

IS Machine optimises output for glass manufacturers

Rolf Themann* outlines the features of T&T's ISX Machine, which is designed to provide greater flexibility and productivity in glass manufacturing.



▲ Pic 1. A close-up of T&T's ISX Machine.

▲ Rolf Themann, Managing Director of T&T, at Glasstec 2024.

The ISX Machine, pioneered by T&T, was on show at last year's Glasstec event in Dusseldorf, Germany.

Many of you came to our booth to see this new concept of IS Machine, and to discuss how it could be of interest to your manufacturing operations.

In case you were unable to see it on display, a link to a short video showing the ISX Machine in action at Glasstec is available at the end of the article.

The machine has too many features to include in this article, so we will just focus on the 'X' part of the ISX Machine.

The X stands for extra flexibility, as well as extra-large mould cavity centre distances, which can double your productivity of manufactured glass tonnes in certain cases.

We can split the flexibility aspect into three areas:

1. Flexibility to meet the needs of your developing market for your glass products.

2. Flexibility in offering the full range of production in any one ISX Machine.

3. Flexibility in purchasing plans for acquiring the ISX Machine(s) for your facility.

We will now go into more detail on these areas.

1. Flexibility in a developing market

It has always been the case, so far, that all contemporary IS Machines are supplied on one single machine bed, and so you are then fixed with a specific maximum number of sections you can install upon it.

With the ISX Machine, you have the flexibility to add more sections by extending our modular IS Machine Bed. You could also take out some section bed modules and use those elsewhere.

All that is required to enlarge a machine is to fit an extra 2-Section bed module at a time and change the crossbeam to meet

the full size of the new modular machine bed. All other parts are retained, including the Machine Uprights.

In the case you had an 8-Section Machine on one line and a 10-Section Machine on another line, you could even swap around a machine bed module of 2-Sections to swap that configuration. You will then have an 8-Section Machine where the 10-Section Machine was and a 10-Section Machine where the 8-Section Machine was.

That is just one simple example. To increase overall capacity, purchasing more 2-Section bed modules and a new crossbeam (if required) for the new configuration is all that is needed to accommodate the installation of additional section boxes.

The section boxes themselves can each be installed in 10 minutes by simply slotting them in position and making a few quick connections. All section

		IS										T&T			
		Type 4 1/4"			Type 5"			Type 5 1/2"		Type 6 1/4"		ISX			
		SG	DG 4 1/4"	TG 3"	SG	DG 5"	TG 85	SG	DG 5 1/2"	DG 6 1/4"	TG 4 1/4"	DG 8 1/2"	TG 6 1/4"	QG 4 1/4"	PG 95
B&B	Max. height under finish	341 (358) a)	301	276	341	325	244	380 (352) b)	343	342	287	385	385	385	385
	Min. height under finish	61	58	59	74	73	55	121	68	115	105	15	15	15	15
	Max. body diameter														
	* with stack cooling	178	90	52	178	102	62	178	111	130	90	178	130	90	70
	* with VertiFlow cooling	156	76	51	156	95	60	156	102	121	76	178	130	90	70
P&B	Max. height under finish	265 (282) a)	282	268	265	290	212	326 (298) b)	302	301	268	385	385	385	385
	Min. height under finish	74	40	47	74	55	50	121	58	105	86	15	15	15	15
	Max. body diameter														
	* with stack cooling	178	90	52	178	102	62	178	111	130	90	178	130	90	70
	* with VertiFlow cooling	156	76	51	156	95	60	156	102	121	76	178	130	90	70
NNPB	Max. height under finish	N.A.	282	268	N.A.	285	212	N.A.	296	296	268	385	385	385	385
	Min. height under finish	N.A.	40	47	N.A.	55	50	N.A.	57	105	86	15	15	15	15
	Max. body diameter														
	* with stack cooling	N.A.	90	52	N.A.	102	62	N.A.	111	130	90	178	130	90	70
	* with VertiFlow cooling	N.A.	76	51	N.A.	95	60	N.A.	102	121	76	178	130	90	70
		N.A.	38	38	N.A.	38	38	N.A.	38	38	38	48	48	48	48

- a) with blow mold stack cooling using non VertiFlow adaptor
b) with blow mold stack cooling, with or without non VertiFlow adaptor
c) 70mm max. finish with VertiFlow blow mold cooling

▲ Fig 1. Comparison of ISX production capability with traditional IS Machine types and sizes.

NOTE: The stated T&T Special Center Distance (CD) sizes are provided to maximize production output. All 'conventional' CD sizes will also be possible, if required. Penta Gob will be unique compared to other IS Machines.

		A/IS		B/IS			NIS			ISS			T&T			
		Type 6 1/4"		BIS			NIS			ISS			ISX			
		DG 6 1/4"	TG 4 1/4"	DG 140	TG 95	QG 70	DG 6 1/4"	TG 5"	QG 95	DG 6 1/4"	TG 5"	QG 95	DG 8 1/2"	TG 6 1/4"	QG 4 1/4"	PG 95
B&B	Max. height under finish	347 d)	304 d)	342	322	302	365	365	250	347	347	250	385	385	385	385
	Min. height under finish	110	110	64	59	TBD	95	95	70	66	50	54	15	15	15	15
	Max. body diameter															
	* with stack cooling									121	90	65	178	130	90	70
	* with VertiFlow cooling	121	76	102	65	45	121	90	65	48	48	35	178	130	90	70
P&B	Max. height under finish	300 d)	285 d)	323	303	283	345	345	250	342	342	250	385	385	385	385
	Min. height under finish	80	80	45	40	TBD	75	75	70	66	50	35	15	15	15	15
	Max. body diameter									121	90	65	178	130	90	70
	* with stack cooling												178	130	90	70
	* with VertiFlow cooling	121	76	102	65	45	121	90	65	48	48	35	178	130	90	70
NNPB	Max. height under finish	300 d)	285 d)	323	303	283	345	345	250	347	347	250	385	385	385	385
	Min. height under finish	80	80	45	40	TBD	75	75	70	66	50	31	15	15	15	15
	Max. body diameter															
	* with stack cooling									121	90	65	178	130	90	70
	* with VertiFlow cooling	121	76	102	65	45	121	90	65	48	48	38	178	130	90	70
		48	38	72	38	TBD	50	50	38	48	48	38	48	48	48	48

- d) with vertiFlow

▲ Fig 2. Comparison of ISX production capability with all other IS Machine suppliers.

NOTE: The stated T&T Special Center Distance (CD) sizes are provided to maximize production output. All 'conventional' CD sizes will also be possible, if required. Penta Gob will be unique compared to other IS Machines.

boxes can be removed in 10 minutes and replaced in 10 minutes quite comfortably. Of course, that also brings other benefits, but here we are just focusing on the adaptability of the size of the IS Machine.

Compare that to having the traditional fixed machine beds where you have no such options as outlined above. The current offering of the ISX machine therefore brings new potential to the long-term optimisation planning for production. Even at a colour change, you can easily imagine such changes taking place to facilitate the requirements of the job mix in the new glass colour.

Without this ability, there are many glass plants missing out on extra sales, more revenue, and more profit simply because they don't have this flexibility.

2. Maximising output

All three forming processes of Blow Blow (BB), Press and Blow (PB), and Narrow Neck Press and Blow (NNPB) are available and in all centre distance sizes. Therefore, the full range of normal IS Machine production can be made on any ISX

Machine.

On top of that, there are some new and larger centre distance sizes that have been added to the ISX Machine's configuration capability.

The significance of these additional sizes ensures a plant can fully optimise the pull from the furnace for any number of sections that are installed.

In the case of a large single gob production that cannot be made double gob on a standard IS Machine, the ISX Machine offers the 8.5" double gob centre distance, meaning most single-gob jobs can then be run in double gob. This means a 100% increase in output at the IS Machine if the tonnage is available and the downstream processing from the machine can handle it.

In the case of large double gob production that cannot be made triple gob on a standard IS Machine, the ISX Machine offers a 6.25" TG Centre distance, meaning that 6.25" produced ware, such as up to 1.5L wine bottles, can be made in Triple Gob rather than double gob as is currently only available on all

other IS Machines.

Quad gob can be accommodated and give 4.25" centre distances, which is larger than all other quad machine centre distances available, which means more machine speed available for any given product.

Finally, an option to run five cavities in a 95mm centre distance (the typical centre distance of a quad) is available in the design of the section, and it is large enough to do that too. The name given to this is Penta Gob.

A spreadsheet we used to compare the designed capability of the ISX Machine with standard IS Machines is given in **Fig 1**, as well as other common types of IS Machines in **Fig 2**.

3. Flexibility in purchasing options

Purchasing an ISX Machine from T&T gives options to suit any individual company's needs. This comes in three main categories, although other options

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are available.

A. Traditional staged payment terms.

The normal staged payment offerings are available for an outright purchase, as is the normal case with all other IS Machine suppliers. There is some flexibility in this, as it can be customised to suit both T&T and the customer.

B. Purchase via financing package.

An arrangement has been formally agreed with a funding bank from the Czech Republic and backed by the Czech Government to support exports. Depending upon the country of operation, you may be offered a deal at a low interest rate to finance the purchase of the ISX Machine(s) and pay it back over an agreed period, typically 5 years.

This means you can pay back the loan with the money you are generating from the asset that you have purchased. Where the ISX Machine offers you additional output due to the factors mentioned above, you will effectively be getting the ISX Machine(s) for free.

C. Technology licensing and support arrangement

A licensing arrangement to use the technology also comes in flexible packages and is subject to individual negotiation.

With this arrangement to acquire an IS Machine, you can even fabricate and build the ISX Machine yourself. Some companies have access to local engineering facilities or even have such in-house.

In this situation, the licence will give you full access to the manufacturing and assembly drawings and the supporting electronic technology can be purchased locally via a Siemens representative who will also give additional local technical support.

Included in the agreement is technical support direct from T&T at all stages of the project, with just on-site work being charged in addition.

That means any company can make and even sell this technology with the full support of T&T, for production and further development, where required.

As stated at the outset of this section, this arrangement is highly flexible, and

you will need to enquire for further details.

Conclusion

Let's conclude with a question: what more flexibility is needed?

We believe the flexibility of the ISX Machine gives you the adaptability to survive and thrive in the current economic climate, which is a challenge in many parts of the world right now. But if you think we have missed something, please let us know.

Let me finish with a statement I made in an earlier article, which I still believe to be true: Someday, all IS Machines will be made this way. ■

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Link to a short video showing the ISX Machine in action at Glasstec:

<https://vimeo.com/1024804176/a537d27349>