

FUNDAMENTAL MANUFACTURING PROCESSES

Threading

SCENE 1.

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

SCENE 2.

TH07A, SME2578, 03:12:27:00-03:12:37:00
screw thread
TH07B, SME4389, 21:05:04:00-21:05:16:00
zoom out, lead screw turning
TH07C, SME3330, 08:04:48:00-08:05:58:00
screws used in assembly operation
TH07D, SME3928, 23:04:09:00-23:04:27:00
mechanical fasteners tightening composite
assembly together, alternate shot

NARRATION (VO) :

THE HELICAL THREAD OR SCREW FORM HAS TWO
PRIMARY FUNCTIONS:
TO TRANSMIT POWER AND MOTION...,
AND TO ATTACH AND SECURE PARTS TOGETHER.

SCENE 3.

TH09A, zoom in, still of external threads
TH09B, zoom out, still of internal threads

NARRATION (VO) :

THERE ARE EXTERNAL...,
AND INTERNAL THREADS.

SCENE 4.

TH12A, CGS: Major Diameter
TH12D, ANI: bolt, arrow and lines
TH12G, ANI: nut, arrow and lines
TH13A, CGS: Minimum/Minor Diameter
TH13D, ANI: bolt, arrow and lines
TH13G, ANI: nut, arrow and lines
TH14A, CGS: Thread Pitch
TH14D, ANI: bolt edge, arrow and lines
TH14G, ANI: nut edge, arrow and lines
TH15A, CGS: Thread Pitch Diameter
TH15E, ANI: bolt/nut with pitch diameter

NARRATION (VO) :

THREADS ARE IDENTIFIED CHIEFLY BY THEIR
MAJOR DIAMETER...,
MINIMUM DIAMETER...,
THREAD PITCH...,
AND THREAD PITCH DIAMETER.

SCENE 5.

TH25A, SME4384, 15:40:11:00-15:40:28:00
c. u. external thread being produced
TH25B, CGS: Hand Threading
Turning
Chasing
Milling
Grinding
Rolling

NARRATION (VO) :

EXTERNAL THREADS CAN BE GENERATED BY:
HAND THREADING,
TURNING,
CHASING,

MILLING,
GRINDING,
AND ROLLING.

SCENE 6.

TH26A, CGS: Hand Threading
TH26B, **SME4389**, **21:08:40:00-21:08:56:00**
threading die fitted into holding collet
TH26C, **SME4389**, **21:12:12:00-21:12:18:00**
die positioned over hole, manually turned
TH26D, **SME4389**, **21:12:38:00-21:13:35:00**
c.u. die carving thread

NARRATION (VO) :

THREADS ARE HAND-CUT USING A DIE FITTED
IN A HOLDING COLLET THAT SLIPS OVER THE
WORKPIECE. THE DIE CARVES A THREAD INTO
THE WORKPIECE AS IT IS TURNED.

SCENE 7.

TH28A, CGS: Thread Turning
TH28B, **SME4391**, **23:43:11:00-23:44:08:00**
c.u. thread turning

NARRATION (VO) :

IN THREAD TURNING, THE CUTTING TOOL
MOVES ALONG THE AXIS OF A ROTATING
WORKPIECE, CUTTING A HELIX. SEVERAL
PASSES ARE REQUIRED TO COMPLETE THE
THREADS.

SCENE 8.

TH39A, CGS: Thread Chasing
TH39C, **SME4384**, **15:19:26:00-15:19:54:00**
chasing operation

NARRATION (VO) :

IN THREAD CHASING, THREADS ARE PRODUCED
BY FORCING CYLINDRICAL BLANKS INTO
ROTATING DIES.

SCENE 9.

TH42A, CGS: Thread Milling
TH43A, **SME4391**, **23:30:33:00-23:31:12:00**
thread milling operation

NARRATION (VO) :

THREAD MILLING IS USED FOR VERY PRECISE
THREADING OPERATIONS. THIS IS USUALLY
ACCOMPLISHED ON A MACHINING CENTER WITH
CNC HELICAL INTERPOLATION.

SCENE 10.

TH46A, CGS: Thread Grinding
TH46C, **SME2621**, **01:08:38:00-01:08:50:00**
large part, thread grinding

NARRATION (VO) :

THREAD GRINDING IS OFTEN USED TO
GENERATE THREADS IN VERY HARD MATERIALS

OR WHERE HIGH PRECISION IS REQUIRED.

SCENE 11.

TH48A, CGS: Thread Rolling

TH49B, **SME4390**, **22:05:41:00-22:06:05:00**

zoom in, roll forming operation

NARRATION (VO) :

THREAD ROLLING PRODUCES A STRONGER

THREAD THAN THE THREAD CUTTING PROCESSES

BECAUSE THE METAL IS COLD-WORKED AS IT

IS PLASTICALLY DEFORMED INTO THREADS.

SCENE 12.

TH60A, **SME4384**, **15:29:37:00-15:30:01:00**

zoom in, large tapping operation

TH60B, CGS: Tapping

NARRATION (VO) :

TAPPING IS THE MOST COMMONLY USED

TECHNIQUE TO GENERATE INTERNAL THREADS.

SCENE 13.

TH61C, **SME4389**, **21:26:49:00-21:27:10:00**

zoom out, manually tapping hole

TH87A, **SME2632**, **02:06:29:00-02:06:45:00**

rigid/synchronous tap driving operation

TH88A, **SME4387**, **19:09:56:00-19:10:18:00**

zoom in, tapping head operation

NARRATION (VO) :

TAPS CAN BE MANUALLY DRIVEN...,

OR MOUNTED IN MACHINE TOOL SPINDLES...,

OR SPECIAL TAPPING HEADS.

SCENE 14.

TH81C, **SME4388**, **20:01:58:00-20:02:09:00**

zoom out, forming tap used on multiple holes

NARRATION (VO) :

THREAD-FORMING TAPS LOOK LIKE

CONVENTIONAL SCREWS, BUT HAVE SMALL

LOBES THAT FORM, RATHER THAN CUT, THE

THREAD.

SCENE 15.

TH94B, **SME4253**, **10:10:52:00-10:11:08:00**

critical thread dimensions checked

TH91D, **SME4016**, **00:50:38:00-00:50:55:00**

space shuttle taking off

TH92B, **SME4384**, **15:08:52:00-15:09:10:00**

go-no-go gages used on large bolt

TH94C, **SME4262**, **19:07:06:00-19:07:25:00**

zoom out, threaded fastener checked for roundness

TH95A, **SME4079**, **15:34:00:00-15:34:30:00**

zoom out, fatigue testing of thread

TH98C, **SME4384**, **15:03:02:00-15:03:18:00**

zoom out, bolt inspected under black light

TH99B, **SME4384**, **15:08:24:00-15:08:43:00**

zoom in, ultrasonic testing of bolt

NARRATION (VO) :

THE QUALITY AND DIMENSIONS OF THREADED

PARTS MUST BE VERIFIED, SINCE THEY ARE

COMMONLY USED FOR CRITICAL SAFETY-

RELATED PURPOSES. TO THIS END, DIFFERENT

LEVELS OF THREAD INSPECTION ARE

PERFORMED FOR BOTH HIGH- AND LOW-VOLUME

MANUFACTURING. ADDITIONALLY, MECHANICAL,

OR DESTRUCTIVE TESTING, IS USED TO
GATHER SPECIFIC PERFORMANCE OR PROPERTY
VALUES OF MATERIALS, WHILE NON-
DESTRUCTIVE TESTING IS OFTEN UTILIZED TO
LOCATE FLAWS IN THREADED PARTS.

--- FADE TO BLACK ---