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FUNDAMENTAL MANUFACTURING PROCESSES

Sheet Metal Stamping Dies & Processes-SD

SCENE 1.
FMP RVW, CGS: Review
white text, centered on background
FMP BKG, motion background

SCENE 2.
SD07A, SME4427, 15:14:59:00-15:15:06:00
c.u. stamping operation, emphasis on die set
SD07B, SME4427, 15:19:14:00-15:19:30:00
c.u. stamping operation, emphasis on die set

NARRATION (VO):

STAMPING DIES ARE THE TOOLS, MOUNTED IN PRESSES, THAT CUT AND SHAPE SHEET METAL PARTS.

SCENE 3.
SD10B, SME4427, 15:44:52:00-15:44:02:00
sheet metal being stamped

NARRATION (VO):

THE PROPERTIES OF SHEET METAL INFLUENCE THE WAY STAMPING PRESS DIES WORK.

SCENE 4.
SD11A, SME2694, 02:12:56:00-02:13:19:00
sheet metal being stamped on progressive die line

NARRATION (VO):

GOOD FORMABILITY IS AN ESSENTIAL PROPERTY OF SHEET METAL AND MEANS IT HAS THE CAPABILITY OF BEING EXTENSIVELY DEFORMED INTO INTRICATE SHAPES WITHOUT DEFECTS IN THE FINISHED PART.

SCENE 5.
SD15B, SME2756, 02:18:34:00-02:18:43:00
c.u. foil being stamped
SD15C, SME4137, 08:26:18:00-08:26:28:00
thick stock being punched
SD15D, SME4137, 08:27:44:00-08:28:00:00
stamping operation

NARRATION (VO):

SHEET METAL USED FOR STAMPING VARIES IN THICKNESS FROM THIN FOIL...,
TO MATERIAL UP TO ONE INCH THICK. THE MAJORITY OF STAMPINGS ARE MADE FROM METAL WITH THICKNESS FROM TWENTY THOUSANDTHS TO EIGHTY THOUSANDTHS OF AN INCH IN LOW-CARBON SHEET STEEL.

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SCENE 6.
SD20A, SME4311, 03:40:16:00-03:40:34:00
zoom out, formed part placed in die, punched and removed
SD20B, CGS: Die
SD20C, SME2695, 03:18:05:00-03:18:12:00
entire press tooling
SD20D, SME2695, 03:20:14:00-03:20:23:00
female side of die

NARRATION (VO):

THE TERM 'DIE' MEANS THE ENTIRE PRESS TOOLING USED TO CUT AND FORM METAL, YET ALSO REFERS TO THE FEMALE HALF OF THE TOOLING THAT MATES WITH THE MALE PUNCH.

SCENE 7.
SD23A, CGS: Die Set
SD23B, SME2761, 04:10:04:00-04:10:17:00
die set taken apart
SD23C, SME2761, 04:02:23:00-04:02:26:00
small die set
SD23D, SME2761, 04:01:24:00-04:01:28:00
small die set
SD23E, SME2765, 02:03:44:00-02:03:47:00
large die set
SD23F, SME4426, 14:31:06:00-14:31:10:00
large die set

NARRATION (VO):

THE TERM 'DIE SET' REFERS TO THE UPPER AND LOWER DIE ASSEMBLIES, WHICH ARE ALSO CALLED PUNCH AND DIE HOLDERS, OR SHOES, AS WELL AS OTHER COMPONENTS. DIE SETS CAN TAKE MANY FORMS, SHAPES AND SIZES.

SCENE 8.
SD26C, SME2694, 02:10:00:00-02:10:05:00
cutting die operation
SD26D, SME4421, 12:40:53:00-12:41:03:00
forming die operation

NARRATION (VO):

THE TWO MOST COMMON TYPES OF DIES ARE

CUTTING DIES...,

AND FORMING DIES.

SCENE 9.
SD27A, CGS: Cutting
SD27B, SME3528, 02:13:50:00-02:14:00:00
cutting die operation
SD28A, CGS: Shearing
SD28B, SME2766, 04:02:05:00-04:02:20:00
stock being sheared
SD29A, CGS: Blanking
SD29B, SME3534, 10:02:20:00-10:02:30:00
parts being blanked on press
SD29C, SME3534, 10:07:43:00-10:07:53:00
parts being blanked on press
SD30A, CGS: Punching
SD30B, SME2693, 01:13:37:00-01:13:55:00
part being punched
SD35B, CGS: Trimming
SD35C, SME2758, 02:05:35:00-02:05:46:00
trimming operation on same part
SD47A, CGS: Hemming
SD47B, SME2758, 02:15:43:00-02:16:01:00
c.u. hemmed edge of sheet metal part

NARRATION (VO):

CUTTING OPERATIONS INCLUDES:

SHEARING,

BLANKING,

HOLE PUNCHING,

AND TRIMMING.

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SCENE 10.
SD36A, CGS: Forming
SD36B, SME4427, 15:02:06:00-15:02:15:00
forming operation
SD37A, CGS: Drawing
SD37B, SME2765, 02:20:50:00-02:20:59:00
draw forming operation
SD45A, CGS: Bending
SD45B, SME4314, 06:07:54:00-06:08:18:00
zoom out, bending operation on progressive die
SD46A, CGS: Flanging
SD46B, SME4427, 15:25:06:00-15:25:35:00
c.u., part edge being flanged

NARRATION (VO):

COMMON FORMING OPERATIONS INCLUDE

DRAWING,

BENDING,

FLANGING,

AND HEMMING.

SCENE 11.
SD49A, SME2755, 01:24:37:00-01:24:52:00
multiple operations carried out on part using combination die
SD49B, SME4314, 06:06:10:00-06:06:32:00
parts stamped using progressive die

NARRATION (VO):

MULTIPLE OPERATIONS MAY BE CARRIED OUT

ON SHEET METAL STOCK EITHER AT A SINGLE

DIE STATION...,

OR AT MULTIPLE STATIONS WITHIN A SINGLE

STROKE OF THE PRESS.

SCENE 12.
SD51A, SME4314, 07:09:06:00-07:09:23:00
compound die operation, edit at multiple points
SD52A, SME4421, 12:40:55:00-12:41:17:00
combination die operation

NARRATION (VO):

DIES USED IN SINGLE-STATION OPERATIONS

CAN BE EITHER COMPOUND DIES...,

OR COMBINATION DIES.

SCENE 13.
SD54A, SME4138, 09:10:59:00-09:11:13:00
progressive die stamping operation
SD54B, SME4392, 01:06:08:00-01:06:20:00
pan, transfer die stamping operation
SD57A, SME2757, 01:01:51:00-01:02:08:00
tandem line producing parts
SD57B, SME2757, 01:16:43:00-01:16:53:00
robots griping parts, moving

NARRATION (VO):

MULTIPLE-STATION OPERATIONS ARE

PERFORMED WITH EITHER PROGRESSIVE

DIES...,

OR TRANSFER DIES.

LARGE PARTS CAN BE TRANSFERRED BETWEEN

TANDEM LINE PRESSES, EACH OF WHICH

PERFORMS DIFFERENT OPERATIONS ON THE

WORKPIECE.

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SCENE 14.
SD60A, SME2694, 02:02:36:00-02:02:44:00
c.u. lubricant being used in operation
SD60B, SME2694, 02:19:26:00-02:19:36:00
c.u. lubricant
SD60C, SME4392, 01:27:37:00-01:27:54:00
lubricant used to perform deep draw operation

NARRATION (VO):

A LUBRICANT'S MAIN FUNCTION IN SHEET METAL OPERATIONS IS TO MINIMIZE SURFACE CONTACT BETWEEN THE TOOLING AND THE WORKPIECE.

SCENE 15.
SD67A, SME2694, 02:03:04:00-02:03:16:00
manual roller application of lubricant
SD68A, SME2755, 01:24:55:00-01:25:15:00
drip application of lubricant
SD69C, SME4428, 16:27:58:00-16:28:23:00
zoom out, roller coating of lubrication
SD70A, SME4138, 09:18:00:00-09:18:15:00
zoom out, airspraying application of lubricant
SD71B, SME3468, 04:01:50:00-04:02:11:00
zoom out, flood lubrication system used to coat round blanks

NARRATION (VO):

METHODS OF APPLYING LUBRICANT INCLUDE

MANUAL...,

DRIP...,

ROLLER...,

SPRAYING...,

AND FLOODING.

SCENE 16.
SD78A, SME2765, 02:24:28:00-02:24:44:00
c.u. deformed grid of part being inspected

NARRATION (VO):

DEFORMATION OF THE ETCHED GRID ON THE SURFACE OF A BLANK ALLOWS POINT-TO-POINT CALCULATIONS OF THE DEFORMATION THAT OCCURRED DURING STAMPING.

SCENE 17.
SD80A, SME4002, 01:43:12:00-01:43:28:00
computer screen with formed part, indication of parts formability
SD80B, SME4427, 15:55:04:00-15:55:37:00
computer screen with sheet metal cycling through drawing operation forces
SD80C, SME4427, 15:55:56:00-15:56:00:00
long still of final formed part

NARRATION (VO):

COMPUTER SOFTWARE PROGRAMS ARE AVAILABLE TO MINIMIZE THE LENGTHY FINE-TUNING PROCESS OF DIE MAKING.

--- FADE TO BLACK ---