

Bombardier Transportation Facilities in China



Three Manufacturing Joint Ventures

BOMBARDIER

Introduction

Bombardier Transportation is a leading provider of rail equipment, systems and services to China, and is actively supporting the country's development of urban mass transit and intercity rail systems.

BT's presence in China includes three manufacturing joint ventures and three wholly foreign owned enterprises, along with offices in Beijing, Shanghai, Guangzhou and Hong Kong. Bombardier and its joint venture partners employ more than 2,500 people in China.

The joint venture facilities at which this brochure looks at in detail, serve three sectors of the Chinese rail equipment market:

- Bombardier-Sifang-Power (Qingdao) Transportation Ltd. (BSP), established in 1998, manufactures passenger rail cars and rolling stock
- Changchun Bombardier Railway Vehicles Co. Ltd. (CBRC), established in 1996, focuses mainly on the production of metro vehicles
- Bombardier CPC Propulsion System Co. Ltd. (BCP), is dedicated to the production, marketing, and maintenance of propulsion equipment





◁ Bombardier Sifang Power (Qingdao) Transportation Ltd. ▷

Bombardier Sifang Power (Qingdao) Transportation Ltd. (BSP) is mainly engaged in the design and manufacture of railway passenger cars and rolling stock.

BSP was jointly established by Bombardier-Power (Mauritius) Ltd. and CSR Sifang Locomotive and Rolling Stock Co. Ltd in 1998. Being the only sino-foreign joint venture for railway passenger rolling stock manufacturing in China, it has become one of the most important manufacturers in this area, within China.

To date BSP has delivered 840 world-class railway passenger cars to China's Ministry of Railways (MOR), including 338 high-grade intercity cars which can travel at speeds of up to 160km/h, 182 high-altitude railway passenger cars, and 40 high-speed EMU trains (electric multiple units).

Almost 1,000 BSP vehicles are currently under operation in Beijing, Shanghai, Guangzhou, Shenzhen, Zhengzhou, Shenyang and other railway hub cities in China.

Facts and Figures

Location: Qingdao, Shandong Province

Shareholders: Bombardier Holding (Mauritius) Ltd. (50%), CSR Sifang Rolling Stock Co., Ltd (50%)

Investment: Total investment is US\$ 72.39 million including US\$ 44.12 million for registered capital

Business activities: Design and manufacture of high grade rail passenger cars, passenger car bodies, EMUs, luxury double deck passenger cars, high-speed railway passenger cars, sales of the products manufactured by BSP in addition to after-sales services

Company area: 151,038 square meters in total, in which the construction area makes up 73,123 square meters, including 62,757 square meters of original buildings and 10,366 square meters of new buildings

Production capacity: 350 high-grade cars and assembly of 400 EMU cars per year

Employees: Approximately 1,400 employees



Shear-cutting



Laser-cutting



Roof



End floor

Milestones

27 November 1997

President Jiang Zemin of the People's Republic of China and Prime Minister Jean Chretien attended the signing ceremony of a Memorandum of Understanding (MOU) to establish a joint venture which would manufacture high grade railway passenger cars in China

27 November 1998

A year later the BSP joint venture was established

12 November 1999

The site received its first order for 300 high grade railway cars from China's Ministry of Railways (MOR)

17 November 1999

The company held its first board meeting

19 July 2000

A ceremony was held to mark the start of construction at the new site

17 October 2001

The inauguration ceremony of the new site took place

31 December 2002

BSP delivered the first high grade railway passenger car to MOR

3 January 2004

Awarded the ISO 9001: 2000 Certificate



Trainset testing (dynamic) line



Skeleton of sidewall



End wall

- 1 EMU Final Assembly Workshop
- 2 Trainset Test Shop for EMU
- 3 EMU Storage Area
- 4 Carbody Shop
- 5 Single Car Test Shop
- 6 Final Assembly Shop
- 7 Glung Shop
- 8 Man Office
- 9 Propane Station
- 10 Steel Yard
- 11 Paint Shop
- 12 Paint Preparation Shop
- 13 Grit Blast

- EMU
- High Grade Car
- New Building
- BSP Borderline

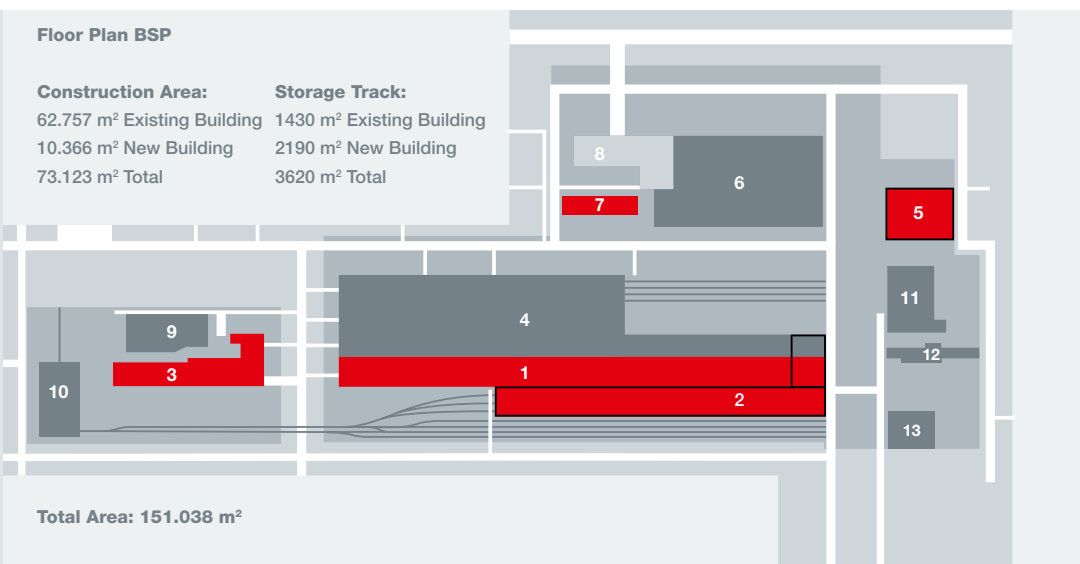
Floor Plan BSP

Construction Area:

62.757 m² Existing Building
10.366 m² New Building
73.123 m² Total

Storage Track:

1430 m² Existing Building
2190 m² New Building
3620 m² Total





Major Orders Delivered

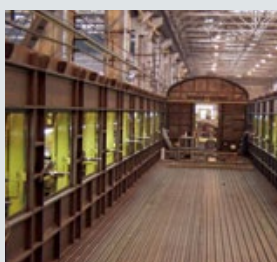
- A contract was signed with MOR for 300 high grade cars in November 1999
- An additional 38 high grade cars were ordered by MOR in August 2003
- 20 eight-car high-speed EMU trainsets (160 cars) were ordered by MOR and Guangshen Railway Co. in October 2004
- 173 high altitude railway passenger cars were ordered by MOR and Qing-Zang Railway Co. in February 2005
- 20 eight-car high-speed EMU trainsets (160 cars) were ordered by MOR and Guangzhou Railway Co. in May 2005
- An additional 9 high altitude railway passenger cars order from MOR and Qing-Zang Railway Co. in November 2006

Major Backlog Orders

- 49 high altitude luxury tourist railway passenger cars were ordered from RailPartner in April 2007
- A contract was signed for 40 sixteen-car high-speed EMU trains with MOR in October 2007

Bending

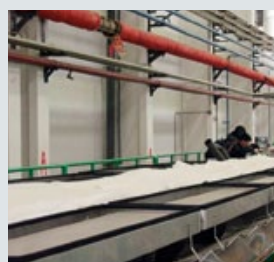




Final assembly of carbody



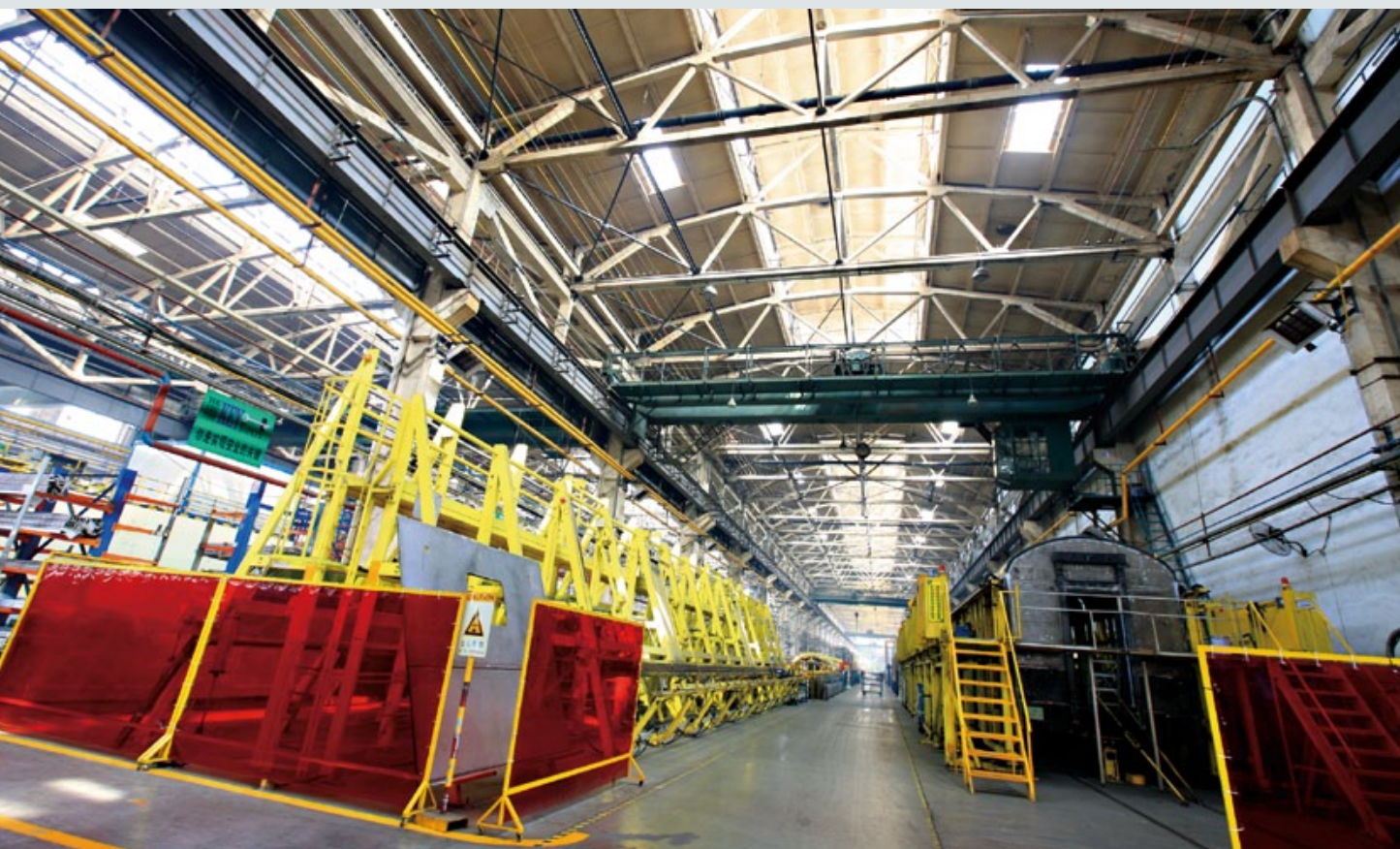
Final assembly of carbody



Roof sub-assembly



Final assembly of carbody
(roof installation)



EMU manufacture facilities



Assembly of driver cab



Final assembly for high-altitude railway passenger car



Painting of the whole car



◁ Changchun Bombardier Railway Vehicles Company Ltd. ▷

Changchun Bombardier Railway Vehicles Company, Ltd (CBRC) focuses mainly on metro car production, and has been approved by the National Development and Reform Commission of China as a Designated Localization Enterprise (DLE).

CBRC was established as a joint venture by Bombardier-Power (Mauritius) Ltd. and Changchun Railway Vehicles Co. Ltd (CRC) in 1997. The joint venture is based within the CRC campus in Changchun, the capital city of Jilin Province.

In order to meet the manufacturing demands of its orders, it expanded its vehicle production base to approximately 30,000 square meters in 2008. Today the CBRC site consists of self-contained workshops, test facilities and offices.

Facts and Figures

Location: Changchun, the capital city of Jilin Province

Shareholders: Bombardier Holding (Mauritius) (50%), Changchun Railway Vehicles Co. Ltd (50%)

Investment: Total registered capital amounts to RMB 240 million

Business activities: Develop, manufacture and assembly of metro cars, light rail vehicles, commuter trains, and aluminum carbodies

Company area: Total area 77,800 square meters. This includes three main buildings for pre-assembly, bogie assembly, final assembly and test; warehouses; a test hall with 4 x 160m elevated tracks - equipped with the most advanced testing equipment for full trainset test, plus access to CRC's 2 km test track for commissioning

Production capacity: Approximately 500 metro cars per year

Employees: Approximately 500 employees

Milestones

19 March 1997

The Changchun Bombardier Railway Vehicles Company Ltd was established

November 2002

Delivery of its first metro train

26 March 2004

Awarded ISO 9001: 2000 Certification

October 2005

CBRC named as a "Red List Enterprise" by the General Administration of Customs (GAC) of China

6 June 2006

The company delivered the 1000th Bombardier Transportation metro car in China to the Guangzhou Line 1 & 2, which also happened to be the fourth train to be delivered to the customer on the project

March 2008

CBRC received the „2007 Excellent Supplier“ award from Guangzhou Rail Transit project

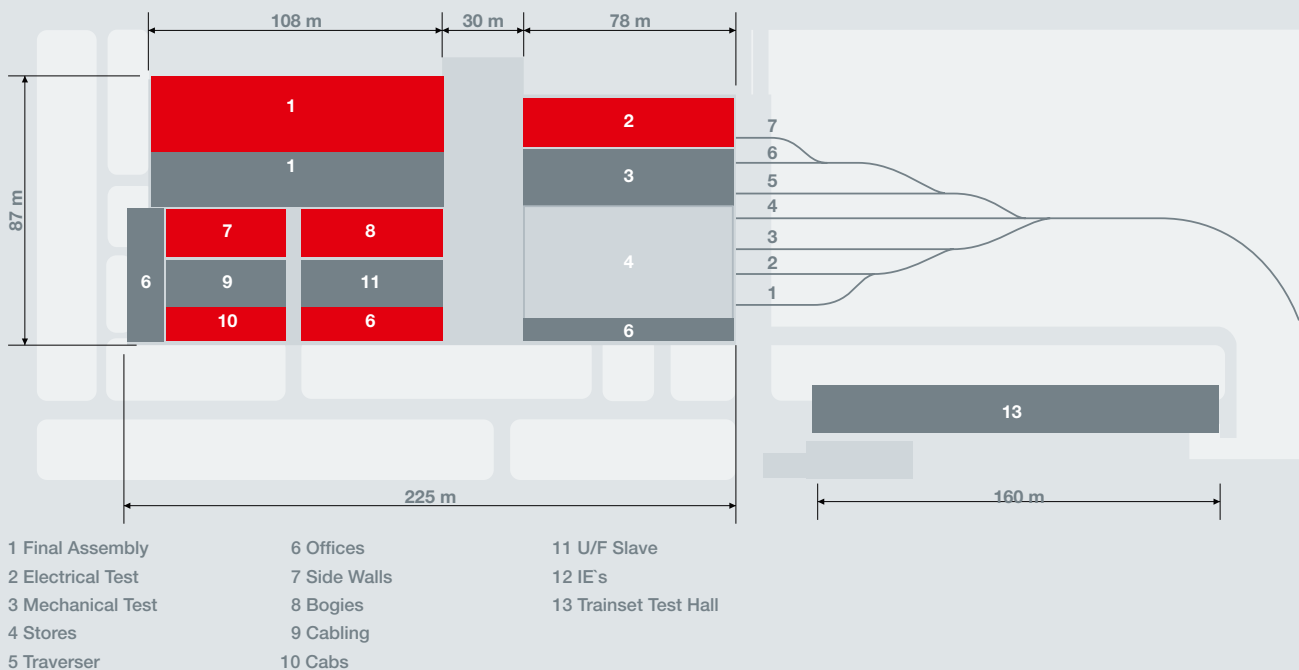
Major Orders Delivered

- A contract was signed for 26 trainsets (156 cars) with the Guangzhou Metro Corporation for the Guangzhou Line 2, in August 2000
- 19 trainsets (114 cars) were ordered for the Shenzhen Metro Corporation for the first phase of the Shenzhen Metro in December 2001
- An additional 3 trainsets (18 cars) were ordered from Shenzhen Metro Corp. for Shenzhen Metro Phase 1 in December 2002
- A contract was signed for 10 trainsets (60 cars) for the Shanghai Shentong Metro Group Co. Ltd., and Shanghai Metro Operation Co. Ltd., for Shanghai Line 1 in December 2002
- 48 metro cars were ordered by the Guangzhou Metro Corporation for supplementary cars of Guangzhou Metro Line 1 & 2 in October 2004

Major Backlog Orders

- 306 cars were ordered from Shanghai Shensong Line Mass Transit Co. Ltd., in November 2006
- 192 cars from Shanghai Rail Transit Line 7 Development Co. Ltd. in April 2007

Floor Plan CBRC





Cable loom



Bogie compression test after assembly



Roof overturn machine



Final assembly



Under frame pre assembly in under frame jig



Static testing shop



Vehicle gauge test equipment



Rinsing test-station



◁ Bombardier CPC Propulsion System Company Ltd. ▷

Bombardier CPC Propulsion System Company Ltd. (BCP) is dedicated to the production, marketing, and maintenance of propulsion equipment for rail vehicles. The company was jointly established by Bombardier-Power (Mauritius) Ltd. (BPML) and Changzhou Railcar Propulsion Engineering R&D Center (CPC) in 2003.

BCP currently houses two separate workshops for converter assembly and traction motor production with a technical capacity for more than 350,000 production hours per year.



Rotor area

Facts and Figures

Location: Changzhou, Jiangsu Province, in the Yangtze-river delta about 180 km northwest to Shanghai

Shareholders: Bombardier Holding (Mauritius) (50%), CPC (50%)

Investment: Total registered capital amounts to 3.5 million EURO

Company area: 18,000 square meters (by end 2008) of which the office area is 2,000 square meters

Business activities: production, marketing of propulsion equipment for metro, EMU and locomotives. Main products include converter and auxiliary converter, traction motors and gears, train control management system (TCMS)

Production capacity: Production of 1500 medium and low power converter and 2000 traction motors per year. By the end of 2008 the plan is to increase the capacity to the production of 720 traction converter, 250 AFC and 1440 traction motors for locomotives

Employees: Approximately 400 employees



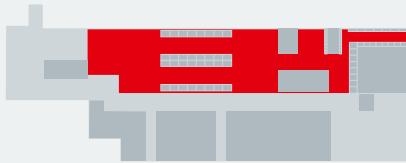
Traction motor in the testing bed



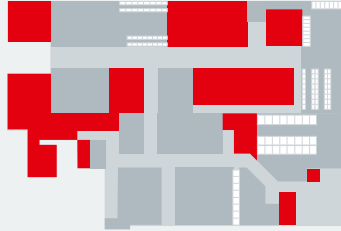
Rotor bar spreading

Floor Plan CBRC

Converter Workshop Second Floor Layout



Converter Workshop First Floor Layout



Motor Workshop Layout



Motor final assembly line

Milestones

January 2003:

The BCP joint-venture was established

August 2004:

BCP delivered the first train set for the Tehran Metro Line 1, extension project

July 2005:

Awarded the ISO 9001 V2000 Certificate in July 2005

April 2006:

BCP took the decision to implement traction motor localization

May 2006:

BCP received a third capital injection of 450k EURO from Bombardier Power (Mauritius) Ltd.

October 2006:

Awarded both ISO 14001 and OHSAS 18001 Certifications

February 2008:

Awarded IRIS Certification

March 2008:

The BCP Training Centre officially opened

Major Orders Delivered

- In November 2003 a Propulsion and control system supply contract for CRC was won for 105 metro cars, for the extension line of the Tehran Metro Line 1
- Propulsion equipment for a high-speed EMU order was received in May 2005
- Follow-up contract signed for Tehran Metro with CRC in June 2005
- Propulsion equipment for the Guangzhou Line 1 & 2 extension project signed with CBRC in June 2005

Major Backlog Orders

- Propulsion and control system for Beijing Line 4 contract received in May 2006
- Propulsion and control system for Shanghai Line 9 contract was received in November 2006
- An order was won with Dalian 500 freight electric locomotives for a Propulsion and control system in February 2007
- A Propulsion and control system for Shanghai Line 7 order awarded in May 2007
- Propulsion and control system for Shenzhen Line 1 was won in May 2007
- Propulsion equipment for high-speed EMU order received together with Bombardier and BSP in October 2007



Sand blasting machine



EFD rotor brazing machine

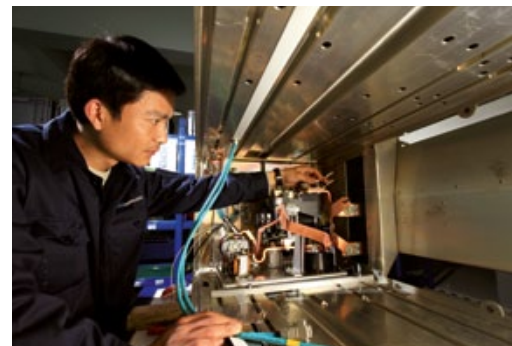
Lathe machine



Generator and transformer for motor testing lab



Hydraulic press machine for rotor stacking



Final assembly – ACM box of Shanghai Line 9 metro car



Motor test monitor

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