

FUNDAMENTAL MANUFACTURING PROCESSES

Roll Forming

SCENE 1.

RF01A, GRAPHIC: FBI warning
white text centered on black to blue
gradient

WARNING

Federal law provides severe civil and
criminal penalties for the unauthorized
reproduction, distribution or exhibition
of copyrighted media.

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SCENE 2.

RF02A, GRAPHIC: disclaimer
white text centered on black to blue
gradient

Always read the operating manual and safety
information provided by the manufacturer
before operating any roll forming equipment.
Make sure all machine guards are in place,
and follow all safety procedures when
working with or near roll forming equipment.

SCENE 3.

RF03A, GRAPHIC: F&F/SME screen
white text centered on black to blue
gradient

This program was produced using the technical
resources of the Forming & Fabricating
Community of SME.

For more information on roll forming,
please visit our website at:

www.sme.org

SCENE 4.

RF04A, SME logo open, with music

SCENE 5.

RF05A, FMP open, with music
RF05B, peter carey narration
RF05C, blue background

MUSIC UP AND UNDER

NARRATION (VO) :

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

SCENE 6.

RF06A, GRAPHIC: Roll Forming
white text centered on black

NARRATION (VO) :

THIS PROGRAM EXPLORES THE FUNDAMENTALS OF ROLL
FORMING.

SCENE 7.

RF07A, tape 967, 15:09:04-15:09:26

zoom out, roll forming operation

RF07B, tape 955, 03:05:57-03:06:14

pan, roll forming operation

NARRATION (VO) :

ROLL FORMING IS A CONTINUOUS PROCESS FOR FORMING SHEET, STRIP OR COILED METAL STOCK INTO LONG SHAPES OF ESSENTIALLY UNIFORM CROSS-SECTION. THE MATERIAL IS FED THROUGH MULTIPLE PAIRS OF CONTOURED FORMING ROLLS, WHICH PROGRESSIVELY SHAPE THE METAL UNTIL THE DESIRED CROSS SECTION IS PRODUCED.

SCENE 8.

RF08A, tape 957, 05:09:13-05:09:30

zoom in, c.u. roll forming

NARRATION (VO) :

FORMING IS ACCOMPLISHED STRICTLY BY BENDING. EXCEPT FOR SLIGHT THINNING AT THE BEND RADII, NO CHANGE IN STOCK THICKNESS OCCURS.

SCENE 9.

RF09A, tape 959, 07:13:56-07:14:21

zoom in, roll forming

RF09C, tape 966, 14:10:51-14:11:05

zoom out, roll forming operation

RF09D, tape 954, 02:23:39-02:23:54

zoom out, roll forming operation

NARRATION (VO) :

ROLL FORMING IS TYPICALLY A HIGH-VOLUME PRODUCTION PROCESS, BUT ALSO SUITS LIMITED PRODUCTION OF SHAPES. ANY READILY CUT AND BENDABLE MATERIAL CAN BE PROCESSED AND CLOSE-TOLERANCE CROSS-SECTIONS ACHIEVED. ADDITIONALLY, THE FORMING ROLLS USED CAN GENERATE HUGE PRODUCT QUANTITIES BEFORE REQUIRING MAINTENANCE.

SCENE 10.

RF10A, still, roll formed cross sectional shape

RF10B, still, roll formed cross sectional shape

RF10C, still, roll formed cross sectional shape

RF10D, tape 955, 03:03:28-03:03:44

zoom in, roll forming operation

RF10E, CGS: Automotive
Building
Office Furniture

NARRATION (VO) :

THE VARIETY OF FORMABLE CROSS-SECTIONS IS UNLIMITED AND APPLICATIONS OCCUR IN MANY INDUSTRIES, NOTABLY THE AUTOMOTIVE, BUILDING, OFFICE FURNITURE, APPLIANCE, AIRCRAFT, AND HEATING, VENTILATING AND AIR-CONDITIONING

Appliance
Aircraft
Heating, Ventilating &
Air Conditioning

INDUSTRIES.

SCENE 11.

RF11A, tape 967, 15:06:28-15:06:53

zoom out, roll forming operation

RF11B, CGS: Stainless Steels

Maraging Steels

High-Strength-Low-Alloy
Steels

Cold-Worked Steels

Aluminum Alloys

RF11C, tape 967, 15:01:36-15:01:53

zoom out, coated stock being roll
formed

NARRATION:

VIRTUALLY ALL METALS, FERROUS AND NONFERROUS,
AND SOME NONMETALLICS CAN BE ROLL FORMED. MILD
STEEL AND ALUMINUM ACCOUNT FOR MOST
APPLICATIONS BUT FAR LESS FORMABLE METALS ARE
ALSO PROCESSED, INCLUDING STAINLESS STEELS,
MARAGING STEELS, HIGH-STRENGTH-LOW-ALLOY
STEELS, COLD-WORKED STEELS AND ALUMINUM
ALLOYS. POLISHED, PAINTED, COATED AND PLATED
MATERIALS CAN ALSO BE ROLL FORMED.

SCENE 12.

RF12A, tape 968, 16:06:58-16:07:12

zoom out, roll forming of precut
stock

RF12B, tape 956, 04:08:07-04:08:20

post cutting of roll formed part

NARRATION (VO):

THE STARTING STOCK FOR ROLL FORMING MAY BE
PRECUT...,
BUT IS MOST COMMONLY POST-CUT TO REQUIRED PART
LENGTH.

SCENE 13.

RF13A, tape 968, 16:07:29-16:07:51

zoom in, precut length fed into roll
forming machine

NARRATION (VO):

IN THE PRECUT METHOD, PRECUT LENGTHS OF
MATERIAL ARE FED INTO AND FORMED IN A ROLL
FORMING MACHINE OPERATING AT A FIXED SPEED
TYPICALLY BETWEEN 50 TO 250 FEET, OR 15 TO 76
METERS PER MINUTE.

SCENE 14.

RF14A, tape 968, 16:14:04-16:14:21

precut length fed into roll forming
machine

RF14B, tape 968, 16:13:43-16:13:57

precut length fed into roll forming
machine

NARRATION (VO):

PRECUT ROLL FORMING IS COMMONLY USED FOR LOW-
VOLUME PRODUCTION WHEN NOTCHING IS REQUIRED

THAT CANNOT BE EASILY DONE USING POST-CUT LINES, OR WHEN MULTIPLE PROFILE WIDTHS REQUIRE EXPENSIVE AND OR TIME CONSUMING DIE CHANGEOVER.

SCENE 15.

RF15A, tape 958, 06:02:41-06:03:11
zoom out, roll formed part being post cut

NARRATION (VO) :

POST-CUT ROLL FORMING IS THE MOST WIDELY USED ROLL FORMING METHOD SINCE IT IS MORE EFFICIENT, MORE PRODUCTIVE, MORE CONSISTENT AND LESS TROUBLESOME.

SCENE 16.

RF16A, tape 966, 14:17:13-14:17:26
zoom out, uncoiler
RF16B, tape 966, 14:19:33-14:19:40
roll forming machine
RF16C, tape 967, 15:04:31-15:04:46
zoom out, cutoff machine to runout table

NARRATION (VO) :

TYPICALLY, THE POST-CUT METHOD REQUIRES A STOCK UNCOILER...,
A ROLL FORMING MACHINE...,
A CUTOFF MACHINE...,
AND A RUNOUT TABLE.

SCENE 17.

RF17A, tape 961, 09:10:46-09:11:12
zoom out, pan roll forming system
RF17B, tape 956, 04:09:55-04:10:56
roll formed part being cut off

NARRATION (VO) :

PRODUCTION SPEEDS AVERAGE 100 TO 180 FEET, OR 30 TO 55 METERS PER MINUTE, BUT CAN REACH 600 FEET, OR 185 METERS PER MINUTE. CUTTING THE WORKPIECE TO DESIRED LENGTH AFTER FORMING IS TYPICALLY DONE ON THE FLY AS THE STOCK IS MOVING.

SCENE 18.

RF18A, tape 957, 05:14:41-05:15:03
prenotching operation
RF18B, CGS: Prenotching
Punching
Embossing
Marking
Trimming
Welding
Curving

NARRATION (VO) :

POST-CUT ROLL FORMING IS ALSO COMMONLY AUGMENTED WITH A RANGE OF AUXILIARY EQUIPMENT TO PERFORM CERTAIN OPERATIONS, SUCH AS PRENOTCHING, PUNCHING, EMBOSSING, MARKING,

Die Forming

TRIMMING, WELDING, CURVING, AND DIE FORMING.

SCENE 19.

RF19A, tape 957, 05:15:53-05:16:14
zoom out, pre-punched material going
into roll forming machine

NARRATION (VO) :

BY INCORPORATING AUXILIARY EQUIPMENT, THE
POST-CUT METHOD CAN BE A COMPLETE NET-SHAPE
PROCESS, FULLY AUTOMATED OR NEARLY SO IF
DESIRED. BUT TOOL COST AND TOOL CHANGE TIME
ARE MORE THAN FOR THE PRECUT METHOD.

--- TOUCH BLACK ---

SCENE 20.

RF20A, tape 965, 13:04:24-13:04:54
zoom out, roll forming of metal

NARRATION (VO) :

THE CONTROL OF A MATERIAL'S DIMENSIONAL
TOLERANCES DURING ROLL FORMING IS CRITICAL IN
THE MANUFACTURE OF QUALITY PARTS.

SCENE 21.

RF21A, tape 965, 13:19:10-13:19:42
zoom in, part being cut off
RF21B, CGS: Material Width &
 Thickness
 Physical Properties of
 the Material
 Tooling Quality
 Machine Conditions
 Operator Skill

NARRATION (VO) :

CROSS-SECTIONAL TOLERANCES OF ROLL FORMED
PARTS STEM FROM VARIATIONS IN MATERIAL WIDTH
AND THICKNESS, PHYSICAL PROPERTIES OF THE
MATERIAL, TOOLING QUALITY, MACHINE CONDITIONS,
AND OPERATOR SKILL.

SCENE 22.

RF22A, tape 966, 14:09:09-14:09:33
zoom out, roll formed parts being
produced
RF22B, tape 958, 06:09:40-06:09:58
zoom out, deep profile part being
produced

NARRATION (VO) :

CROSS-SECTION DIMENSIONS ARE COMMONLY HELD TO
PLUS OR MINUS TEN THOUSANDTHS TO THIRTY
THOUSANDTHS OF AN INCH, OR 25 TO 78 HUNDREDTHS
OF A MILLIMETER, AND PLUS OR MINUS ONE DEGREE
ANGULARLY. HOWEVER, SLIGHTLY GREATER
TOLERANCES ARE NECESSARY FOR GAUGE VARIATIONS,
AND OTHER CROSS-SECTIONAL FEATURES LIKE WIDE
PANELS OR DEEP PROFILES.

SCENE 23.

RF23A, tape 958, 06:04:38-06:05:08

zoom in, formed part being cut off
from side

RF23B, CGS: Material Thickness
Part Length
Line Speed
Equipment Quality &
Condition
Measurement & Cutoff
System Used

NARRATION (VO) :

ROLL FORMING LENGTH TOLERANCES ARE DEPENDENT
ON MATERIAL THICKNESS, PART LENGTH, LINE
SPEED, EQUIPMENT QUALITY AND CONDITION, AND
THE MEASUREMENT AND CUTOFF SYSTEM USED.

SCENE 24.

RF24A, tape 958, 06:28:54-06:29:28

zoom in, formed part being cut off

NARRATION (VO) :

IN GENERAL, ROLL FORMING LENGTH TOLERANCES OF
PLUS OR MINUS 20 TO 93 THOUSANDTHS OF AN INCH,
OR 51 TO 236 HUNDREDTHS OF A MILLIMETER ARE
POSSIBLE, DEPENDING ON THE LENGTH. THE LONGER
THE LENGTH THE GREATER THE TOLERANCE.

SCENE 25.

RF25A, tape 958, 06:15:03-06:15:27

pan of roll forming system

RF25B, CGS: Camber
Curve
Bow
Twist

NARRATION (VO) :

IN ADDITION TO CROSS-SECTIONAL, ANGULAR AND
LENGTH TOLERANCES, STRAIGHTNESS OF THE
MATERIAL AND THE FORMED SECTION IS IMPORTANT.
SOME OF THE PARAMETERS THAT DETERMINE
STRAIGHTNESS INCLUDE:
CAMBER,
CURVE,
BOW,
AND TWIST.

SCENE 26.

RF26A, CGS: Camber

RF26B, GRAPHIC: flat sheet metal
stock with curve, lines & arrows
appear showing camber

RF26C, tape 958, 06:10:56-06:11:14

zoom in, uncoiler reel feeding into
roll forming machine

NARRATION (VO) :

CAMBER IS THE DEVIATION OF A SIDE EDGE FROM A
STRAIGHT LINE. MEASURED PRIOR TO ROLL FORMING,
THE MAXIMUM ALLOWABLE CAMBER IS THREE-EIGHTS
OF AN INCH IN 10 FEET, OR 9.5 MILLIMETERS IN 3

METERS. EXCESSIVE CAMBER INDUCES CURVE, BOW AND TWIST IN THE FINISHED ROLL FORMED PARTS.

SCENE 27.

RF27A, CGS: Curve

RF27B, CGS: Sweep

RF27C, ANI: roll formed part with curve

RF27D, GRAPHIC: roll formed part with curve, lines & arrows appear showing curve

RF27E, **tape 958**, **06:18:58-06:19:19** zoom in, roll forming operation

NARRATION (VO) :

CURVE, WHICH IS ALSO REFERRED TO AS SWEEP, IS THE DEVIATION FROM A STRAIGHT LINE IN THE HORIZONTAL PLANE. IT CAN BE CAUSED BY IMPROPER HORIZONTAL ROLL ALIGNMENT AND UNEVEN FORMING PRESSURE IN ROLL PAIRS. CURVE CAN BE HELD TO PLUS OR MINUS ONE-EIGHTH INCH IN 10 FEET, OR 3 MILLIMETERS IN 3 METERS.

SCENE 28.

RF28A, CGS: Bow

RF28B, ANI: roll formed part with bow

RF28C, GRAPHIC: roll formed part with bow, lines & arrows appear showing cross bowing

RF28D, GRAPHIC: roll formed part with bow, lines & arrows appear showing longitudinal bowing

RF28E, **tape 957**, **05:13:06-05:13:34** pan, roll forming operation

NARRATION (VO) :

BOW, THE VERTICAL PLANE DEVIATION FROM A STRAIGHT LINE, CAN BE CROSS..., OR LONGITUDINAL BOW. IT IS CAUSED BY UNEVEN VERTICAL GAPS ON SYMMETRICAL CROSS-SECTIONS AND UNEVEN FORMING AREAS ON ASYMMETRICAL SECTIONS. IN GENERAL, BOW CAN BE HELD TO PLUS OR MINUS ONE-EIGHTH INCH IN 10 FEET, OR 3 MILLIMETERS IN 3 METERS.

SCENE 29.

RF29A, CGS: Twist

RF29B, ANI: part profile, twisted

RF29C, **tape 957**, **05:09:36-05:09:52** zoom out, roll formed part produced

NARRATION (VO) :

TWIST IN A ROLL FORMED PART RESEMBLES A CORKSCREW EFFECT AND OFTEN RESULTS FROM EXCESSIVE FORMING PRESSURE AND ASYMMETRICAL PROFILES. GENERALLY, TWIST CAN BE HELD TO LESS THAN 5 DEGREES IN 10 FEET, OR 3 METERS.

SCENE 30.

RF30A, **tape 967**, **15:02:24-15:02:38** zoom in, straightening device

RF30B, **tape 961**, **09:09:20-09:09:37**

NARRATION (VO) :

A STRAIGHTENING UNIT INSTALLED AFTER THE FINAL

zoom out, curved part being produced

ROLL PASS IS OFTEN USED TO MINIMIZE OR ELIMINATE THE INTERNAL STRESSES THAT CAUSE CURVE, BOW AND TWIST. IN SOME INSTANCES THOUGH, ROLL FORMING PARAMETERS CAN BE ADJUSTED TO PRODUCE PARTS WITH CONTROLLED CURVATURE.

SCENE 31.

RF31A, tape 961, 09:06:17-09:06:41

zoom out, roll formed part ends

RF31B, CGS: Springback
End Flare

NARRATION (VO) :

OTHER FORMS OF DISTORTION THAT AFFECT THE QUALITY AND ACCURACY OF ROLL FORMED MATERIALS INCLUDE:

SPRINGBACK,

AND END FLARE.

SCENE 32.

RF32A, CGS: Springback

RF32B, ANI: part profile, springing
back out of tolerance

RF32C, tape 966, 14:23:28-14:23:52

zoom out, roll forming operation

RF32D, ANI: over formed part
profile, springing back to desired
shape

NARRATION (VO) :

SPRINGBACK IS THE TENDENCY OF THE FINISHED PART PROFILE TO SLIGHTLY RETURN TO ITS ORIGINAL SHAPE AND STEMS FROM NOT STRESSING THE MATERIAL STOCK BEYOND ITS ELASTIC LIMIT DURING ROLL FORMING. SPRINGBACK IS OFTEN COMPENSATED FOR BY OVERFORMING THE MATERIAL AND THEN ALLOWING IT TO SPRING BACK TO THE REQUIRED PART PROFILE.

SCENE 33.

RF33A, CGS: End Flare

RF33B, tape 968, 16:05:53-16:06:03

zoom out, c.u part with end flare

RF33C, tape 965, 13:20:12-13:20:31

roll formed part being cut off

RF33D, tape 966, 14:11:54-14:12:08

pan of roll forming operation

NARRATION (VO) :

END FLARE APPEARS AT THE ENDS OF THE ROLL FORMED SECTION AND IS CAUSED BY THE RELEASE OF INTERNAL STRESSES ALONG THE EDGES OF THE STOCK WHEN THE PART IS CUT OFF. THERE ARE MANY WAYS TO MINIMIZE END FLARE, INCLUDING APPLYING

ADDITIONAL ROLL PASSES AND AVOIDING PREPUNCHED
EDGES IN THE CUTOFF REGION.

--- FADE TO BLACK ---

SCENE 34.

RF34A, GRAPHIC: Roll Form Tooling
white text centered on black

SCENE 35.

RF35A, peter carey narration
RF35B, **tape 967, 15:08:39-15:09:01**
zoom out, roll forming with emphasis
on tooling

NARRATION (VO) :

FORMING ROLLS ARE THE TOOLS THAT DO THE ACTUAL
FORMING OF THE MATERIAL AS IT MOVES THROUGH
THE ROLL FORMING MACHINE.

SCENE 36.

continue previous shot, loop end
after landing
RF36A, CGS: Number of Forming Passes
Material Width
Flower Design
Roll Material

NARRATION (VO) :

SEVERAL FACTORS NEED TO BE CONSIDERED WHEN
DESIGNING THE ROLLS TO FORM A PARTICULAR PART,
INCLUDING:

THE NUMBER OF FORMING PASSES,

THE MATERIAL WIDTH,

THE 'FLOWER' DESIGN,

AND THE ROLL MATERIAL.

SCENE 37.

RF37A, CGS: Number of Forming Passes
RF37B, **tape 964, 12:16:47-12:17:18**
zoom out, pan of roll forming
operation
RF37C, **tape 959, 07:21:58-07:22:15**
roll forming operation

NARRATION (VO) :

ROLL FORMING MATERIAL INTO A DESIRED FINAL
SHAPE IS A PROGRESSIVE OPERATION IN WHICH
SMALL AMOUNTS OF FORMING ARE PERFORMED AT EACH
PASS OR PAIR OF ROLLS. THE AMOUNT OF SHAPE OR
CONTOUR CHANGE IN EACH PASS MUST BE RESTRICTED
SO THAT THE REQUIRED BENDS CAN BE FORMED
WITHOUT ELONGATING THE MATERIAL. TOO FEW
PASSES CAN CAUSE DISTORTION AND LOSS OF
TOLERANCE, TOO MANY PASSES INCREASE THE FINAL

TOOLING COST.

SCENE 38.

RF38A, tape 957, 05:08:00-05:08:18
overhead pan of roll forming
RF38B, CGS: Material Thickness
Material Hardness
Material Composition

NARRATION (VO) :

GENERALLY, THE NUMBER OF PASSES DEPENDS UPON THE PROPERTIES OF THE MATERIAL TO BE FORMED AND THE COMPLEXITY OF SHAPE. MATERIAL THICKNESS, HARDNESS, AND COMPOSITION ALL AFFECT THE NUMBER OF PASSES REQUIRED TO ACHIEVE A DESIRED SHAPE.

SCENE 39.

RF39A, tape 964, 12:22:07-12:22:20
cut off of roll formed part
RF39B, tape 965, 13:09:15-13:09:30
zoom in, roll forming operation
with complex design

NARRATION (VO) :

SHAPE COMPLEXITY REFERS TO THE NUMBER OF BENDS AND THE BEND AMOUNT TO WHICH THE PART MUST BE FORMED. FOR PARTS HAVING MULTIPLE BENDS, THE NUMBER OF PASSES MUST BE DETERMINED FOR EACH BEND AND THEN, AFTER THE FORMATION OF BENDS HAVE BEEN COMBINED, THE APPROXIMATE NUMBER OF PASSES CAN BE DETERMINED.

SCENE 40.

RF40A, CGS: Material Width
RF40B, tape 954, 02:19:15-02:19:32
material going into roll forming
operation

NARRATION (VO) :

PROPER MATERIAL WIDTH IS CRITICAL IN PRODUCING PART PROFILES WITHIN REQUIRED DIMENSIONAL TOLERANCES.

SCENE 41.

continue previous shot
RF41A, GRAPHIC: part profile, no
lines
RF41B, ANI: part profile, lines
appear braking profile up in to
curves and straights sections,
profile pulled flat with lines
staying intact
RF41C, GRAPHIC: flat part profile,
no lines
RF41D, tape 958, 06:13:39-06:13:56
material going into roll forming
operation

NARRATION (VO) :

THE MATERIAL WIDTH NEEDED TO PRODUCE THE DESIRED ROLL FORMED SHAPE MAY BE DETERMINED BY DIVIDING THE PART PROFILE INTO ITS COMPONENT CURVED AND STRAIGHT SECTIONS, AND THEN TOTALING THE INDIVIDUAL LENGTHS OF THESE SECTIONS. TYPICALLY, WIDTH CALCULATION MUST BE

MODIFIED SLIGHTLY ONCE THE PART IS RUN.

SCENE 42.

RF42A, CGS: Flower Design

RF42B, tape 953, 01:01:44-01:01:59

zoom out, graphic flower design

RF42C, ANI: station by station

buildup of part contour from flat
stock to finished profile

NARRATION (VO) :

DEVELOPMENT OF THE 'FLOWER' DESIGN IS THE INITIAL STEP IN THE DESIGN OF ROLL FORM TOOLING. THE 'FLOWER' IS A STATION-BY-STATION OVERLAY OF THE PROGRESSIVE PART CONTOURS STARTING WITH THE FLAT STRIP WIDTH BEFORE FORMING AND ENDING WITH THE FINAL DESIRED SECTION PROFILE.

SCENE 43.

RF43A, tape 953, 01:08:39-01:09:08

computer screen scroll of part
profile progression

NARRATION (VO) :

THE INTERMEDIATE PROFILES BETWEEN FLAT MATERIAL AND FINISHED PROFILE ARE GRADUATED AT A RATE THAT ENABLES THE SECTION TO BE COMPLETED IN THE FEWEST NUMBER OF PASSES WITHOUT COMPROMISING STANDARD ROLL FORMING PARAMETERS.

SCENE 44.

RF44A, tape 953, 01:15:13-01:15:45

use of cad to produce roll form
tooling

NARRATION (VO) :

THE USE OF COMPUTER-AIDED DESIGN, OR 'CAD', SOFTWARE PACKAGES AND FAST COMPUTERS HAVE GREATLY IMPROVED THE CONSISTENCY, ACCURACY AND SPEED IN ROLL FORM TOOLING DEVELOPMENT.

SCENE 45.

continue previous shot

RF45A, computer graphic of stresses
anticipated in roll forming
operation

RF45B, tape 963, 11:16:18-11:16:48

cam package used in turning roll
form tooling

NARRATION (VO) :

IN ADDITION TO 'CAD', ROLL FORMING ENGINEERS HAVE ACCESS TO MANY OTHER SOFTWARE PACKAGES INCLUDING FINITE ELEMENT ANALYSIS, WHICH IS USED TO CALCULATE AND GRAPHICALLY PRESENT ANTICIPATED STRESSES GENERATED WITHIN THE

MATERIAL AS IT IS FORMED, AND COMPUTER-AIDED MACHINING, OR 'CAM', PACKAGES FOR OPTIMIZING ROLL MACHINING.

SCENE 46.

RF46A, CGS: Roll Material
RF46B, tape 963, 11:04:52-11:05:15
zoom out, tool steel being turned

NARRATION (VO) :

SEVERAL TYPES OF MATERIALS ARE USED TO MANUFACTURE FORMING ROLLS. THE SELECTION OF ROLL MATERIAL IS DEPENDENT UPON THE TYPE AND SHAPE OF MATERIAL BEING ROLL FORMED AND THE DESIRED QUANTITY OF PARTS BEING PRODUCED.

SCENE 47.

RF47A, tape 962, 10:12:27-10:12:56
zoom out, roll being turned
RF47B, tape 962, 10:25:14-10:25:27
zoom out, hardened rolls on cart
RF47C, tape 963, 11:01:31-11:01:49
zoom out, set of carbide rolls

NARRATION (VO) :

THE MOST WIDELY USED MATERIALS FOR FORMING ROLLS ARE OIL-HARDENED TOOL STEELS. FOR EXTENDED TOOL LIFE, HARDENED HIGH-CARBON, HIGH-CHROMIUM TOOL STEELS ARE USED. ON EXTREMELY TOUGH FORMING APPLICATIONS INVOLVING HIGH TEMPERATURES AND OR ABRASIVE MATERIALS, ALUMINUM/BRONZE OR CARBIDE ROLLS MAY BE REQUIRED.

SCENE 48.

RF48A, tape 967, 15:02:43-15:02:58
zoom out, roll forming of painted surface stock
RF48B, tape 962, 10:16:09-10:16:25
zoom out, plastic roll material

NARRATION (VO) :

TO MAINTAIN HIGHLY POLISHED FINISHES OR TO PREVENT COATED OR PAINTED SURFACES FROM BEING MARRED, CHROMIUM-PLATED ROLLS OR ROLLS PRODUCED FROM PLASTIC MATERIALS, SUCH AS NYLON OR TEFLON MAY BE USED.

SCENE 49.

RF49A, tape 953, 01:28:24-01:28:38
zoom out, roll being machined
RF49B, tape 956, 04:19:58-04:20:11
split roll being pulled from spindle
in sections

NARRATION (VO) :

SINGLE ROLLS ARE FREQUENTLY MANUFACTURED IN MULTIPLE SECTIONS, CALLED SPLIT ROLLS. SPLIT

RF49C, tape 953, 01:20:19-01:20:39
zoom out, machined split rolls

ROLLS ARE ADVANTAGEOUS IN THAT THEY LIMIT THE WEIGHT OF ROLLS FOR HANDLING PURPOSES AND ARE EASIER TO MACHINE IN SEGMENTS. SPLIT ROLLS ARE ALSO USED WHEN A TOOL SET IS INTENDED FOR A FAMILY OF ROLL FORMED PARTS.

SCENE 50.

RF50A, tape 963, 11:03:47-11:04:17
rolls being stamped with information

NARRATION (VO) :

ONCE PRODUCED, ROLLS ARE MARKED WITH INFORMATION SUCH AS DATE OF MANUFACTURE, CUSTOMER NAME, ROLL MATERIAL TYPE, WHICH PASS THE ROLL IS PART OF, WHETHER THE ROLL IS TO BE MOUNTED ON THE TOP OR BOTTOM SPINDLE, AND SO ON.

--- FADE TO BLACK ---

SCENE 51.

**RF51A, GRAPHIC: Roll Forming
Machines**
white text centered on black

SCENE 52.

RF52A, peter carey narration
RF52B, tape 964, 12:16:06-12:16:32
zoom out, roll forming machine

NARRATION (VO) :

ROLL FORMING MACHINES TYPICALLY HAVE A NUMBER OF INDIVIDUAL DUAL-SPINDLE ROLL FORMING UNITS MOUNTED ON A BASEPLATE. THE BASEPLATE MAY BE OF SUFFICIENT LENGTH TO ADD OTHER SUCH FORMING UNITS AS FUTURE NEEDS ARISE.

SCENE 53.

RF53A, tape 960, 08:22:37-08:22:52
rolls being mounted to spindle
RF53B, tape 959, 07:03:53-07:04:04
rack focus use of spacers to align tooling
RF53C, tape 961, 09:16:43-09:16:55
zoom out, spacers with tooling

NARRATION (VO) :

IN SET-UP, SOLID ROLLS OR SPLIT ROLLS ARE MOUNTED AND ALIGNED ON THESE DUAL-SPINDLE ROLL FORMING UNITS. SPACERS ARE USED TO FIX THE ROLLS IN EXACT POSITION ON THE SPINDLES.

SPACERS CAN BE STOCK SPACERS WHICH ARE USED INTERCHANGEABLY WITH OTHER TOOL SETS, OR DEDICATED SPACERS WHICH MAKE UP PART OF A SPECIFIC TOOL SET.

SCENE 54.

RF54A, tape 965, 13:14:44-13:15:14
rolls being adjusted

NARRATION (VO) :

VERTICAL ADJUSTMENT OF THE TOP SHAFT POSITION FINE TUNES IT TO ACCOMMODATE SPECIFIC ROLLS AND MATERIAL THICKNESS. TYPICAL SHAFT SIZE RANGES FROM 1 TO 4 INCHES, OR 25 TO 90 MILLIMETERS.

SCENE 55.

RF55A, tape 966, 14:18:54-14:19:08
outboard style roll forming machine

NARRATION (VO) :

THERE ARE MANY STYLES OF SPINDLE SUPPORT FOR ROLL FORMING MACHINES, WITH THE MOST POPULAR TYPE BEING OUTBOARD-STYLE SPINDLE SUPPORT MACHINES.

SCENE 56.

RF56A, tape 954, 02:05:10-02:05:18
pan, outboard roll forming machine
RF56B, tape 954, 02:03:18-02:03:47
zoom out, roll forming machine,
housing support being adjusted

NARRATION (VO) :

OUTBOARD MACHINES HAVE HOUSINGS SUPPORTING BOTH ENDS OF THE SPINDLE SHAFTS. THE OUTBOARD HOUSING IS GENERALLY ADJUSTABLE ALONG THE SPINDLES, LESSENING THE DISTANCE BETWEEN SUPPORTS TO ACCOMMODATE SMALL SHAPES OF THICK GAGE.

SCENE 57.

RF57A, tape 957, 05:19:52-05:20:17
pan, roll forming machine
RF57B, tape 954, 02:20:17-02:20:38
zoom out, roll forming operation
RF57C, CGS: Single-Duty Machines
Standard/Conventional
Machines
Side-by-Side Machines
Double-Head Machines

NARRATION (VO) :

THE MANNER IN WHICH ROLL FORMING UNITS ARE MOUNTED ON A COMMON BASEPLATE LARGELY DETERMINES THE TYPES OF SHAPES FORMED ON A PARTICULAR MACHINE. THE MOST COMMON TYPES OF

Rafted Machines

ROLL FORMING MACHINES INCLUDE:

SINGLE-DUTY MACHINES,
STANDARD, OR CONVENTIONAL, MACHINES,
SIDE-BY-SIDE MACHINES,
DOUBLE-HEAD MACHINES,
AND RAFTED MACHINES.

SCENE 58.

RF58A, CGS: Single-Duty Machines
RF58B, **tape 967, 15:07:01-15:07:18**
pan, single duty machine
RF58C, **tape 967, 15:11:58-15:12:06**
zoom in, entire line

NARRATION (VO) :

SINGLE-DUTY MACHINES, AS THE NAME IMPLIES, ARE
MADE FOR ONE PARTICULAR CROSS-SECTIONAL
PROFILE OR TOOL SET AND ARE NOT NORMALLY
DESIGNED FOR CONVENIENT ROLL CHANGE. THEIR
COST IS LOW AND THEY ARE TYPICALLY USED FOR
LONG PRODUCTION RUNS.

SCENE 59.

RF59A, CGS: Standard/Conventional
Machines
RF59B, **tape 959, 07:18:17-07:18:30**
pan, standard machine
RF59D, **tape 960, 08:25:06-08:25:28**
wide, zoom out, standard machine,
outboard support being removed

NARRATION (VO) :

STANDARD, OR CONVENTIONAL, MACHINES ARE MORE
VERSATILE BECAUSE THEIR OUTBOARD SUPPORTS ARE
EASILY REMOVED, PERMITTING TOOL CHANGE TO
PRODUCE VARIOUS PROFILES. FOR TOOL CHANGE, TOP
AND BOTTOM SPINDLE LOCKNUTS ARE REMOVED AND
THE OUTBOARD HOUSING IS PULLED OFF THE
SPINDLES AND REPLACED WITH THAT OF THE DESIRED
PROFILE.

SCENE 60.

RF60A, CGS: Side-by-Side Machines
RF60B, **tape 962, 10:04:50-10:05:06**
zoom out, two sets of tooling next
to each other
RF60C, **tape 968, 16:18:50-16:19:04**
c.u. machine bed being shifted
RF60D, **tape 962, 10:09:16-10:09:28**
zoom out, side by side tooling

NARRATION (VO) :

SIDE-BY-SIDE MACHINES ACCOMMODATE MULTIPLE
PROFILES BY HAVING MORE THAN ONE SET OF ROLL
TOOLS MOUNTED ON THE SPINDLE SHAFT AT THE SAME
TIME. CHANGING FROM ONE PROFILE TO ANOTHER IS

DONE BY SHIFTING THE MACHINE BED TO THE DESIRED PROFILE. MACHINE COST IS LOW, TOOL CHANGE IS FAST, AND REQUIRED FLOOR SPACE IS MINIMAL.

SCENE 61.

RF61A, CGS: Double-head machines
RF61B, tape 968, 16:17:26-16:17:41
pan, double-head roll forming machine
RF61C, tape 968, 16:10:28-16:10:40
zoom in, roll shafts and housing moving in on double-head machine
RF61D, tape 968, 16:13:14-16:13:32
roll forming with double-head machine

NARRATION (VO) :

DOUBLE-HEAD MACHINES HAVE TWO SEPARATE SETS OF HOUSINGS AND ROLL SHAFTS THAT FACE ONE ANOTHER. THE HOUSINGS ARE MOUNTED ON AN ADJUSTABLE PLATE MECHANISM SO THAT THEY CAN BE SHIFTED TO CHANGE OVERALL WIDTH WHILE MAINTAINING THE SAME PROFILE FOR EDGE FORMATION.

SCENE 62.

RF62A, CGS: Rafted Machines
RF62B, tape 957, 05:19:55-05:20:23
pan rafted machine roll forming
RF62C, tape 960, 08:07:24-08:07:43
raft being removed from machine

NARRATION (VO) :

RAFTED MACHINES RESEMBLE SINGLE-DUTY AND CONVENTIONAL MACHINES IN THAT THEY HAVE HOUSINGS AND SPINDLE SHAFTS WITH ONE PARTICULAR SET OF ROLL TOOLS MOUNTED TO IT. HOWEVER, SEVERAL FORMING UNITS ARE ON RAFTS OR SUBPLATES THAT ARE REMOVABLE FROM THE ROLL-FORMER BASE.

SCENE 63.

continue previous shot
RF63A, tape 960, 08:11:49-08:12:36
replacement raft added to machine

NARRATION (VO) :

ON TOOL CHANGE, THESE INDIVIDUAL RAFTS ARE REMOVED AND REPLACEMENT RAFTS INSTALLED HOLDING TOOLING THAT HAS BEEN SET-UP OFF-LINE.

SCENE 64.

RF64A, tape 960, 08:19:46-08:19:54
zoom out, raft plate located
RF64B, tape 960, 08:13:11-08:13:26
zoom out, replacement raft being secured to roll forming machine

NARRATION (VO) :

CARE MUST BE TAKEN IN THAT REPLACEMENT RAFTS MUST BE ACCURATELY LOCATED TO ENSURE PROPER

ALIGNMENT OF THE ROLL FORM TOOLING.

--- TOUCH BLACK ---

SCENE 65.

RF65A, tape 964, 12:13:06-12:13:16

zoom out, drive system of roll forming unit

RF65B, tape 965, 13:22:54-13:23:14

zoom out, drive system of roll forming unit

RF65C, CGS: Chain

Spur Gear

Worm Gear

Square Gear

Universal

RF65D, tape 956, 04:03:44-04:03:54

rack focus, universal drive unit powering roll forming machine

NARRATION (VO) :

ROLL FORMING MACHINES USE A VARIETY OF DRIVE

MECHANISMS TO POWER THE FORMING UNITS. THESE

DRIVE MECHANISMS INCLUDE:

CHAIN,

SPUR-GEAR,

WORM-GEAR,

SQUARE-GEAR,

AND UNIVERSAL DRIVES. OF THESE DRIVE

MECHANISMS, THE UNIVERSAL-DRIVES ARE THE MOST

FLEXIBLE.

SCENE 66.

RF66A, tape 957, 05:27:31-05:27:56

zoom out, universal drive unit powering roll forming machine

RF66B, tape 956, 04:05:21-04:05:35

zoom out, universal drive unit powering roll forming machine

NARRATION (VO) :

UNIVERSAL-DRIVE MACHINES HAVE A SERIES OF

WORM-DRIVEN GEAR BOXES WITH TOP AND BOTTOM

OUTPUTS THAT TRANSFER THE POWER SOURCE TO THE

INDIVIDUAL SHAFTS THROUGH A DOUBLE-JOINTED

UNIVERSAL COUPLING. THESE MACHINES ELIMINATE

THE NEED FOR ANY SPUR GEARING OR ROLLER-CHAIN

AND SPROCKET DRIVES. FOR SOME APPLICATIONS,

ONLY THE BOTTOM SPINDLE IS DRIVEN.

SCENE 67.

RF67A, tape 960, 08:14:54-08:15:09

zoom out, universal coupling connected to rafted machine

NARRATION (VO) :

THESE MACHINES FEATURE SIMPLE DESIGN AND LOW

MAINTENANCE. THEY ARE USUALLY USED WITH RAFTED

MACHINES TO SPEED TOOL CHANGE.

--- TOUCH BLACK ---

SCENE 68.

RF68A, tape 966, 14:05:55-14:06:29

zoom out, coolant used in roll forming operation

RF68B, CGS: Evaporative Compounds
Chemical Solutions/
Synthetics
Microemulsions/
Semisynthetics
Macroemulsions/
Water Solubles
Petroleum-Based Lubricants

NARRATION (VO) :

IN ROLL FORMING, LUBRICANTS ARE OFTEN USED TO REDUCE OR ELIMINATE THE FRICTION GENERATED WITHIN THE PROCESS. ROLL FORMING LUBRICANTS CAN BE CLASSIFIED AS EVAPORATIVE COMPOUNDS, CHEMICAL SOLUTIONS OR SYNTHETICS, MICRO-EMULSIONS OR SEMI-SYNTHETICS, MACRO-EMULSIONS OR WATER SOLUBLES AND PETROLEUM-BASED LUBRICANTS.

SCENE 69.

RF69A, tape 955, 03:03:50-03:04:10

zoom out, use of lubricants

NARRATION (VO) :

THESE LUBRICANTS ARE OFTEN MODIFIED WITH ADDITIVES THAT ENHANCE LUBRICITY, INHIBIT CORROSION, REDUCE COLD WELDING, PREVENT METAL BUILD-UP AND MINIMIZE SURFACE HEAT.

SCENE 70.

RF70A, tape 957, 05:24:51-05:25:05

zoom out, lubricant with contaminates being filtered

NARRATION (VO) :

LUBRICANTS ALSO SERVE TO WASH AWAY PROCESSING PARTICLES, DEBRIS AND CONTAMINANTS.

SCENE 71.

RF71A, tape 959, 07:17:07-07:17:34

flood lubrication system

RF71B, CGS: Air/Airless Spraying
Wiping
Roll Coating
Dripping
Flooding

RF71C, tape 957, 05:10:26-05:10:40

zoom out, flood lubricant system

NARRATION (VO) :

THE LUBRICANTS CAN BE APPLIED BY AIR OR AIRLESS SPRAYING, WIPING, ROLL COATING, DRIPPING OR FLOODING AND THE SYSTEM CAN BE HIGHLY AUTOMATED. MAINTENANCE PROCEDURES SHOULD ENSURE CONSISTENT LUBRICANT AND APPLICATION QUALITY.

SCENE 72.

RF72A, tape 957, 05:18:44-05:19:10

coolant being used

RF72B, CGS: Once-Through Systems
Recirculating Systems

NARRATION (VO) :

TWO BASIC LUBRICATING SYSTEMS ARE USED IN ROLL FORMING:

ONCE-THROUGH SYSTEMS,
AND RECIRCULATING SYSTEMS.

SCENE 73.

RF73A, CGS: Once-Through Systems
RF73B, **tape 966, 14:04:48-14:05:11**
zoom out, once through lubricant
being applied

NARRATION (VO) :

IN THE ONCE-THROUGH SYSTEMS, THE APPLIED
LUBRICANT LEAVES THE ROLL FORMING EQUIPMENT
EITHER ADHERED TO THE MATERIAL OR SEPARATELY
AS A WASTE BYPRODUCT.

SCENE 74.

RF74A, CGS: Recirculating Systems
RF74B, **tape 959, 07:15:31-07:15:50**
pan, lubricant washing off rolls

NARRATION (VO) :

IN RECIRCULATING SYSTEMS, MOST OF THE
LUBRICANT IS CAPTURED, FILTERED AND
RECIRCULATED FOR REUSE. GENERALLY,
RECIRCULATING SYSTEMS ARE MORE ECONOMICAL THAN
ONCE-THROUGH SYSTEMS.

--- FADE TO BLACK ---

SCENE 75.

RF75A, GRAPHIC: Review
white text on black
RF75B, peter carey narration

MUSIC UP AND UNDER

NARRATION (VO) :

LET'S REVIEW THE MATERIAL CONTAINED IN THIS
PROGRAM.

SCENE 76.

RF76A, **tape 967, 15:09:04-15:09:26**
zoom out, roll forming operation
RF76B, **tape 955, 03:05:57-03:06:14**
pan, roll forming operation
RF76C, review music, up & under

NARRATION (VO) :

ROLL FORMING IS A CONTINUOUS PROCESS FOR
FORMING SHEET, STRIP OR COILED METAL STOCK
INTO LONG SHAPES OF ESSENTIALLY UNIFORM CROSS-
SECTION. THE MATERIAL IS FED THROUGH MULTIPLE
PAIRS OF CONTOURED FORMING ROLLS, WHICH
PROGRESSIVELY SHAPE THE METAL UNTIL THE
DESIRED CROSS SECTION IS PRODUCED.

SCENE 77.

RF77A, tape 957, 05:09:13-05:09:30
zoom in, c.u. roll forming

NARRATION (VO) :

FORMING IS ACCOMPLISHED STRICTLY BY BENDING.
EXCEPT FOR SLIGHT THINNING AT THE BEND RADII,
NO CHANGE IN STOCK THICKNESS OCCURS.

SCENE 78.

RF78A, tape 959, 07:13:56-07:14:21
zoom in, roll forming
RF78C, tape 966, 14:10:51-14:11:05
zoom out, roll forming operation
RF78D, tape 954, 02:23:39-02:23:54
zoom out, roll forming operation

NARRATION (VO) :

ROLL FORMING IS TYPICALLY A HIGH-VOLUME
PRODUCTION PROCESS, BUT ALSO SUITS LIMITED
PRODUCTION OF SHAPES. ANY READILY CUT AND
BENDABLE MATERIAL CAN BE PROCESSED AND CLOSE-
TOLERANCE CROSS-SECTIONS ACHIEVED.
ADDITIONALLY, THE FORMING ROLLS USED CAN
GENERATE HUGE PRODUCT QUANTITIES BEFORE
REQUIRING MAINTENANCE.

SCENE 79.

RF79A, tape 968, 16:06:58-16:07:12
zoom out, roll forming of precut
stock
RF79B, tape 956, 04:08:07-04:08:20
post cutting of roll formed part

NARRATION (VO) :

THE STARTING STOCK FOR ROLL FORMING MAY BE
PRECUT...,
BUT IS MORE COMMONLY POST-CUT TO REQUIRED PART
LENGTH.

SCENE 80.

RF80A, tape 966, 14:17:13-14:17:26
zoom out, uncoiler
RF80B, tape 966, 14:19:33-14:19:40
roll forming machine
RF80C, tape 967, 15:04:31-15:04:46
zoom out, cutoff machine to runout
table

NARRATION (VO) :

TYPICALLY, THE POST-CUT METHOD REQUIRES A
STOCK UNCOILER...,
A ROLL FORMING MACHINE...,
A CUTOFF MACHINE...,
AND A RUNOUT TABLE.

SCENE 81.

RF81A, tape 957, 05:14:41-05:15:03
prenotching operation
RF81B, CGS: Prenotching
Punching
Embossing

NARRATION (VO) :

POST-CUT ROLL FORMING IS ALSO COMMONLY
AUGMENTED WITH A RANGE OF AUXILIARY EQUIPMENT

Marking
Trimming
Welding
Curving
Die Forming

TO PERFORM CERTAIN OPERATIONS, SUCH AS
PRENOTCHING, PUNCHING, EMBOSSING, MARKING,
TRIMMING, WELDING, CURVING, AND DIE FORMING.

--- TOUCH BLACK ---

SCENE 82.

RF82A, tape 967, 15:08:39-15:09:01
zoom out, roll forming with emphasis
on tooling

NARRATION (VO) :

FORMING ROLLS ARE THE TOOLS THAT DO THE ACTUAL
FORMING OF THE MATERIAL AS IT MOVES THROUGH
THE ROLL FORMING MACHINE.

SCENE 83.

continue previous shot, loop end
after landing
RF83A, CGS: Number of Forming Passes
Material Width
Flower Design
Roll Material

NARRATION (VO) :

SEVERAL FACTORS NEED TO BE CONSIDERED WHEN
DESIGNING THE ROLLS TO FORM A PARTICULAR PART,
INCLUDING:
THE NUMBER OF FORMING PASSES,
THE MATERIAL WIDTH,
THE 'FLOWER' DESIGN,
AND THE ROLL MATERIAL.

SCENE 84.

RF84A, tape 962, 10:12:27-10:12:56
zoom out, roll being turned
RF84B, tape 962, 10:25:14-10:25:27
zoom out, hardened rolls on cart
RF84C, tape 963, 11:01:31-11:01:49
zoom out, set of carbide rolls

NARRATION (VO) :

THE MOST WIDELY USED MATERIALS FOR
MANUFACTURING FORMING ROLLS ARE OIL-HARDENED
TOOL STEELS. FOR EXTENDED TOOL LIFE, HARDENED
HIGH-CARBON, HIGH-CHROMIUM TOOL STEELS ARE
USED. ON EXTREMELY TOUGH FORMING APPLICATIONS
INVOLVING HIGH TEMPERATURES AND OR ABRASIVE
MATERIALS, ALUMINUM/BRONZE OR CARBIDE ROLLS
MAY BE REQUIRED.

SCENE 85.

RF85A, tape 953, 01:28:24-01:28:38
zoom out, roll being machined
RF85B, tape 956, 04:19:58-04:20:11

NARRATION (VO) :

SINGLE ROLLS ARE FREQUENTLY MANUFACTURED IN

split roll being pulled from spindle
in sections
RF85C, tape 953, 01:20:19-01:20:39
zoom out, machined split rolls

MULTIPLE SECTIONS, CALLED SPLIT ROLLS. SPLIT ROLLS ARE ADVANTAGEOUS IN THAT THEY LIMIT THE WEIGHT OF ROLLS FOR HANDLING PURPOSES AND ARE EASIER TO MACHINE IN SEGMENTS. SPLIT ROLLS ARE ALSO USED WHEN A TOOL SET IS INTENDED FOR A FAMILY OF ROLL FORMED PARTS.

--- TOUCH BLACK ---

SCENE 86.
RF86A, tape 964, 12:16:06-12:16:32
zoom out, roll forming machine

NARRATION (VO) :
ROLL FORMING MACHINES TYPICALLY HAVE A NUMBER OF INDIVIDUAL DUAL-SPINDLE ROLL FORMING UNITS MOUNTED ON A BASEPLATE. THE BASEPLATE MAY BE OF SUFFICIENT LENGTH TO ADD OTHER SUCH FORMING UNITS AS FUTURE NEEDS ARISE.

SCENE 87.
RF87A, tape 957, 05:19:52-05:20:17
pan, roll forming machine
RF87B, CGS: Single-Duty Machines
RF87C, tape 967, 15:07:01-15:07:18
pan, single duty machine
**RF87D, CGS: Standard/Conventional
Machines**
RF87E, tape 959, 07:18:17-07:18:30
pan, standard machine
RF87F, CGS: Side-By-Side Machines
RF87G, tape 962, 10:04:50-10:05:06
zoom out, two sets of tooling next
to each other
RF87H, CGS: Double-Head Machines
RF87I, tape 968, 16:13:14-16:13:32
roll forming with double-head
machine
RF87J, CGS: Rafted Machines
RF87K, tape 960, 08:07:24-08:07:43
raft being removed from machine

NARRATION (VO) :
THE MANNER IN WHICH ROLL FORMING UNITS ARE MOUNTED ON THE BASEPLATE LARGELY DETERMINES THE TYPES OF SHAPES FORMED ON A PARTICULAR MACHINE. THE MOST COMMON TYPES OF ROLL FORMING MACHINES INCLUDE:
SINGLE-DUTY MACHINES...,
STANDARD, OR CONVENTIONAL, MACHINES...,
SIDE-BY-SIDE MACHINES...,
DOUBLE-HEAD MACHINES...,
AND RAFTED MACHINES.

SCENE 88.
RF88A, tape 964, 12:13:06-12:13:16
zoom out, drive system of roll
forming unit
RF88B, tape 965, 13:22:54-13:23:14
zoom out, drive system of roll

NARRATION (VO) :
ROLL FORMING MACHINES USE A VARIETY OF DRIVE MECHANISMS TO POWER THE FORMING UNITS. THESE

forming unit

RF88C, CGS: Chain
Spur Gear
Worm Gear
Square Gear
Universal

RF88D, tape 956, 04:03:44-04:03:54
rack focus, universal drive unit
powering roll forming machine

DRIVE MECHANISMS INCLUDE:

CHAIN,

SPUR-GEAR,

WORM-GEAR,

SQUARE-GEAR,

AND UNIVERSAL DRIVES. OF THESE DRIVE

MECHANISMS, THE UNIVERSAL-DRIVES ARE THE MOST

FLEXIBLE.

--- TOUCH BLACK ---

SCENE 89.

RF89A, tape 966, 14:05:55-14:06:29
zoom out, coolant used in roll
forming operation

NARRATION (VO) :

IN ROLL FORMING, LUBRICANTS ARE OFTEN USED TO

REDUCE OR ELIMINATE THE FRICTION GENERATED

WITHIN THE PROCESS.

SCENE 90.

continue previous shot
RF90A, CGS: Air/Airless Spraying
Wiping
Roll Coating
Dripping
Flooding

NARRATION (VO) :

THE LUBRICANTS CAN BE APPLIED BY AIR OR

AIRLESS SPRAYING, WIPING, ROLL COATING,

DRIPPING OR FLOODING AND THE SYSTEM CAN BE

HIGHLY AUTOMATED.

SCENE 91.

RF91A, tape 966, 14:04:48-14:05:11
zoom out, once through lubricant
being applied
RF91B, CGS: Once-Through Systems
RF91C, tape 959, 07:15:31-07:15:50
pan, lubricant washing off rolls
RF91D, CGS: Recirculating Systems

NARRATION (VO) :

TWO BASIC LUBRICATING SYSTEMS ARE USED IN ROLL

FORMING:

ONCE-THROUGH SYSTEMS...,

AND RECIRCULATING SYSTEMS.

--- FADE TO BLACK ---

SCENE 92.

RF92A, CG, ROLL: credits
white text on black, fade up mid-
screen

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Executive Producer:
Steven R. Bollinger

Producer/Director/Cameraman:
Jerome T. Cook

Written By:
John A. Vaccari

Graphics By:
Jerome T. Cook
Dennis Summers,
Quantum Dance Works

Technical & Editorial Consulting:
Charles J. Summerhill,
Vice President of U.S. Operations,
Roll-Kraft

Equipment Access Provided By:
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WG Corporation

Production Assistance Provided By:
Lance A. Rosol

Video Editing:
Jerome T. Cook

SCENE 93.
RF93A, GRAPHIC: disclaimer

Some machinery in this program had safety

white text centered on black

equipment removed to allow better recording of
certain processes.

Always read the safety information provided in
the manufacturers' manual before machine
operation.

SCENE 94.

RF94A, SME logo open, with music