

Compact. Flexible. Reliable. Machines in the CX Series

Engineering Passion



Facts and figures regarding the CX Series

Application areas



Automotive

Medical



Electrical/electronics

⊃ackaging

Clamping/injection matrix

Machine/	Injection units (screw diameter in mm)																								
clamping force	SP 55					SP 100			SP 180				SP 380			SP 750				SP 1000		S	SP 1400		
	15	18	3 20	22		20	22	25	28	25	5 28	30	35	30) 35	40	45	40	45	50 5	5	50 5	5 60	55	60 70
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CX 250 / 300										Т															
CX 350												-													
CX 420												-							Т						
CX 500															-										
CX 575 / 650																									
CX 575 / 650 two-p	bart																								

Always the right machine thanks to a fully modular concept The CX Series combines reliability and efficiency

The fully hydraulic machines in the CX Series are available with small and medium clamping forces. Their dominant feature is the two-platen technology that produces an extremely compact machine with very good all-round access.

Thanks to 150 basic variants and more than 500 freely selectable options, we are always able to configure the ideal solution to implement your individual production task involving either simple or very complex processes.

CX injection molding machines impress customers with their compact design and reliability. In short, they offer outstanding performance and flexibility for cost-effective, product-specific applications.

Highlights of the CX Series at a glance:

Compact thanks to:

- Two-platen concept
- Short clamping unit

Flexible thanks to:

- Cantilevered clamping unit
- Large opening strokes
- Modular machine concept

Reliable thanks to:

- Powerful injection unit
- Easy accessibility
- Energy-efficient hydraulics and electrics

Transparent technology A fascinating tour of the CX injection molding machine



Operator-friendly MC6 control system

Simple and clear operation with SplitScreen, ProcessDesigner and Eco function





Cantilevered, lubricant-free clamp

Large area for parts transport and individual automation solutions, clean mold area ideal for cleanroom production

> **Compact two-platen technology** More scope thanks to a short clamping unit





concept Clamp, injector and driv

Fully modular machine

Powerful injection unit with proven plasticizing system Maximum reproducibility and high melt quality

Clamp, injector and drive unit can be individually combined



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Energy-efficient hydraulic and electrical modules High efficiency and low throttle losses **Easy accessibility** saves service time and effort

Flexible injection molding machines with clamping forces from 350 to 6,500 kN CX for different products and industries

Machines in the CX Series provide you with an ideal basis if you are manufacturing, for example, ventilation flaps for the automotive industry, plugs for the electronics industry, storage and transport containers for the chemical industry, or small receptacles for the medical and pharmaceutical industries.

With clamping forces ranging from 350 to 6,500 kN, the flexibly configurable injection molding machines are engineered for sector-specific excellence. The special advantages of the versatile machine series include the two-platen technology, which produces a very compact design, and the four-tiebar clamping system which stands for high precision and efficiency. The extensive range of components and different plasticizing units offers a free choice of customized production solutions which can be continuously extended.

Your advantages:

- Compact footprint thanks to two-platen technology
- Precise and efficient hydraulics
- High degree of flexibility thanks to the modular machine concept
- Enormous number of ways to combine clamping, injection molding and automation
- Highly precise, low-wear injection units



The cantilevered clamping unit offers more scope for parts transport.



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Absolute platen parallelism prevents mold wear



The four-tiebar clamping system stands for high precision and efficiency.





The clamping unit, a powerhouse – Excellent platen parallelism plus a small footprint

The two-platen clamping technology from KraussMaffei delivers a number of decisive advantages for your production, e.g. space savings, a far lower reject count and low maintenance effort.

Box shape for safe operation

In all models in the CX Series the clamping unit is constructed as a rigid box. The moving and fixed platens (MP, FP), as well as the tiebars are supported separately on a robust machine bed. The tiebars are bolted to the MP and guided in the FP.

This box – supported on bearings spaced far apart – distributes forces over the maximum possible distances. This design means that there is no risk of tilting between the individual platens. The result is exact platen parallelism even with extremely high mold weights. Wear and maintenance effort for the machine and molds are minimized.

Exploiting mold height and opening stroke

The advantage of the box design is a large opening width which, when combined with the two-platen technology, ensures ideal mold insertion options. Almost the entire opening width can be used as a maximum mold height. This means that large molds can be operated even on small machines.

Compact two-platen technology More scope thanks to a short clamping unit

The length of the clamping unit with two-platen technology is 30% shorter compared with conventional concepts. The cantilevered design provides sufficient space for simple and flexible integration of parts transport systems. Individual production and automation solutions can also be easily integrated at any time.

Cleanroom compliance included

The compact two-platen technology is ideally suited to cleanroom production solutions. The cantilevered clamping unit up to 1,600 kN is another variant for a cleanroom concept. Only the protruding part of the clamping unit can be integrated in the actual cleanroom. The rest of the machine remains in the greyroom area. This approach is effective whether the cleanroom is a laminar-flow canopy or a fixed construction. Disturbance and contamination sources on the machine lie outside the molding area. The size of the required cleanroom is reduced, thus leading to huge savings in capital investment and operating costs.

Your advantages:

- Smaller footprint thanks to a clamping unit that is 30% shorter
- Large molds can be operated on small machines
- Exact platen parallelism even with heavy molds
- Space for parts transport and individual automation solutions
- Cost-effective, high-class cleanrooms possible



The easy-to-access ejector area of the CX Series.



Effective area use thanks to a cantilevered clamping unit and a two-platen concept



In the CX Series only the ejector is positioned on the moving platen. This means that the clearance can be easily extended and also that there is a maximum opening width. Structured production: The area underneath the clamp can be used for additional peripherals, e.g. for up to 5 heat-balancing units or for the integration of a rejection chute.

Thanks to the cantilevered clamping unit, any transport system can be used. All objects underneath the clamp are clearly visible and can be easily removed.

The injection units in the CX Series Low-wear and processing-specific





Linear force transmission ensures maximum shot weight constancy.

Plasticizing systems are some of the core competences of KraussMaffei. A suitable plasticizing unit is available to cope with all material and process-related requirements.

Unlimited precision

Thanks to the proven 3-piston injection units in which force is directly transmitted centrally to the screw via the injection pistons, maximum shot weight consistency and reproducibility can be attained. Regulation is always high-resolution even at low pressures. This is an important advantage, especially in the melt phase that is vital for the process.

High throughput rates with optimum melt quality

Every plasticizing system is characterized by excellent melt behavior and covers a wide range of applications for different types of plastic. Thanks to our many years of expertise in the manufacture of plasticizing units, we guarantee high throughput rates for optimum melt quality. The right choice of plasticizing system leads to high product quality and, thus, cost-efficiency. You remain flexible because the plasticizing systems in the CX Series can be exchanged with those from other KraussMaffei machine series.

Always the right screw

Depending on the part requirement, special plasticizing systems containing specific screws, non-return valves and cylinder fittings are available in our product portfolio. Additional requirements such as wear resistance to adhesion, abrasion and corrosion are taken into account in this respect. The wide range of plasticizing screws includes, for example, solutions for processing:

- PC and PMMA
- Glass fiber-reinforced plastics
- Blends
- Thermosets
- Silicone

Superb melt quality and low stagnation pressure

The higher the quality of the part and the utilized plastic, the more important the optimum plasticizing unit becomes. KraussMaffei developed the HPS-M screw specially for this purpose. A direct comparison with alternative solutions for master batch applications reveals that the main characteristics of the HPS-M screw are optimum melt quality without streaks and the shortest possible color change. In geometrical terms, the HPS-M screw is a combination of a standard 3-zone screw and the shearing and mixing part of the high-performance screw. It therefore attains optimum homogenization results through active shearing and mixing. Using this screw technology helps to reduce stagnation pressure considerably. This in turn produces positive impacts in terms of material loading and wear in the plasticizing unit. HPS-M screws offer impressive quality in every respect.

Your advantages:

- A suitable screw for every processing task
- High throughput rates with optimum melt quality
- Wear resistance to adhesion, abrasion and corrosion
- In-line injection unit ensures high shot weight consistency and reproducibility
- HPS-M screws are more flexible

Shot weight consistency



Shot weight consistency of 0.042% based on the example of a box lid with a shot weight of 828 g (PP) and a cycle time of 39 seconds.

Usability is our top priority The new MC6 control system with SplitScreen technology and Eco function





Do you get the most energyefficient machine setting? Always! - Simply press the Eco button

The new MC6 control system meets all of your usability needs.

Whether you are working with a KraussMaffei control system for the first time or you are accustomed to its MC5 predecessor – MC6 technology is so intuitively accessible that you will work better and more efficiently than ever before.

Everything in sight - thanks to the new SplitScreen technology

SplitScreen technology is one of the special highlights of the MC6: Thanks to the split-screen display, you can see the most important production processes simultaneously. In parallel with the actual value cycles, you can control, for example, the injection process.

Clarity thanks to the ProcessDesigner tool

The integrated ProcessDesigner tool provides a clear visual presentation of all current processes and enables you to modify them, depending on requirements, by means of simple drag-anddrop movements or swiping movements.

Destination reached with just two taps – thanks to a drop-down menu and a favorites bar

To ensure that handling the control unit is as user-friendly as possible, deeper navigation levels have generally been avoided with the MC6. Based on the credo "reaching the destination as quickly as possible", a clear overall concept with individually configurable favorites bars is produced. In order to guarantee optimum use, the machine keypad only provides the keys which can be selected in regard to the operating states of the machine. Our userfriendly principle is rounded off by a special field for selecting systems. You can therefore directly select all components of the machine up to automation and technology.

Go Eco! Energy efficiency at the push of a button

In keeping with our overall energy-efficient design, the MC6 control system has an "Eco button". This allows you to configure the machine in the most energyefficient manner at the touch of a button.

Intelligent user profiles

Thanks to standardized role profiles – from the machine operator and mold setter through to the production manager you can assign different authorizations quickly and easily. Of course, you can also create additional hierarchy levels and assign individual rights to users. Another feature of the MC6 is the resistive dual-touch function which also allows the screen to be operated by a person wearing gloves. With the Windows 7 Embedded operating system, the MC6 is ideally equipped for today's technologies and those in future. The MC6 control system can be ordered in more than 30 languages. And best of all: Every feature is available not only with the control system, but also on the handheld pendant.

Your advantages:

- User-friendly function principle
- Simple process control thanks to SplitScreen and ProcessDesigner
- Clear structures
- Standardized user administration
- Two-way operation of automation and machine possible



The MC6 control system impresses customers with its clear overall concept. Here using ProcessDesigner as an example.



You can operate the automation both from the handheld pendant and from the injection molding machine. And, with the MC6, even reverse operation of the injection molding machine is easy from the robot's hand-operated console.

The extensive module box of the CX Series Flexible and extensive

The CX is also as flexible as your business. A large number of clamping and injection combinations, an extensive options catalog, a modular technology platform and total freedom in part demolding or connecting peripherals make every CX machine the ideal production solution.

Your advantages:

- Large number of clamping and injection combinations
- Free choice in regard to part demolding
- Great scope for individual ejector concepts
- Extensive options catalog

Safety with transparency

The well-designed safety housing has large transparent panes for a clear view into the mold and ejector area. Front and rear safety doors can be opened separately for work in the mold area. The door glides mounted directly on the machine bed ensure maximum access. The nozzle and ejector are easily accessible through additional safety doors. Mold changing in low-ceilinged production halls is easy because there are no housing panels to prevent set-up.

Directly accessible interfaces

All cooling water connections, core puller valves, cascade control systems and the related interfaces for electric signals are arranged in fixed positions on the mold fixing platens. This ensure clear structures and easy set-up.

Ample set-up space

Behind the moving mold fixing platen there is free access to the clamp, simplifying machine set-up and adjustment. This area can be used for special mold-specific solutions, for example unscrewing systems. Excellent access increases machine availability because time is saved by reducing set-up effort and errors.

Noise reduction and service-friendly engineering

The pump unit in the CX is completely enclosed in a soundproof housing to effectively reduce noise emissions. Housing elements can be removed individually for access, thus making maintenance work easy. All hydraulic elements are easily accessible, which means that maintenance, repairs and service can be carried out quickly and easily This also makes a significant difference to machine uptime.

Open for automation concepts

The protective housing is open at the top, thus making it easy to integrate handling systems to demold parts. Connecting automation equipment can be added at any time.



The CX module platform offers total freedom for extension into a production cell.



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The mold area in the CX Series contains space for extensive equipment.

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The hydraulics in the CX Series Precise and efficient

CX Series hydraulic systems are extremely precise and efficient. From the pump drive, variable delivery pumps, proportional valves, control elements and optional modules through to noise protection, all hydraulic components ensure reliable machine technology and low production costs.

Your advantages:

- Reliable machine technology
- Precision with fast movements
- Modular design for retrofittings
- Optional Blue Power modules for minimum energy consumption

High stable value

The hydraulics for mold movement in the CX machines are integrated inside the tiebars in four coupled clamping cylinders. They act absolutely symmetrically, thus ensuring uniform clamping force distribution. Even at maximum injection pressure, there is no risk of one-sided mold opening. Opening and closing remain exact even with fast movements. The hydraulics are also encapsulated and function with a self-lubricating system so that the mold area always remains clean. This is the ideal condition for cleanroom production.

Precise mold locking

In the CX the mold locking phase and clamping force build-up phase are separated The multi-phase (up to 16 phases) mold locking mechanism can be set easily and precisely.

Your mold is therefore securely protected against damage even with fast cycles. This in turn leads to longer service lives, low mold maintenance costs and, thus, attractive production costs.

Energy-saving drive concept

The modular drive concept of the CX has also been engineered for high machine performance and low energy consumption. In the basic version the hydraulic drive pump generates the pressure and the oil quantity for all machine movements. Optional modules such as a pressure accumulator and additional pumps are available for higher performances or parallel machine movements. The program is completed by hybrid drive concepts. We can certainly adapt your CX to your needs precisely and cost-efficiently.

Optional BluePower modules

BluePower is an extensive package of tools and products that KraussMaffei offers for minimizing energy consumption on CX machines. With the BluePower servo drive, for example, the hydraulic system can be fitted with servo technology as an optional extra. This servo drive is characterized by high efficiency and low throttle losses. Especially in slower cycles with long cooling periods, the energy consumption of the machine can be reduced by up to 40%.





With its high-efficiency filtration unit, the CX hydraulic system is engineered for long operating periods between oil changes and highest machine uptime.

Sensitive mold locking thanks to a linear force profile

Max. force							Mold locked			
						d				
						[
CX Tog	gle lever		Stroke				r 			
Mold locking phase										





Automation solutions for the CX Integrated and functional

Our extensive know-how in the areas of injection molding machinery and automation is your economic advantage. Standardized elements combined with customer-specific solutions form the basis for high flexibility in production. The integrated CE-approved safety concept ensures a high safety standard and reduces the machine costs.

Functional unit as a complete package

In its capacity as a system partner, KraussMaffei can supply customers, on request, with an injection molding machine and an automation system as a fully integrated overall concept. Thanks to the fast VARAN-BUS technology, the machine and the automation system form a functional unit. The joint control system allows both functional units to be controlled on any control panel.

20 safety zones, of which five are dynamic, protect the operator and equipment, and also increase the efficiency of the control programs. The perfect symbiosis of a machine and automation technology is rounded off by a standard safety housing.

WizardX – Smarter programming

The dialog-based programming assistant in the MC6 control system allows even beginners to create basic demolding processes in the shortest possible time. The interactive communication between the user and the control system makes manual programming superfluous and eliminates programming errors.



WizardX programming assistant Easy to recognize by the "magic wand symbol"

Automation solutions for the CX Integrated and functional

Linear robots

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Machine/ clamping force in to	LRX 50 (payload ≤5 kg)	LRX 100 [navload ≤10 kg]	LRX 150 (payload <15 kg)	LRX 250 (payload ≤25 kg)	LRX 350 (payload <30 kg)
CX 35					
CX 50					
CX 65					
CX 80					
CX 110					
CX 130					
CX 160					,
CX 200					
CX 250					
CX 300					
CX 350					
CX 420					
CX 500					
CX 575					
CX 650					

Industrial robot (floor)

Industrial robot (console)

Machine/	IR 60	IR 160	IR 300	IR 600	IR 300	IR 1200	IR 900	IR 1200	IR 60	IR 160	IR 60	IR 300	IR 300
force in to	F/K	F/K	R2030 F/K	R2030 E/K	R2430 F/K	R2500 F/K	R2/00 F/K	R2900 F/K	R1800 S/K	K1800 S/K	R2100 S/K	R2230 S/K	R2630 S/K
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CX 50													
CX 65													
CX 80													
CX 110													
CX 130													
CX 160													
CX 200													
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CX 350													
CX 420													
CX 500	· · · · · · · · · · · · · · · · · · ·												
CX 575	· · · · · · · · · · · · · · · · · · ·												
CX 650													

Key for industrial robots: IR = Industrial robot 300 = Payload in N R2030 = Reach in mm F = Floor S = Shelf type K = KUKA

The great advantage of the unit comprising an injection molding machine and automation technology is that all process data are available in real time on any control unit via the integrated control panel thanks to VARAN-BUS technology. Operation is clear and simple. Programming can therefore be learned intuitively, which reduces the time spent on training.

Remote operation via a handheld pendant.

Every robot in the LRX/LRX-S Series has a remote control unit, the handheld pendant, for efficient instruction and ergonomic programming. The handheld pendant can be simply operated via a touchscreen display – the operating steps are identical to the control panel on the machine. Using the handheld pendant of the robot, the injection molding machine can also be controlled and vice versa - a flexibility bonus.

Common dataset for more convenience

In the integrated solution the machine and automation system can not only be controlled via a control panel, data from both units can also be stored in one dataset. This ensures both total data security and maximum operational convenience.



Work is made easier through mutual operation – the injection molding machine can be controlled by the automation handheld pendant – and vice versa.

Your advantages:

- Machine and automation system as optical and functional unit
- Integrated control system with central operating unit
- Smart programming and operation with WizardX
- CE conformity included
- Wide range of automation systems from pick & place through to highly complex solutions

CX Hybrid: Efficient universal solution with a wide range of applications Hydraulic and electric

The CX Hybrid combines the advantages of hydraulic clamping concepts with those of electric injection molding units. It is the efficient universal solution from KraussMaffei for the electronics, packaging and medical industries, as well as for manufacturers of technical parts. Thanks to the cantilevered clamping unit in the hydraulic variant, complex cleanrooms up to Class 5 can be implemented. The electrically powered injection units also ensure both unbeatable precision and low energy consumption as standard features with parallel movements and injection speeds up to 300 mm/s.

More efficiency and parallel movements

Since every axis of the injection unit has its own electric drive unit, it is possible, for example, to open the mold and operate the ejector during the plasticizing phase. This increases the efficiency of the overall process. A 32-bit control system triggers movements of the drive units with high precision, thus leading to processes with high repeatability and the closest tolerances.

Your benefits: Lowest shot weight fluctuations of less than 0.07% coupled with first-class product quality and a wide process window.

Combined advantages

Both systems – an all-electric injection unit and a hydraulic clamp – bring their advantages to bear in the CX Hybrid when they are combined. Highly accurate injection is combined with the exactly parallel clamp to form an unrivaled overall system for the ambitious injection molder.

Your advantages:

- Clean production, cleanroom-compliant
- Fast cycle times for maximum output
- High degree of flexibility thanks to
- the cantilevered clamping unit in the hydraulic variant
- Increased efficiency thanks to electric drive units
- Wide range of applications for special processes





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The CX Hybrid is our efficient universal solution for the electronics, packaging and medical industries, as well as for manufacturers of technical parts.

Further information which might also interest you





Are you looking for a suitable automation solution?

We can offer you the right robot for every production task. You can also choose special mold clamping systems or other accessories for your injection molding machine.

You can find more information about the following for example:

- Linear robots in the LRX/LRX-S Series
- Industrial robots in the IR Series

We have also compiled extensive infor-

mation on the subject of service for you. Using our general and maintenance services, you can increase the flexibility of your injection molding machines for constantly occurring new process requirements and permanently extend their performance level. We are happy to provide you with detailed information on this.

You can find our brochures and flyers on other topics online at: www.kraussmaffei.com. On request, we would also be happy to send you information and technical data for our products free of charge.

KraussMaffei A strong brand in a unique global group

Cross-technology system and process solutions

Whether in Injection Molding, Reaction Process Machinery or Automation – the KraussMaffei brand stands for pioneering and cross-technology system and process solutions in plastics processing worldwide. For decades, our expertise, innovative ability and passionate commitment to plastics engineering have been your competitive edge. As a cross-industry system provider, we offer you modular and standardized systems as well as solutions customized to your needs.

There for you around the world

With our worldwide sales and service network, we offer our international customers an excellent basis for a successful business relationship. Due to the close proximity to our customers, we are able to answer your individual inquiries very quickly. We work out the best possible technical and economical solution for your product and production requirements together with you. Test our machine technology for your applications and let our experts put together an individualized service package for you.

Individualized service

Our employees from customer service, application technology and service help you with your questions and needs on every topic dealing with machines, systems and processes – around the globe, quickly and with a high level of expertise. We have developed an extensive customized service spectrum with our lifecycle design, which accompanies you throughout the entire lifecycle of your machines and systems. Take advantage of the personal interaction and flexibility we offer in our practically oriented seminars. We carry out customer-specific trainings either at your location or at our sales and service locations.

You can find additional information about KraussMaffei at: www.kraussmaffei.com

KraussMaffei Group Comprehensive expertise

Unique selling proposition Technology³ The KraussMaffei Group is the only provider in the world to possess the essential machine technologies for plastics and rubber processing with its KraussMaffei, KraussMaffei Berstorff and Netstal brands: Injection Molding Machinery, Automation, Reaction Process Machinery and Extrusion Technology.

The group is represented internationally with more than 30 subsidiaries and over ten production plants as well as about 570 commercial and service partners. This is what makes us your highly skilled and integrated partner. Use our comprehensive and unique expertise in the industry.

You can find additional information at: www.kraussmaffeigroup.com

The KraussMaffei Group has a global presence. Countries with subsidiaries are marked in dark blue. In the white-colored regions, the Group is represented by over 570 sales and service partners.

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