

High speed hot end coating for hollow glass

Gabriel Chwalek describes the latest coating innovation from GlassChemConsult and the system's success on high speed production lines.

GlassChem's HECSt 1800 hot end coating system for high speed bottle production lines was introduced at the end of 2011. Subsequently, this equipment has been successfully brought into operation on a glass container production line, working at speeds of approximately 600 bottles/min. Prior to the installation, only appropriate floor and conveyor space needed to be prepared, together with the necessary electrical outlets. The installation itself was also uncomplicated, since the glass plant was already acquainted with the hood concept employed, which is the same as a standard hood. Even the exhaust system connections correspond to those of a standard system and consequently, equipment implementation was performed smoothly.

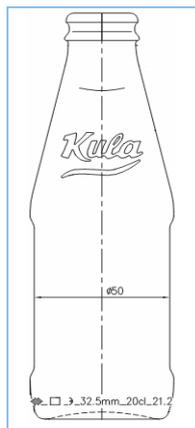
After positioning the system on the conveyor frame and connecting the power supply, start-up was a straightforward process via a touch screen on the electrical panel. This screen allows all necessary modules to be connected or disconnected simply.

VAPOUR GUIDANCE (TRIPLE LOOP)

The MBTC vapour is guided in three loops via three chambers and six circulation blowers. Theoretically therefore, a perfectly even coating is ensured.

Due to the high speed of the bottles on the conveyor belt and - as a consequence - the short contact

Hood	GlassChem
Line	A4
Product	316420 Kula
Date	08.05.2012



ANADOLU CAM YENİŞEHİR SANAYİ A.Ş.											
TEST BOTTLE 1						TEST BOTTLE 2					
0°	90°	180°	270°	Average	Homogeneity	0°	90°	180°	270°	Average	Homogeneity
4 ctu	5 ctu	2 ctu	1 ctu	3,0 ctu	homogeneous	7 ctu	6 ctu	3 ctu	4 ctu	5,0 ctu	homogeneous
9 ctu	10 ctu	8 ctu	3 ctu	7,5 ctu	homogeneous	12 ctu	9 ctu	5 ctu	5 ctu	7,8 ctu	homogeneous
42 ctu	38 ctu	34 ctu	46 ctu	40,0 ctu		44 ctu	40 ctu	38 ctu	45 ctu	41,8 ctu	
49 ctu	46 ctu	38 ctu	58 ctu	47,8 ctu		54 ctu	52 ctu	45 ctu	57 ctu	52,0 ctu	
48 ctu	43 ctu	36 ctu	51 ctu	44,5 ctu		52 ctu	45 ctu	40 ctu	47 ctu	46,0 ctu	

Coating results obtained by a leading glass container producer.

time with the coating vapour, the wind suction stream needs to be broken. This ensures an even cross stream with the vapour. Despite the short transit time in the hood and the fast flow, an even structure of the SnO₂ layer is also ensured.

FINISH PROTECTION

A reliable finish protection system is essential, especially for these bottle types (usually for soft drinks). For this reason, considerable importance has been attached to the development of this special protection.

In alignment to the triple vapour loop system, an appropriate air stream is guided evenly to the bottle finish area. In this way, turbulence - with the result of coating vapour in these finish areas - is avoided.

EXHAUST SYSTEM

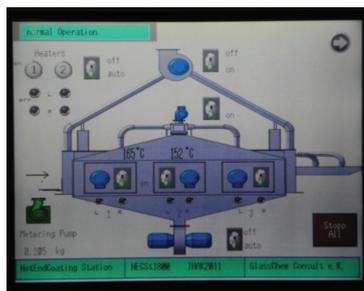
Finish protection is further optimised by a special exhaust system. In addition to the standard exhaust system at the hood entry and exit, the exhaust area at the hood exit is extended.

High production speeds cause a slipstream of coating vapour behind the bottles and this vapour escapes at the hood exit.

In the case of standard bottle production, the vapour is distributed in the ambient area towards the annealing lehr entrance, with the risk of subsequent finish coating. For this special type of hood, the standard exhaust system is adjustable via flaps so that exhaust quantity (eg at hood entry) can be reduced, with the result of increased quantity by the extended exhaust system at the hood exit.



The HECSt 1800 exit exhaust.



The system's user-friendly touch screen.



GlassChem HECSt 1800 hot end coating system has been developed specifically for high speed production lines.

TOUCH SCREEN

Via a user-friendly touch screen, all necessary modules can be connected or disconnected. This includes the following parameters:

- Status (full status quo of the system at a glance).
- Intelligent motor management for fans and pumps.
- Intelligent temperature control.
- Queries relating to consumption figures.
- Comprehensive alarm system for the status quo 'attention' and 'malfunction'.
- Detailed fault analysis and fault assignment.
- Faster diagnosis by graphical error indicator.
- Network connection and connection to central guide system.
- Remote query.
- Controls and programming are update-capable.
- Separation between operating and programming levels.
- Freely programmable password protection.
- Reduction of mechanical switch contacts and thus reduction of possible breakdown. This feature allows simple and fast control of consumption values, which are calculated continuously by the scale integrated in the hood.

INITIAL RESULTS

After start-up of this system, first measurements showed coating results that were clearly within the nominal value range of the glass plant. Bottle body areas were evenly coated, along with the finish protection required and no differences or disadvantages compared to slower standard bottle production were identified.

In the period after start-up and during production, routine control measurements confirmed excellent results. The glass plant tested three system types on a high speed production line and describes the coating results achieved as having "no competition and exceptionally satisfying".

Experiences with the reproduction of a previous system design failed to produce comparable positive results.

TWO MONTHS OF SUCCESSFUL OPERATION

After several months of operation, the use of HECSt 1800 for high speed production has confirmed the following positive results:

- Distribution and coating layer on the bottles is very even.
- The finish coating is completely minimised in accordance with the necessary values of the specification.
- Compared to other systems, there is low pollution and minimal creation of residue buildup inside the hood due to the high efficiency and the straight-lined design of the system.
- Experience shows a significant difference in consumption figures. Compared to other properly working standard systems for high speed glass production, HECSt 1800 ensures a reduced coating product consumption of approximately 20%.

GlassChem HECSt 1800 represents the advance in this area, with all necessary features for high speed bottle production. As such, the technology is recommended for future system investments. Its features can be also transferred to existing installations. ■

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