

Automate blast cleaning

Improve quality and efficiency

Improve health and safety of operators



PROCESS INFORMATION

Workpiece

- Passenger coaches

Workpiece condition

- New production, rust grade A-B

Pressure

- 8 bar

Abrasive

- Aluminium oxide

Nozzle / robot

- 2 x 19 mm

Efficiency

- 120 m^2/h

Typical manual blasting efficiency

- 10-15 m^2/h per worker for a similar process

Cleanliness

- Sa 2,5 / Sa 3

ALSTOM TRANSPORT

Salzgitter, Germany

DELIVERY IN 2011

2 x Blastman B20C robot

OBJECTIVE

Automate blast cleaning

Improve quality and efficiency

Improve health and safety of operators

"We are already operating with the third generation Blastman robots. Maintenance costs are low, even though we use the robots in three shifts."

Andre Sunke, Alstom, Germany

PROCESS INFORMATION

Workpiece

- Passenger coaches

Workpiece condition

- New production, rust grade A-B

Pressure

- 8 bar

Abrasive

- Garnet

Nozzle / robot

- 1 x 19 mm per robot

Efficiency

- 2 car bodies per shift ~ 180 m^2/h

Typical manual blasting efficiency

- 10-15 m^2/h for a similar process

Cleanliness

- Sa 2,5 / Sa 3

BOMBARDIER SIFANG TRANSPORTATION LTD

Qingdao, China

DELIVERY IN 2011

Blastman B20 robot

2 x Blastman B16ML manlifts

Abrasive handling system

"In order to continue enhancing Bombardier car finishing facilities and to release human from harsh work environment, we became the first railcar manufacturer in China to realize robot blasting of interior and exterior of the car bodies by choosing Blastman as a turnkey delivery partner.
Blastman blast robot has been continuous under operation and cleaning bodies of passenger coaches since December 2010. Robot plant has met our requirement by providing high surface quality and the capacity of 8 hours per car body.
Blastman service team provides fast and efficient support to keep robot perform reliably. Blastman is a valued partner within our organization. "

Bombardier Sifang (Qingdao) Transportation Ltd

OBJECTIVE

8 hours per car body

Improve quality and automation level

Improve health and safety of operators

PROCESS INFORMATION

Workpiece

- Passenger coaches

Workpiece condition

- New production, rust grade A-B

Pressure

- 6 bar

Abrasive

- Aluminium oxide

Nozzle / robot

- 2 x 16 mm

Efficiency

- 3,5 hours per car ~150 m^2/h

Typical manual blasting efficiency

- 10-15 m^2/h per worker for a similar process

Cleanliness

- Sa 2,5

ALSTOM FERROVIARIA S.p.A.

Savigliano, Italy

DELIVERY IN 2010

Blastman B20 robot

2 x Blastman B16ML manlifts

Blastman BP350 blast pot

OBJECTIVE

Automate blast cleaning

Improve quality and efficiency

Improve health and safety of operators

PROCESS INFORMATION

Workpiece

- Passenger coaches

Workpiece condition

- New production, rust grade A-B

Pressure

- 8 bar

Abrasive

- Aluminium oxide

Nozzle / robot

- 1 x 19 mm

Efficiency

- 4,5 h per car ~120 m^2/h

Typical manual blasting efficiency

- 10-15 m^2/h per worker for a similar process

Cleanliness

- Sa 2,5

ALSTOM TRANSPORTE S.A.

Perpétua, Spain

DELIVERY IN 2009

Blastman B20 robot

2 x Blastman B16ML manlifts

Blastman BP350 blast pots

Blast room modifications

OBJECTIVE

Automate blast cleaning

Improve quality and efficiency

Improve health and safety of operators

PROCESS INFORMATION

Workpiece

- Passenger coaches

Workpiece condition

- New production, rust grade A-B

Pressure

- 8 bar

Abrasive

- Aluminium oxide

Nozzle / robot

- 1 x 19 mm

Efficiency

- 120 m^2/h

Typical manual blasting efficiency

- 10 -15m^2/h per worker for a similar process

Cleanliness

- Sa 2,5

ALSTOM FERROVIARIA S.p.A.

Colleferro, Italy

DELIVERY IN 2007

Blastman B20LW robot

OBJECTIVE

Automate blast cleaning

Improve quality and efficiency

Improve health and safety of operators

PROCESS INFORMATION

Workpiece

- Passenger coaches

Workpiece condition

- New production, rust grade A-B

Pressure

- 8 bar

Abrasive

- Aluminium oxide

Nozzle / robot

- 1 x 19 mm

Efficiency

- 100 m^2/h

Typical manual blasting efficiency

- 10-15 m^2/h per worker for a similar process

Cleanliness

- Sa 2,5

RAIL COACH FACTORY

Kapurthala, India

DELIVERY IN 2005

2 x Blastman B20C robots

2 x Blastman BP350 blast pots

Blast room modifications

OBJECTIVE

Automate blast cleaning

Improve quality and efficiency

Improve health and safety of operators

PROCESS INFORMATION

Workpiece

- Passenger coaches

Workpiece condition

- New production, rust grade A-B

Pressure

- 8 bar

Abrasive

- Garnet

Nozzle / robot

- 1 x 19 mm

Efficiency

- 100 m^2/h

Typical manual blasting efficiency

- 10-15 m^2/h for a similar process

Cleanliness

- Sa 2,5

ALSTOM LHB

Salzgitter, Germany

DELIVERY IN 2002

2 x Blastman B20C robots

"We are already operating with the third generation Blastman robots. Maintenance costs are low, even though we use the robots in three shifts."

Andre Sunke, Alstom, Germany

OBJECTIVE

Automate blast cleaning

Improve quality and efficiency

Improve health and safety of operators

PROCESS INFORMATION

Workpiece

- Passenger coaches

Workpiece condition

- New production, rust grade A-B

Pressure

- 8 bar

Abrasive

- Garnet

Nozzle / robot

- 1 x 19 mm per robot

Efficiency

- 2 car bodies per shift

Typical manual blasting efficiency

- 10-15 m^2/h for a similar process

Cleanliness

- Sa 2,5 / Sa 3

Blastman Robotics Ltd

Blastman Robotics Ltd
Kiertorata 17
FI-90440 Kempele
FINLAND

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

www.blastman.com