Ebawe Anlagentechnik GmbH, 04838 Eilenburg, Germany

Turkmenistan: Large-scale investment in precast technology

Three fully modernised precast plants have been in operation in Turkmenistan for more than a year. 2 carrousel plants, 3 tilting tables, 12 reinforcement machines, 15 moulds for special elements and 18 battery moulds were installed. The engineering company "Turkmen Enjam" which was commissioned by the Turkmenian government to operate the plants, is satisfied following a successful year and is extremely positive about the future of precast technology in the Central Asian country. The company has an experienced project partner at its side in the Progress Group.

Begench Gurbanberdyev, managing director of "Turkmen Enjam".

"I'm convinced that the modern equipment with which we have equipped our three plants will contribute to an increase in precast construction as a percentage of the Turkmenian construction industry to 50% and will raise the precast industry to a new technical level." This statement by Begench Gurbanberdyev, managing director of the "Turkmen Enjam" company, is not without cause. Gurbanberdyev was responsible for the complete modernisation of three precast plants in the Central Asian country and was assigned by the Turkmenian Ministry of Industry to run the modernised plants. The three plants have been successfully producing high-quality solid and sandwich walls, solid slabs, ventilation shafts, stairs and other special elements for over a year now.

State programme for the construction of affordable and modern living space

Turkmenistan has been pursuing a programme of modernisation of various branches of industry for years. A large number of state programmes are intended to drive the development of the Turkmenian industry forwards in the right direction and to promote it. One of the government's primary aims is to make affordable and modern living space available to the population. The precast construction method was allocated an important part in this.

Modernisation of three existing precast plants

With the help of a state programme, three existing precast plants – in the capital city Ashgabat and in the cities of Abadan in the west and Turkmenbat in the east of the country – were to be fully modernised. The goal was to create ideal conditions for modern and efficient production. Following an international selection process, the decision fell on a collaboration with three companies from the Progress Group: Ebawe Anlagentechnik, Progress Maschinen & Automation and Tecnocom.

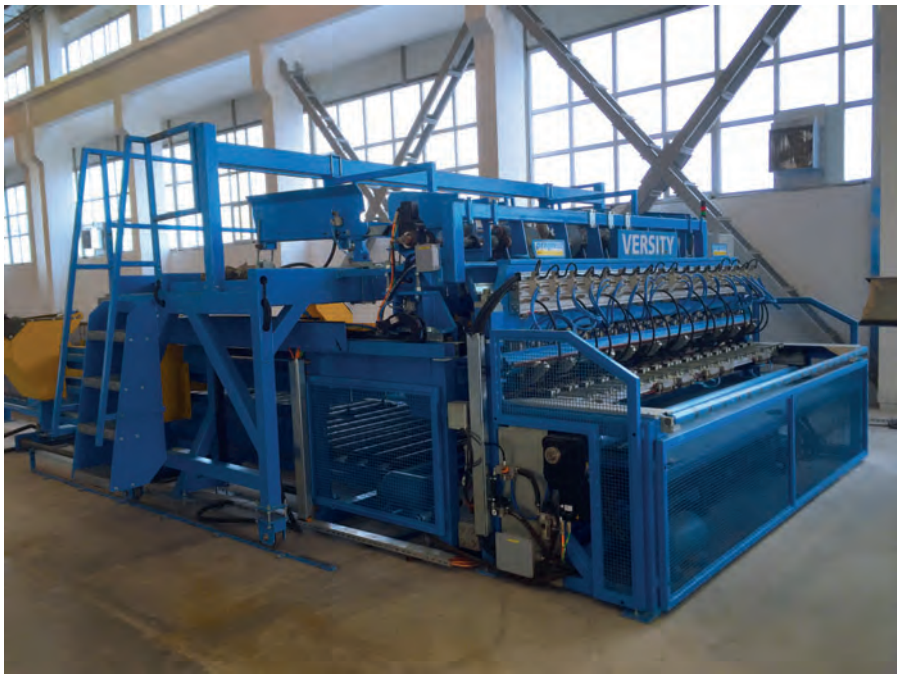
"It was important to us to be able to fulfil the tasks facing us with the new equipment and not only to guarantee high productivity, but also high quality of the end products", explains managing director Gurbanberdyev. "We also evaluated the readiness and possibilities to respond to our special requirements, both now and in the future."

Ebawe Anlagentechnik, which has been operating with success in the region for decades, took on the role of general contractor. "The task of the general contractor was to coordinate all the companies involved and to lead them to a common, ideal result", says Gurbanberdyev. "Progress Group successfully performed this role together with LiCon, its representative for the Russian-speaking region."

Earthquake safety – an important aspect

High importance was attached to earthquake safety in the elaboration of the project and the planning of the precast concrete elements to be produced. "We all still

Affordable and modern living space is to be created with the aid of state programmes. Precast technology is playing a big part in this project.



A mesh welding machine of the type Versity was installed in each of the modernised plants for the production of standard meshes. Stirrups and bars are produced on 9 additional machines.

Solid and sandwich walls are manufactured on two carrousel plants (the picture shows the one in Ashgabat).

remember the earthquake catastrophe from the 5th to the 6th of October 1948, which destroyed Ashgabat", says Gurbanberdyev, underlining the relevance of this topic. Since a large part of Turkmenistan is located in a seismic danger zone, particular attention has to be paid to earthquake-proof construction. "The specialists from our partners have tested our house project, which is to be built with precast concrete elements from the modernised plants, and made the necessary modifications", says a satisfied Gurbanberdyev.

Impressive reinforcement production with 12 machines

One of the changes made was the strengthening of the reinforcement in the precast concrete elements. The material necessary for this is produced mostly off the coil in the three plants on a total of 12 machines, all developed by Progress Maschinen & Automation.

Three compact automatic stirrup bending machines of the type EBA S12 are used for the manufacture of the necessary stirrups. These machines are characterised by high productivity and precise processing – that is ensured by the automatic wire change-over, the automatic roller adjustment and the robust bending system.

A total of six model-ESR straightening machines were supplied to Turkmen Enjam for the straightening, cutting and bending of the bars. The machines process steel in diameters from 4 to 12 mm and are particularly flexible with a high yield at the same time. The proven rotor straightening technology and the flying shear ensure a constant high quality of the bars produced.

The reinforcement production equipment is completed by three mesh welding machines of the type Versity. The machines, which are designed for the series production of standard meshes, are characterised by a high production output. In Turkmenistan the longitudinal bars are placed manually, while the transverse bars are fed automatically. A welding portal with 18 welding heads finally manufactures the necessary meshes.

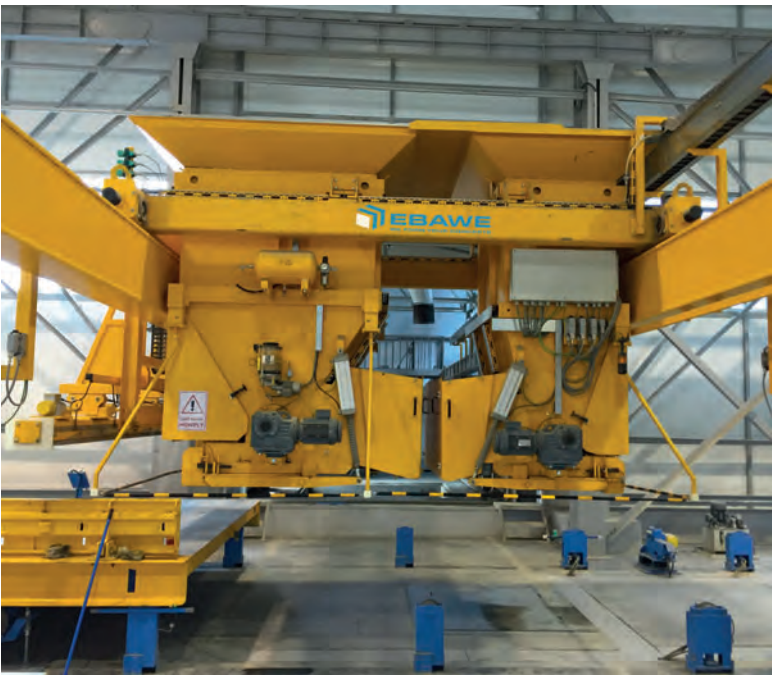
Manufacture of the precast concrete elements

A total of 2 carrousel plants, 18 battery moulds and 3 tilting tables were installed in the three plants for the manufacture of the solid and sandwich walls as well as the solid slabs. 15 further moulds are used for the manufacture of special precast concrete elements such as ventilation shafts, stairs and other special elements.

Two carrousel plants for solid and sandwich walls

The two carrousel plants for the production of solid and sandwich walls were installed in the Ashgabat and Abadan plants. 25 pallets circulate in the plant in Ashgabat and 14 in the plant in Abadan some 20 km away.

At the start of the production process a concrete distributor pours the fresh concrete into the mould, which has already been prepared by inserting the reinforcement. Both concrete distributors are equipped with an additional bucket. This second,



The concrete distributors for the efficient pouring of the fresh concrete were equipped with two buckets. The second, smaller bucket is intended for lightweight or coloured concrete, which can be applied to the precast concrete elements as a facade layer.

smaller bucket is intended for lightweight or coloured concrete, which can be applied to the elements as the top layer.

Intensive compaction of the concrete is provided for by two separate compaction devices, one of which is manufactured as a combination of high-frequency vibrators and a horizontal compaction device, while the other is manufactured as a high-frequency vibration device alone. In both plants the fine smoothing of the concrete surface is finally done with a power trowel. Thanks to this processing step the surface does not need to be machined any further after curing. The elements cure in a total of three stacking racks.

Control by a complete software solution

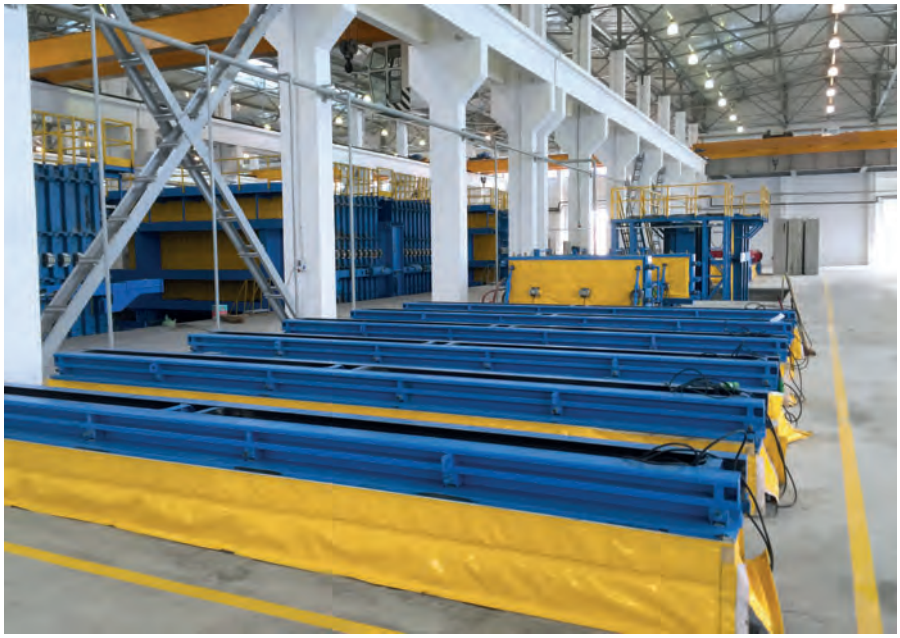
Both plants are controlled by ebos®, a software solution developed by Progress Group especially for precast plants. This overall system accompanies all aspects of the production sequence throughout, from work preparation and production to the process analysis.

ebos' special analysis functions make a major contribution to the planning capability and transparency of the production. By means of a PTS test (Production Test Service), for instance, CAD data can be checked for their production feasibility even before production. With this and other tools, ebos supports the increase of production and helps at the same time to detect deficits, weak points and unnecessary additional costs.

Stationary production: 18 battery moulds, 15 moulds for special elements and several tilting tables

In addition to the two carrousel plants, a total of 18 battery moulds were delivered to all three plants. Nine of them were installed in the Ashgabat plant, seven in Abadan and two in Turkmenabat. High productivity can be achieved in the smallest space using this mould system developed by Tecnocom. Not only that, the concrete elements are given smooth surfaces on both sides. Turkmen Enjam pro-

Solid walls and slabs are manufactured in the smallest space using a total of 18 battery moulds.



Beams (foreground), stairs (centre of picture) and ventilation shafts (background) can be produced using additional moulds, of which there are 15 in total. An integrated heating system accelerates the curing of the concrete.

duces solid walls and slabs measuring 6.5 to 8 m in length and 3.3 to 3.8 m in height using the battery moulds. In addition, several tilting tables are also used in Ashgabat for the production of large and special elements.

Beyond that, 15 moulds are used for the manufacture of special precast concrete elements. For instance, an additional battery mould is used for the production of ventilation shafts. Beams, stairs and stair landings as well as other special elements are manufactured with other moulds.

Turkmen Enjam: Construction with precast concrete elements is trendsetting

Turkmen Enjam is convinced that the right signal has been set by modernising the three precast plants. Managing director Begench Gurbanberdyev puts it more precisely: "Our manufacturing price for one square metre of living space using the precast construction method is about 20% lower than that for the conventional construction method. There are other advantages, too, such as better quality, the speeding up of construction work and the lowering of costs on the building site." Gurbanberdyev is, however, aware that the precast industry itself also has some tasks to do: "It's important that precast concrete construction doesn't close itself to new ideas, that it picks up on modern trends in architecture and that it doesn't represent an obstacle to architectural variety."

FURTHER INFORMATION

Turkmen Enjam
1916 Street/157
Ashgabat,744000, Turkmenistan
T +993 12 328210
F +993 12 328210
info@turkmenenjam.com
www.turkmenenjam.com

Ebawe Anlagentechnik GmbH
Dübener Landstr. 58
04838 Eilenburg, Germany
T +49 3423 6650
F +49 3423 665200
info@ebawe.de
www.ebawe.de

Progress Maschinen & Automation AG
Julius-Durst-Str. 100
39042 Brixen, Italy
T +39 0472 979100
F +39 0472 979200
info@progress-m.com
www.progress-m.com

Tecnocom
Via Antonio Zanussi 305
33100 Udine, Italy
T +39 0432 621222
F +39 0432 621200
info@tecnocom.com
www.tecnocom.com