

FUNDAMENTAL MANUFACTURING PROCESSES

Plastics Finishing

SCENE 1.

CG: FBI warning
white text centered on black to
blue gradient

WARNING

federal law provides severe civil and
criminal penalties for the unauthorized
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of copyrighted videotapes.

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SCENE 2.

CG: disclaimer
white text centered on black to
blue gradient

Always read the operating manual and safety
information provided by the manufacturer before
operating any plastic production or finishing
equipment.

Make sure all machine guards are in place, and
follow all safety procedures when working with or
near plastic production or finishing equipment.

SCENE 3.

tape 40, 01:00:00-01:00:12
SME logo, with music
CG, SUPER: www.sme.org

SCENE 4.

tape 25, 01:01:00-01:01:45
fundamental series open, with
music
tape 652, 01:00:01-01:01:49
peter carey narration,
intro segment

MUSIC UP AND UNDER

NARRATION (VO) :

THE FUNDAMENTAL MANUFACTURING PROCESSES VIDEO
SERIES, EXAMINING THE TOOLS AND TECHNIQUES OF
PRECISION MANUFACTURING.

SCENE 5.

program title:
CG: Plastics finishing
white text centered on black

NARRATION (VO) :

THIS PROGRAM IS AN INTRODUCTION TO PLASTICS
FINISHING.

SCENE 6.

tape 421, 15:20:04-15:20:10
part coming out of injection
mold
tape 403, 01:46:21-01:46:25

NARRATION (VO) :

THE MOLDING OF PLASTICS IS A COMMON METHOD OF

parts being blow molded
tape 630, 08:07:53-08:07:58
parts being thermoformed
tape 421, 15:04:02-15:04:10
zoom out, part coming out of
injection mold

MANUFACTURING PARTS, AND ENCOMPASSES A VARIETY OF
PROCESSES, WITH THE PRINCIPAL TYPE BEING PLASTIC
INJECTION MOLDING.

SCENE 7.
tape 408, 10:03:25-10:03:37
zoom out, plastic being sucked
CG, SUPER: Thermoplastics
Thermosets

NARRATION (VO) :
INJECTION MOLDED PARTS ARE PRODUCED FROM TWO TYPES
OF PLASTICS:
THERMOPLASTICS,
AND THERMOSETS.

SCENE 8.
tape 392, 08:23:46-08:24:01
thermoplastic melted
tape 398, 02:09:32-02:09:40
thermoplastic being reground

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

SCENE 9.
tape 403, 01:30:29-01:30:42
2 shots, zoom out, thermoset
mold closing, dissolve to mold
opening, showing thermoset parts
tape 403, 01:33:19-01:33:24
thermoset parts pulled from mold

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 10.
tape 417, 12:05:34-12:05:46
thermoplastic part pulled out of
mold

NARRATION (VO) :
OF THE TWO TYPES OF MATERIALS, THERMOPLASTICS ARE
THE MOST PREDOMINATELY USED.

SCENE 11.
tape 428, 00:06:24-00:06:44
ANI: injection molding process,
flip image, run at double speed
tape 415, 10:25:49-10:26:02
mold opening and plastic part
falling out

NARRATION (VO) :
IN INJECTION MOLDING, MOLTEN PLASTIC MATERIAL IS
INJECTED AT HIGH PRESSURE INTO A MOLD CONTAINING
THE FORM OF A PART. ONCE THIS PLASTIC COOLS AND
SOLIDIFIES, THE MOLD OPENS, AND THE PART IS
EJECTED.

SCENE 12.

tape 626, 06:10:12-06:10:24
parts being ultrasonically assembled
tape 641, 19:08:09-19:08:16
zoom in, part being deflashed
tape 628, 07:26:28-07:26:34
part being blasted
tape 626, 06:07:06-06:07:10
part being degated
tape 621, 15:05:21-15:05:28
parts being decorated, painted
tape 635, 15:23:01-15:23:06
parts being decorated, plated
tape 625, 05:14:16-05:14:19
part being degated
CG, SUPER: Degating
tape 625, 05:15:23-05:15:30
part being deflashed
CG, SUPER: Deflashing
tape 621, 15:02:17-15:02:23
parts being cleaned
CG, SUPER: Cleaning
tape 639, 16:04:06-16:04:13
part being decorated, silk screened
CG, SUPER: Decorating

NARRATION (VO) :

ONCE MOLDED, MOST PARTS REQUIRE ADDITIONAL PROCESSING, SUCH AS ASSEMBLY FOR COMPLETION. BUT MANY PLASTICS FINISHING PROCESSES ARE PERFORMED FOR AESTHETIC, OR APPEARANCE, PURPOSES. THESE FINISHING PROCESSES ARE THE PRIMARY FOCUS OF THIS PROGRAM, AND INCLUDE:
DEGATING...,
DEFLASHING...,
CLEANING...,
AND DECORATING.

--- FADE TO BLACK ---

SCENE 13.

CG: Degating
white text centered on black
tape 652, 01:01:52-01:04:50
peter carey narration,
degating segment

SCENE 14.

tape 417, 12:15:20-12:15:31
mold opening, part ejected, mold closing, injection of plastic
tape 428, 00:10:00-00:10:15
ANI: the cold-runner two-plate mold, molding sprue, runners and gate along with the parts, ejected
GRAPHIC: add arrow to show sprue bushing
tape 422, 16:26:12-16:26:22
zoom in to c.u. of sprue bushing
CG, SUPER: Sprue Bushing

NARRATION (VO) :

IN THE PRODUCTION OF AN INJECTION MOLDED PART, PLASTIC IS FORCED UNDER PRESSURE FROM THE NOZZLE OF THE INJECTION MACHINE'S HEATING CYLINDER INTO THE MOLD THROUGH AN OPENING CALLED THE SPRUE BUSHING.

SCENE 15.

continue previous shot
tape 422, 16:23:58-16:24:07
zoom in, mold half showing sprue

NARRATION (VO) :

THE SPRUE BUSHING DIRECTS THE MOLTEN MATERIAL FROM

bushing, runner system stopping
at gate of mold

THE INJECTION MACHINE'S NOZZLE EITHER DIRECTLY
INTO THE MOLD'S CAVITY, OR INTO THE MOLD'S RUNNER
SYSTEM.

SCENE 16.

tape 422, 16:17:21-16:17:39

c.u. pan of mold half showing
runner system stopping at gate
of mold

NARRATION (VO) :

THIS RUNNER SYSTEM IS THE CHANNEL OR CHANNELS
THROUGH WHICH THE MELTED THERMOPLASTIC FLOWS TO
REACH THE GATE.

SCENE 17.

continue previous shot

CG, SUPER: Gate

GRAPHIC: add arrows indicating
gates

tape 398, 02:15:21-02:15:29

part with gate and runner being
ejected from the mold

NARRATION (VO) :

THE GATE LINKS THE RUNNERS TO THE CAVITY THAT
FORMS THE PART. THE GATE AND RUNNER TYPICALLY
REMAINS ATTACHED TO THE PART UPON EJECTION FROM
THE MOLD.

SCENE 18.

CG, SUPER: Degating

tape 400, 05:09:51-05:10:01

part being degated

NARRATION (VO) :

DEGATING IS THE PROCESS OF REMOVING THE MOLDED
PART FROM THE GATE AND RUNNER SYSTEM.

SCENE 19.

tape 399, 03:11:50-03:11:59

parts separated from by-products
part degated by manually

tape 625, 05:20:48-05:20:58

zoom out, snapping part from the
gate and runner system

tape 625, 05:14:55-05:15:03

part degated using side-cutter
hand tool

tape 625, 05:19:11-05:19:24

trimming fixture used to degate
parts

tape 424, 18:01:30-18:01:43

zoom out, cold-runner three
plate mold ejecting part and
runner system

CG, SUPER: Cold-Runner Three-
Plate Mold

NARRATION (VO) :

DEGATING CAN BE ACCOMPLISHED USING A VARIETY OF
METHODS, INCLUDING:

MANUALLY 'SNAPPING' THE PART FROM THE GATE TO

REMOVE THE RUNNER SYSTEM...,

USING HAND TOOLS, SUCH AS A SIDE-CUTTER, FOR

SEPARATION...,

USING DEDICATED TRIMMING FIXTURES FOR PARTS OR A

FAMILY OF PARTS...,

OR USING AUTOMATED TOOLING DEVICES, SUCH AS THE

COLD-RUNNER THREE-PLATE MOLD.

SCENE 20.

continue previous shot

NARRATION (VO) :

tape 428, 00:12:25-00:12:32
GRAPHIC: static, cold-runner
three plate mold

CG, SUPER: Stripper Plate
tape 428, 00:11:18-00:11:28

GRAPHIC: stripper plate,
highlighted

CG, SUPER: Cavity Plate
tape 428, 00:11:38-00:11:48

GRAPHIC: cavity plate,
highlighted

CG, SUPER: Movable Plate
tape 428, 00:11:58-00:12:08

GRAPHIC: movable plate,
highlighted

SCENE 21.

tape 428, 00:12:44-00:12:58

ANI: cold-runner three plate
mold opening up ejecting parts

SCENE 22.

tape 626, 06:04:55-06:05:05

degating operation

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

runnerless type mold ejecting
part, cycle starting again

CG, SUPER: Hot Sprue-Gated Mold
Hot-Runner Mold
Insulated Runner Mold

SCENE 23.

CG, SUPER: Hot Sprue-Gated Mold

tape 422, 16:22:10-16:22:18

zoom in, sprue gate mold

SCENE 24.

CG, SUPER: Hot-Runner Mold

tape 428, 00:13:45-00:14:18

ANI: hot-runner mold with heated
manifold keeping the molten
thermoplastic in the runners at
the same temperature as the
heating cylinder, mold opens,

THE COLD-RUNNER THREE-PLATE MOLD USES THREE
SEPARATE PLATES TO MOLD THE PART. THESE PLATES

INCLUDE THE STRIPPER PLATE, WHICH CONTAINS THE
SPRUE,

THE MIDDLE OR CAVITY PLATE, WHICH HOLDS THE
CAVITY, RUNNER AND GATE,

AND THE MOVABLE PLATE, WHICH HOLDS THE MOLDED
PART.

NARRATION (VO) :

THIS TYPE OF COLD RUNNER MOLD DESIGN AUTOMATICALLY
SEPARATES THE RUNNER SYSTEM FROM THE PART EACH
TIME THE MOLD OPENS.

NARRATION (VO) :

TO ELIMINATE THE NEED FOR MANUAL OR AUTOMATED
DEGATING, 'RUNNERLESS' INJECTION MOLDS HAVE BEEN
DESIGNED. THESE MOLDS INCLUDE:

THE HOT SPRUE-GATED MOLD,
THE HOT-RUNNER MOLD,
AND THE INSULATED RUNNER MOLD.

NARRATION (VO) :

A HOT SPRUE-GATED MOLD ALLOWS THE MOLTEN MATERIAL
INTO THE MOLD CAVITY DIRECTLY FROM THE HEATED
SPRUE BUSHING WITHOUT THE USE OF A RUNNER SYSTEM.

NARRATION (VO) :

THE HOT-RUNNER MOLD USES AN ELECTRICALLY HEATED
MANIFOLD THAT KEEPS THE MOLTEN THERMOPLASTIC IN
THE RUNNERS AT THE SAME TEMPERATURE AS THE HEATING

parts ejected, mold closes
GRAPHIC: add arrow indicating
heated runner system

CYLINDER. THE HEATED RUNNER SYSTEM IS CONTAINED IN
A PLATE OF ITS OWN AND DOES NOT OPEN DURING THE
MOLDING CYCLE. BECAUSE OF THIS, HOT-RUNNER MOLDS
PRODUCE PARTS WITHOUT GENERATING RUNNERS OR
SPRUES.

SCENE 25.

CG, SUPER: Insulated Runner Mold
tape 428, 00:15:03-00:15:26
ANI: insulated runner mold with
large diameter runner, during
injection, the outer surface of
the material freezes in runner,
insulating the center material,
keeping it at the molding
temperature
GRAPHIC: add arrow indicating
insulated runner system

NARRATION (VO) :

THE INSULATED RUNNER MOLD IS MUCH LIKE THE HOT-
RUNNER MOLD BUT IT USES A LARGE DIAMETER RUNNER.
DURING INJECTION, THE OUTER SURFACE OF THE RUNNER
SOLIDIFIES. THIS INSULATES THE CENTER MATERIAL,
KEEPING IT AT THE FLUID MOLDING TEMPERATURE.

--- FADE TO BLACK ---

SCENE 26.

CG: Deflashing
white text centered on black
tape 652, 01:04:52-01:07:07
peter carey narration,
deflashing segment

NARRATION (VO) :

DURING THE INJECTION MOLDING PROCESS, EXCESS
PLASTIC CAN LEAK BETWEEN MOLD HALVES FORMING
FLASH.
FLASH MAY OCCUR BOTH INTERNALLY...,
AND EXTERNALLY.

SCENE 27.

tape 424, 18:13:42-18:13:48
part ejected from mold
tape 632, 12:04:49-12:05:02
zoom out, part with flash
tape 632, 12:06:42-12:06:50
part with internal flash
tape 632, 12:08:10-12:08:18
part with external flash

NARRATION (VO) :

THE PRIMARY TYPES OF FLASH REMOVAL, OR DEFLASHING
INCLUDE:
CUTTING AND TRIMMING...,
MEDIA BLASTING...,

SCENE 28.

tape 641, 19:10:34-19:10:52
hand trimming of flash off part
CG, SUPER: Cutting & Trimming
tape 628, 07:22:23-07:22:27
zoom out, blasting flash off
parts
CG, SUPER: Media Blasting
tape 622, 01:12:04-01:12:10
zoom in, cryogenic deflashing of
parts

CG, SUPER: Cryogenic Deflashing OR CRYOGENIC DEFLASHING.

--- TOUCH BLACK ---

SCENE 29.
CG, SUPER: Cutting & Trimming
tape 641, 19:09:55-19:10:26
trimming of flash

NARRATION (VO) :

CUTTING AND TRIMMING ARE THE MOST COMMON METHODS OF DEFLASHING MOLDED PARTS, AND ARE PERFORMED MANUALLY USING KNIVES, OR OTHER CUTTING UTENSILS.

SCENE 30.
continue previous shot
tape 641, 19:01:56-19:02:13
trimming of plastic parts

NARRATION (VO) :

CUTTING AND TRIMMING OPERATIONS ARE COST EFFECTIVE, BUT SINCE THEY REQUIRE THE HANDLING OF SHARP CUTTING UTENSILS, CARE MUST BE TAKEN TO PREVENT OPERATOR INJURIES, DAMAGE TO EXPENSIVE MOLDS, AND DAMAGE TO THE PLASTIC PARTS.

--- TOUCH BLACK ---

SCENE 31.
CG, SUPER: Media Blasting
tape 628, 07:03:56-07:04:14
media blasting operation
tape 628, 07:15:50-07:16:00
zoom out, media used for blasting

NARRATION (VO) :

MEDIA BLASTING INVOLVES BROADCASTING AN IMPACT MEDIA UNDER PRESSURE AGAINST PARTS THAT ARE BEING CONVEYED, ROTATED, OR TUMBLED. THIS IMPACT MEDIA IS USUALLY A PARTICULATE POLYMER, ALTHOUGH ORGANIC MATERIALS SUCH AS GROUND WALNUT SHELLS ARE ALSO USED.

SCENE 32.
tape 628, 07:10:35-07:10:50
zoom out, media blasting operation

NARRATION (VO) :

AS THE MEDIA IMPACTS THE PARTS, IT BREAKS UP BOTH THE INTERNAL AND EXTERNAL FLASH.

SCENE 33.
tape 628, 07:25:45-07:25:55
parts being run through blasting operation

NARRATION (VO) :

CARE MUST BE TAKEN TO SELECT A BLASTING MEDIA THAT WILL ADEQUATELY DEFLASH PARTS WITHOUT CAUSING

DAMAGE.

--- TOUCH BLACK ---

SCENE 34.

CG, SUPER: Cryogenic Deflashing

tape 622, 01:05:24-01:05:34

zoom out, parts unloaded from
cryogenic deflashing operation

tape 622, 01:07:50-01:07:57

parts loaded to cryogenic
deflashing operation

tape 622, 01:10:28-01:10:34

liquid nitrogen tank

tape 622, 01:09:39-01:09:46

zoom in, carbon dioxide/media
flow label on machine control
panel

NARRATION (VO) :

CRYOGENIC DEFLASHING INVOLVES QUICKLY FREEZING AND
EMBRITTLING THE THIN FLASH ON PLASTIC PARTS. THE
PARTS ARE FIRST LOADED TO THE CRYOGENIC DEFLASHING
MACHINE AND THEN TUMBLED OR VIBRATED. LIQUID
NITROGEN, CARBON DIOXIDE OR DRY ICE IS THEN ADDED.
THE PARTS ARE THEN BLASTED WITH MEDIA TO BREAK UP
AND REMOVE THE FLASH.

SCENE 35.

tape 622, 01:08:36-01:08:56

media used in cryogenic
deflashing added to machine

NARRATION (VO) :

THE TYPE OF MEDIA USED CAN INCLUDE GROUND WALNUT
SHELLS, SOLID RUBBER BALLS, STAINLESS STEEL BALLS,
CERAMIC MEDIA, AND SOMETIMES THE PARTS THEMSELVES.

SCENE 36.

tape 622, 01:04:46-01:04:57

zoom in, parts being removed
from cryogenic deflashing
operation

NARRATION (VO) :

CRYOGENIC DEFLASHING CAN BE PERFORMED ON EITHER
THERMOPLASTIC OR THERMOSET MATERIALS.

--- FADE TO BLACK ---

SCENE 37.

CG: Cleaning

white text centered on black

tape 652, 01:07:09-01:08:02

peter carey narration,
cleaning segment

NARRATION (VO) :

DURING MOLDING THERE ARE MANY OPPORTUNITIES FOR
PLASTIC PARTS TO BECOME CONTAMINATED WITH DIRT OR
GREASE. PROCESSING AIDS, SUCH AS MOLD RELEASE

SCENE 38.

tape 400, 06:04:45-06:04:57

mold opening, parts falling out

tape 629, 01:27:37-01:27:45

mold release being sprayed in
mold before injection

tape 640, 18:02:59-18:03:06

part handled with hands

AGENTS, MAY LEAVE RESIDUE ON THE FINAL MOLDED PARTS. EVEN THE NATURAL OILS OF THE OPERATOR'S HANDS CAN CONTAMINATE PARTS.

SCENE 39.

tape 640, 18:12:11-18:12:24
plastic parts being painted
tape 635, 15:24:25-15:24:32
plastic part being plated
tape 639, 16:19:32-16:19:36
zoom in, silk screening on
plastic part

NARRATION (VO) :

THESE CONTAMINANTS INTERFERE WITH THE BONDING ACTION OF ANY POST-MOLDING DECORATION OR SURFACE TREATMENT, SUCH AS:

PAINTING...,

PLATING...,

OR PRINTING.

SCENE 40.

tape 640, 18:06:35-18:07:02
zoom out, parts being sprayed
after molding

NARRATION (VO) :

RESIDUE FROM THE MOLDING PROCESS CAN BE REMOVED BY SOAKING OR SPRAYING PARTS IN A MILD DETERGENT SOLUTION. MANY OF THESE DETERGENTS ARE DESIGNED FOR SPECIFIC PART CONTAMINANTS. AFTERWARDS, THESE PARTS ARE SUBJECTED TO A THOROUGH RINSE AND THEN DRIED FOR DECORATION.

--- FADE TO BLACK ---

SCENE 41.

CG: Decorating
white text centered on black
tape 652, 01:08:04-01:18:36
peter carey narration,
decorating segment

SCENE 42.

tape 624, 04:01:46-04:01:56
pan, vacuum metallized parts
tape 400, 06:07:34-06:07:42
colored plastic part being
processed
CG, SUPER: Molded-In Decorations
tape 631, 10:25:34-10:25:40
plastic part being painted
CG, SUPER: Applied Decorations

NARRATION (VO) :

VIRTUALLY ALL PLASTIC PRODUCTS REQUIRE SOME DECORATION. THE METHODS OF DECORATING MOLDED PARTS INCLUDE:

'MOLDED-IN' DECORATIONS...,

AND 'APPLIED' DECORATIONS.

SCENE 43.

CG, SUPER: Molded-In Decorations

tape 400, 06:09:47-06:09:52

mold opening ejecting part

tape 416, 13:11:52-13:11:57

pan, textured part

tape 398, 02:03:45-02:03:53

two-shot molding operation,
parts pulled from mold, inserts
placed in

tape 398, 02:03:06-02:03:12

dissolve to, two-shot molding
operation, insert moving to
molding station, being molded

tape 421, 15:07:25-15:07:31

colored plastic part ejected
from mold

NARRATION (VO) :

'MOLDED-IN' DECORATIONS ARE THOSE MACHINED INTO

THE MOLD, SUCH AS TEXTURES...,

OR BY IMPLANT, AS WITH TWO-SHOT MOLDING WHERE AN

INSERT IS PLACED INTO A MOLD, AND THEN MOLTEN

PLASTIC IS INJECTED AROUND THE EXPOSED AREAS OF

THE INSERT, CREATING THE PART.

EVEN PRE-COLORED PLASTIC RESINS ARE CONSIDERED

'MOLDED-IN' COLOR.

SCENE 44.

CG, SUPER: Applied Decorations

tape 624, 04:15:02-04:15:09

plastic parts after being vacuum
metallized

tape 640, 18:14:48-18:15:06

plastic parts being painted

CG, SUPER: Painting

tape 635, 15:09:18-15:09:22

plastic parts being plated

CG, SUPER: Plating

tape 624, 04:06:25-04:06:30

plastic parts after being vacuum
metallized

CG, SUPER: Vacuum Metallizing

tape 625, 05:11:14-05:11:25

plastic parts being pad printed

CG, SUPER: Pad Printing

tape 640, 17:02:48-17:02:53

plastic parts being hot stamped

CG, SUPER: Hot Stamping

tape 639, 16:21:53-16:21:57

plastic part being silk
screened

CG, SUPER: Silk Screening

tape 632, 11:03:19-11:03:27

parts being filled and wiped

CG, SUPER: Fill & Wipe

NARRATION (VO) :

'APPLIED' DECORATIONS ARE ADDED TO THE PLASTIC

PART AFTER MOLDING. THE MOST COMMON TYPES OF

APPLIED DECORATIONS INCLUDE:

PAINTING...,

PLATING...,

VACUUM METALLIZING...,

PAD PRINTING...,

HOT STAMPING...,

SILK SCREENING...,

FILL-AND-WIPE...,

AND OTHERS.

--- TOUCH BLACK ---

SCENE 45.

CG, SUPER: Painting

tape 632, 11:10:58-11:11:08

painting of plastic part

tape 641, 19:13:39-19:13:52

zoom out, car bumpers/hoods

NARRATION (VO) :

LIQUID PAINTS MAY BE APPLIED TO PLASTIC PARTS FOR

MANY REASONS, BUT USUALLY TO ENSURE PROPER COLOR

MATCHING BETWEEN ADJACENT PLASTIC AND NON-PLASTIC PARTS, AS ON AN AUTOMOBILE.

SCENE 46.

tape 623, 03:01:09-03:01:26
parts being prepared for flow coating
tape 623, 03:05:11-03:05:18
parts being flow coated

NARRATION (VO) :

AS WITH ANY FINISHING PROCESS, SURFACE OR SUBSTRATE PREPARATION IS A CRITICAL STEP. SURFACES MUST BE ABSOLUTELY CLEAN AND FREE OF ANY CONTAMINANTS. THIS HELPS ENSURE ADEQUATE PAINT ADHESION TO THE PLASTIC PART.

SCENE 47.

tape 639, 16:08:21-16:08:43
parts being painted
CG, SUPER: Epoxies
Polyurethanes
Enamels
Acrylics
Latexes

NARRATION (VO) :

THERE ARE A VARIETY OF PAINTS AVAILABLE FOR USE ON PLASTICS, INCLUDING:
EPOXIES,
POLYURETHANES,
ENAMELS,
ACRYLICS,
AND LATEXES.

SCENE 48.

tape 632, 11:07:29-11:07:42
parts being painted using conventional air spray
CG, SUPER: Conventional Air Spraying
tape 640, 18:13:34-18:13:41
parts being painted using high volume/low pressure spraying
CG, SUPER: High Volume/Low Pressure Spraying
tape 623, 03:07:15-03:07:22
parts being painted using flow coating
CG, SUPER: Flow Coating

NARRATION (VO) :

PAINTS ARE APPLIED TO PLASTICS USING MANY METHODS, WITH SOME OF THE MOST COMMON INCLUDING:
CONVENTIONAL AIR SPRAYING,
HIGH VOLUME/LOW PRESSURE SPRAYING,
AND FLOW COATING.

SCENE 49.

CG, SUPER: Conventional Air Spraying
tape 632, 11:08:02-11:08:20
plastic parts being spray painted using conventional air

NARRATION (VO) :

CONVENTIONAL AIR SPRAYING USES HIGHLY COMPRESSED AIR TO ATOMIZE THE PAINT, WHICH IS APPLIED USING A

SPRAY GUN.

SCENE 50.

tape 639, 16:09:33-16:09:41
pan from paint being applied to
plastic to paint feeding system
tape 639, 16:11:30-16:11:36
spraying of parts using
conventional air system

NARRATION (VO) :

THE PAINT IS FED TO THE GUN THROUGH EITHER A
GRAVITY, SIPHON OR PRESSURE SYSTEM. THE PAINT MAY
BE APPLIED MANUALLY, SEMI-AUTOMATICALLY, OR
AUTOMATICALLY.

SCENE 51.

CG, SUPER: High Volume/Low
Pressure Spraying
tape 640, 18:12:35-18:13:03
plastic parts being sprayed

NARRATION (VO) :

HIGH VOLUME/LOW PRESSURE, OR "HVLP", SPRAYING IS
AN AIR ATOMIZATION SYSTEM THAT USES LESS THAN 10
PSI OR 69 KILO-PASCAL'S OF AIR PRESSURE TO APPLY
PAINT. "HVLP" SPRAYING PRODUCES A SOFTER, MORE
CONTROLLABLE SPRAY, REDUCING OVERSPRAY AND PAINT
WASTAGE.

SCENE 52.

CG, SUPER: Flow Coating
tape 623, 03:10:32-03:11:08
plastic parts being painted
using flow coating

NARRATION (VO) :

IN A FLOW-COATING SYSTEM, A NUMBER OF INDIVIDUAL
STREAMS OF PAINT ARE DIRECTED AT THE PLASTIC PART.
EXCESS PAINT IS COLLECTED AS IT DRAINS OFF, WHERE
IT IS PUMPED THROUGH FILTERS AND RECIRCULATED FOR
REUSE.

SCENE 53.

continue previous shot
tape 623, 03:07:44-03:07:50
zoom out, flow coated parts
being cured
tape 631, 10:25:06-10:25:14
painted plastic parts placed in
rack for curing at room
temperature
tape 640, 18:18:55-18:19:03
painted plastic parts cured in
oven

NARRATION (VO) :

ONCE A PAINT COATING HAS BEEN APPLIED IT IS
TRANSFORMED INTO A FINISHED SOLID PAINT FILM BY
CURING.
DEPENDING ON THE COATING, CURING CAN OCCUR AT ROOM
TEMPERATURE...,
OR WITHIN AN OVEN.

--- TOUCH BLACK ---

SCENE 54.

CG, SUPER: Plating

tape 635, 15:11:47-15:11:59

plastic part in plating
operation

NARRATION (VO) :

PLATING IS THE CHEMICAL OR ELECTROCHEMICAL DEPOSIT
OF A THIN METAL LAYER TO THE SURFACE, OR
SUBSTRATE, OF THE PLASTIC PART.

SCENE 55.

tape 635, 15:20:27-15:20:33

plastic parts going into
electroless plating

tape 635, 15:21:00-15:21:13

parts coming out of electroless
plating

CG, SUPER: Electroless Plating

NARRATION (VO) :

PLATING REQUIRES THE PLASTIC PARTS TO BE
ELECTRICALLY CONDUCTIVE. TO ACHIEVE THIS
CONDUCTIVITY, THE PLASTIC PARTS ARE FIRST
SUBJECTED TO AN ELECTROLESS PLATING OPERATION.

SCENE 56.

tape 633, 13:05:57-13:06:06

parts placed in electroless
plating acid bath

tape 651, 00:01:01-00:01:09

ANI: side view, cross section,
plastic surface in acid bath
becoming pock marked

NARRATION (VO) :

PLASTIC PARTS ARE PREPARED FOR ELECTROLESS PLATING
BY SUBMERSION IN A SULFURIC CHROMIC ACID BATH...,
THIS ACID SLIGHTLY ETCHES THE PLASTIC SUBSTRATE
SURFACE, CREATING MICROSCOPIC POCKETS, OR
POCKMARKS.

SCENE 57.

tape 633, 13:17:24-13:17:33

plastic parts placed in
activator bath after acid
etching

tape 633, 13:20:36-13:20:43

plastic parts in accelerator
bath

tape 633, 13:22:32-13:22:38

plastic parts placed in
electroless plating bath after
accelerator bath

tape 651, 00:01:50-00:02:05

ANI: side view, cross section,
pock marked plastic surface
lined with activator/accelerator
attracting metal in bath which
deposit in pock marks

NARRATION (VO) :

AFTER ETCHING, THE PLASTIC PARTS ARE PLACED IN A
ACTIVATOR BATH...,
AND AN ACCELERATOR BATH...,
THESE BATHS LINE THE POCKMARKS ON THE PART
SURFACE, MAKING IT CHEMICALLY ATTRACTIVE TO THE
METALS SUSPENDED IN THE ELECTROLESS PLATING BATH
SOLUTION. AS THE PART SITS IN THE ELECTROLESS
PLATING SOLUTION, THE NICKEL, AND OR COPPER,
DEPOSIT AND BECOME TRAPPED IN THE POCKMARKS.

SCENE 58.

tape 633, 13:26:44-13:27:16

parts being taken out of
electroless plating bath

NARRATION (VO) :

THE TIME IN, AND THE TEMPERATURE OF, THE

ELECTROLESS PLATING BATH DETERMINES THE THICKNESS OF THE METAL LAYER. AFTERWARDS, THE PARTS ARE ELECTRICALLY CONDUCTIVE.

SCENE 59.

continue previous shot
tape 633, 13:25:20-13:25:25
parts after electroless plating operation

tape 635, 15:06:00-15:06:08
cross dissolve to same parts after they have been through electrolytic plating operation, and have bright chrome finish

NARRATION (VO) :

ELECTROLESS PLATING PROVIDES A DULL METALLIC FINISH, AND OFTEN IS APPLIED TO PLASTIC PRODUCTS USED IN SHIELDING APPLICATIONS. BUT ELECTROLESS PLATING IS ALSO THE FIRST PHASE IN THE ELECTROLYTIC PLATING PROCESS WHICH PROVIDES A DECORATIVE BRIGHT CHROME FINISH.

SCENE 60.

CG, SUPER: Electrolytic Plating
tape 635, 15:05:35-15:05:42
plastic parts in electrolytic plating operation

tape 651, 00:02:36-00:02:58
ANI: side view, cross section, plastic surface with bright nickel plating in electrolytic bright chrome plating bath, symbols for positive (solution) and negative (part) appear, metal in solution attracted to part surface
CG, SUPER: Anode
CG, SUPER: Cathode

NARRATION (VO) :

ELECTROLYTIC PLATING USES ELECTRICAL CURRENT TO DRAW, OR PRECIPITATE POSITIVELY CHARGED PLATING METALS OUT OF SOLUTION TO COAT THE NEGATIVELY CHARGED CONDUCTIVE PLASTIC PART SURFACE. THE POSITIVELY CHARGED PLATING METALS ARE REFERRED TO AS THE ANODE, AND THE NEGATIVELY CHARGED PLASTIC PART, THE CATHODE.

SCENE 61.

tape 635, 15:09:55-15:10:01
parts after being chrome plated
tape 634, 14:18:36-14:18:52

zoom in, plastic plated parts along plating line, ending on parts coming out of bright copper plating bath

tape 635, 15:02:22-15:02:29
plastic plated parts coming out of bright nickel plating bath

tape 635, 15:08:04-15:08:12
plastic plated parts coming out of final chrome plating bath

NARRATION (VO) :

TO ARRIVE AT THE FINAL CHROME PLATED FINISH, PLASTIC PARTS MUST GO THROUGH A MINIMUM OF TWELVE PREPARATION, PLATING SOLUTION, AND RINSE BATHS. THE VARIOUS PLATING SOLUTION BATHS INCLUDE:
A BRIGHT COPPER PLATING BATH...,
A BRIGHT NICKEL PLATING BATH...,
AND THE FINAL CHROME PLATING BATH.

--- TOUCH BLACK ---

SCENE 62.

CG, SUPER: Vacuum Metallizing
tape 624, 04:19:07-04:19:20
vacuum metallizing operation

NARRATION (VO) :

VACUUM METALLIZING IS A PHYSICAL, RATHER THAN ELECTROCHEMICAL, PROCESS OF DEPOSITING A METAL LAYER ONTO A PLASTIC PART'S SURFACE.

SCENE 63.

tape 624, 04:24:09-04:24:21
plastic parts prepared for vacuum metallizing with a lacquer
tape 624, 04:03:36-04:03:46
lacquered parts fixtured onto rack

NARRATION (VO) :

IN VACUUM METALLIZING, PLASTIC PARTS ARE FIRST PREPARED WITH A LACQUER..., AND FIXTURED ONTO A RACK.

SCENE 64.

tape 624, 04:28:28-04:28:46
zoom out, clips on fixture
tape 624, 04:08:42-04:08:50
zoom out, aluminum clips being placed in fixture

NARRATION (VO) :

SMALL CLIPS OF THE DESIRED METAL FINISH MATERIAL ARE THEN STRATEGICALLY LOCATED ON THE RACK. ANY METAL OR METAL ALLOY CAN BE VACUUM METALLIZED. BUT ALUMINUM IS THE MOST POPULAR BECAUSE OF ITS PHYSICAL PROPERTIES, AND LOW COST.

SCENE 65.

tape 624, 04:27:30-04:27:38
fixtured parts placed into vacuum chamber
tape 624, 04:29:01-04:29:13
vacuum chamber securely closed
tape 624, 04:25:59-04:26:30
electrical charge applied to the metal clips, causing vaporization

NARRATION (VO) :

AFTER THE CLIPS ARE ADDED, THE RACK IS THEN PLACED INTO A VACUUM CHAMBER. ONCE THE CHAMBER IS SECURELY CLOSED, ITS ATMOSPHERE IS EVACUATED, CREATING A VACUUM. WHEN THE PROPER VACUUM LEVEL IS ACHIEVED, AN ELECTRICAL CHARGE IS APPLIED TO THE METAL CLIPS. THIS CAUSES THEM TO VAPORIZE, COVERING EVERYTHING WITHIN THE CHAMBER, INCLUDING THE PLASTIC PARTS, WITH A METAL LAYER. MASKING PROTECTS ANY AREAS NOT NEEDING METALLIZATION.

SCENE 66.

tape 624, 04:00:23-04:00:32

NARRATION (VO) :

vacuum metallized plastic parts
being coated with clear coating

AFTER METALLIZATION, THE PARTS ARE SOMETIMES
COATED WITH A CLEAR LIQUID TOP COAT TO PROTECT THE
FINISH FROM OXIDATION.

SCENE 67.

tape 623, 03:13:38-03:13:56
zoom out, parts unloaded out of
fixturing

NARRATION (VO) :

THE VACUUM METALLIZING PROCESS IS MUCH LESS
EXPENSIVE THAN PLATING AND MORE ENVIRONMENTALLY
FRIENDLY. BUT THE METALLIZED FINISH IS NOT NEARLY
AS DURABLE AS THE PLATED FINISH.

--- TOUCH BLACK ---

SCENE 68.

CG, SUPER: Pad Printing
tape 625, 05:09:02-05:09:20
wide, pad printing operation,
zoom into pad printing on part
CG, SUPER: Cliché

NARRATION (VO) :

IN PAD PRINTING, INK OR PAINT IS PICKED UP BY A
SILICONE RUBBER TRANSFER PAD FROM A PLATE WITH AN
ETCHED IMAGE, COMMONLY CALLED THE CLICHÉ. THE PAD
THEN REPOSITIONS AND PRESSES THE IMAGE ONTO THE
SURFACE OF A PLASTIC PART.

SCENE 69.

tape 630, 09:12:15-09:12:37
c.u. cliché pad pressing into it
picking up ink, zoom out

NARRATION (VO) :

THE CLICHÉ IS PRODUCED FROM STEEL PLATES FOR HIGH
VOLUME PRODUCTION RUNS, OR FROM NYLON PLATES FOR
SHORTER RUNS. THE IMAGE DEPTH ETCHED INTO THE
CLICHÉ VARIES DEPENDING UPON THE AMOUNT OF DETAIL
REQUIRED IN THE FINAL PART, WITH COMMON ETCHED
IMAGE DEPTHS OF APPROXIMATELY ONE ONE-THOUSANDTH
OF AN INCH, OR TWENTY FIVE THOUSANDTHS OF A
MILLIMETER.

SCENE 70.

tape 639, 16:28:14-16:28:32
c.u. cliché flooded with ink

NARRATION (VO) :

TO PAD PRINT, THE CLICHÉ IS FIRST FLOODED WITH
INK. THE EXCESS INK IS THEN REMOVED WITH A WIPING

ACTION, LEAVING INK ONLY IN THE ETCHED AREAS.

SCENE 71.

tape 639, 16:28:38-16:29:00
zoom out, transfer pad picking
up image from cliché,
repositioning over part

NARRATION (VO) :

THE TRANSFER PAD THEN PRESSES AND PICKS UP THE INK
FROM THE CLICHÉ AND MOVES IN TO POSITION OVER THE
PART. DURING THIS REPOSITIONING, THE INK ON THE
PAD BECOMES TACKY.

SCENE 72.

tape 639, 16:29:17-16:29:36
part placed in fixture, pad over
part lowering, transferring
image

NARRATION (VO) :

ONCE OVER THE PART, THE PAD LOWERS, PRESSING THE
INK ON TO THE SURFACE OF A PLASTIC PART,
TRANSFERRING THE IMAGE.

SCENE 73.

continue previous shot
tape 630, 09:07:02-09:07:23
pad printing operation
CG, SUPER: Print on a Range of
Part Surfaces & Part
Geometries
Reproduce Fine Image
Detail
Wet-On-Wet Printing
of Multiple Colors

NARRATION (VO) :

PAD PRINTING IS USED EXTENSIVELY IN INDUSTRIAL AND
COMMERCIAL APPLICATIONS BECAUSE OF ITS ABILITY TO
PRINT ON A RANGE OF PART SURFACES AND PART
GEOMETRIES,
REPRODUCE FINE IMAGE DETAIL,
AND PERFORM WET-ON-WET PRINTING OF MULTIPLE
COLORS.

--- TOUCH BLACK ---

SCENE 74.

CG, SUPER: Hot Stamping
tape 623, 02:03:59-02:04:12
zoom out, hot stamping operation
on plastic parts

NARRATION (VO) :

HOT STAMPING USES HEATED SILICONE RUBBER DIES TO
FORCE INK FROM A FOIL FILM-CARRIER INTO THE
SURFACE OF A PLASTIC PART.

SCENE 75.

tape 623, 02:12:00-02:12:06
hot stamping operation on flat
plastic parts
tape 640, 17:02:02-17:02:09
hot stamping operation on
contoured plastic parts

NARRATION (VO) :

HOT STAMPING CAN BE PERFORMED ON FLAT...,
OR CONTOURED PARTS.

SCENE 76.

CG, SUPER: Vertical Hot Stamping
tape 640, 17:04:33-17:04:59
vertical hot stamping operation

NARRATION (VO) :

THE MOST POPULAR METHOD OF HOT STAMPING IS VERTICAL HOT STAMPING. PARTS ARE HELD IN A FIXTURE AND THE HEATED RUBBER DIE DROPS VERTICALLY TO FORCE THE FOIL AGAINST THE PART SURFACE. AFTER CONTACT, THE DIE RETRACTS. THE HOT STAMPED PART IS THEN REMOVED AND REPLACED WHILE THE STRIP OF FOIL INDEXES TO AN UNUSED SECTION.

--- TOUCH BLACK ---

SCENE 77.

CG, SUPER: Silk Screening
tape 631, 10:20:27-10:20:42
image being photo-chemically reproduced on a finely woven fabric screen
tape 631, 10:21:07-10:21:20
zoom out, screen being exposed to light
tape 631, 10:22:09-10:22:18
screen being washed

NARRATION (VO) :

IN SILK SCREENING, AN IMAGE IS EXPOSED ONTO A FINELY WOVEN FABRIC SCREEN THAT HAS A LAYER OF A PHOTSENSITIVE CHEMICAL APPLIED TO IT. THE EXPOSURE CURES THE SCREEN AREA NOT COVERED BY THE IMAGE, ADHERING THE PHOTSENSITIVE CHEMICAL TO THE SCREEN. THIS SCREEN IS THEN WASHED, RINSING AWAY THE UNCURED PHOTSENSITIVE CHEMICAL, EXPOSING THE IMAGE.

SCENE 78.

tape 639, 16:05:23-16:05:38
screen placed over plastic parts, inked and squeegeed through screen onto part

NARRATION (VO) :

TO TRANSFER ITS IMAGE, A SILK SCREEN IS PLACED ON THE SURFACE OF THE PLASTIC PART. INK, OR THICK PAINT, IS THEN SQUEEZED THROUGH THE POROUS OPENINGS OF THE SCREEN AND ONTO THE PART SURFACE.

SCENE 79.

tape 631, 10:12:28-10:12:35
plastic silk-screened part drying

NARRATION (VO) :

ONCE SCREENED, THE PLASTIC PART IS REMOVED AND ALLOWED TO DRY.

--- TOUCH BLACK ---

SCENE 80.

CG, SUPER: Fill and Wipe
tape 632, 11:01:28-11:01:43
zoom out, parts painted for fill
and wipe operation
tape 632, 11:02:33-11:02:38
paint wiped off part
tape 632, 11:04:29-11:04:39
zoom in, fill and wipe operation

NARRATION (VO) :

FILL-AND-WIPE IS A PROCESS THAT REQUIRES THE
PLASTIC PART TO HAVE A GROOVED OR ETCHED
IMPRESSION. A COATING, SUCH AS AN INK OR PAINT, IS
APPLIED TO THE IMPRESSION AREA...,
AND THEN WIPED OFF...,
THIS REMOVES THE COATING FROM THE SURROUNDING
AREAS WHILE LEAVING THE MATERIAL WITHIN THE
IMPRESSION INTACT.

--- FADE TO BLACK ---

SCENE 81.

CG: Review
white text centered on black
tape 652, 01:18:38-01:21:17
peter carey narration,
review segment
tape 63, 12:00:15-12:03:49
review music

MUSIC UP AND UNDER

NARRATION (VO) :

LET'S REVIEW THE MATERIAL CONTAINED IN THIS
VIDEOTAPE.

SCENE 82.

tape 421, 15:20:04-15:20:10
part coming out of injection
mold
tape 403, 01:46:21-01:46:25
parts being blow molded
tape 630, 08:07:53-08:07:58
parts being thermoformed
tape 421, 15:04:02-15:04:10
zoom out, part coming out of
injection mold

NARRATION (VO) :

THE MOLDING OF PLASTICS IS A COMMON METHOD OF
MANUFACTURING PARTS, AND ENCOMPASSES A VARIETY OF
PROCESSES, WITH THE PRINCIPAL TYPE BEING PLASTIC
INJECTION MOLDING.

SCENE 83.

tape 415, 10:25:49-10:26:02
mold opening and plastic part
falling out
tape 626, 06:10:12-06:10:24
parts being ultrasonically
assembled
tape 641, 19:08:09-19:08:16
zoom in, part being deflashed
tape 628, 07:26:28-07:26:34

NARRATION (VO) :

ONCE PARTS ARE INJECTION MOLDED, MOST REQUIRE
ADDITIONAL ASSEMBLY AND OR FINISHING OPERATIONS.
MANY FINISHING PROCESSES ARE PERFORMED FOR
AESTHETIC, OR APPEARANCE, PURPOSES. THESE

part being blasted
tape 626, 06:07:06-06:07:10
part being degated
tape 621, 15:05:21-15:05:28
parts being decorated, painted
tape 625, 05:14:16-05:14:19
part being degated
CG, SUPER: Degating
tape 625, 05:15:23-05:15:30
part being deflashed
CG, SUPER: Deflashing
tape 621, 15:02:17-15:02:23
parts being cleaned
CG, SUPER: Cleaning
tape 639, 16:04:06-16:04:13
part being decorated, silk
screened
CG, SUPER: Decorating

FINISHING PROCESSES INCLUDE:

DEGATING...,

DEFLASHING...,

CLEANING...,

AND DECORATING.

SCENE 84.
CG, SUPER: Degating
tape 400, 05:09:49-05:10:01
part being degated

NARRATION (VO) :

DEGATING IS THE PROCESS OF REMOVING THE MOLDED

PART FROM THE GATE AND RUNNER SYSTEM.

SCENE 85.
tape 399, 03:11:45-03:11:56
parts separated from by-products
part degated by manually
tape 625, 05:20:48-05:20:58
zoom out, snapping part from the
gate and runner system
tape 625, 05:14:55-05:15:03
part degated using side-cutter
hand tool
tape 625, 05:19:11-05:19:24
trimming fixture used to degate
parts
tape 424, 18:01:30-18:01:43
zoom out, cold-runner three
plate mold ejecting part and
runner system

NARRATION (VO) :

DEGATING CAN BE ACCOMPLISHED USING A VARIETY OF

METHODS, INCLUDING:

MANUALLY 'SNAPPING' THE PART FROM THE GATE TO

REMOVE THE RUNNER SYSTEM...,

USING HAND TOOLS, SUCH AS THE SIDE-CUTTER FOR

SEPARATION...,

USING DEDICATED TRIMMING FIXTURES FOR PARTS OR A

FAMILY OF PARTS...,

OR USING AUTOMATED TOOLING DEVICES, SUCH AS THE

COLD-RUNNER THREE-PLATE MOLD.

SCENE 86.
CG, SUPER: Deflashing
tape 641, 19:09:55-19:10:26
trimming of flash
CG, SUPER: Cutting & Trimming
tape 628, 07:10:35-07:10:50
zoom out, media blasting
operation

NARRATION (VO) :

DEFLASHING IS THE REMOVAL OF THE EXCESS PLASTIC

THAT LEAKS BETWEEN MOLD HALVES DURING INJECTION

MOLDING. DEFLASHING PROCESSES INCLUDE:

CG, SUPER: Media Blasting
tape 622, 01:05:24-01:05:34
zoom out, parts unloaded from
cryogenic deflashing operation
CG, SUPER: Cryogenic Deflashing

CUTTING AND TRIMMING...,
MEDIA BLASTING...,
AND CRYOGENIC DEFLASHING.

SCENE 87.

CG, SUPER: Cleaning
tape 640, 18:06:35-18:07:02
zoom out, parts being sprayed
after molding
tape 640, 18:14:48-18:15:06
plastic parts being painted
tape 635, 15:24:25-15:24:32
plastic part being plated

NARRATION (VO):

CLEANING IS PERFORMED TO REMOVE MOLDING PROCESS
CONTAMINANTS THAT MAY INTERFERE WITH THE BONDING
ACTION OF POST-MOLDING DECORATION OR SURFACE
TREATMENT PROCESSES.

SCENE 88.

tape 624, 04:01:46-04:01:52
pan, vacuum metallized parts
tape 400, 06:07:34-06:07:42
colored plastic part being
processed
CG, SUPER: Molded-In Decorations
tape 631, 10:25:34-10:25:40
plastic part being painted
CG, SUPER: Applied Decorations

NARRATION (VO):

THE METHODS OF DECORATING MOLDED PARTS INCLUDE:
'MOLDED-IN' DECORATIONS...,
AND 'APPLIED' DECORATIONS.

SCENE 89.

CG, SUPER: Molded-In Decorations
tape 400, 06:09:47-06:09:52
mold opening ejecting part
tape 416, 13:11:52-13:11:57
pan, textured part
tape 398, 02:03:45-02:03:53
two-shot molding operation,
parts pulled from mold, inserts
placed in
tape 421, 15:07:25-15:07:31
colored plastic part ejected
from mold

NARRATION (VO):

'MOLDED-IN' DECORATIONS ARE THOSE MACHINED INTO
THE MOLD, SUCH AS TEXTURES...,
OR BY IMPLANT, AS WITH TWO-SHOT MOLDING.
EVEN PRE-COLORED PLASTIC RESINS ARE CONSIDERED
'MOLDED-IN' COLOR.

SCENE 90.

CG, SUPER: Applied Decorations
tape 623, 03:13:38-03:13:56
plastic parts after being vacuum
metallized
tape 632, 11:07:29-11:07:34
plastic parts being painted
CG, SUPER: Painting
tape 635, 15:09:18-15:09:22
plastic parts being plated
CG, SUPER: Plating
tape 624, 04:19:07-04:19:20
plastic parts after being vacuum

NARRATION (VO):

'APPLIED' DECORATIONS ARE ADDED TO THE PLASTIC
PART AFTER MOLDING. THE MOST COMMON TYPES OF
APPLIED DECORATIONS INCLUDE:
PAINTING...,
PLATING...,

metallized
CG, SUPER: Vacuum Metallizing
tape 630, 09:13:30-09:13:36
plastic parts being pad printed
CG, SUPER: Pad Printing
tape 640, 17:02:48-17:02:53
plastic parts being hot stamped
CG, SUPER: Hot Stamping
tape 639, 16:21:53-16:21:57
plastic part being silk
screened
CG, SUPER: Silk Screening
tape 632, 11:03:19-11:03:27
parts being filled and wiped
CG, SUPER: Fill & Wipe

VACUUM METALLIZING...,
PAD PRINTING...,
HOT STAMPING...,
SILK SCREENING...,
FILL-AND-WIPE,
AND OTHERS.

--- FADE TO BLACK ---

SCENE 91.
CG, ROLL: credits
white text centered on black,
fade up mid-screen

Produced By:
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Communicore

SCENE 92.
CG: disclaimer
white text centered on black

Some machinery in this program had safety
equipment removed to allow better recording of
certain processes.
Always read the safety information provided in the
manufacturers' manual before machine operation.

SCENE 93.
tape 40, 01:00:00-01:00:12
SME logo, with music
CG, SUPER: www.sme.org