

FUNDAMENTAL MANUFACTURING PROCESSES

PLASTIC INJECTION MOLDING

SCENE 1.

CG: REVIEW

white text on black

tape 63, 12:00:15-12:03:49

review music

SCENE 2.

tape 421, 15:24:01-15:24:11

part falling out of injection
mold, cycle beginning

tape 422, 16:06:17-16:06:47

zoom in, injection process
part falling out of injection
mold, cycle beginning

NARRATION (VO) :

INJECTION MOLDING IS THE MOST COMMON METHOD OF
PRODUCING PARTS OUT OF PLASTIC MATERIAL. THE
PROCESS INVOLVES INJECTING MOLTEN PLASTIC AT HIGH
PRESSURE INTO A MOLD SHAPED IN THE FORM OF A PART.
ONCE THIS PLASTIC COOLS AND SOLIDIFIES, THE MOLD
OPENS, AND THE PART IS EJECTED.

SCENE 3.

tape 405, 10:02:22-10:02:28

2 shots, parts falling out of
injection mold, cycle beginning

tape 424, 18:16:25-18:16:32

part falling out of injection
mold

NARRATION (VO) :

INJECTION MOLDING IS AN EXTREMELY VERSATILE
PROCESS THAT CAN PRODUCE PARTS WITH A WIDE RANGE
OF ATTRIBUTES.

SCENE 4.

tape 405, 10:13:57-10:14:00

injection molding machine

tape 420, 03:06:55-03:07:03

injection molding machine

tape 422, 16:04:51-16:04:54

injection molding machine

tape 420, 03:00:47-03:00:52

injection molding machine

tape 405, 10:21:03-10:21:09

injection molding machine

tape 421, 15:12:34-15:12:38

injection molding machine

tape 420, 03:16:50-03:17:00

electric injection molding
machine

NARRATION (VO) :

THERE ARE AN EXTENSIVE VARIETY OF INJECTION
MOLDING MACHINES IN USE TODAY. THESE MACHINES ARE
ALL A COMBINATION OF TWO SYSTEMS,
AN INJECTION SYSTEM,
AND A CLAMPING SYSTEM.

SCENE 5.

tape 417, 12:05:16-12:05:25

NARRATION (VO) :

machine heating plastic,
dissolve to next shot
tape 417, 12:04:32-12:04:40
machine injecting melt into mold
CG, SUPER: Injection System

THE INJECTION SYSTEM HEATS THE THERMOPLASTIC
MATERIAL TO ITS APPROPRIATE VISCOSITY OR
FLOWABILITY AND THEN FORCEFULLY INJECTS IT INTO
THE MOLD.

SCENE 6.
continue previous shot
tape 424, 18:08:02-18:08:11
reciprocating screw injection
molding machine
tape 421, 15:14:09-15:14:14
two-stage screw injection
molding machine

NARRATION (VO):

THERE ARE TWO TYPES OF INJECTION MECHANISMS:
THE RECIPROCATING SCREW, WHICH IS THE MOST COMMON,
AND THE TWO-STAGE SCREW.

SCENE 7.
tape 400, 06:05:09-06:05:28
tilt, clamping system as mold
opens
CG, SUPER: Clamping System

NARRATION (VO):

THE FUNCTION OF AN INJECTION MOLDING MACHINE'S
CLAMPING SYSTEM IS TO KEEP THE PLASTIC MATERIAL
FROM LEAKING OUT, OR FLASHING, AT THE PARTING LINE
OF THE MOLD'S CAVITY AND CORE.

SCENE 8.
tape 400, 05:11:44-05:12:00
pan, hydraulic clamping system
of injection molding machine
tape 421, 15:10:22-15:10:34
toggle clamping system of
injection molding machine

NARRATION (VO):

THE CLAMPING SYSTEM OF THE INJECTION MOLDING
MACHINE HAS TWO CONFIGURATIONS:
A FULLY HYDRAULIC SYSTEM...,
AND A TOGGLE SYSTEM.

SCENE 9.
tape 415, 10:28:06-10:28:26
pull back of injection molding
machines

NARRATION (VO):

INJECTION MOLDING MACHINES ARE DESIGNATED BY THEIR
CLAMP TONNAGE, WHICH IS THE AMOUNT OF SEALING
FORCE A MACHINE CAN PRODUCE AGAINST THE HIGH
PRESSURES GENERATED DURING THE INJECTION PROCESS.

SCENE 10.
tape 417, 12:22:30-12:22:50
c.u. large mold as part is being
removed
CG, SUPER: Determines Shape Of
The Part
Acts As A Heat

NARRATION (VO):

THE INJECTION MOLD BOTH DETERMINES THE SHAPE OF
THE DESIRED PART OR PARTS, AND ACTS AS A HEAT

Exchanger
Vents Trapped Air/Gas
Ejects The Cooled
Part
build with red bullets

EXCHANGER TO DRAW HEAT AWAY FROM THESE PARTS. IN
ADDITION, THE INJECTION MOLD VENTS TRAPPED AIR OR
GAS, AND EJECTS THE COOLED PARTS.

SCENE 11.

tape 421, 15:08:29-15:08:43
pull out, mold cooling lines
pan to cooling unit
tape 415, 10:25:49-10:26:02
mold with cooling lines, opening
expelling part

NARRATION (VO) :

THE SPEED OF THE INJECTION MOLDING PRODUCTION
CYCLE IS CONTROLLED BY THE EFFICIENCY OF THE
MOLD'S COOLING SYSTEM. ASIDE FROM PRODUCING
ACCEPTABLE PARTS, EFFICIENT COOLING IS THE MOST
IMPORTANT FACTOR OF THE INJECTION MOLDING PROCESS.

SCENE 12.

tape 400, 05:14:50-05:15:04
pull back of machine controls
tape 417, 12:07:55-12:08:02
swish pan from operator to
machine controls
tape 420, 03:10:19-03:10:25
pull out machine controls

NARRATION (VO) :

THE TYPE AND LOCATION OF MACHINE CONTROLS ARE
DEPENDENT UPON THE INJECTION MOLDING MACHINE.
THESE CONTROLS CAN VARY FROM ELECTROMAGNETIC
RELAYS AND TIMERS,
TO COMPUTER DRIVEN SOLID-STATE DEVICES.

SCENE 13.

tape 424, 18:09:59-18:10:16
zoom out, machine controls

NARRATION (VO) :

THESE COMPUTERS NOT ONLY CONTROL THE PROCESS, BUT
PERFORM SEVERAL OTHER FUNCTIONS.

SCENE 14.

tape 397, 01:09:37-01:09:48
simulation of injection process
tape 425, 19:01:56-19:02:04
machining of mold

NARRATION (VO) :

ADDITIONALLY, COMPUTERS ARE ALSO USED FOR VARIOUS
ACTIVITIES THROUGHOUT THE DESIGN AND CONSTRUCTION
OF THE INJECTION MOLD.

--- FADE TO BLACK ---