

FUNDAMENTAL MANUFACTURING PROCESSES

PLASTIC INJECTION MOLDING

SCENE 1.

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 2.

tape 405, 10:02:22-10:02:28
2 shots, parts falling out of
injection mold, cycle beginning
tape 416, 13:01:51-13:01:55
small part with many holes
tape 416, 13:02:29-13:02:33
small gray door with spring
tape 416, 13:04:45-13:04:49
glue stick with thread
tape 416, 13:11:32-13:11:39
cd-rom holder with hinge

NARRATION (VO) :

INJECTION MOLDING IS AN EXTREMELY VERSATILE
PROCESS THAT CAN PRODUCE PARTS WITH HOLES,
SPRINGS,
THREADS,
HINGES,
AND UNDERCUTS IN A SINGLE OPERATION.

SCENE 3.

tape 416, 13:08:51-13:02:57
simple injection molded frisbee
tape 416, 13:13:42-13:13:47
complex, solid tan speaker cover
threaded part
tape 416, 13:00:40-13:00:50
foamed part, styrofoam cup
tape 416, 12:02:40-12:02:50
still, reinforced injection
molded electrical connectors
tape 416, 13:14:43-13:14:47
filled black threaded part
tape 416, 13:07:02-13:07:06
small injection molded model
part
tape 416, 12:01:10-12:01:20
still, large injection molded
dumpster
tape 416, 13:02:56-13:03:03
thick injection molded part

NARRATION (VO) :

INJECTION MOLDED PARTS CAN BE SIMPLE,
OR COMPLEX,
AND CAN BE SOLID,
FOAMED,
REINFORCED,
OR FILLED.
THEY CAN BE SMALL,
OR LARGE,
THICK,

tape 416, 13:16:22-13:16:27
thin, flexible injection molded
diaphragm
tape 416, 12:02:10-12:02:20
still, rigid injection molded
medical item

OR THIN,
FLEXIBLE,
OR RIGID.

SCENE 4.

tape 424, 18:16:25-18:16:32
part falling out of injection
mold
tape 416, 13:01:35-13:01:45
polished injection molded pearls
tape 416, 13:11:52-13:11:57
leather textured injection
molded car part
tape 427, 20:01:39-20:01:43
hot stamped injection molded
wood grain car interior
tape 416, 13:09:00-13:09:06
plated injection molded make-up
case
tape 416, 12:01:40-12:01:50
still, colored/clear injection
molded camera
tape 416, 12:03:10-12:03:20
still, clear/colored injection
molded turn signal casing
tape 415, 10:15:37-10:15:46
worker pulling part out of mold

NARRATION (VO):

INJECTION MOLDED PARTS ALSO LEND THEMSELVES TO
ENDLESS DECORATIVE EFFECTS. THEY CAN BE POLISHED,
TEXTURED,
HOT STAMPED,
PLATED,
COLORED,
OR CLEAR. NO OTHER MANUFACTURING PROCESS OFFERS
THE RANGE OF CAPABILITIES INJECTION MOLDING
PROVIDES.

--- FADE TO BLACK ---

SCENE 5.

tape 417, 12:05:34-12:05:46
zoom out, part falling out of
injection mold
tape 390, 03:22:25-03:22:35
zoom out plastic pouring

NARRATION (VO):

TO BETTER UNDERSTAND THE INJECTION MOLDING PROCESS
REQUIRES UNDERSTANDING SOME PROPERTIES INHERENT IN
PLASTIC ITSELF. THE SIMPLEST DEFINITION OF A
PLASTIC IS ANY NATURAL OR SYNTHETIC POLYMER THAT
HAS A HIGH MOLECULAR WEIGHT.

SCENE 6.

tape 420, 03:07:55-03:08:00
shot of plastic
tape 427, 22:01:00-22:01:30
blue background
CG: Thermoplastic
Thermosets
build with red bullets

NARRATION (VO):

THERE ARE TWO TYPES OF PLASTICS:
THERMOPLASTIC,
AND THERMOSETS.

SCENE 7.

tape 392, 08:23:46-08:24:01

NARRATION (VO):

thermoplastic melted
tape 398, 02:09:32-02:09:40
thermoplastic being reground

THERMOPLASTICS UNDERGO A REVERSIBLE CHANGE FROM SOLID TO LIQUID WHEN HEATED, AND CAN BE COOLED, AND REGROUND FOR REUSE OVER AND OVER AGAIN.

SCENE 8.
tape 403, 01:30:25-01:30:39
2 shots, thermoset injection molding process

NARRATION (VO) :
THERMOSETS UNDERGO A CHEMICAL REACTION BETWEEN TWO REAGENTS WHEN HEATED, AND ACHIEVE THEIR STRENGTH THROUGH THE INTERLOCKING CHEMICAL BONDS. ONCE MOLDED, THERMOSETS CANNOT BE RESOFTENED.

SCENE 9.
tape 403, 01:31:45-01:31:49
thermoset injection molding process
tape 421, 15:18:58-15:19:05
thermoplastic injection molding process

NARRATION (VO) :
WHILE THERMOSETS ARE INJECTION MOLDABLE, MOST MATERIALS USED IN INJECTION MOLDING MACHINES ARE THERMOPLASTICS.

--- FADE TO BLACK ---

SCENE 10.
tape 400, 06:09:44-06:09:54
zoom in to injection molding process

NARRATION (VO) :
INJECTION MOLDING PLASTICS IS EXTREMELY COMPLICATED BECAUSE OF THE INFINITELY CHANGING PRESSURE, TEMPERATURE AND VELOCITY INSIDE THE MOLD.

SCENE 11.
tape 421, 15:07:24-15:07:33
mold opening, part ejected, mold closing, injection cycle beginning

NARRATION (VO) :
THESE MOLDING CONDITIONS DIRECTLY AFFECT THE PROPERTIES OF EACH MOLDED PART. A CHANGE IN ANY OF THE CONDITIONS WILL ALTER THE PARTS PRODUCED.

SCENE 12.
tape 421, 15:04:38-15:05:00
wide pan of injection molding process
CG, SUPER: Molder
Material
Injection Machine
Mold
build with red bullets

NARRATION (VO) :
THERE ARE FOUR PRIMARY ELEMENTS THAT INFLUENCE THE PLASTIC INJECTION MOLDING PROCESS:
THE MOLDER,

tape 421, 15:27:48-15:27:58
wide, injection molding machine
tape 421, 15:03:40-15:03:44
wide, injection mold

THE MATERIAL,
THE INJECTION MACHINE,
AND THE MOLD.

THIS VIDEO FOCUSES ON THE LATTER TWO, THE
INJECTION MACHINE,
AND THE MOLD.

--- FADE TO BLACK ---