

European debut of new **TEX34αIII**

- worldwide highest performance compact twin-screw extruder

Following introduction of its new compact TEX34αIII high-performance compounding extruder at the October 2017 IPF International Plastics Fair in Tokyo, JSW now announces the TEX34αIII debut in the European market too, as an extruder for various applications such as compounding, chemical reaction, dewatering, devolatilizing and so on.

The TEX34αIII model replaces the slightly smaller TEX30α small-lot extruder and, as with other TEX-series extruders, its screw diameter is 36 mm. The extruder's exceptionally high torque density (18.2 Nm/cm³) enables effective yet gentle compounding at low screw speed and optimally low temperature, but without detriment to throughput. Should torque rise to an unacceptably high level, a torque limiting function protects the machine by disengaging the drive motor and gearbox, so that the screw stops rotating.

Throughput typically reaches up to 500 kg/h in talc-filled polypropylene, 250 kg/h in masterbatch compounding and 150 kg/h with polymer blends such as ABS and ABS/PC, etc., a worldwide highest performance level for such a compact compounding extruder of this size.

The TEX34αIII also excels with its conventional yet convenient EZ easy-change tie-bar system, which makes changing barrels easier than in the past.

Depending on customer needs, JSW offers the TEX34αIII with a choice of the standard version model and an ultra-compact version with its control cabinet built-in within the footprint of the machine frame, saving space and installation time. The very small footprint TEX34αIII-52.5BW-2V model with its integrated control system has the following approximate dimensions and weight: 4,250 mm length, 1,250 mm width (incl. the inverter panel), 1,200 mm center height and 3,500 kg weight.

Although specifications and performance of both versions are identical, Jun Kakizaki, General Manager at JSW Europe GmbH in Düsseldorf says "The standard model has a separate control cabinet, because sometimes customers prefer to have the control cabinet in a separate room in order to protect them from e.g. dust during heavy-duty operation. The ultra-compact model is however designed for laboratory applications, where space may be limited".

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While the ultra-compact version does not easily lend itself to customization for individual needs, the standard model can be easily customized, e.g. by provision of a multiple number of vents, adjustment of L/D ratio with screws of different lengths and increasing screw speed by choosing to use one of three drive motors with different performance levels, or even modification to permit explosion-proof operation in hazardous environments.

JSW also has many lineups of original developed special devices to increase the capability of TEX34αIII. Customer can choose optimum device from our lineup in order to improve their production and quality of product. (<http://www.jsw.de/technical-info>).

JSW's NIC (Nikko Intensive Cylinder) mixing barrels have longitudinal grooves on the inside of each barrel, which benefits mixing performance by allowing more polymer to pass through the larger gap between the depth of the grooves and the screw. The associated lower shear rate enables lower temperature mixing and avoids local heat build-up, to the benefit of compound quality and reducing energy consumption by 10-20% compared with standard non-grooved barrels.

The special JSW screw element is the TKD (Twist Kneading Disc), with twisted instead of conventional straight flights, which results in less pressure on the flights and achieves good dispersive mixing with low screw wear, which is an important attribute when compounding abrasive materials. The TKD elements can achieve either higher mixing capability or higher conveying capability, depending on the direction of their rotation. As mixing can take place at around 10% lower temperature than with conventional mixing elements and with less demand on the drive motor, there is corresponding 10% lower energy consumption with TKD elements.

Side feeding is usually applied to introduce fillers such as talc or carbon black or reinforcement fibers into the polymer melt in extruder mixing sections. It is here that JSW offers a SFD (Side Feed Deaerator) in its DGC (De-Gassing Cylinder) technology to exhaust volatile substances, air and moisture via a vacuum pump, so that throughput increases due to an improvement of conveying efficiency by densifying bulky powder material such as Talc, CaCO₃, fine polymer powder and so on.

The effectiveness of the SFD fitted on JSW extruders has been demonstrated in trials showing 57% throughput increase when compounding 30wt% talc filled elastomer-modified PP, 31% increase with PPO/PS blend (80wt%/20wt%) and 58% increase with 30% carbon black filled PBT.

JSW also offers the software packages for simulation of process conditions, screw design, as well

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as for screw element management.

Improvements made to the JSW 64-bit EXANET control system's 15-inch color LCD control panel on both model versions have resulted in more comfortable and faster extruder operation, through for example better visibility of the touch-screen display and its icons, which enables easier triggering of specific functions. Aside from the extruder, the control system can integrate optional auxiliary equipment such as gravimetric feeders, side feeders, pelletizers. Customers can however choose to use a PLC (programmable logical control) system of their own choice, instead of the JSW EXANET system.

Other detailed improvements to the control panel include enhanced I/O (input/output) capability for greater flexibility and easier integration of the extruder with the control system, as well as upgrading of the EXANET system's external interface by inclusion of operational conditions data management via USB connection. This is in an addition to the existing Ethernet LAN (local area network) port, with its NET 100 data logging system allowing simultaneous monitoring of up to 100 extruders.

Monitoring can take place via a web browser on desktop PCs, from which processing conditions can be adjusted via the network. Data can be directly printed or exported as CSV format files for opening with standard office spreadsheet software, typically involving one Gigabyte of data for 300 days operation. Screen shots can also be made of the control panel display screen and exported as PNG format images that can be read with standard image programs.

JSW also offers complete turnkey compounding plants, complete vacuum and gear pumps, various types of barrels, barrel cooling systems, strand cooling baths, pelletizers, screen changers, silos, packing and palletizing equipment. JSW takes on responsibility for all turnkey plant engineering, procurement and project management.

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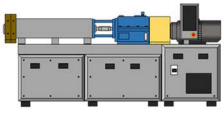
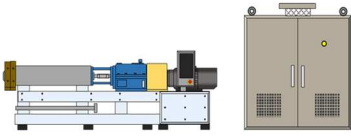
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Ultra-compact version of the TEX34aIII extruder

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TEX34aIII extruder specifications

Basic specifications					
Model		Built-in model	Standard model		
Torque density	N/cm ³		18.2		
Torque	Nm		982		
Normical diameter	mm		φ34		
Screw diameter	mm		φ36		
Extruder					
Motor capacity	kW	37	37	55	75
Screw speed ^{*1}	rpm	37~363~568	37~363~568	54~541~847	73~735~1,150
Heating / cooling ^{*2}		AW / BW	AW / BW / SW / (O)		
Screw configuration			Customizable		
Barrel configuration			Customizable		
Barrel connection			EZ-change tie-bar type		
L/D ratio		52.5	max. 77		
Construction		Box type	Single frame type		
					
Center hight	mm	1,200	nominal 900 (customizable)		
Control & operation panel					
Control panel		Built-in ^{*3}	Separated		
Operation panel		Built-in	On-frame / Built-in control panel / Stand alone		
Others					
Explosion proof		N/A	Available		

*1: Displayed min.~torque const.~power const.

*2: A: aluminium cast heater, B: brass cast heater, S: steam heating, (O): oil heating, W: water cooling

*3: For hazardous areas, the customized model may be applied.