

## SPECIFICATIONS

Clamping Unit	Toggle				
Clamping force	U.S. tons	82.5			
Clamp opening force	U.S. tons	12			
Clamp stroke (max.)	inches	11.81			
Mold height (min.-max.)	inches	5.91 x 14.96			
Daylight (min.-max.)	inches	5.91 x 26.77			
Platen size (HxV)	inches	A - 20.08 x 21.73 O/R B - 22.44 x 21.73			
Distance between tie-rods (HxV)	inches	A - 13.62 x 13.62 O/R B - 15.98 x 13.62			
Tie-rod diameter	inches	2.36			
Hydraulic ejector force	tons	2.80			
Hydraulic ejector stroke	inches	3.94			
Injection Unit	240				
Screw diameter	mm	30	35	40	45
Screw diameter	inches	1.181	1.378	1.575	1.772
Shot size (1)	ounces	3.8	5.2	6.7	8.5
Injection capacity	cu. inches	6.90	9.39	12.26	15.52
Plasticizing capacity (max.)	lbs./hr.	150	218	273	270
Recovery rate	ozs./sec.	0.67	0.97	1.21	1.20
Injection rate at max. pressure (2 + 3)	cu. in./sec.	4.79	6.52	5.67	7.71
Injection rate (regenerative) (2 + 3)	cu. in./sec.	N/A			
Injection velocity at max. pressure (2 + 3)	inches/sec.	4.37	4.37	3.91	2.91
Injection velocity (regenerative) (2 + 3)	inches/sec.	N/A			
Screw stroke	inches	6.30			
Injection pressure (max.) (4)	p.s.i.	32,979	24,229	27,897	22,042
Injection pressure (regenerative)	p.s.i.	N/A			
Screw speed range (4)	rpm	25-344	25-344	25-344	25-274
Screw torque (4)	in.-lbs.	3,089	3,089	3,089	4,452
Screw L/D ratio		20 : 1			
Nozzle stroke	inches	11.81			
Nozzle force	tons	4.86			
Hydraulics					
Pump capacity	gpm	17.70			
System pressure	p.s.i.	2,320			
Oil reservoir capacity	U.S. gal.	42			
Electrics					
Power supply (standard)	volt	230/460/575/3/60			
Total rated HP		20			
Number of heat control zones		3 + N	3 + N	3 + N	4 + N
Total heating wattage	kw	4.96	6.75	7.35	8.80
General					
Dry cycle performance	sec.	1.5			
Water requirements (max.)	gpm	6.0			
Machine dimensions (l x w x h)	inches	167 x 58 x 80			
Machine weight	lbs.	8,500			
Hopper capacity	lbs.	75			

## STANDARD EQUIPMENT

**Clamp**  
 SPI standard platen and K.O. pattern  
 Smooth, fast-acting double toggle  
 Multi-stroke hydraulic ejection, speed and pressure controlled with quick centre K.O. coupling  
 2 specific opening and closing  
 Adjustable support under moving platen  
 Electrically gear-driven central mold height adjustment  
 Heavy tie-bars, large bearing surface area for moving platen  
 Water-cooled stationary platen  
 Central automatic lubrication with pressure system protection  
**Mechanical safety droptbar**  
 Hydraulic, electric and electronic safety gate interlock  
 Divided safety gate  
 Low pressure mold protection with digital setting

**Injection**  
 20 : 1 L/D, nitrated barrel & screw  
 Non-return ring or ball check valve  
 Digital screw RPM indicator  
 3 injection speeds  
 Second stage injection pressure time and stroke dependant  
 Cold start protection  
 Rapid screw pulling from back  
 Discharge hopper chute with side for hopper movement  
 Water-cooled feed throat with thermometer  
 Programs for sprue break, decompression, intrusion, back pressure and transition boost to hold

**Hydraulics**  
 Fully proportional linearized hydraulics  
 Variable displacement pump  
 10 micron pressure filtration with electrical dirt alarm  
 Filter magnet  
 Oil tank with temperature and level indicator  
 Selective readouts for all pressures  
 Oil prewarming system with high and low limit, L.E.D. temperature readout, electrical water valve and closed loop oil temperature control

**Electric & Electronics**  
 REPRO 4WH control for digital settings of all pressures, speeds, strokes and temperatures  
 Selectable manual, semi-automatic and fully automatic modes  
 Potentiometric position control for clamp, ejection, injection & nozzle  
 Diagnostics with 18 L.E.D. alarm indicators  
 L.E.D. indicators for sequence, solenoids and position controls  
 Electronic temperature controls for barrel  
 Electronic temperature control for nozzle  
 Delay timers for plasticizing and sprue break  
 Cycle and hour counters  
 Separate controls for heat & drive  
 Circuit breakers i.p.o. fuses  
 Ventilated control panel  
 High energy-efficient, totally enclosed fan cooled motor(s)  
 Hydro approved (equivalent of C.S.A. and U.L.)

**General**  
 Conforms to latest O.S.H.A. standards  
 Easy access to motors, pumps & hydraulics  
 Large, open drop area for automation

**Notes:** 1. Based on styrene material  
 2. Calculated  
 3. Can be increased with accumulator  
 4. Can be increased  
 5. Adjustable support under moving platen is standard with large platen

**General Notes:** Machines available with different shot sizes upon request. Increased injection pressure available on certain models. N/A = not applicable, O/R = on request

## OPTIONAL EQUIPMENT

**Clamp**  
 Hydromechanical coining system  
 Manual or hydraulic quick mold mounting systems  
 Automatic mold change system  
 Extended tie-bars  
 Closed loop clamp force control for automatic setting and correcting of tonnage  
 Digital tonnage indicator  
 Direct clamp force indicator  
 Mechanical stroke limiter  
 Water-cooled, heated, insulated and nickel-plated platens  
 Special K.O. and platen hole patterns  
 Core pulls, unscrewing and indexing arrangements  
 Air blow-off units with timer & valve  
 Injection compression program  
 Mold venting program

**Injection**  
 Bi-metallic barrels  
 Vented barrels  
 Selective screws for specialized materials  
 Special L/D or compression ratio screws  
 Barrel & screw arrangements for Thermostat, L.I.M., Rubber, P.V.C. and Teflon  
 Smaller or larger than standard selectable shot sizes  
 Heaterless, filter, reverse taper and extra long nozzles  
 Spring-loaded, hydraulic & pneumatic shut off nozzles  
 Fully enclosed or insulated heatshield for barrel  
 Screw anti-rotation device

**Hydraulics**  
 Larger pump and motor for increased drive capacity  
 Larger motor and extra pump for independent screw drive  
 Larger motor and extra pump for K.O., unscrewing or core pull on the fly  
 Accumulator for K.O., unscrewing or core pull on the fly  
 Accumulator for faster injection  
 Increased injection pressure  
 High R.P.M. or high torque screw drive  
 Fine reading and adjustment of back pressure

**Electric & Electronic**  
 Microcomputer total machine controls with closed loop process control  
 Micrograph, microplast, computer interface & printer  
 Delay timers for injection, suck back or other  
 Timer to turn on heaters in advance  
 Timer to shut off machine after cycle set point is reached  
 Try Again program  
 Mold wiper & robot programs  
 Infra-red light curtain ejection control  
 Additional heating zones for machine, mold, hot runner or hot sprue  
 Heater & booster transformers  
 Power capacitor, part start winding or Star Delta  
 Ceramic or air-cooled heaterbands  
 Host computer  
 SPC & SPQC programs

**General**  
 Machine levelling/vibration mounts  
 Cooling-water distributor with flow indicators with or without thermometer's  
 Drawer-type and other hopper magnets  
 Stainless steel hopper, purge shield, etc.  
 Double hopper with indexing for rapid resin change  
 Quick barrel exchange  
 Special painting of machine as per customer's specs.  
 Pneumatic operator safety gate  
 Tool drawers in machine frame  
 Alarm bell in addition to standard alarm light  
 Recommended spare parts package  
 Automated handling systems

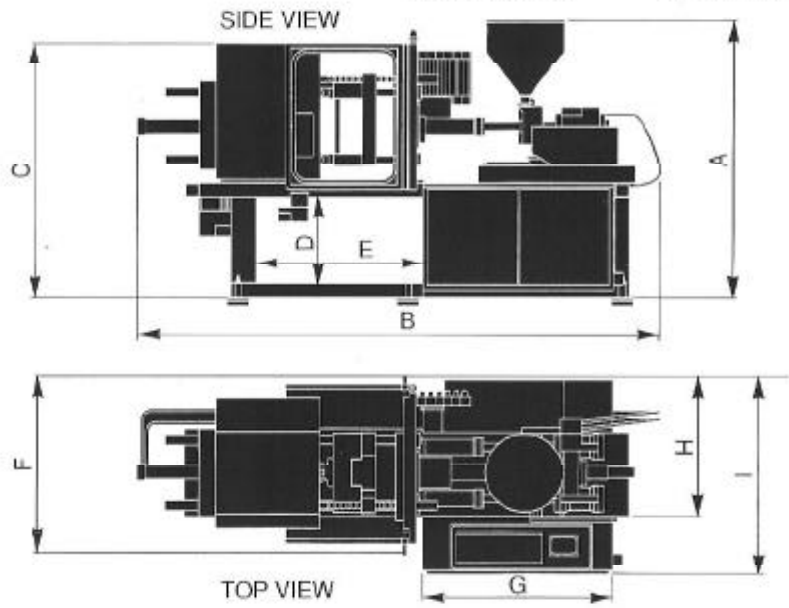
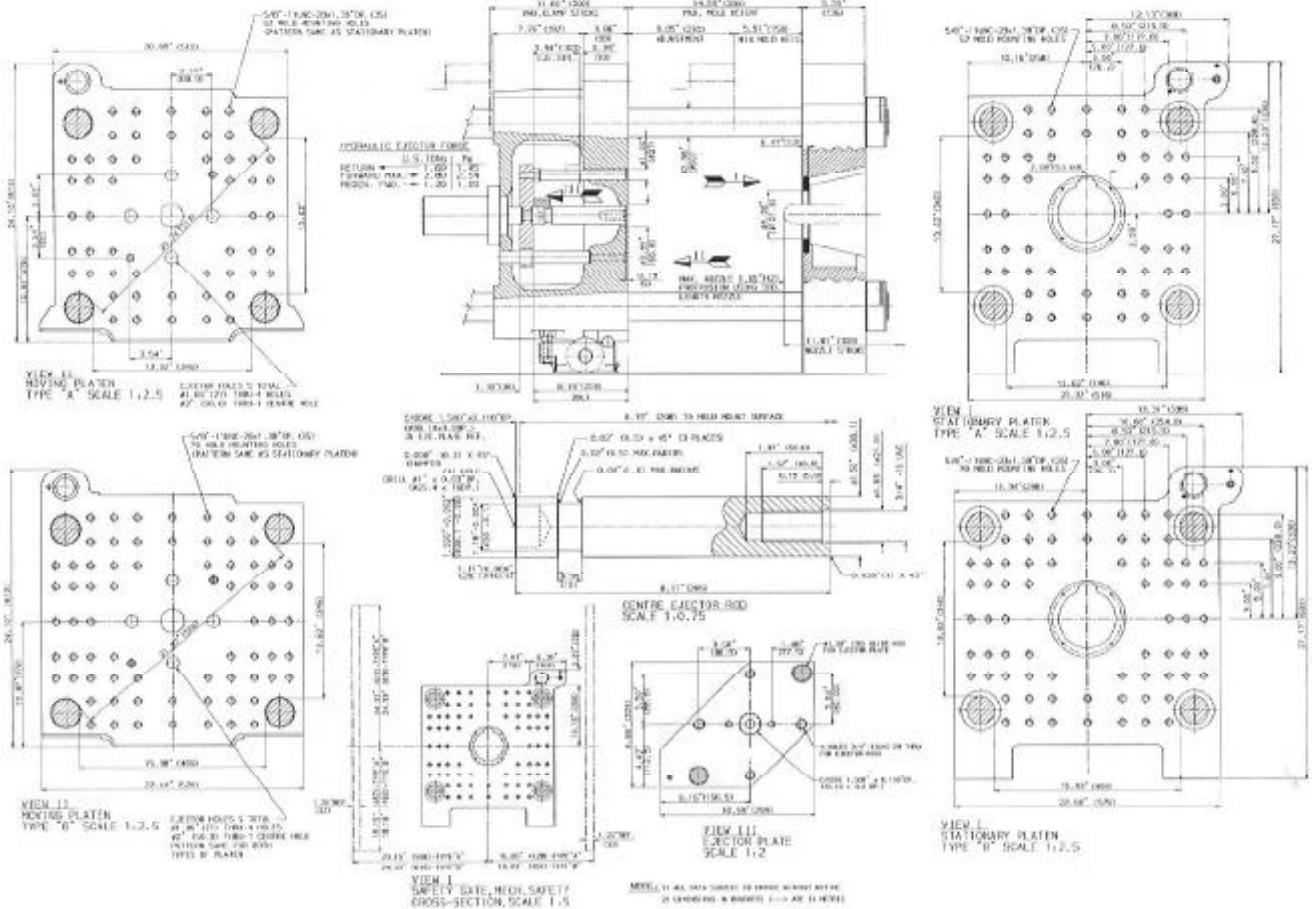
Some options may not be available on all machines

ISSUED APRIL 1990

# ENGEL

# Injection Molding Machine

# ES 80



Machine measurements in inches	
A	80
B	167
C	72
D	24
E	43
F	50
G	54
H	40
I	58

TECHNICAL DATA SUBJECT TO CHANGE WITHOUT NOTICE.

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