

be the first.



Machines

- ENGEL VICTORY
- ENGEL DUO
- ENGEL CLASSIC
- ENGEL E-MOTION
- ENGEL INSERT
- ENGEL ELAST
- ENGEL LIM

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Integrative technology

- ENGEL ROBOTS
- ENGEL CONTROL SYSTEMS
- ENGEL PRECISION MOLDS

Technology

- ENGEL COMBIMELT
- ENGEL FOAMMELT
- ENGEL GASMELT / WATERMELT
- ENGEL TECOMELT
- ENGEL FIBERMELT
- ENGEL X-MELT

Services

- CUSTOMER SERVICE DIVISION

Language

- german
- english
- french
- italian
- spanish

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ENGEL

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>> Progress happens so fast today, that one, who declares something totally unfeasible, is being interrupted by someone else, who has already done it. << Albert Einstein (german physicist, Nobel prize winner)
be the first.

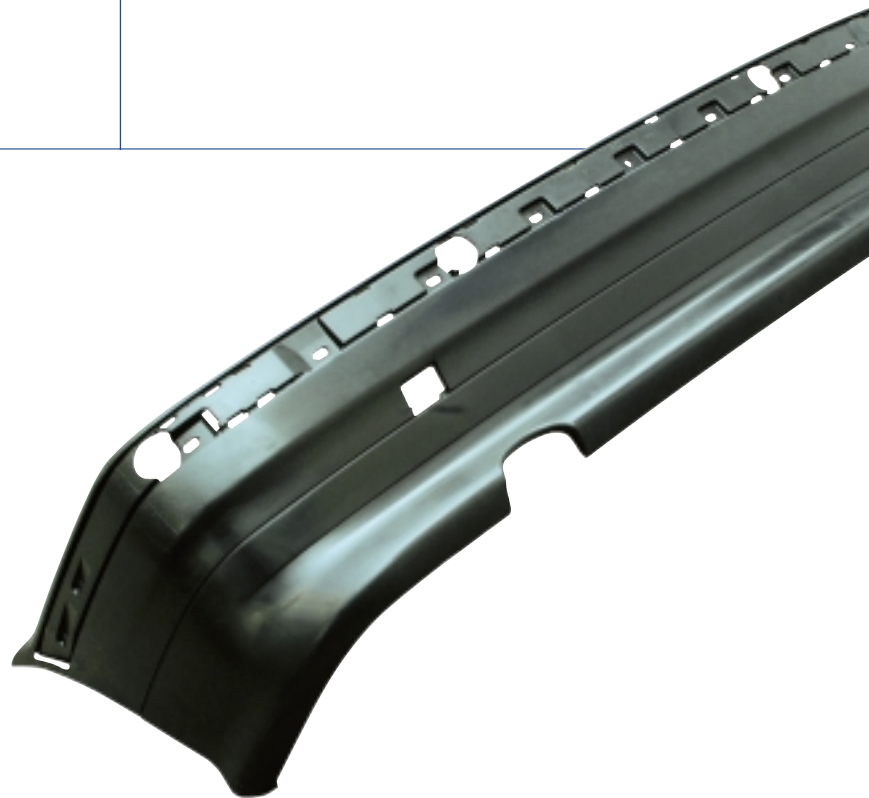


Innovative injection molding technology

ENGEL
duo

ENGEL DUO.
Every task is a challenge.

2





The basis of success.

In a world which seems to be turning faster and faster every day, it is impossible to survive in industry without a firm basis from which to operate.

One such basis is Engel's longstanding experience in the fields of machine manufacture and injection molding technology. It is the basis, for example, of the ENGEL DUO series of injection molding machines. Its history is one of modern progress and its future lies in the hands of those who write history with their innovative products.



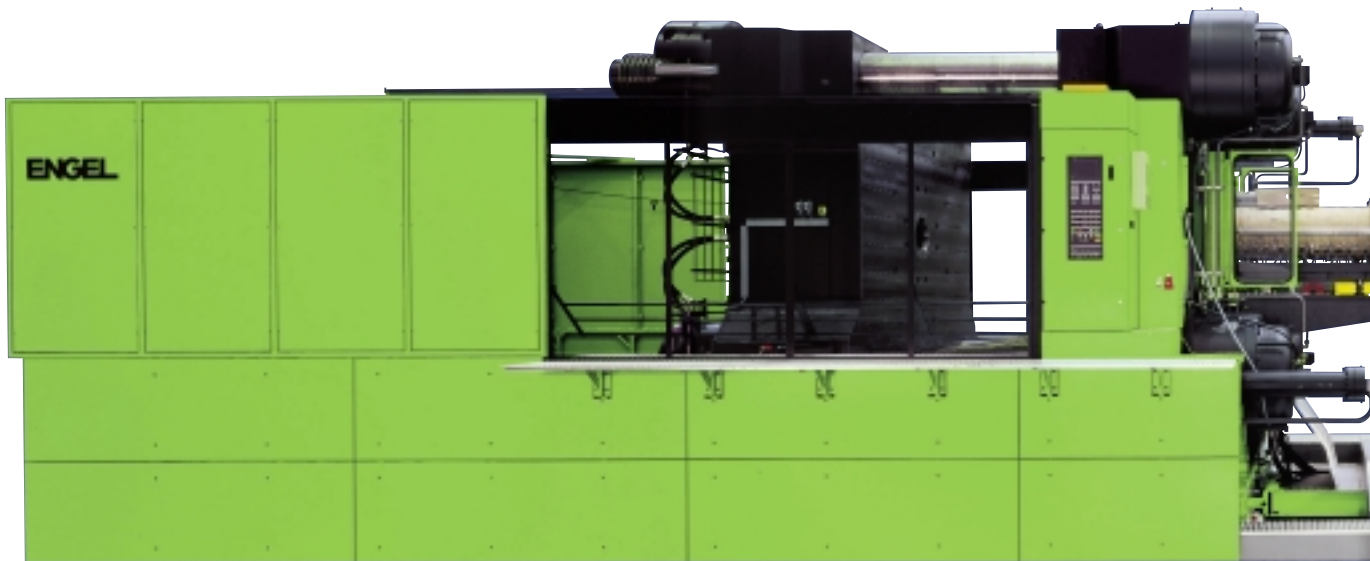
ENGEL DUO.
The perfect combination in 40 variations.

ENGEL DUO 5550 / 900 US



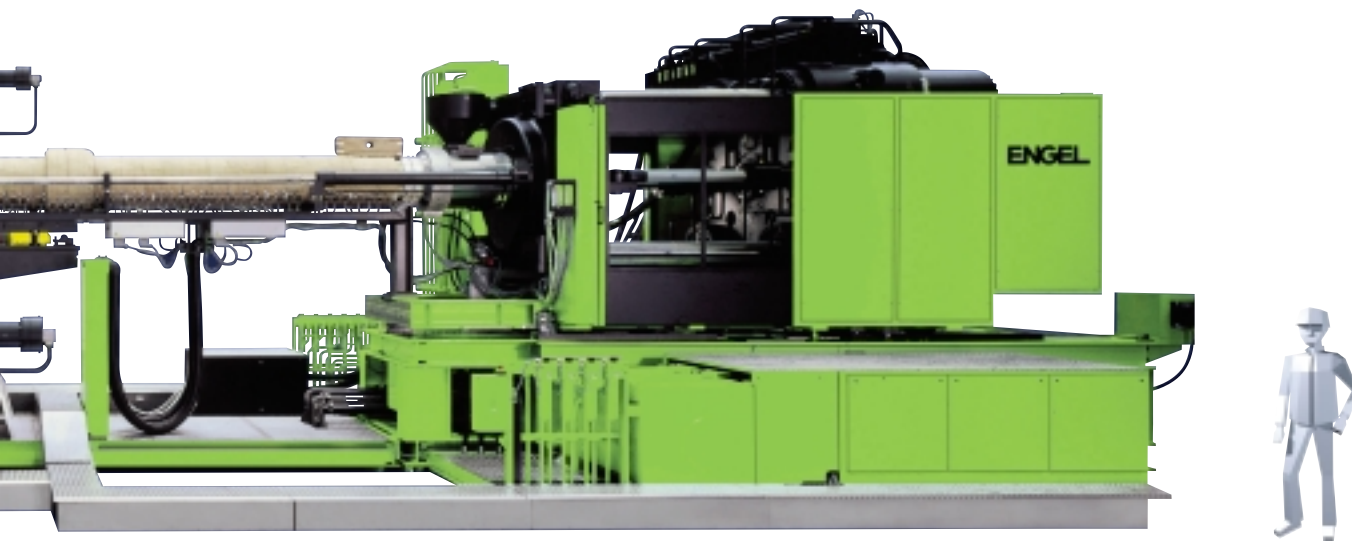
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ENGEL DUO 130000 / 6000 US



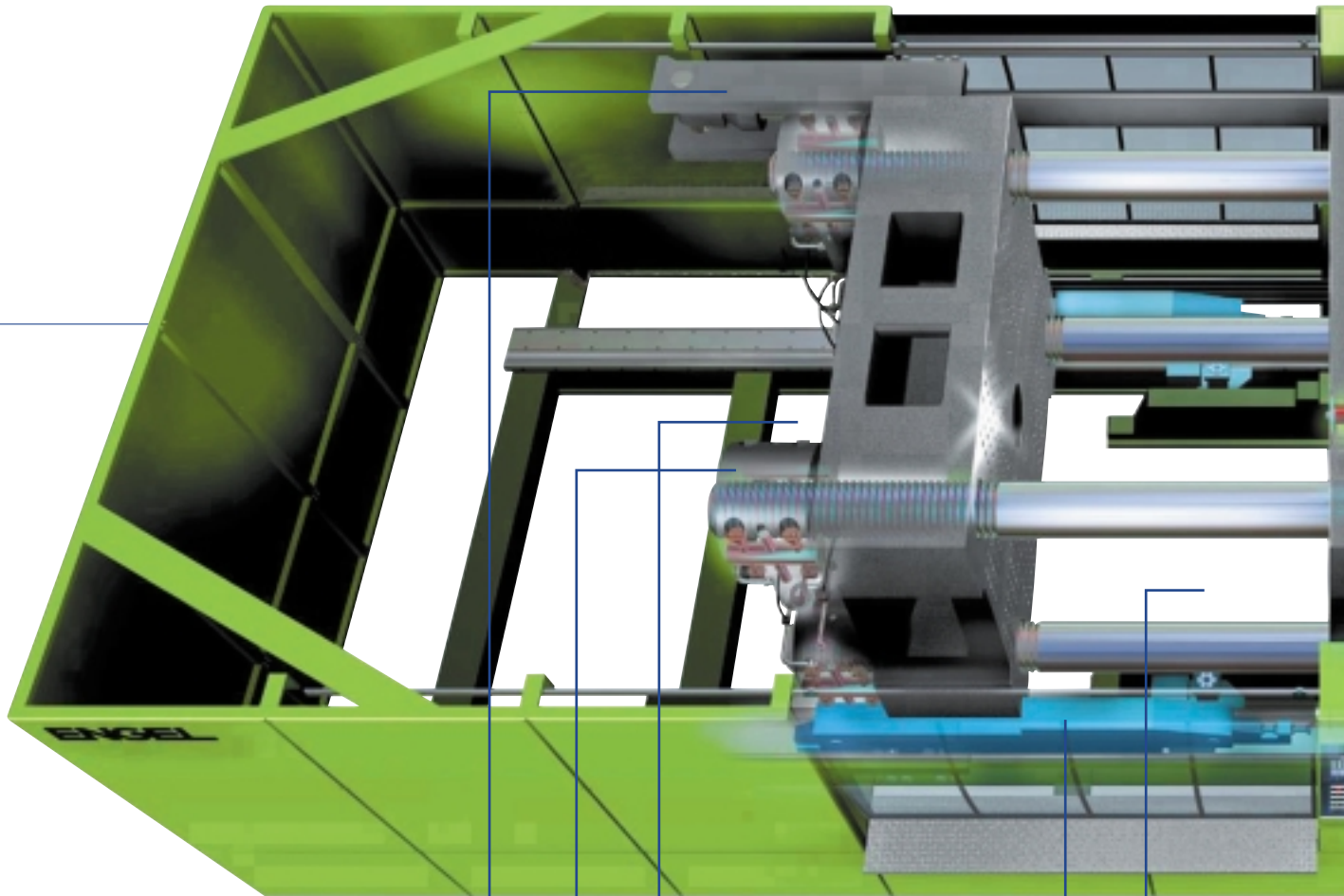
Injection units *	4550	5550	7050	11050	16050	23050	35050	45050	75050	130000
Clamping units	Available screw diameter in mm per injection unit									
DUO 900 US, 1000 US	80/90/105	80/90/105	90/105/120	105/120/135						
DUO 1100 US, 1250 US		80/90/105	90/105/120	105/120/135	120/135/150					
DUO 1400 US, 1650 US			90/105/120	105/120/135	120/135/150	135/150/160				
DUO 1900 US			90/105/120	105/120/135	120/135/150	135/150/160	160/170/180			
DUO 2200 US, 2500 US				105/120/135	120/135/150	135/150/160	160/170/180			
DUO 2800 US, 3000 US					120/135/150	135/150/160	160/170/180	180/190/200	215/230/245	
DUO 3300 US, 3500 US					120/135/150	135/150/160	160/170/180	180/190/200	215/230/245	
DUO 4000 US, 4400 US						135/150/160	160/170/180	180/190/200	215/230/245	
DUO 5500 US, 6000 US						135/150/160	160/170/180	180/190/200	215/230/245	245/260

* international type-size designation, calculated from: max. swept volume [cm³] x max. injection pressure in [bar] / 1000



ENGEL DUO.
Maximum perfection in a minimum of space.

6



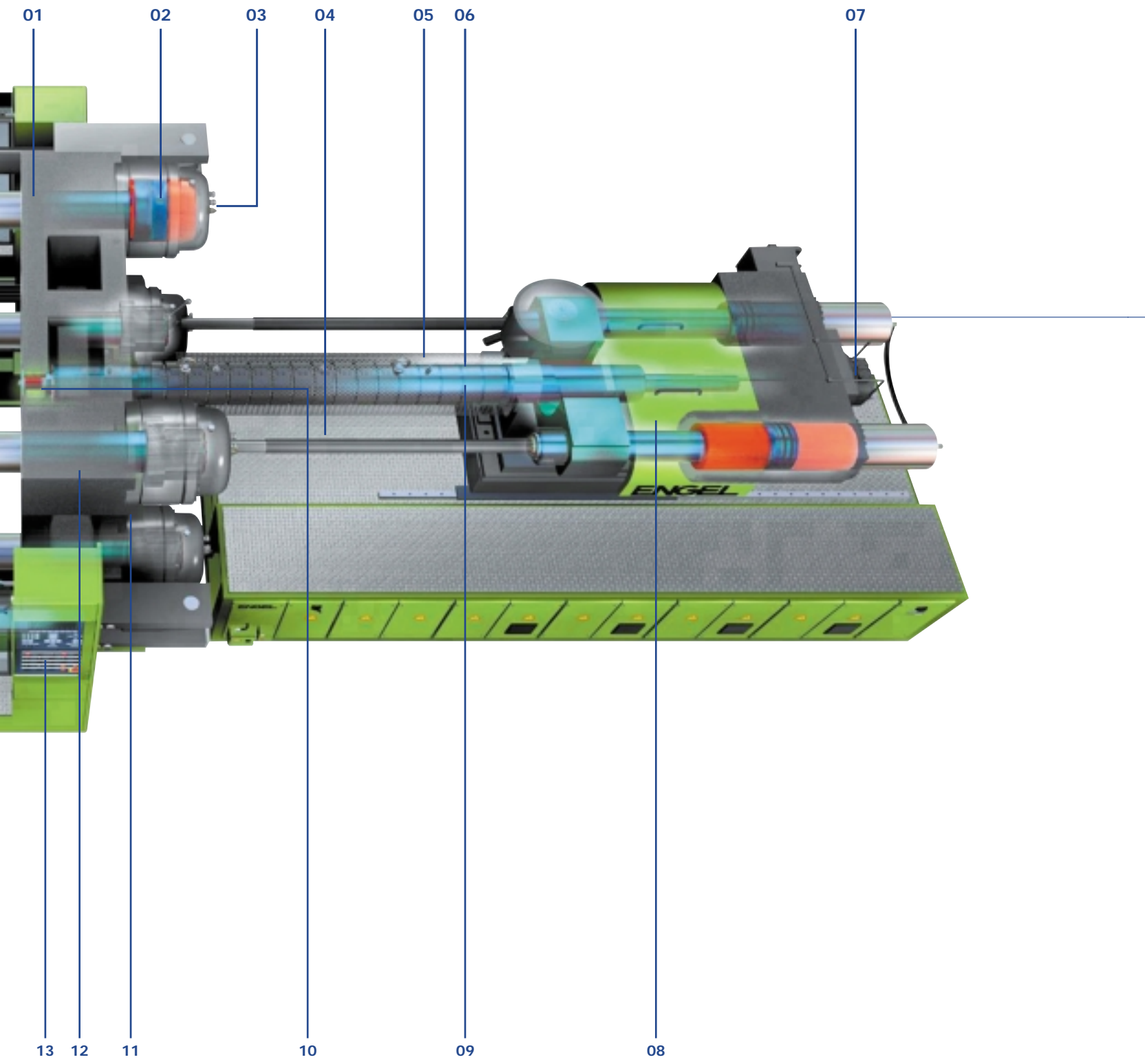
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17

16

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14





08
Swing-out injection unit.
(standard feature up to injection unit 5550 / ...)



12
Stationary platen with
4 pressure pad cylinders



14
Step on safety mat optional
on all ENGEL DUO machines



15
Platen support ensures exact guiding of the platens, even in cases where heavy molds are mounted. Negligible mold wear thanks to long, precision-machined guideways



16
Central ejector plate,
standard feature on all sizes
of machine from ENGEL DUO
900 US to 1900 US. Optional
on machines ENGEL DUO
2200 US and above.



17
Tiebar locking mechanism
with split nut

- 01** Threaded holes for mounting robot
- 02** System pressure in pressure pad
max. 3,625 psi (250 bar)
- 03** Reliable ultrasonic stroke transducer
for accurate positioning
- 04** Fully insulated cabinets for low-noise operation
- 05** Energy-saving hydraulic system with
electrically adjustable variable volume pumps
- 06** Injection cylinder can be readily disconnected and
removed from above; bimetallic cylinder with L/D
ratio of 20:1 is standard

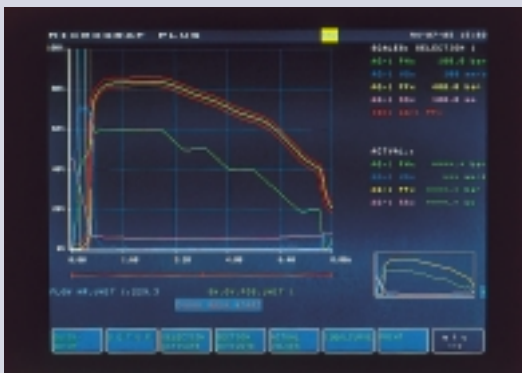
- 07** Direct hydraulic, high torque screw drive;
electric drive available as an option
- 09** Ceramic heater bands
- 10** Readily accessible nozzle
- 11** Modular design permits numerous
clamp and injection unit combinations
- 13** Integrated, ergonomically positioned control panel
- 18** Diagonally positioned high-speed cylinders –
readily accessible

The advantages lie in the basic concept:

- > "ENGEL DUO Base Frame Technology" – the modular system for your perfectly customized machine.
- > Minimum space requirement thanks to a compact two-platen design.
- > Cycle time reduction made possible by two diagonally positioned high-speed cylinders, featuring fast locking action and minimized pressure build-up time.
- > High reliability in operation and high part quality ensured by sturdy platen guides and parallel travel of the moving platen.
- > Easiest conceivable operation thanks to control concept, offering full integration potential for machine, robot and peripheral units.

ENGEL DUO. Comprehensive standards – modular options.

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CC 100: The interface between man and machine

Easy operation

- Ergonomically designed control panel located near the clamping unit
- Single user interface for machine and robot operation
- Toggle switches for main functions as standard
- Well-proven Engel control logic
- Predefined soft-keys
- Basic operations via function keys
- 10.4" color TFT monitor
- Display texts available in 25 languages

- Absolute value input and absolute value calculator
- Operator help system on RAM

High performance

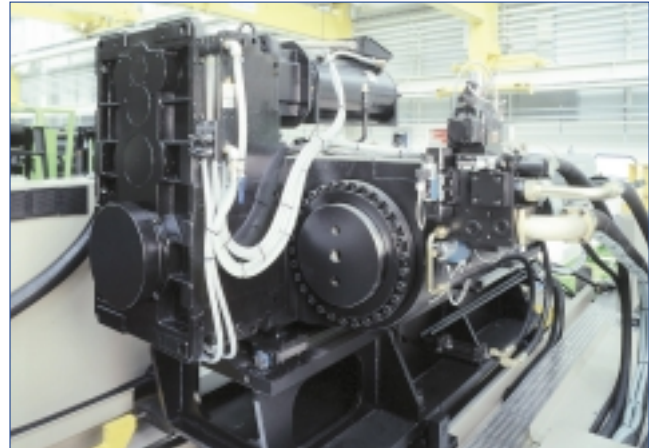
- Decentralized computer system, modular
- Shielded electronic hardware
- Digital output sensors
- Ultrasonic stroke transducers for constant accuracy of measurement
- Linearization program for the measurement and calibration of valve characteristics
- Fully feedback controlled injection process
- Self-learning temperature control system
- ENGEL MICROGRAPH PLUS graphics package for the digital display of up to 7 process data
- ENGEL MICROPLAST process software (for measuring and visualizing the energy required for the mold filling operation)
- QDS (quality data statistics of up to 8 different process parameters) including CPC (Continuous Process Control) for process data control with graphics display
- Statistical quality evaluation using QDS

Modular accessories (optional extras)

- "Autoprotect" self-learning mold protection system
- "Autoprotect" for injection unit
- ENGEL MICROFLOW process software (automatically corrects the change-over point from injection pressure to holding pressure as a function of the flow rate during the injection process)
- Quality assurance and error diagnostics also available via tele-maintenance service



Energy-saving hydraulic system with electrically adjustable variable displacement pumps.



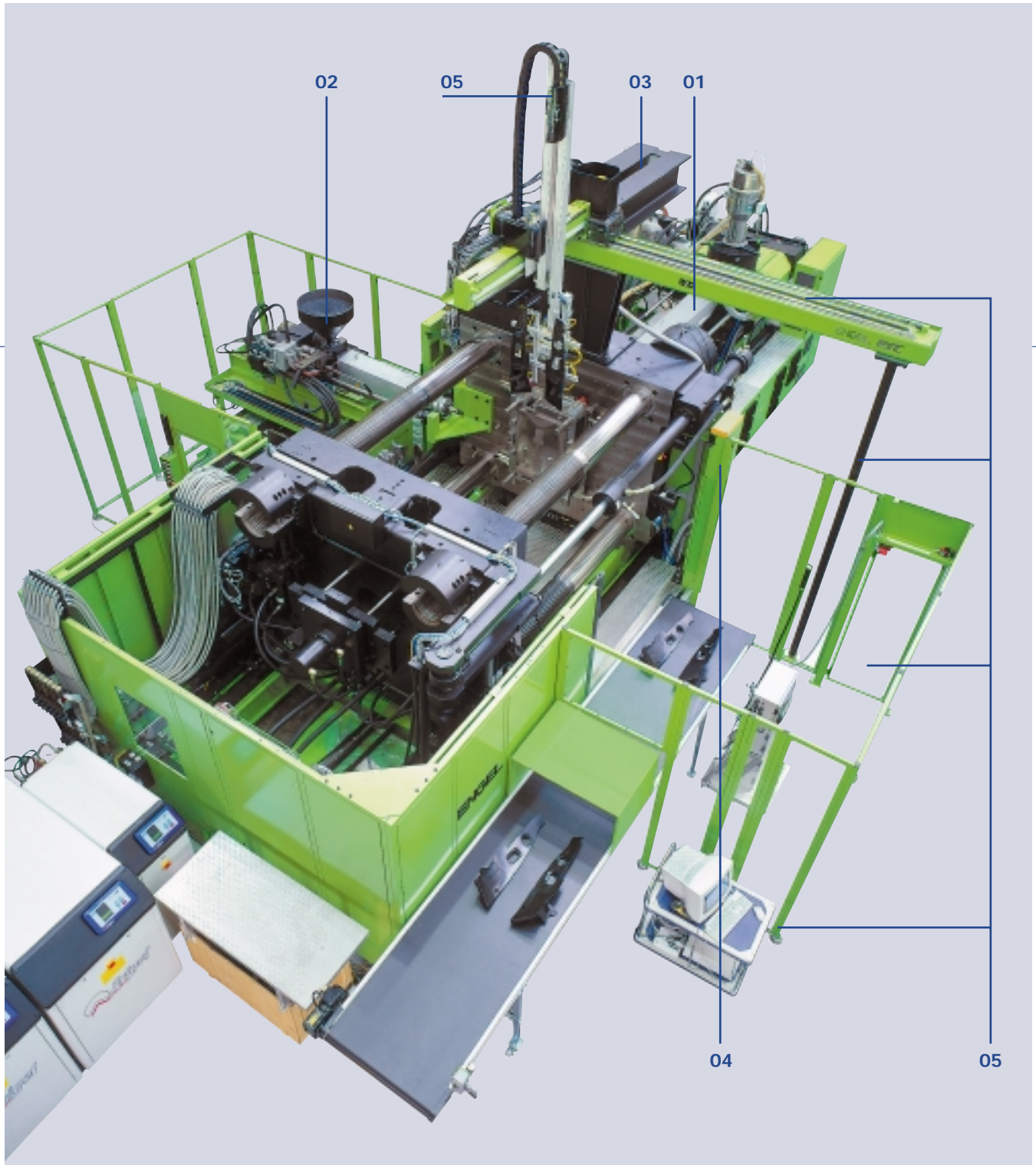
Energy-saving electric screw drive for high plasticizing capacity (optional).

Hydraulic system

All machines of the ENGEL DUO Series feature an energy-saving hydraulic system. Variable displacement pumps adjust the hydraulic pressure to the pressure required by the machine functions actually in operation. When the machine is only working under partial load, the pumps which are not required are automatically switched to zero delivery. This way, only the actual amount of oil needed is pumped through the system, thus reducing energy consumption to a minimum. The high positioning and reproducing accuracy on the moving mold half is achieved by means of a position-controlled proportional valve. The functions of the injection unit – "injection", "back pressure" and "holding pressure" – are controlled, on injection units 7050 and above, via a servo valve. The injection operation may be performed either by increasing the injection pressure or by increasing the injection speed. In compliance with the safety requirements of ANSI B151.1, all hydraulic hose couplings are provided with integrated safety features which prevent the hoses from being accidentally pulled out of their fittings.

ENGEL DUO.
Requirement - complete flexibility across the line.

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ENGEL DUO – the basis for all applications

Engel offers technology modules for the conversion of standard machines to machines for special "value-added" applications. Particularly worth mentioning here are not only Engel's multi-component and multi-color technologies (ENGEL COMBIMELT) but also its automation modules and equipment for the downstream finishing and enhancement of molded parts, including quality control and documentation.

01 Injection unit

The technical features of Engel's standard injection units are the result of continuous research and development over many years. For every standard application Engel can offer well-proven injection system components (see overview in general brochure). In addition, a wide range of optional components allow adaptation to specific performance and production requirements, e.g. the installation of an electric screw drive and barrier screws with an increased L/D ratio for higher plasticizing capacities when processing HDPE or PP. Engel's MARATHON product line guarantees a longer service life for screws and non-return valves (see special product leaflet).

02 Second injection unit

Second injection unit as an extension module for two-color or two-component application.

03 Tiebar retraction device

Low ceiling height and extra large molds are a handicap for normal mold changing operations. In such cases, Engel offers its "tiebar retraction device" as an equipment option.

This hydromechanical device retracts one of the upper tiebars into the machine (in the direction of the injection unit), thus gaining valuable space and time for the mold changing operation. Removal and installation take only a few minutes.

04 Software

The scope of the software offered with ENGEL DUO machines can be readily adapted to the actual application, either modularly or individually.

ENGEL EXPERT CONTROL helps the injection molder to ascertain the optimum operating parameters of his machine. Once the required quality features and tolerance limits of the parts to be molded have been defined, the system accesses a technology matrix and computes a characteristic diagram for the optimum operating point. If desired, the system can also cover individual operations with additional special software.

05 Automation options

The ENGEL DUO machines offer all the prerequisites for combination with automation modules.

The modules offered by ENGEL are:

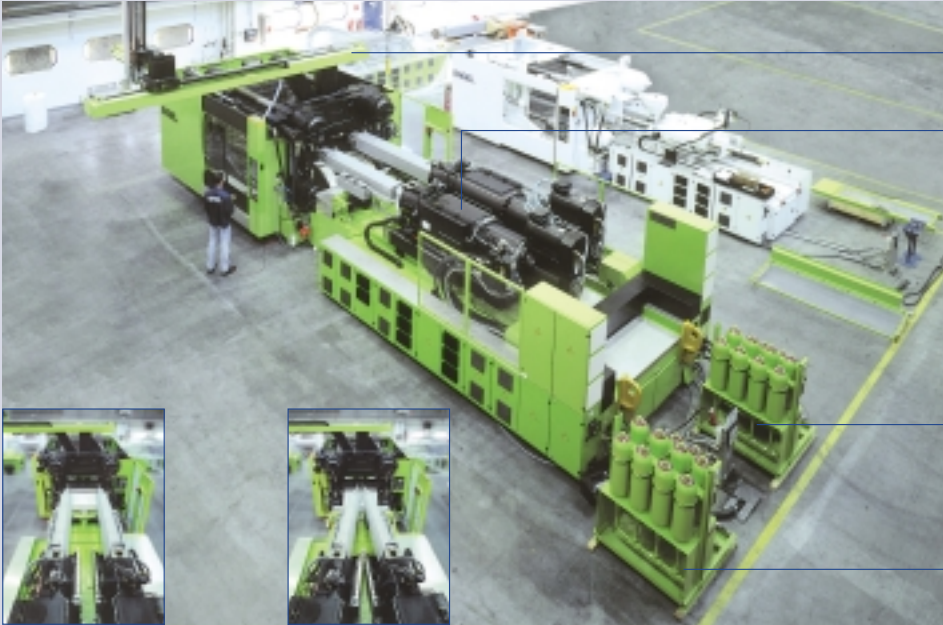
- Engel quick-action mold mounting system (integrated in platens)
- Mold transport and quick mold change systems
- Linear robots and robotic peripherals of Engel's own manufacture (ENGEL ERC-ROBOTS – see special brochure)
- Hardware and software for the interlinking and monitoring of production machines (EMS ENGEL MONITORING SYSTEM – see special product leaflet).

ENGEL DUO.

The right option for every application.

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ENGEL DUO 7000H / 7000H / 1250 US Two Shot
featuring high plasticizing capacity for large shot volumes



ENGEL ERC 83/1-CL
3 axes servo linear robot

Two independent
injection units,
each with a 105 mm
diameter barrier screw,
L/D = 24:1, screw driven
by electric motor

Accumulator
for injection

Both units can be
operated simultaneously
(gating into two molds)

Alternatively, both units can
be combined for gating into
one mold (for large shot volumes)

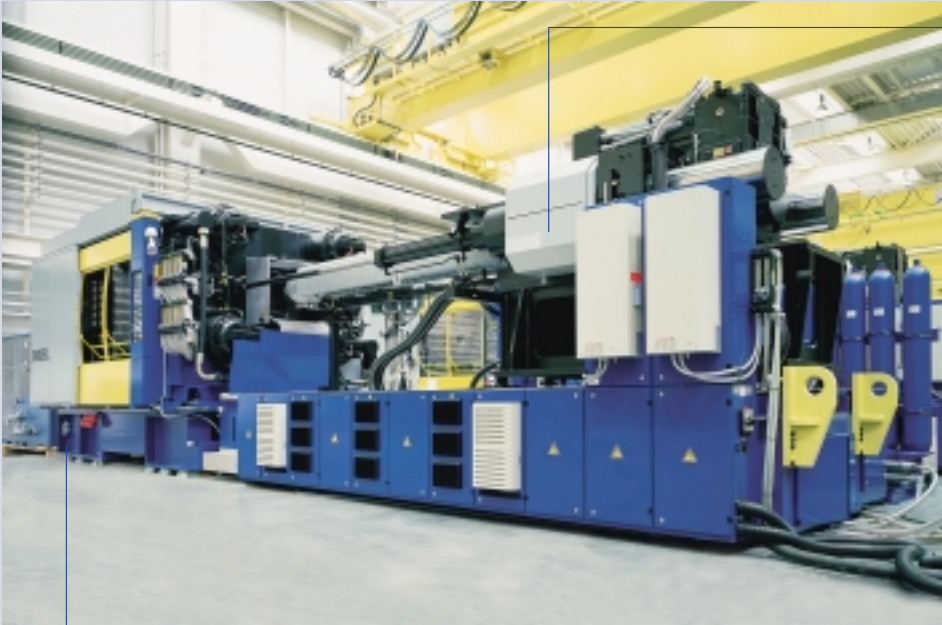
Garden furniture

as examples of parts with large surface-areas,
of widely differing volumes and designs.



ENGEL DUO 16050 / 1250 US

The Engel two-platen machine featuring high plasticizing capacity for reduced cycle times



Injection unit adapted for high plasticizing capacity (135 mm diameter barrier screw, L/D ratio = 24:1, electric screw drive and accumulator for fast injection)

In addition, the machine is linked up with the "ENGEL GASMELT" technology module

ENGEL DUO clamp unit with delivery chute (raised) for integration of discharge conveyor belt for molded bottle crates

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Bottle crates

and other containers, buckets etc., either with solid or with gas-injected, hollow profiles.



ENGEL DUO. The ideal foundation for ENGEL COMBIMELT.

ENGEL DUO 1000H / 1000H / 700H / 600H / 1650 US Combi
ENGEL COMBIMELT (multi-color) machine on ENGEL DUO base frame



Special multiple injection system featuring 4 injection units in square configuration. All 4 units are driven and controlled independently

ENGEL DUO clamp unit with integrated 4-station rotary table, 70.86" (1800 mm) diameter

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Car rear-lights

as examples of a diverse range of single-cycle, multi-color applications.



ENGEL DUO 7050H / 1050W / 1250 US Two Shot

ENGEL DUO machine with 2 injection units



Automatic tiebar retraction device for the installation of extra large molds

Second injection unit in space-saving "piggyback" arrangement (second injection unit positioned on top of first unit)

ENGEL ERC 83/1-CL 3 axes servo linear robot

ENGEL DUO clamp unit with 70.86" (1800 mm) dia. rotary table

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Dashboard

representative of a whole range of large-area car components, such as covers, instrument panels, seat shells, etc.

