glass WORLDWIDE

World's largest foam glass gravel plant commissioned

When looking for a partner to help set up a foam glass gravel plant, Russia's ICM Glass Kaluga turned to Schaumglas Global Consulting. Dr Arjen Steiner describes their collaborative efforts.

Founded in 2007, Schaumglas Global Consulting GmbH (SGGC) has quickly completed projects in Europe, the USA and Russia, developing into a successful worldwide equipment supplier for foam glass production.

The objective for the Kaluga project in Russia was to set up a production facility to produce 300,000m^3 of foam glass gravel annually from recycled glass cullet. This included on the one hand equipment to convert existing cullet (up to 6mm edge length) into a suitable fine glass powder with a d_{90} < 100µm and on the other hand the equipment to produce the foam glass gravel. The plant was successfully commissioned in December 2013.

SGGC supplied all equipment for mixing and dosing, as well as the foaming part of the project. In addition, the company provided complete engineering services for the technological part as well as basic engineering for the civil engineering part of the project. It also managed the implementation of the crushing and milling technology, which was provided by Hosokawa Alpine, a business located at Augsburg, Germany.

PRODUCTION ELEMENTS

The complete foam glass production plant consists of a milling system incorporating a ball mill with a capacity of six tonnes/h and two so-called tandem lines for foam glass production. Each tandem consists of two large glass powder silos (120m^3 each), storage vessels for sodium waterglass and glycerin, a mixing and dosing station and two kilns. Each kiln has a usable width of 2.2m and a tunnel length of 25m.

With this setup of four kilns and two raw material preparation systems, ICM Glass Kaluga can operate the plant with a high degree of freedom to adapt to the local requirements of the Russian market, as different products and different product properties can be made simultaneously, if required.

The recycling of waste glass is important for sustainable reuse of every country's natural resources. However, recycling glass streams come with impurities, eg ceramic, stone and porcelain (CSP) up to 3%, which cannot be reused in other parts of the glass industry but can be used to produce foam glass gravel. After powder preparation, the powder is mixed with the liquids and is heated in the tunnel kiln having a defined heat profile. The endless produced foam ribbon is broken into pieces by thermal shock after the kiln and the final product can be stored outside without any specific protection.

Internal view of one of the two tandem production lines.

External view of the Kaluga production building.

Production capacity in Germany, Switzerland and Austria amounts to approximately 700,000m^3. With the current project, ICM has established a significant production capacity to be - from the outset - the largest player in the Russian foam glass business and also puts itself in a position to supply enough material to the latest high volume markets, eg road construction.

MATERIAL PROPERTIES

When compressed, the two main properties of the gravel are 1.3:1, heat insulation (λ < 0,079 W/(mK)) and compressive strength (> 510kPa). Therefore, the following main applications exist:

- Perimeter insulation (thermal insulation of the underground).
- Foundations.
- Garden and landscape engineering.
- Road, railway and piping substructures.

Because of its light weight (130kg/m^3 < bulk density > 170kg/m^3) and the properties outlined above, the material is applied increasingly in static areas, where weight and loadbearing capability is critical. ■

ABOUT THE AUTHOR:
Dr Arjen Steiner is CEO at Schaumglas Global Consulting

FURTHER INFORMATION:
Schaumglas Global Consulting GmbH,
Zell am Main, Germany
tel: +49 931 99 17 81 12
email: a.steiner@sgg-consulting.com
web: www.sgg-consulting.com/
www.pennosteklo.ru