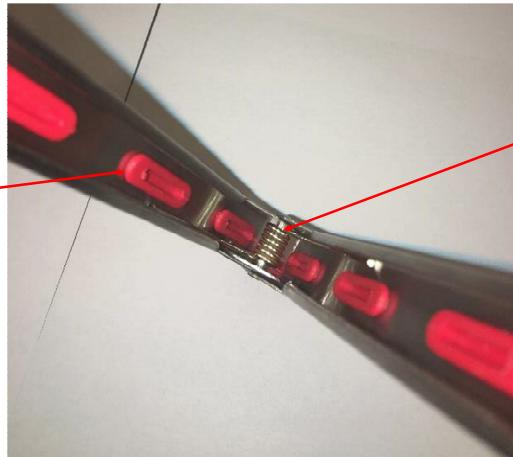
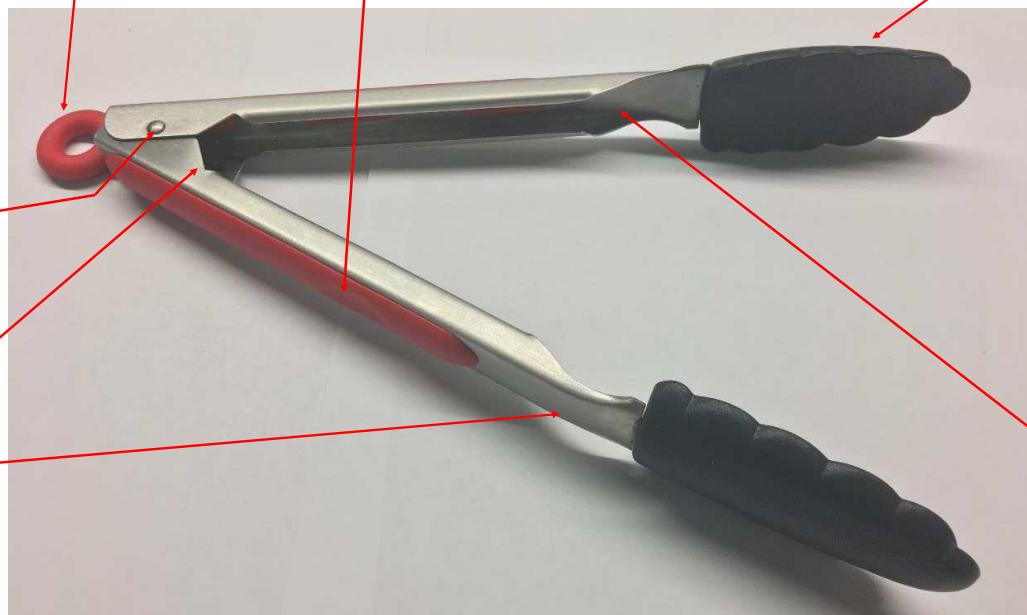
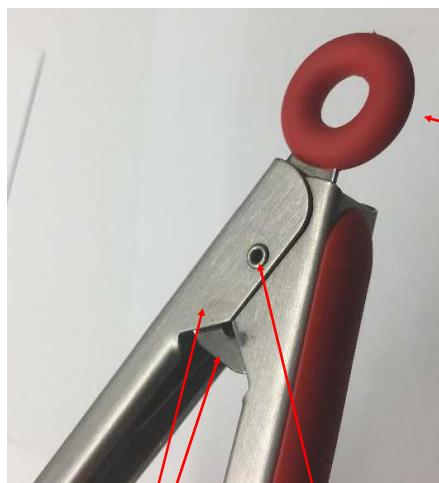


How It's Made?



KITCHEN TONGS

2



Injection molding
(silicone rubber)

Wire forming
(spring steel)

Insert molding
(silicone rubber)

Insert molding
(silicone rubber)

Bulk deformation
(stainless steel)

Sheet metal cutting
(stainless Steel)

Sheet metal bending
(stainless steel)

ESPRESSO FILTER HOLDER

3

Injection Molding
(thermoplastic)

Thermoforming
(Rubber thermoset)

Sheet Metal Forming
(Stainless Steel)

Wire forming (Spring Steel)

Injection Molding (thermoset)

Casting (Aluminum)

Thread Rolling (Steel)

Injection Molding (thermoset)



Impact Drill



Injection molding (thermoplastic)

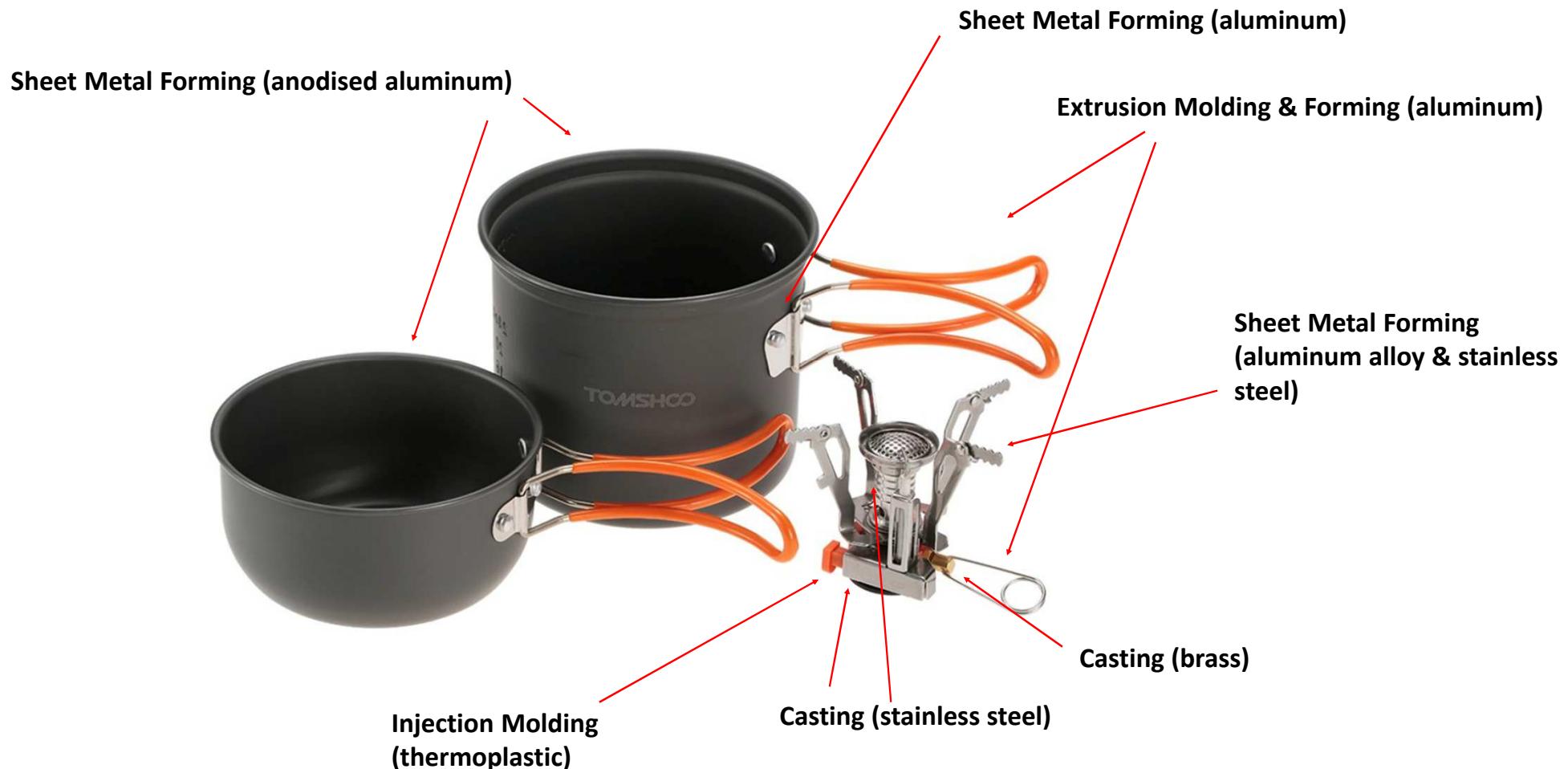
Injection molding
(elastomer)

Casting
(aluminum)



CAMPING COOKWARE

1



LEATHERMAN MULTITOOL

1

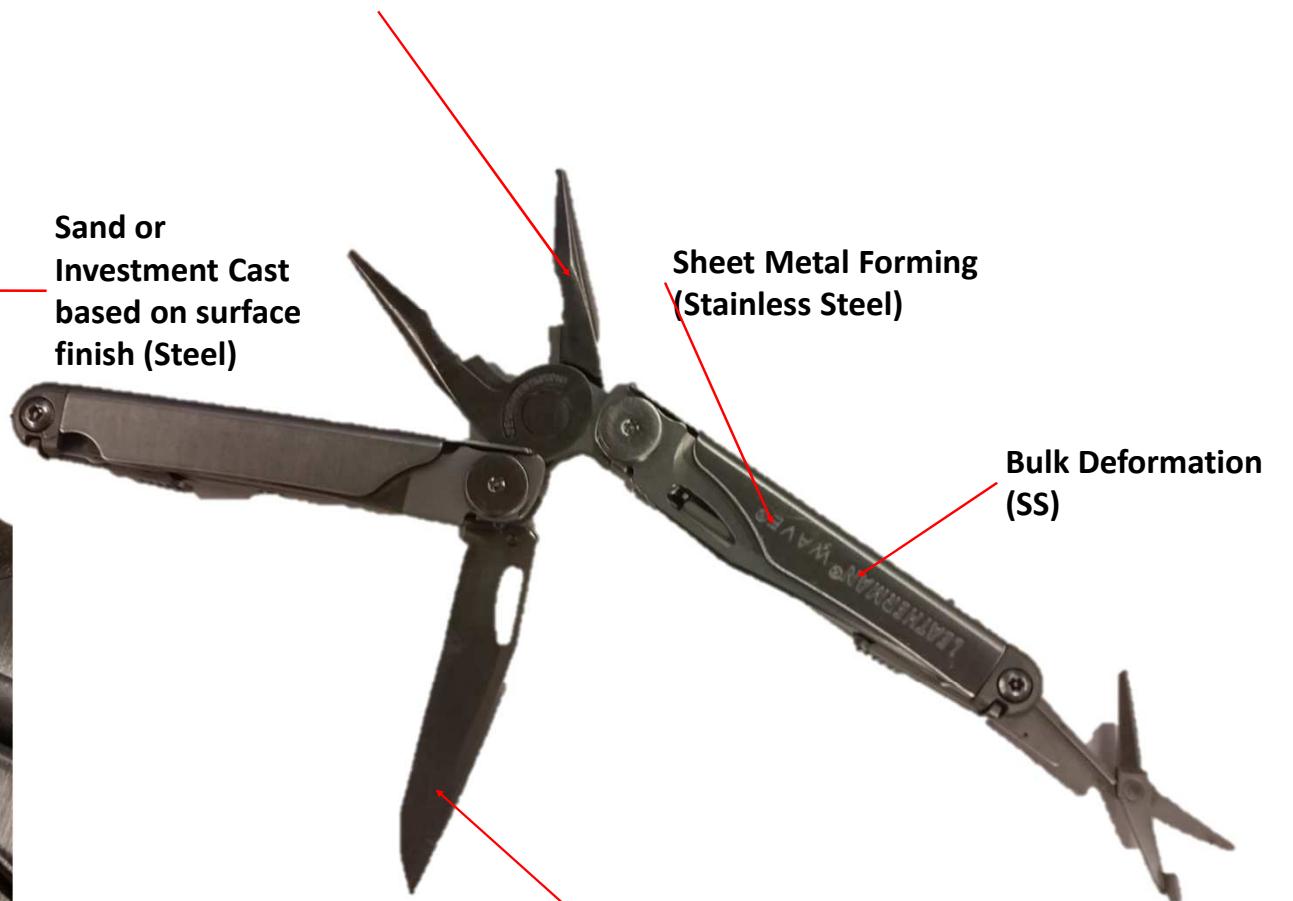
Thread Rolling (Steel)



Bulk Deformation (Steel)



Die Cast & Cold Forged (Stainless Steel)



SHOWER STUD REALISTIC SUCTION CUP DILDO VIBRATOR WITH BALLS 6 INCH

1



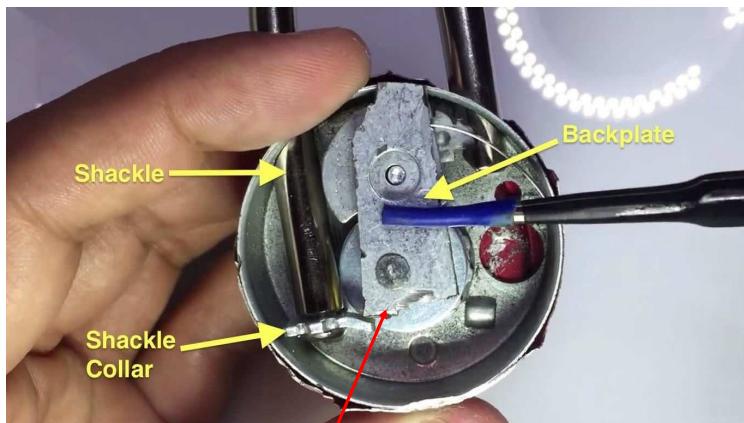
TEAPOT

1



COMBO LOCK

1



Internal Mechanism (Cast Steel)



Lock Body (Cast Steel)

Lock Shackle (Blanked Extrusion)

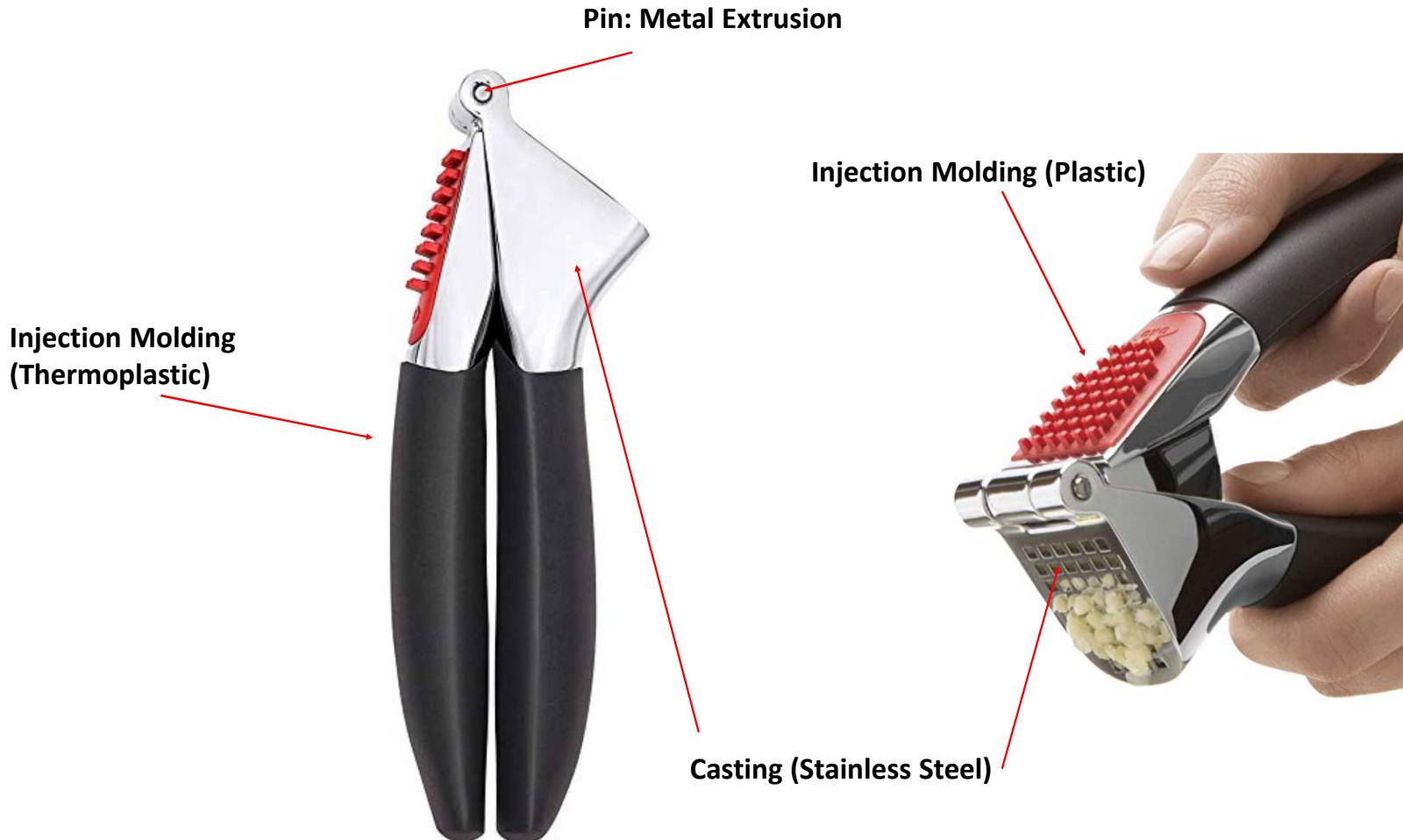


Lock Face (Stamped steel)

Lock Dial
(Rubber Painted Cast Steel)

GARLIC PRESS

1



COAT AND BAG HANGER

1

Extrusion
(Stainless Steel)



Thread Rolling (Steel)



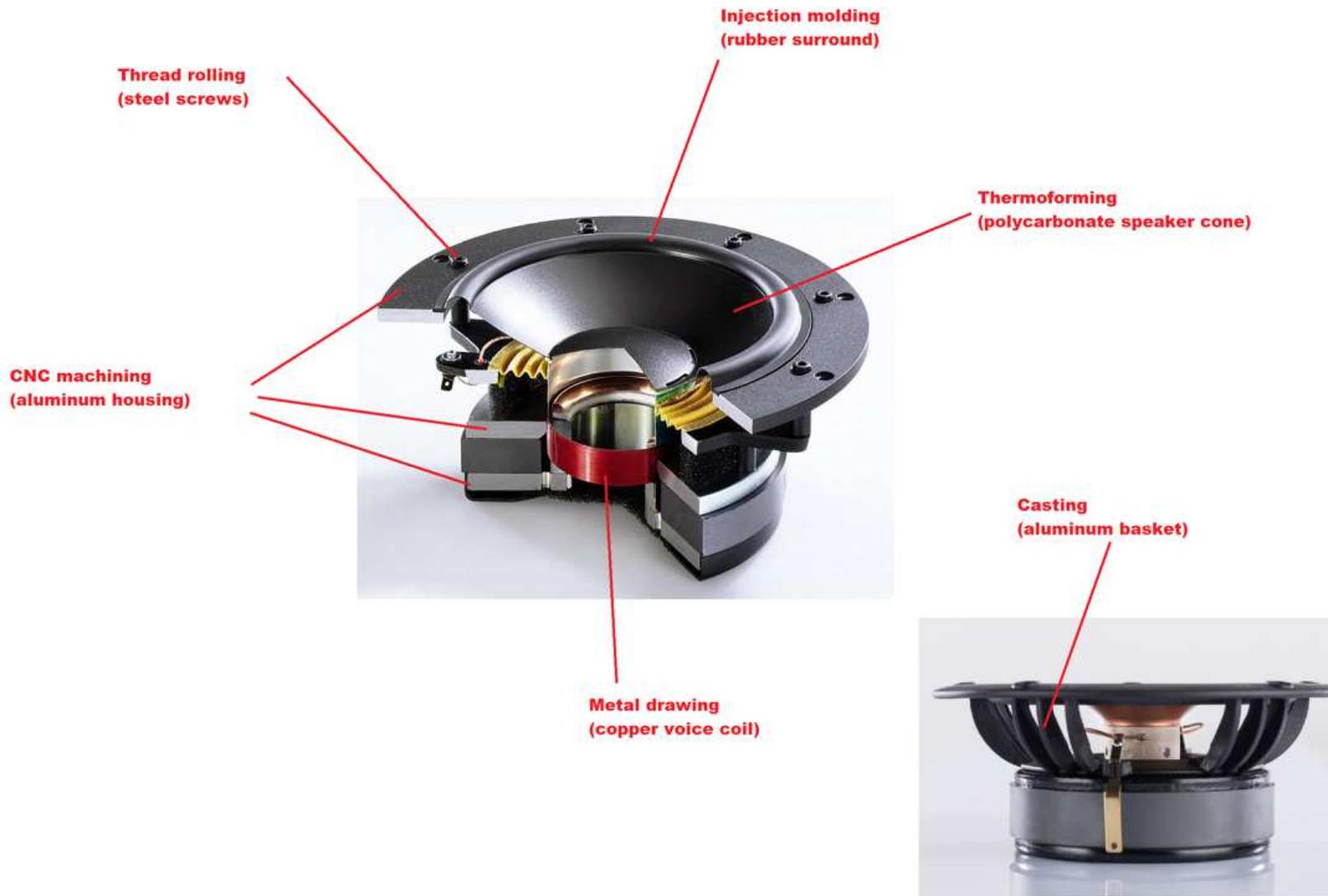
Welding (Steel)

PART YOU CHOOSE

1



Speaker driver manufacturing processes



Golf club

Extruded Steel



Cast then forged

Rubber injection molding

Honda Car Key



Machining (Nickle Silver)

Thread Rolling (Steel)



Sheet Metal Forming (Stainless Steel)

Injection Molding (Thermoplastic)



Thermoforming (Rubber Thermoset)

CAN OPENER

1

Injection Molding
(thermoplastic)

Casting
(aluminum)

Sheet Metal Forming
(aluminum)

Wire Forming
(spring steel)

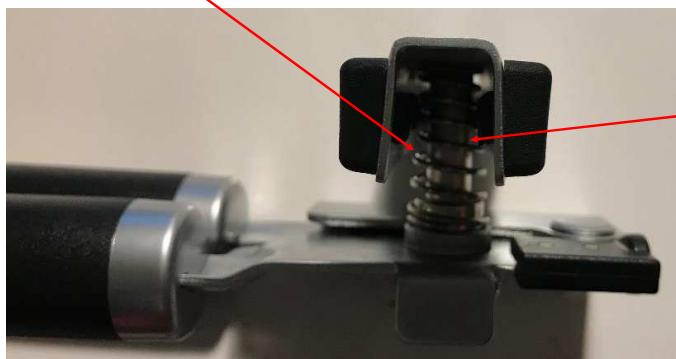
Injection Molding
(thermoset)

Injection Molding
(rubber thermoset)

Casting
(aluminum)

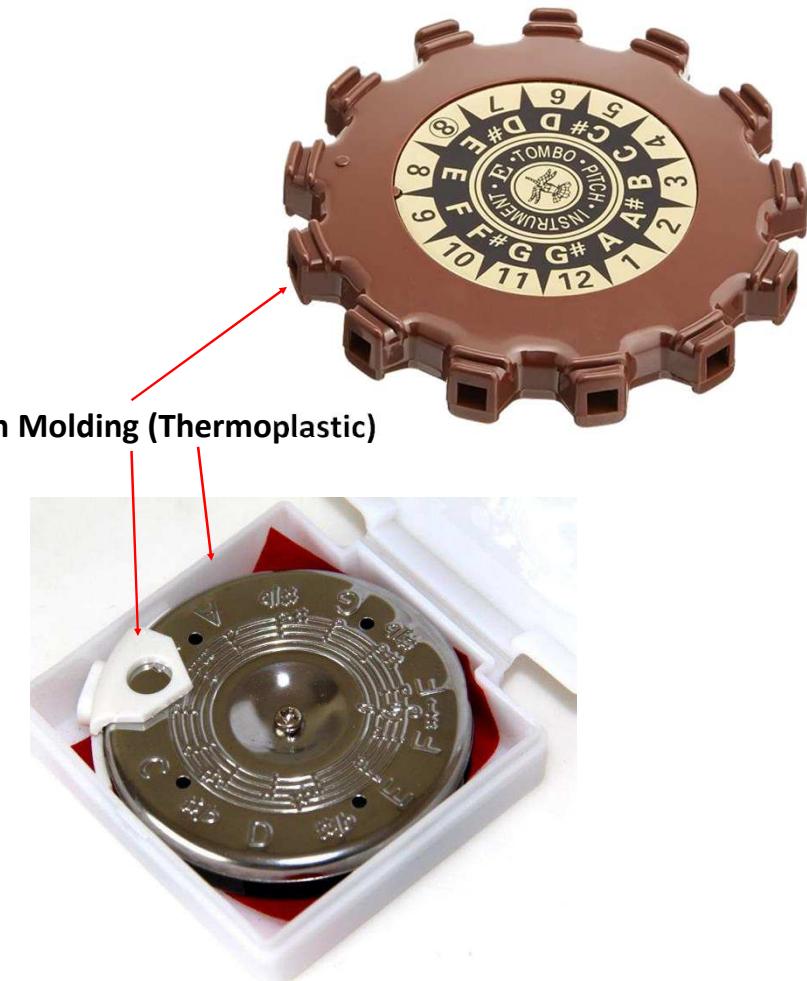
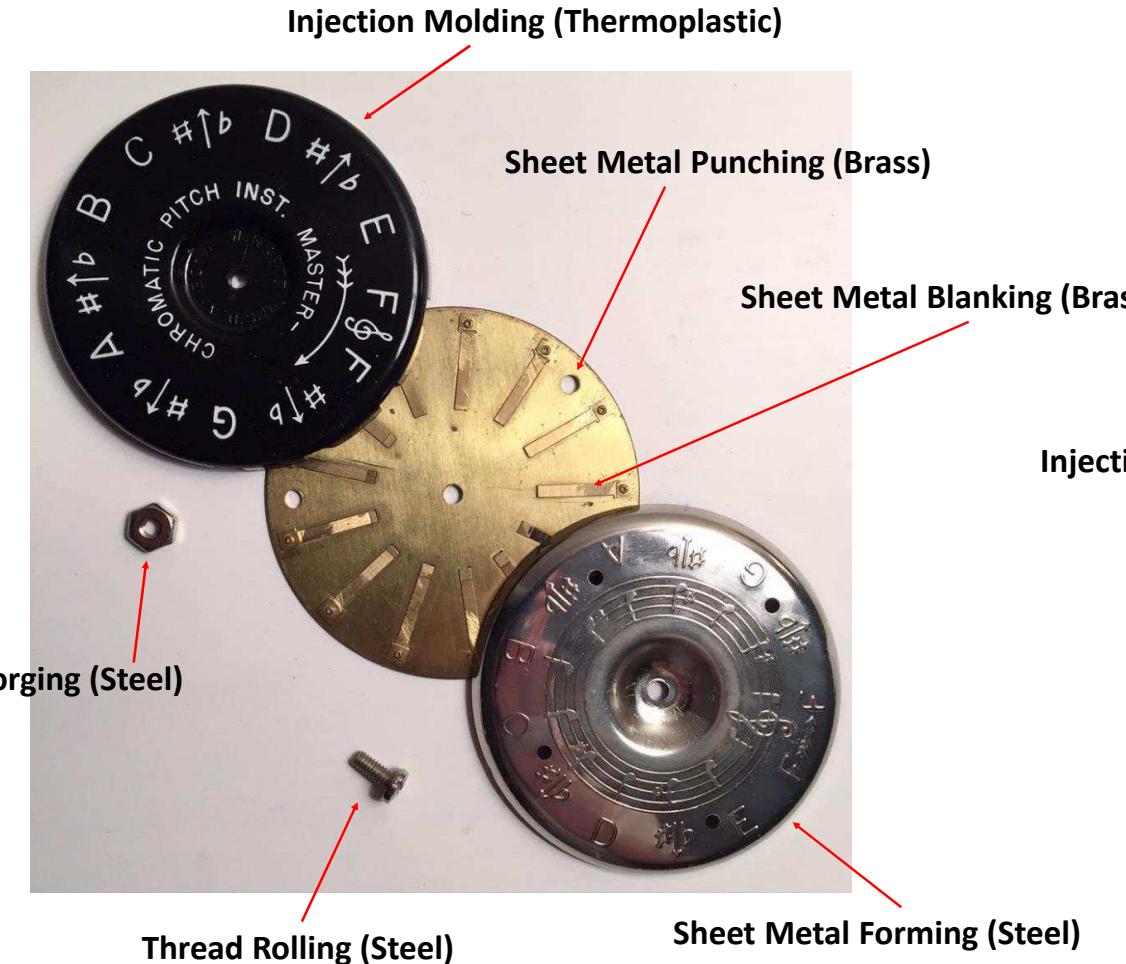
Extrusion
(aluminum)

Forging (riveting)
(aluminum)



PITCH PIPE

1



Water Bottle Lid

Injection molding -
thermoset plastic

Thermoforming –
rubber thermoset

Sheet metal forming –
sheet metal



NALGENE WATER BOTTLE

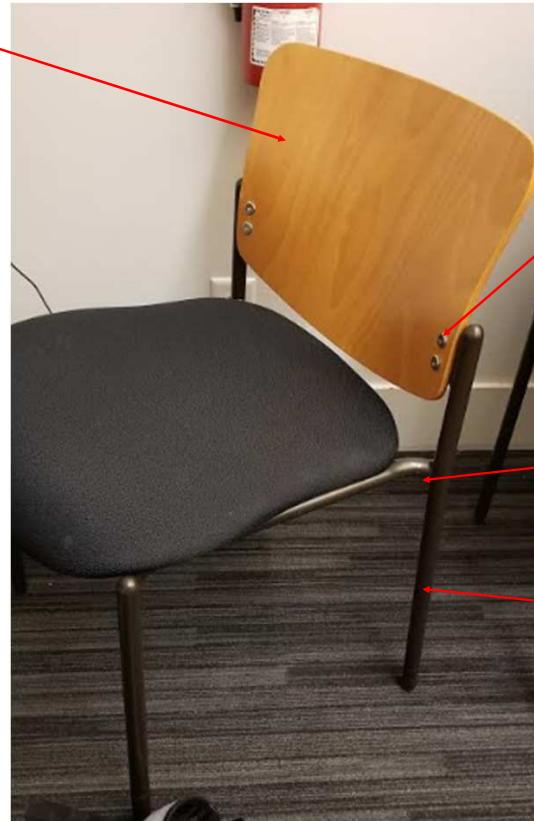
1



PART YOU CHOOSE

1

Lumber manufacturing



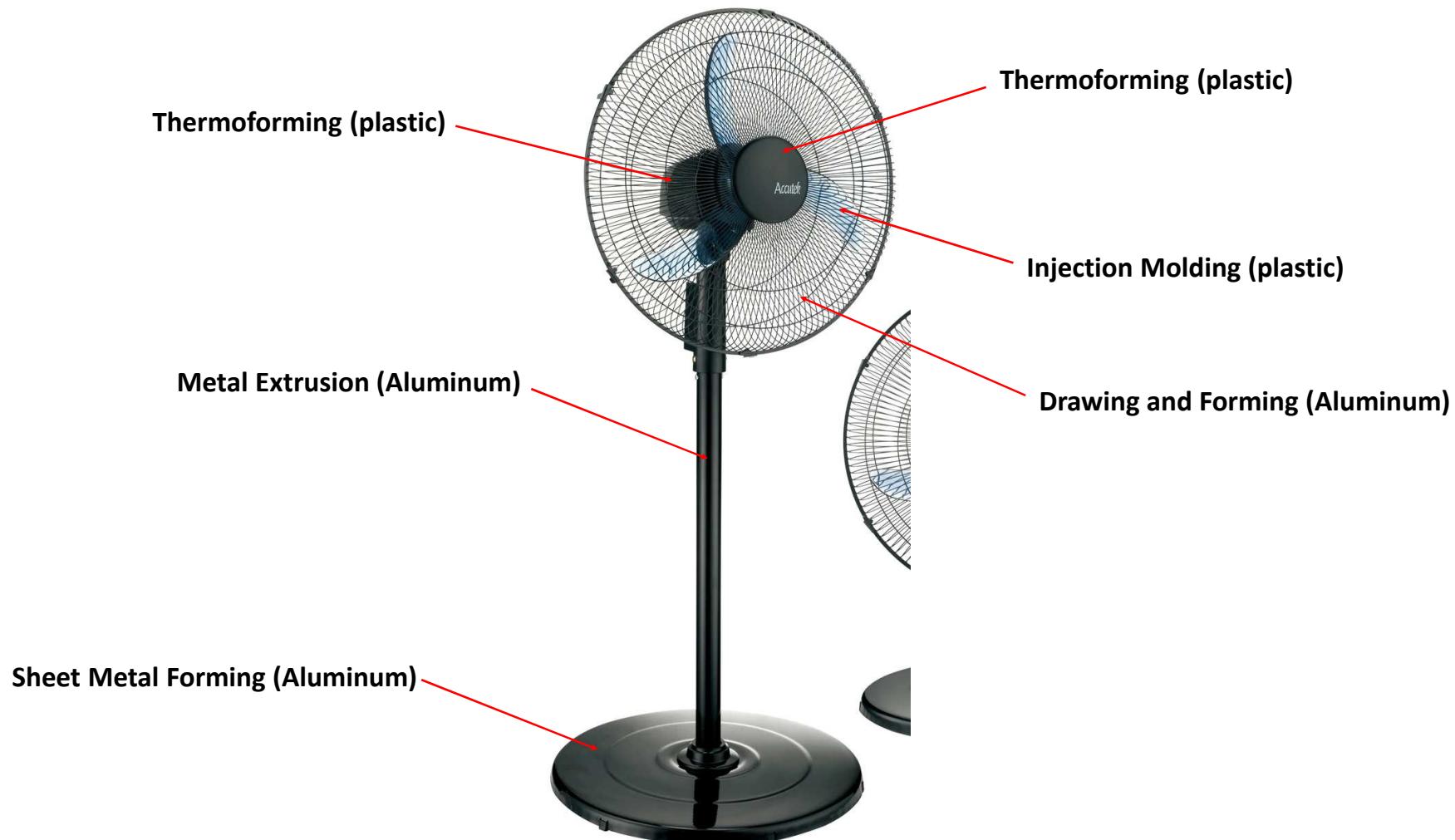
Rolling/Cutting to make threads on bolts
Cold forging to make bolt shape

Welding – Joining vertical and horizontal members

Drawing to make tubing for legs

FAN

1



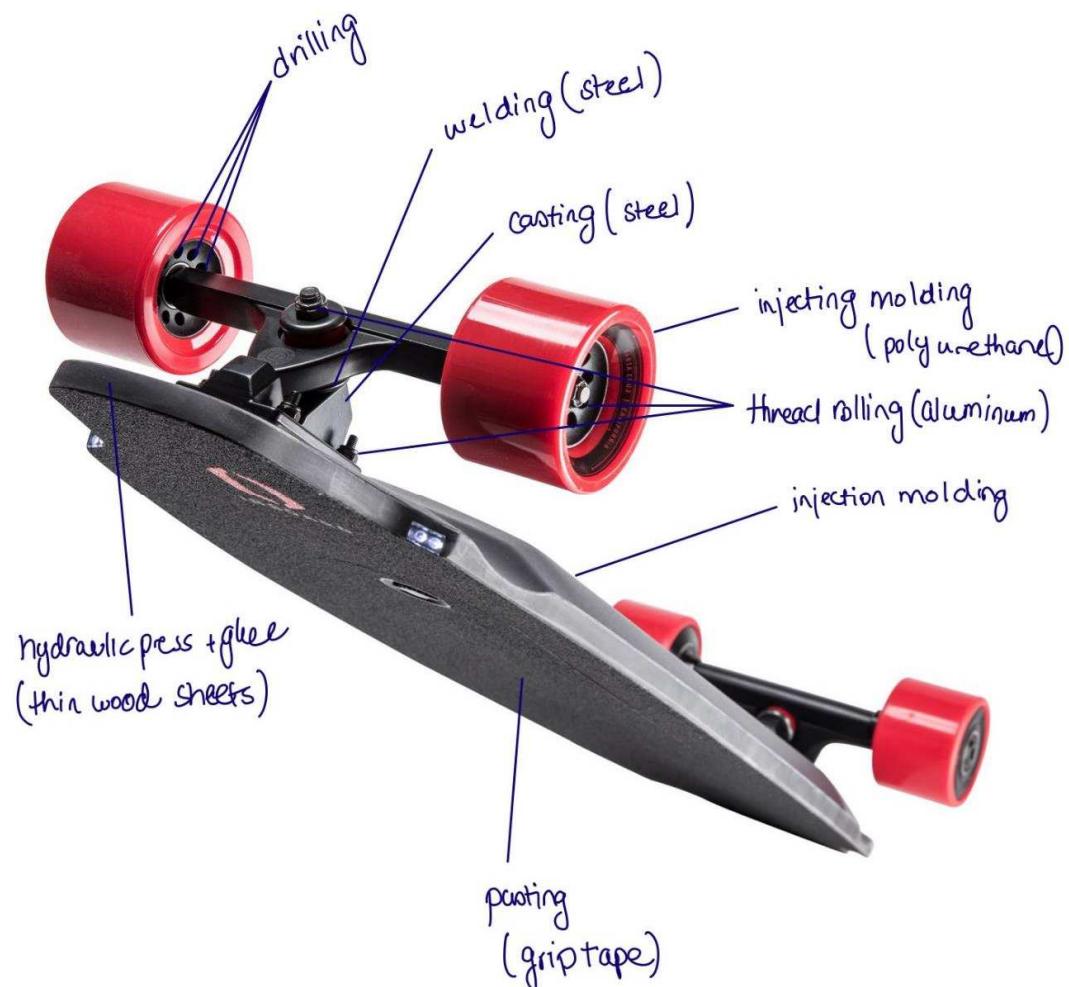
WINE CORKSCREW

1



SKATEBOARD

1



3D DIE CAST CONCORDE MODEL

1



STAPLER

1

Injection Molding (Thermoset)

Blanking/Stamping
(steel)

Forging (steel)

Sheet Metal Bending
(Steel)

Brake Forming (steel)



STAPELER

1

Sheet metal forming (Steel)

Thermoforming (Rubber Thermoset)

Injection molding (Thermoplastic)



Injection molding (Thermoplastic)

Sheet metal forming (Steel)

Wire forming (Spring Steel)

Metal extrusion (Steel)

Sheet metal forming (Aluminum)



STAPLER

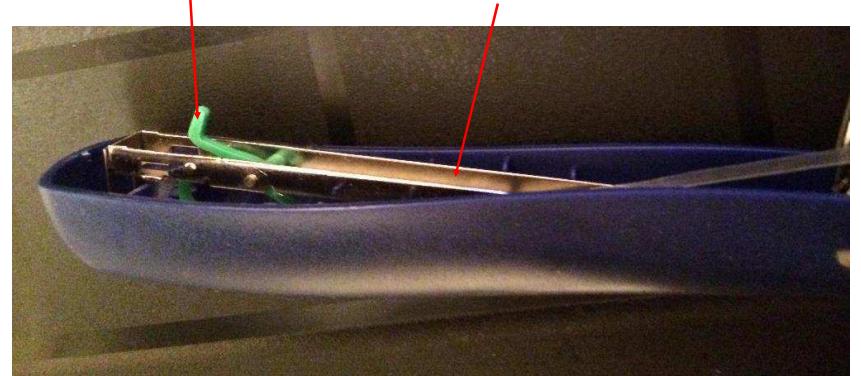
1

Injection Molding
(Thermoplastic)



Injection Molding
(ABS)

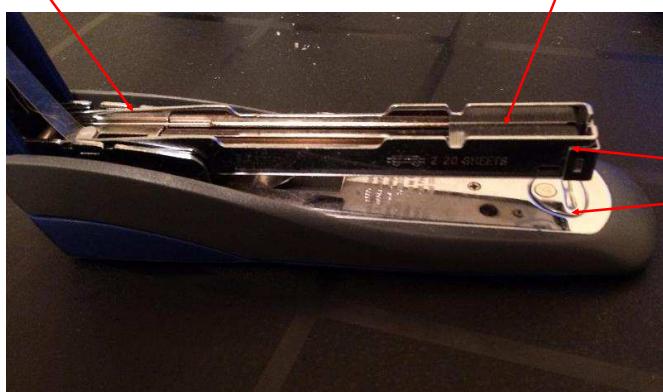
Sheet Metal Forming (Stainless Steel)



Metal Coil Forming (Stainless Steel)

Drawing (Stainless Steel)

Sheet Metal Forming (Stainless Steel)

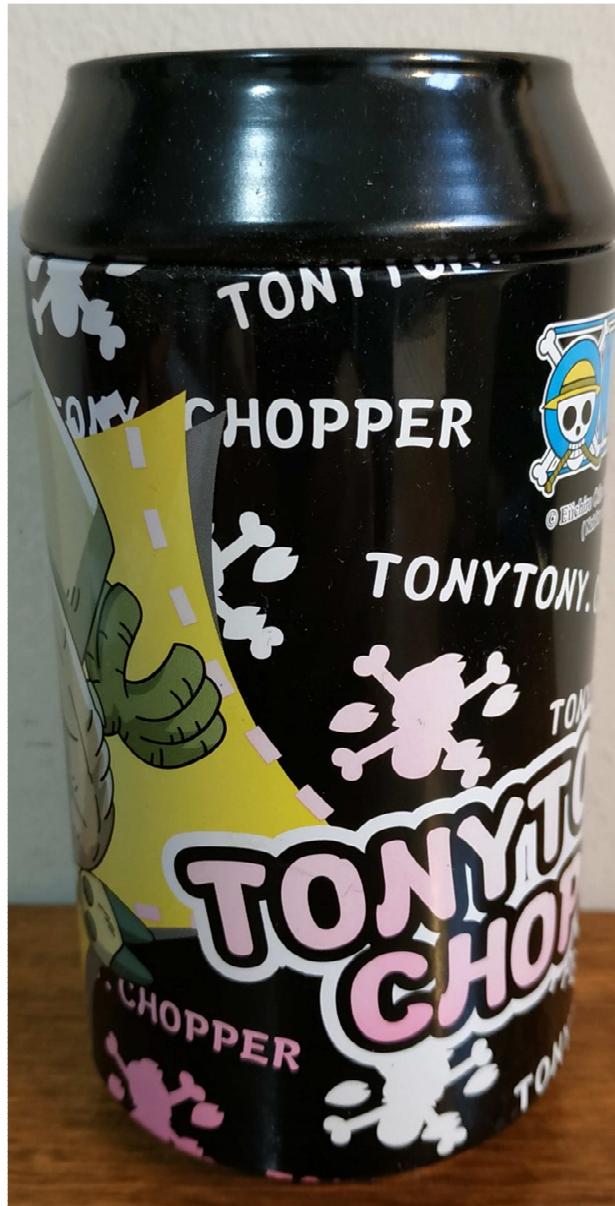


ALUMINUM WATER BOTTLE

1

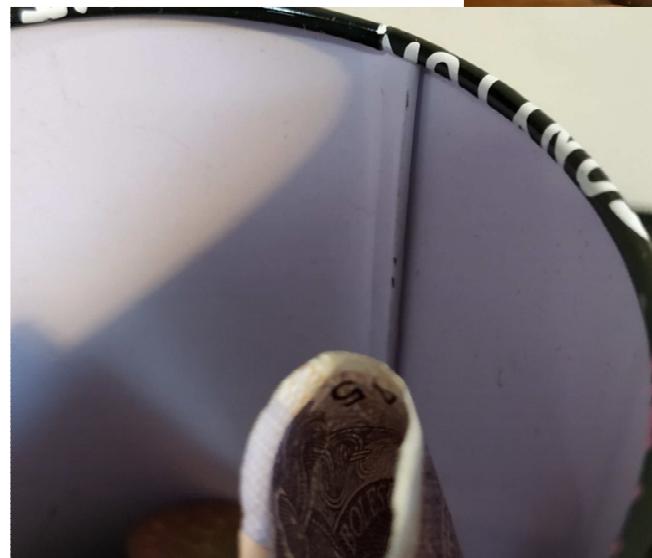


Two piece Coin bank



stamping, forging
and punching

sheet metal



SCISSORS

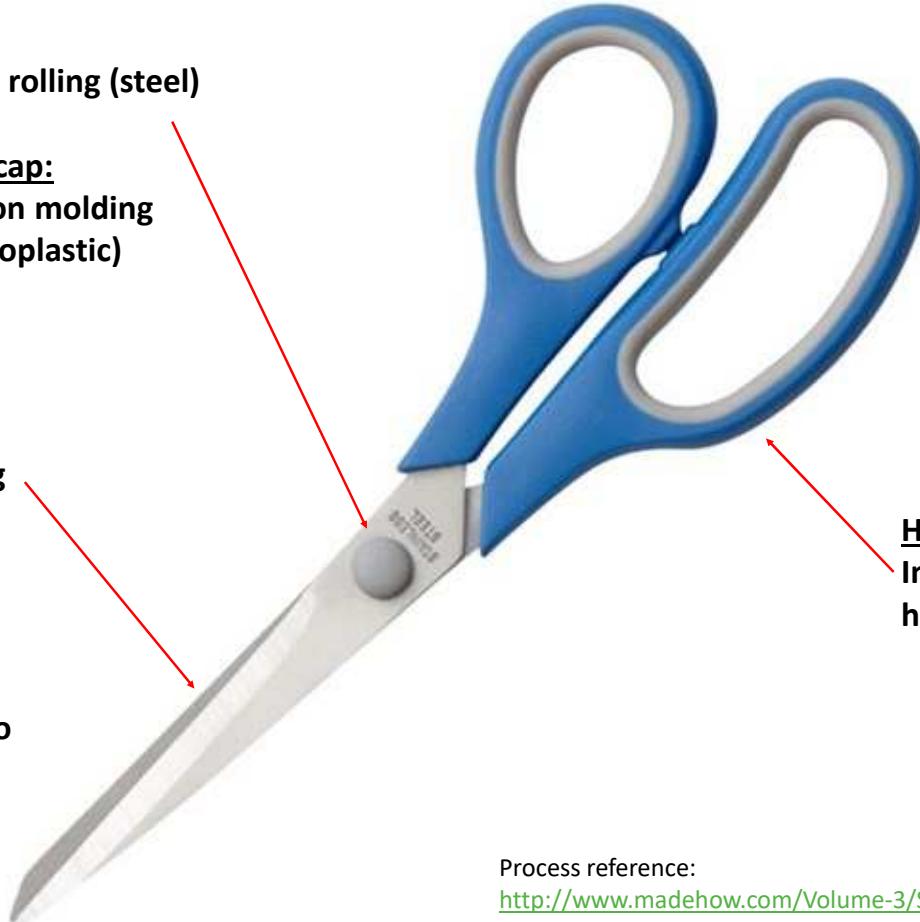
1

Screw:
Thread rolling (steel)

Screw cap:
Injection molding
(thermoplastic)

Blade blanks:
Cold stamping or drop forging
(carbon steel)

Finishing the blades:
- Cut to shape
- Grinding wheel to sharpen
- Dipped in nickel/zinc alloy to
protect against rust



Handles:
Injection molding (thermoplastic
handle, rubber thermoset grip)

Process reference:
<http://www.madehow.com/Volume-3/Scissors.html>

Image source:
https://www.google.com/search?q=scissors&rlz=1C1NHXL_enCA705CA708&sxsrf=ACYBGNRMlzoStrhSxLBg3ms4JLTZRBnvPQ:1573353258930&source=lnms&tbo=isch&sa=X&ved=0ahUKEwjs9erQzd7IAhUdCTQIHZOTAa0Q_AUIEigB&biw=1536&bih=754#imgrc=75ethP2cHs2gQM:

FIGURE SKATE

1

Sheet metal formed aluminum eyelets

Punched, sewn, pressed and glued (leather, synthetic fabric, foam)

Punched, pressed and glued; holes drilled for blades (stiff leather)

Holes punched in leather for eyelets and laces

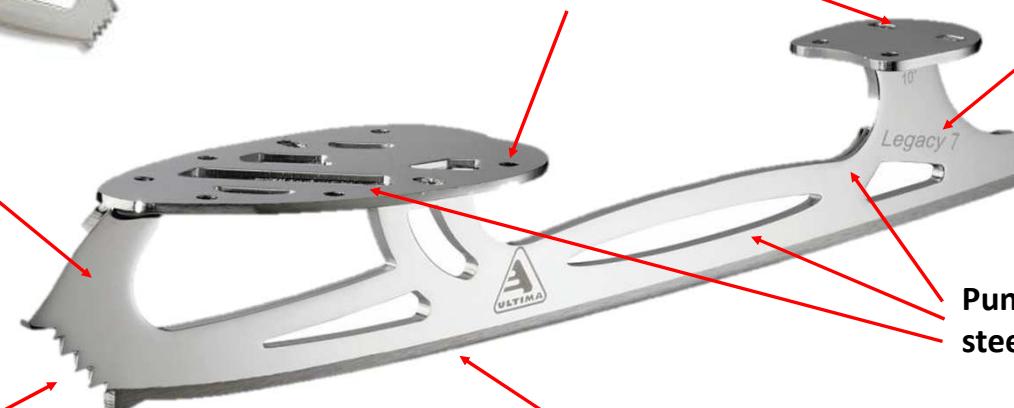


Metal extrusion in T shape (carbon steel, chrome plated)

Machined (holes drilled) to attach to boot (carbon steel, chrome plated)

Laser sintered brand logo and blade name or model (carbon steel)

Punched toe-pick (carbon steel, chrome plated)



Punched for shape (carbon steel, chrome plated)

Machined (grinding) sharp edges (carbon steel, chrome plated)

IRON PAN

1

Casting (iron)



Casting (stainless steel)

Injection molding (rubber thermoset)

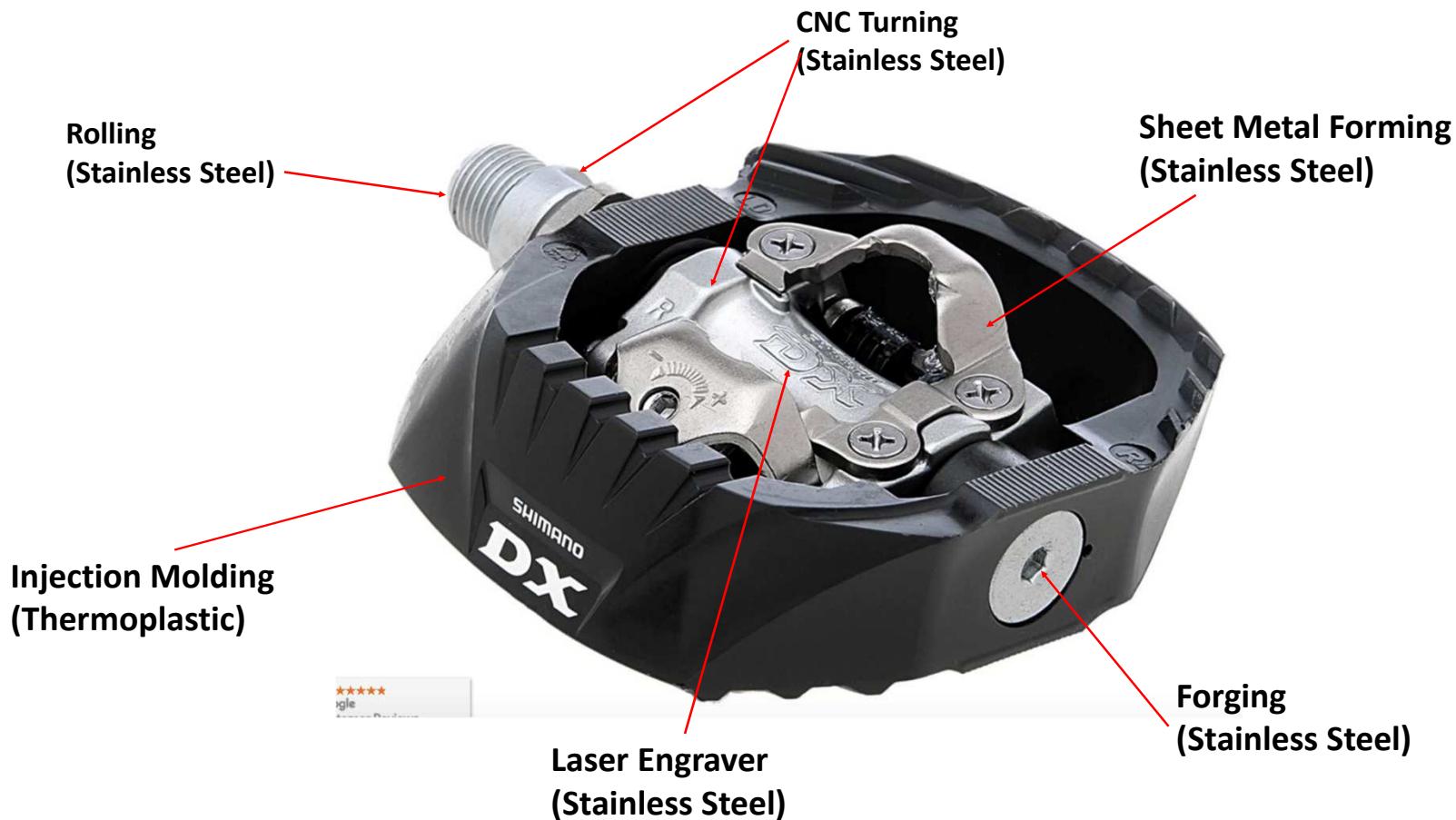
Sheet metal forming (stainless steel)

Fastening (steel)



PART

1



READING GLASSES

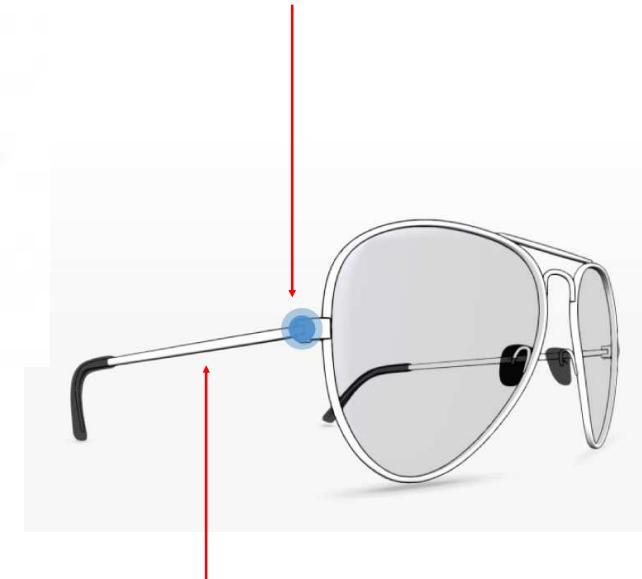
1

Die-Casting & Routing
(Cellulose Rims)



Adhesive Bonding (Silicone)

Friction Welding/Riveting (Titanium)



Brazing (Steel Wire)

MOKA POT (NAMED AFTER YEMENI CITY OF MOCHA)

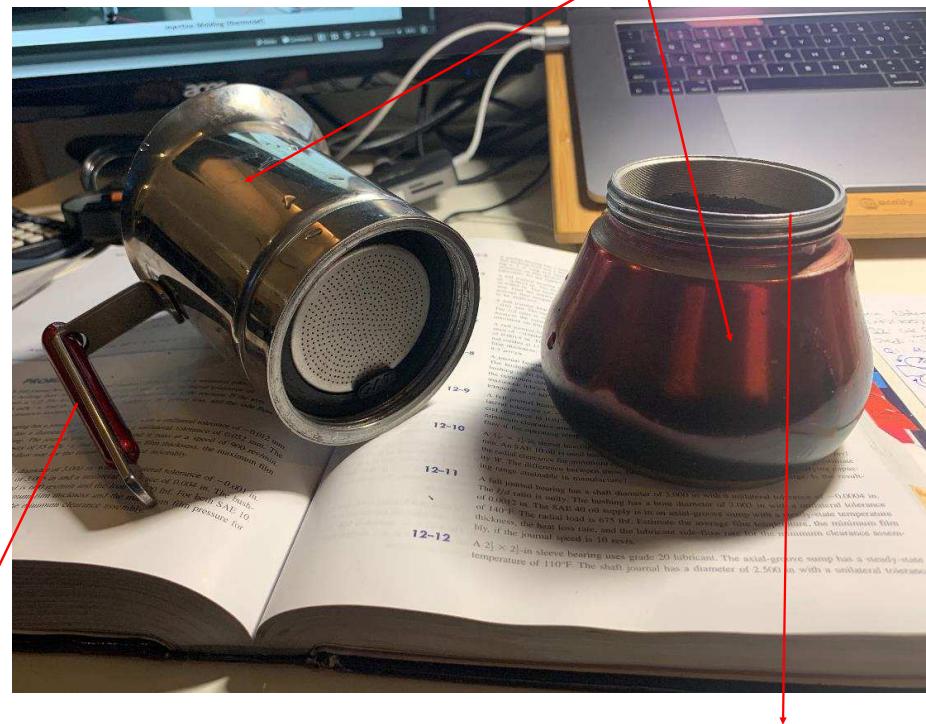
Sheet metal forming (Lid, aluminum (can't see))



Thermoforming (Rubber washer)

Extrusion (Aluminum filter)

Casting (steel reservoir)



Thermoforming (plastic handle)
Sheet metal forming (aluminum handle)

Thread Rolling (Steel)

WIRELESS MOUSE

1

Injection Molding
(Thermoplastic)



Extrusion
(Rubber)



Injection Molding
(Rubber)

Injection Molding
(Thermoplastic)

PART YOU CHOOSE

1



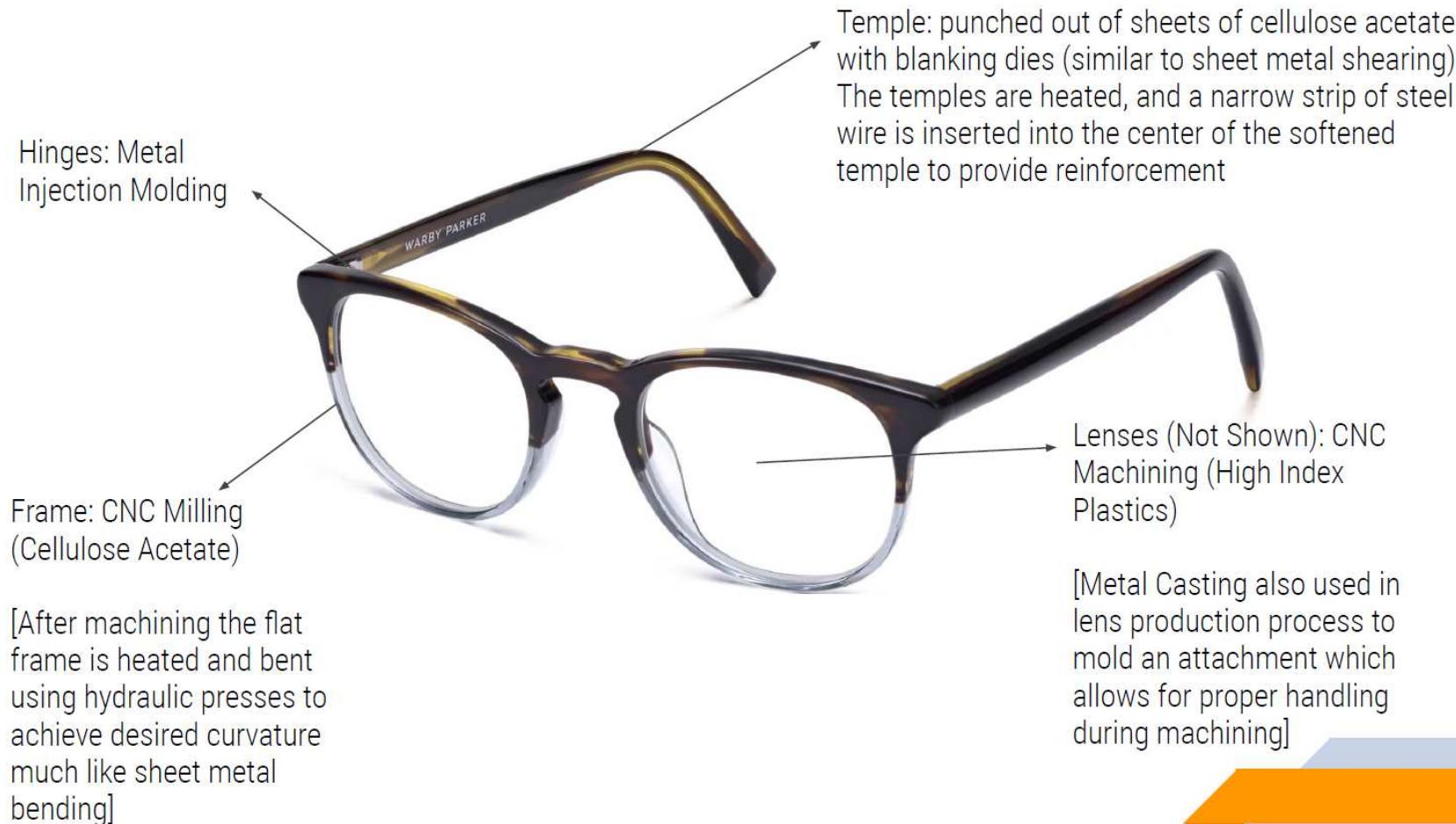
UKULELE

1



GLASSES

1



ELECTRIC GUITAR

1

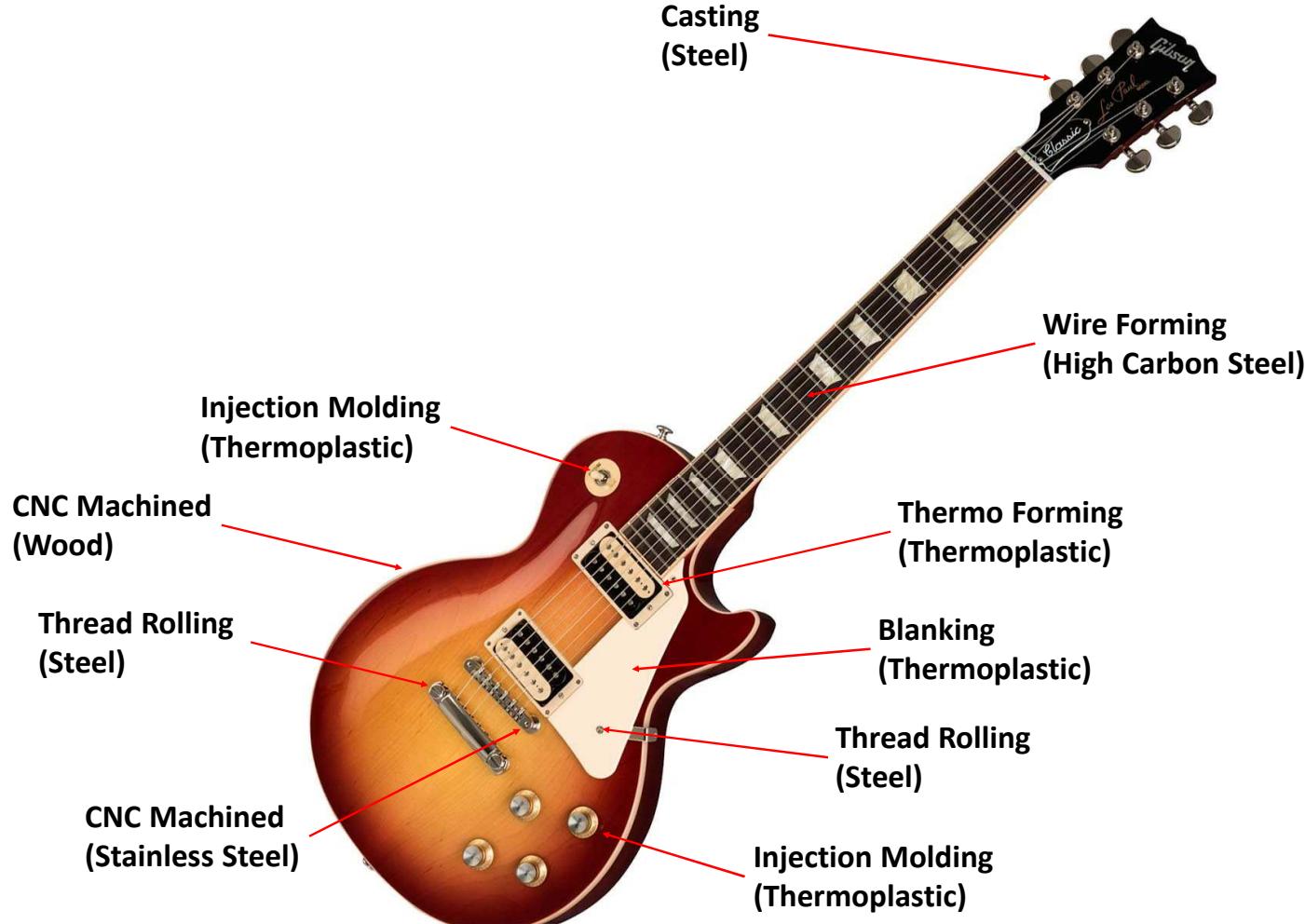
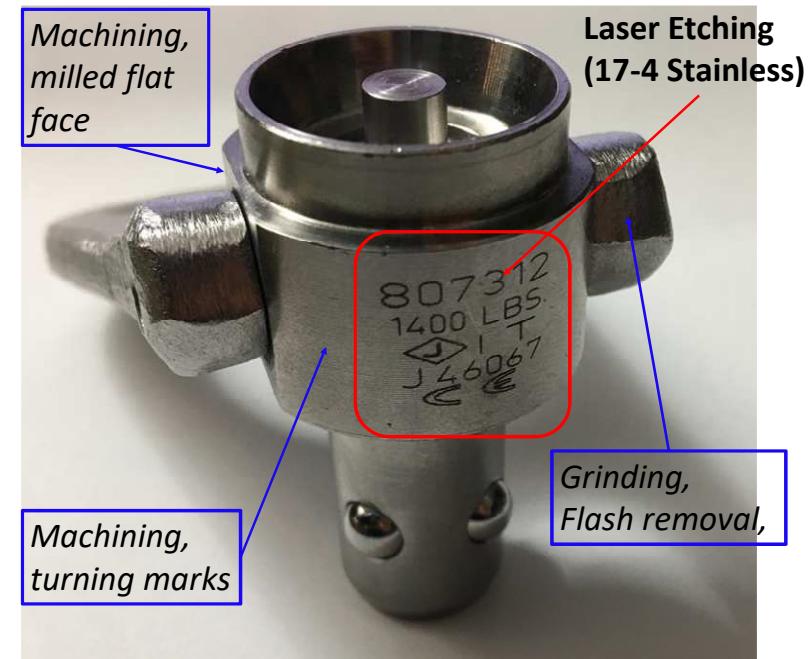
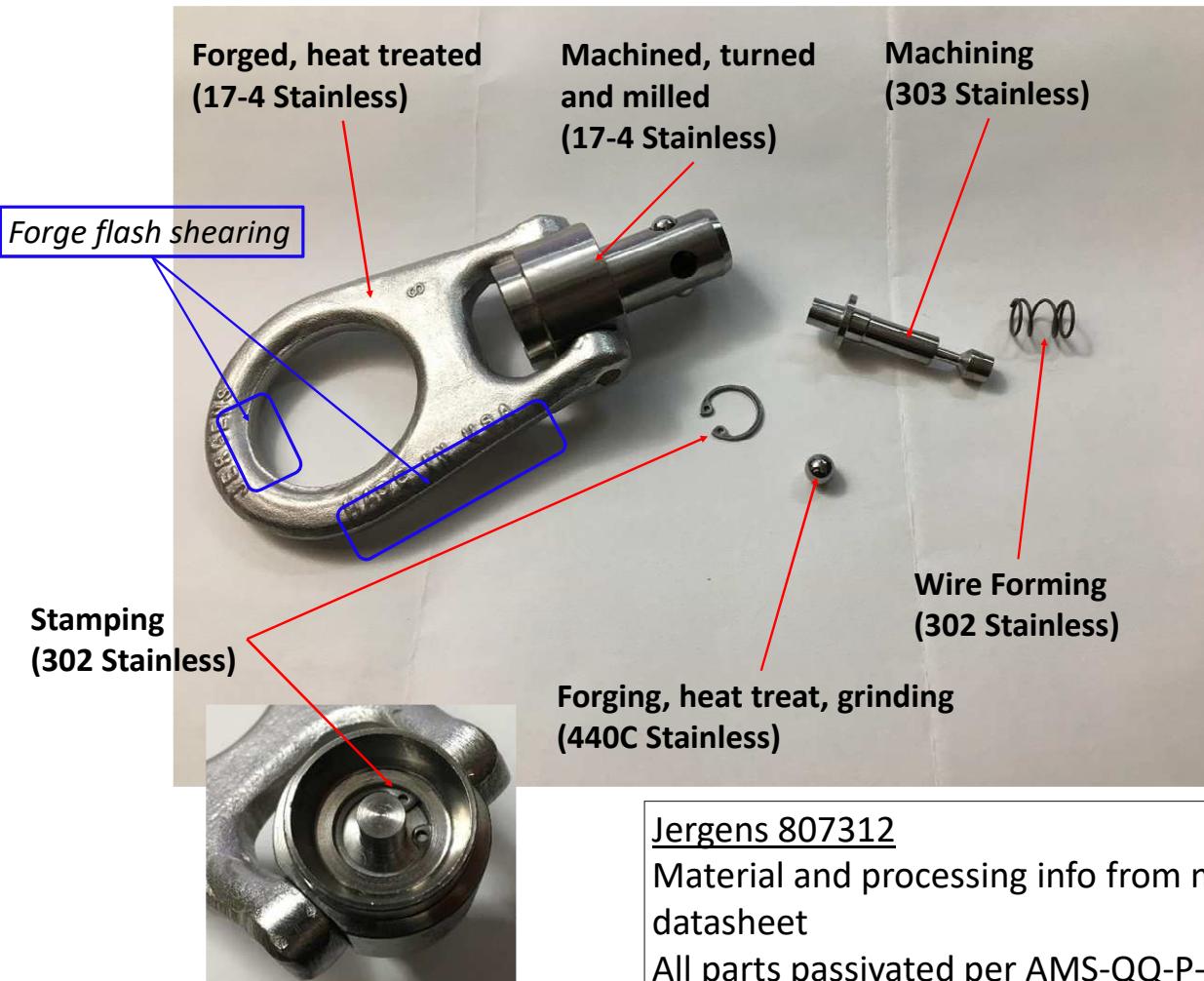


Photo Source: <https://www.dawsons.co.uk/gibson-les-paul-classic-electric-guitar>

SPRING-LOADED, LOCKING, LIFTING PIN (5/8", 1400LB)

1

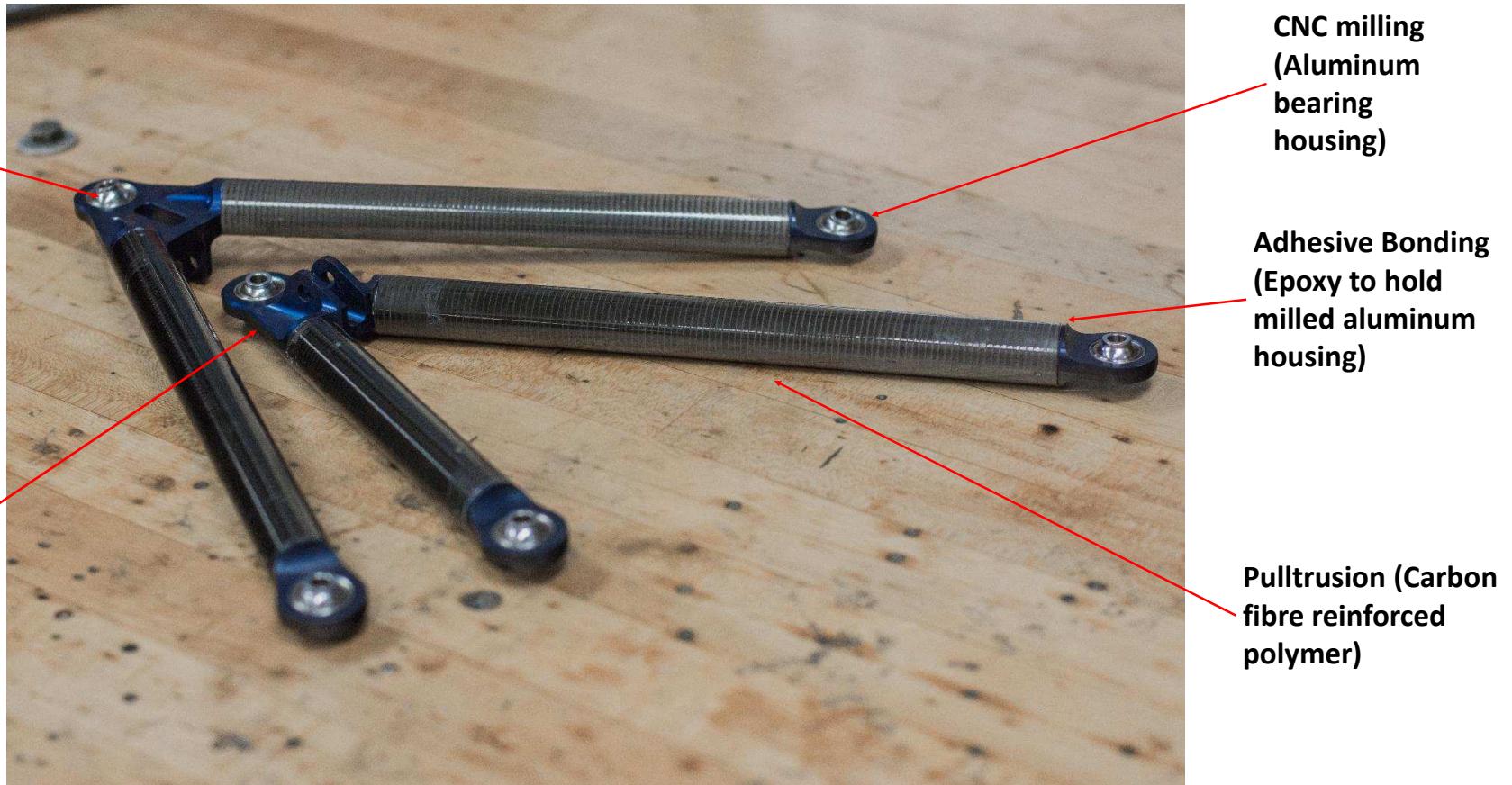


LEGEND:

- Process (Material)
- Notes, further detail, and post processing

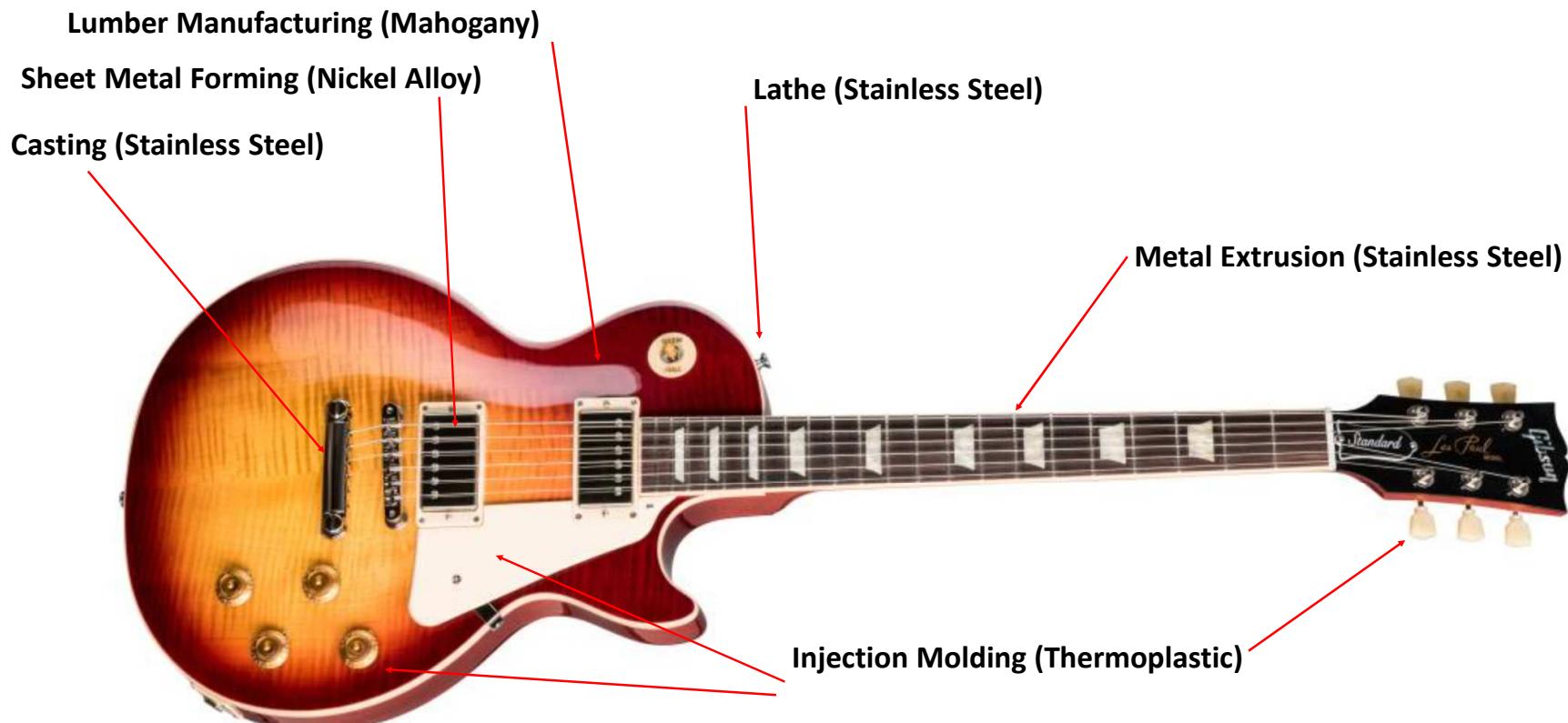
PART

1

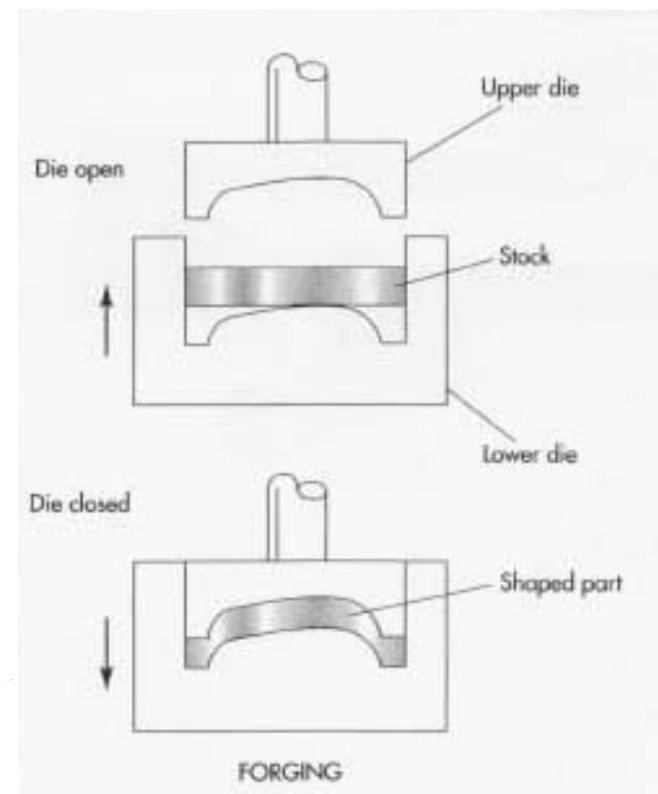
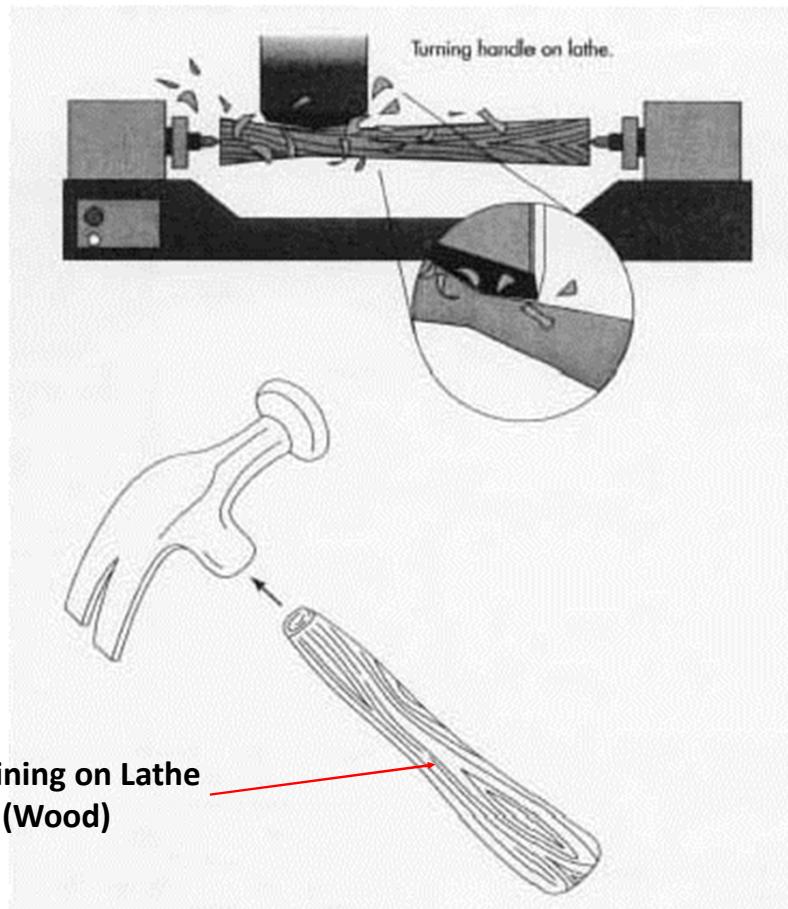


ELECTRIC GUITAR

1



HAMMER



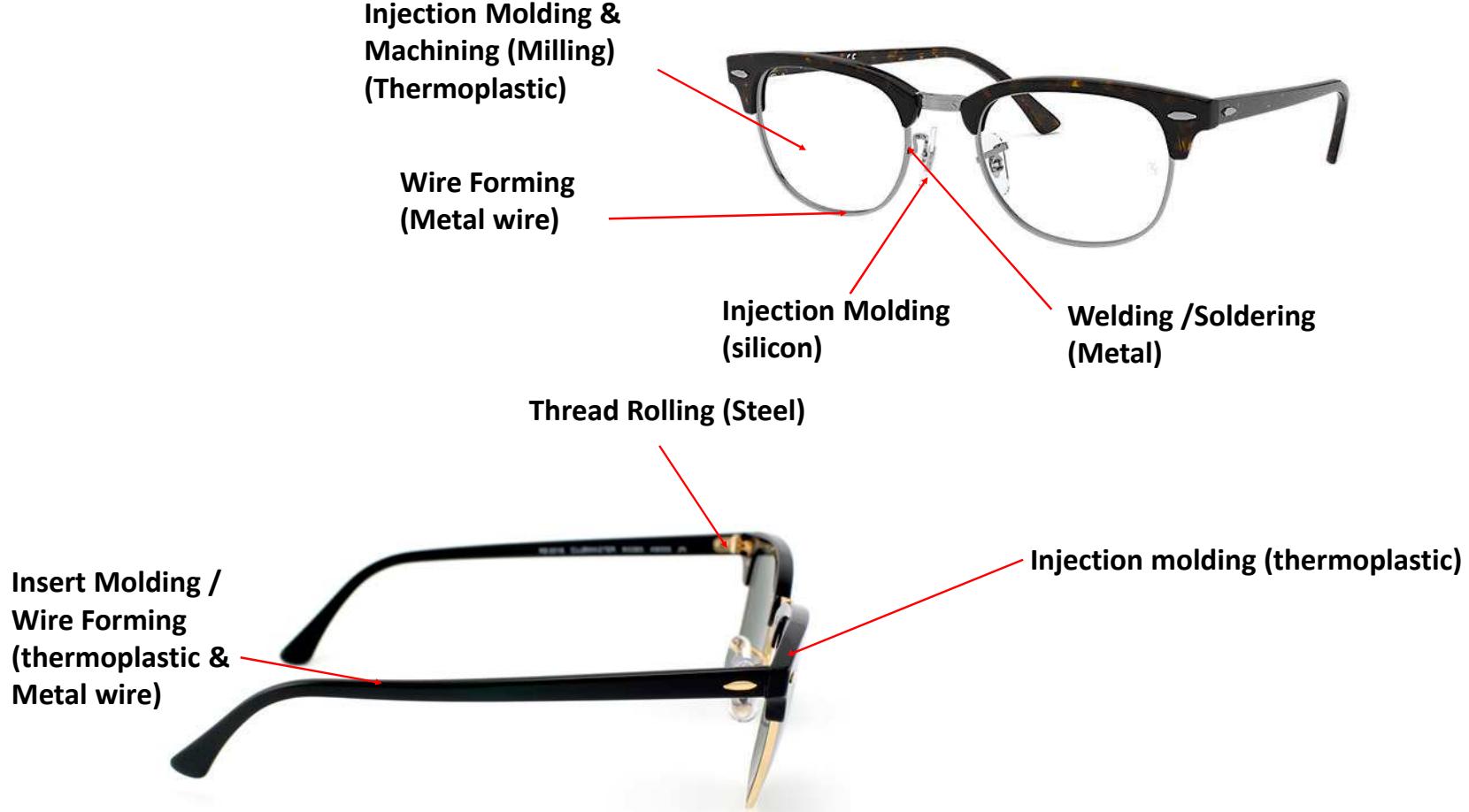
VACUUM CLEANER

1



GLASSES

1



COMPUTER CPU HEAT SINK

1



Injection Molding
(Plastic Fan)

CNC Machined
(Base Plate)

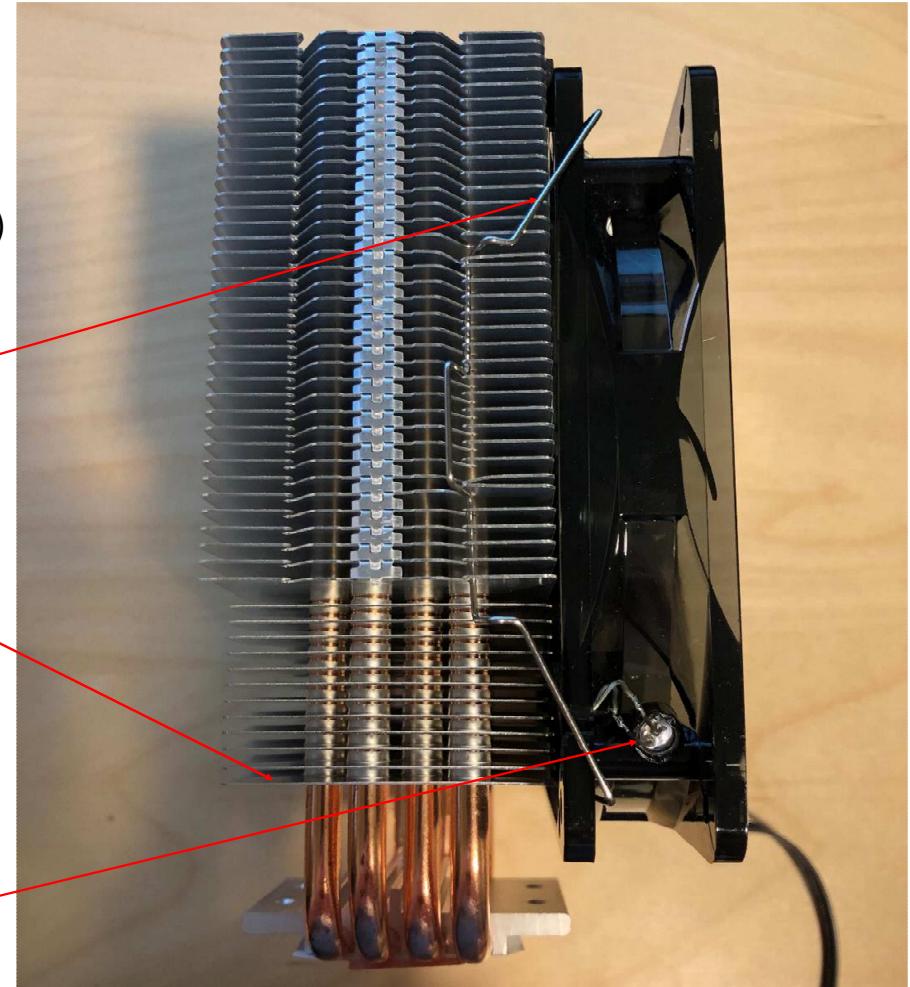
Punching (Screw Holes for the Fan)

Extrusion (Copper Pipe)

Wire Forming
(Spring Wire)

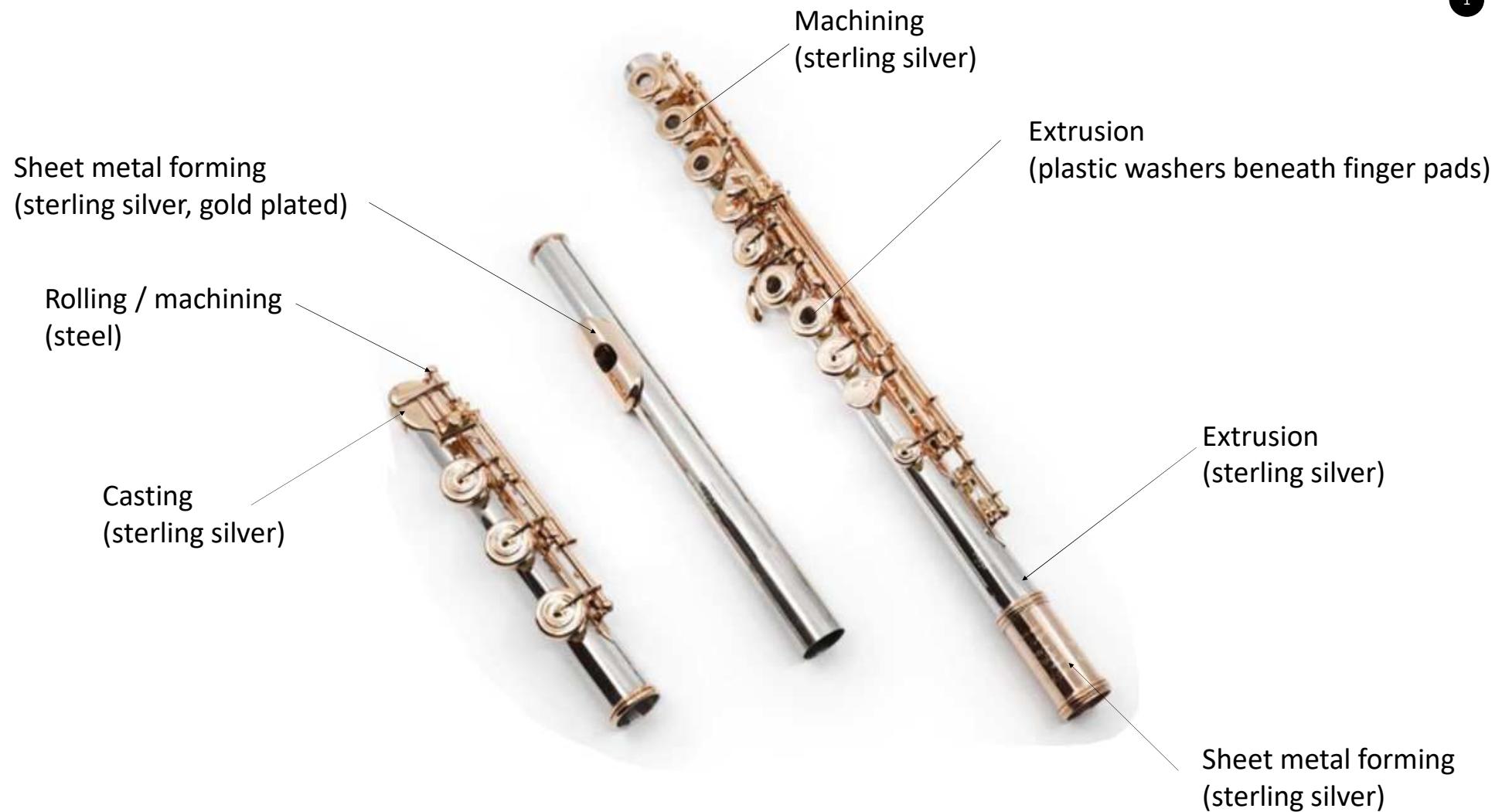
Stamped (Metal Fins)
Holes for the Copper
Tubing are Punched
Using the Copper Tubes

Thread Rolling (Screw)



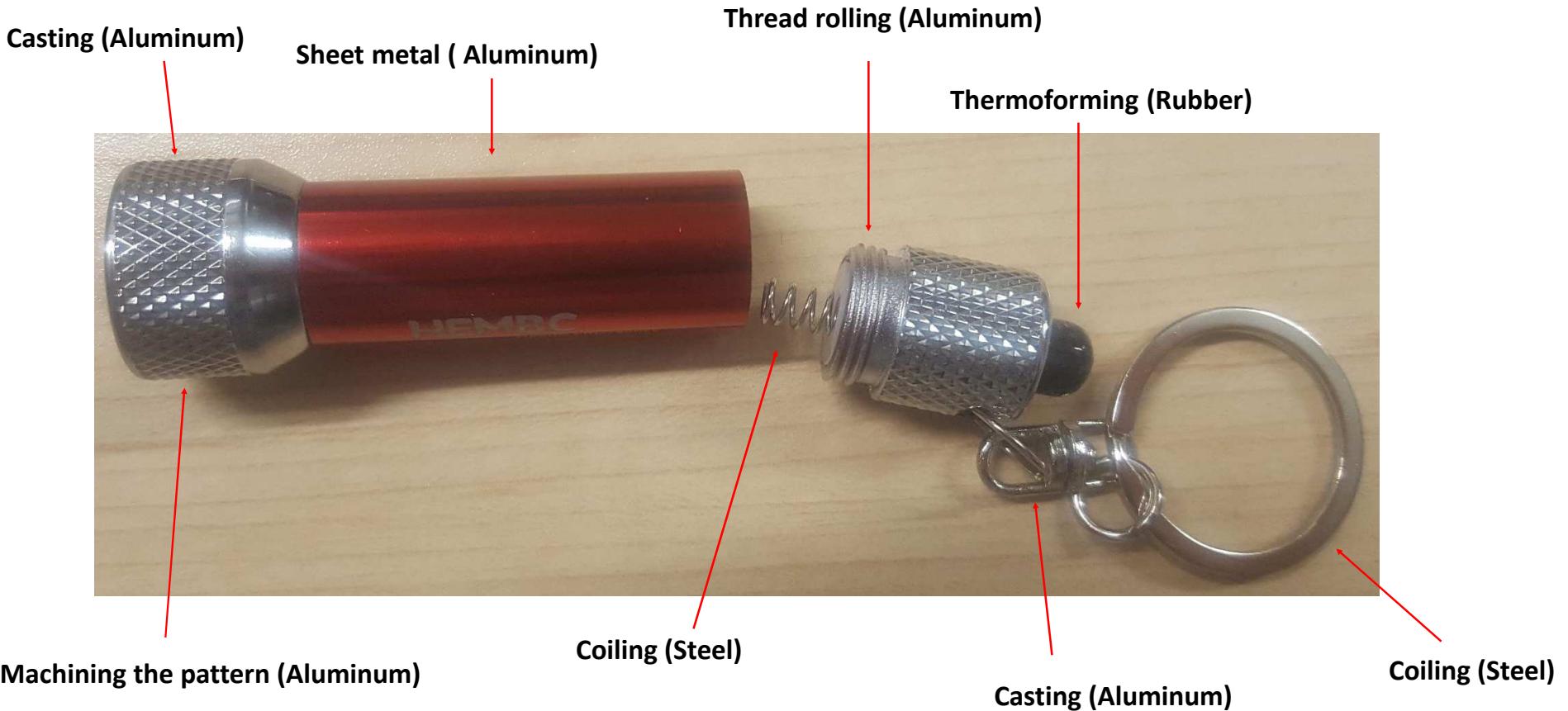
SILVER C FLUTE

1



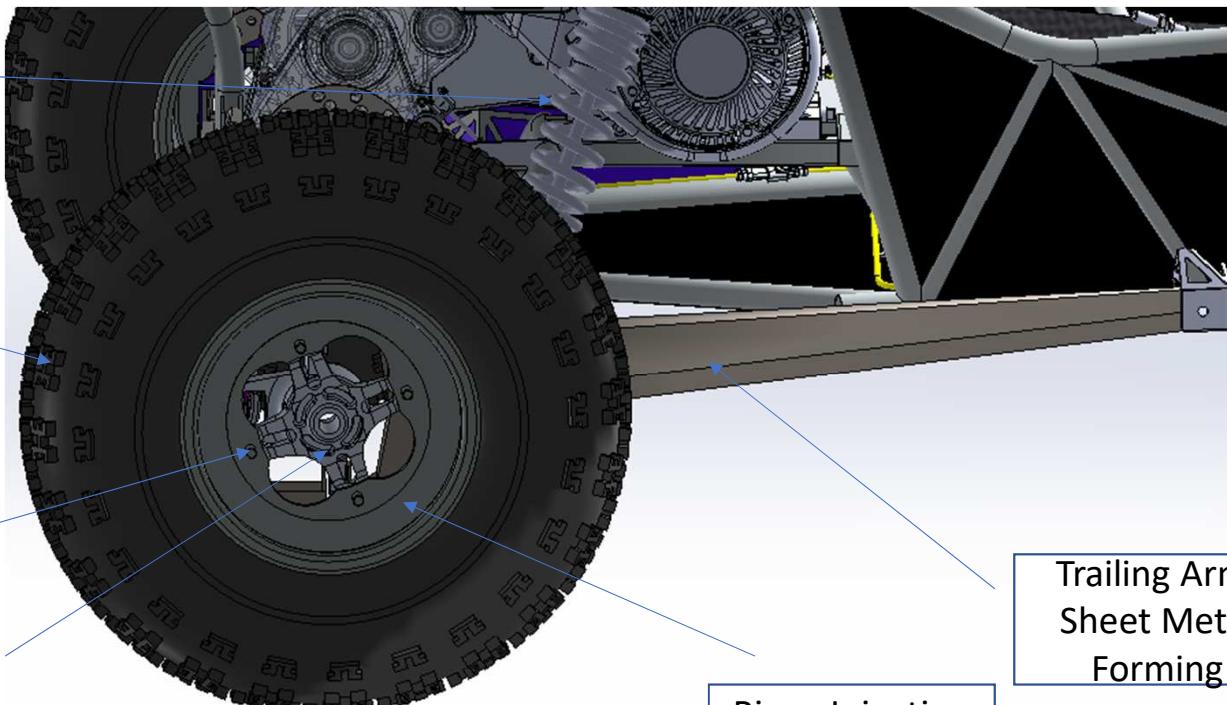
TORCH

1



KA1

Rear Tire Assembly



Slide 1

KA1 Kareem Alaswad, 2019-11-09

HOUSEHOLD FAN

1

Bending and Welding
(Steel)

Injection Moulded Plastic

Injection Moulded Plastic



VEGETABLE PEELER

1

Injection Molding
(Thermoplastic)



Machining (Grinding)
of blade face

Sheet Metal Forming
(Stainless Steel)

Injecting Molding
(Soft Polymer)

PART YOU CHOOSE: WATER BOTTLE

1



TEA KETTLE

1



Thermoforming
(Rubber Thermoset)

Thread Rolling

Injection Molding
(Thermoset)

Sheet Metal Forming
(Stamped)

Injection Molding
(Thermoset)

Injection Molding
(Thermoset)

Sheet Metal Forming
(Stamping)



STAPLER

1

Injection Molding
(Thermoplastic)



Injection Molding
(Thermoplastic)

Injection Over-molding
(Thermoplastic elastomer)

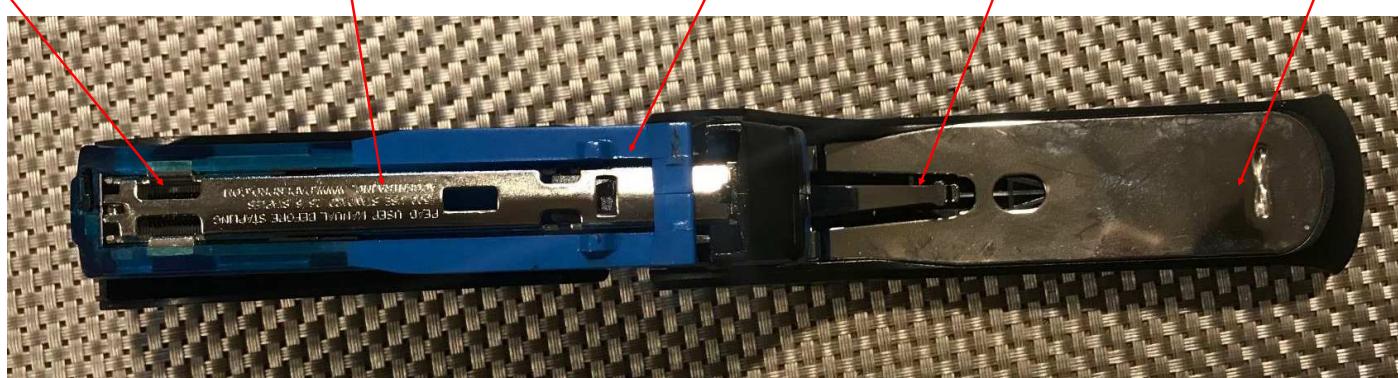
Wire forming
(Spring Steel)

Sheet Metal Forming
(Steel)

Injection Molding
(Thermoplastic)

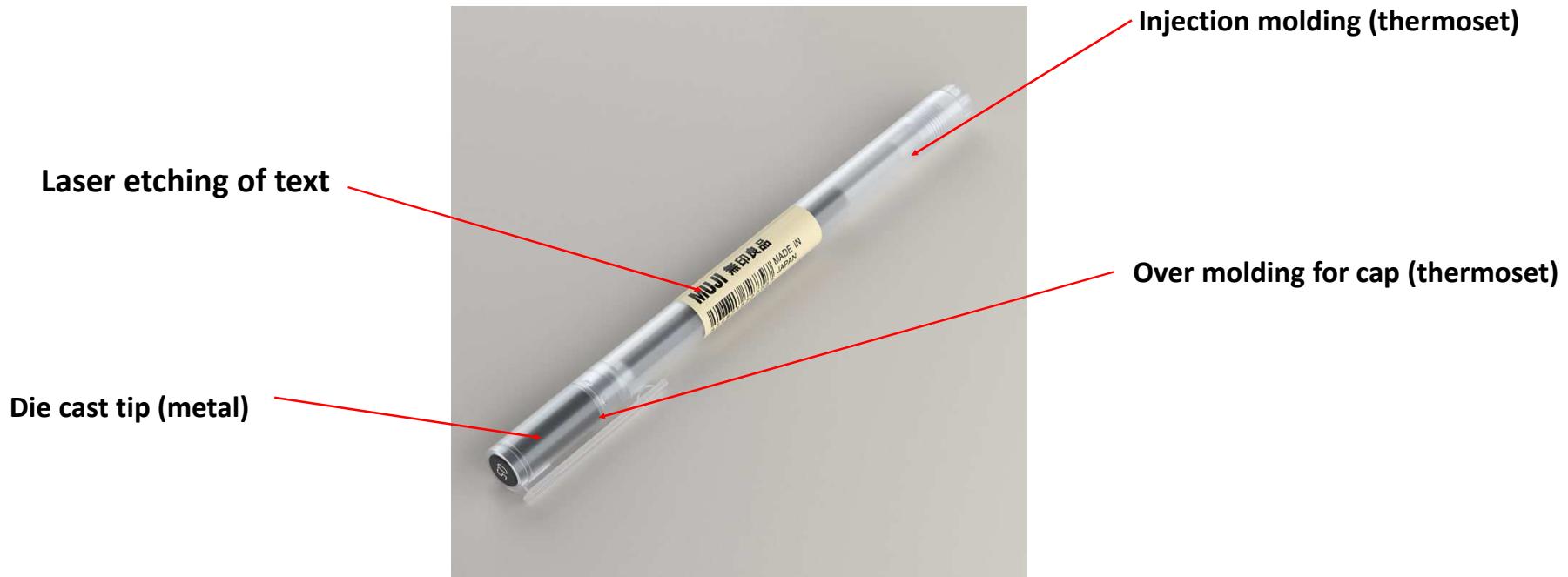
Rolling
(Steel)

Sheet Metal Forming
(Steel)



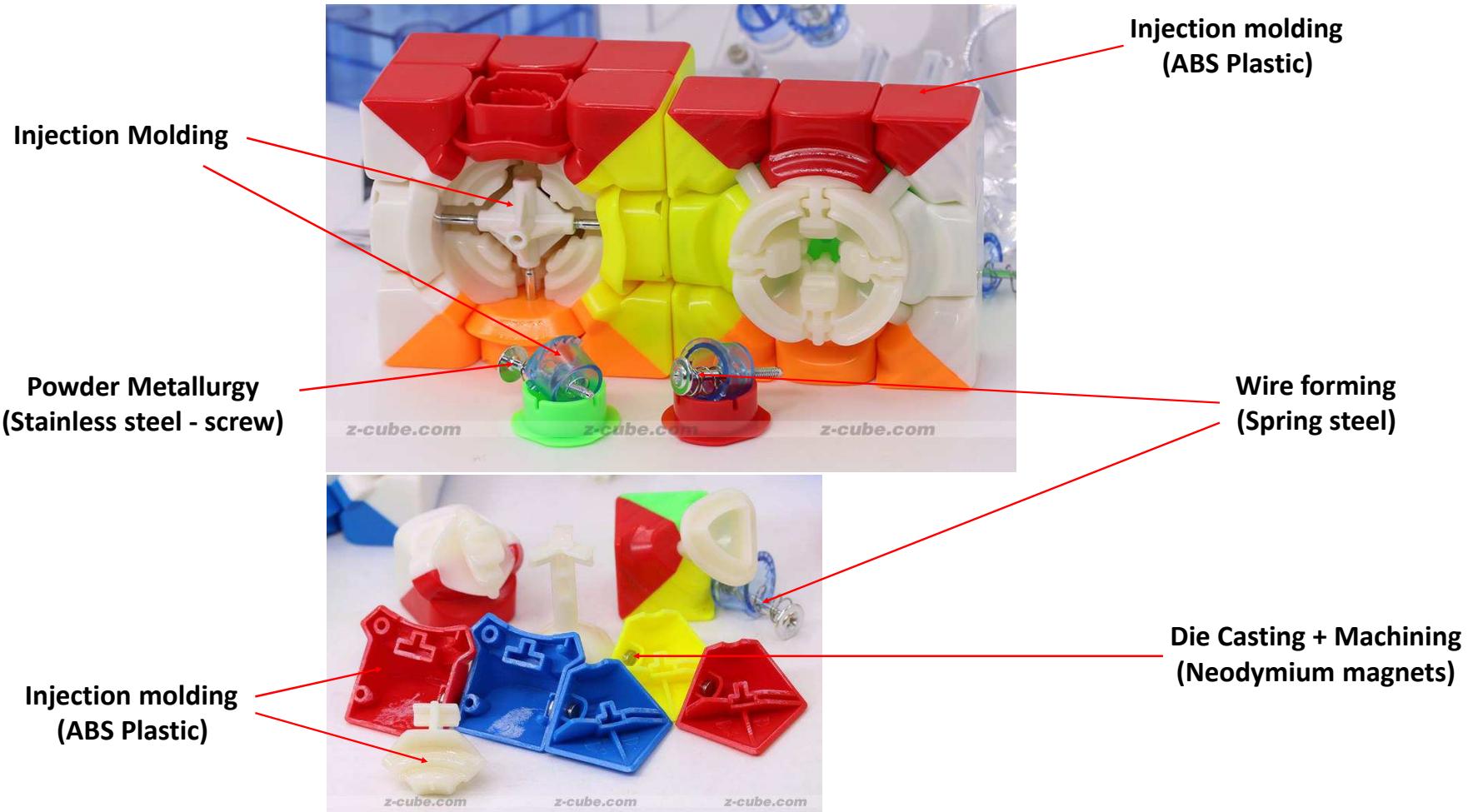
PEN

1



RUBIK'S CUBE

1



HEADPHONES

1



Memory foam padding
(Direct Injection Expanded
Foam Molding)

Frame/headband
(Die Cast Al / Mg Alloy)

Thread Rolling (Steel)

Driver Housing
(Injection Molded Polycarbonate)

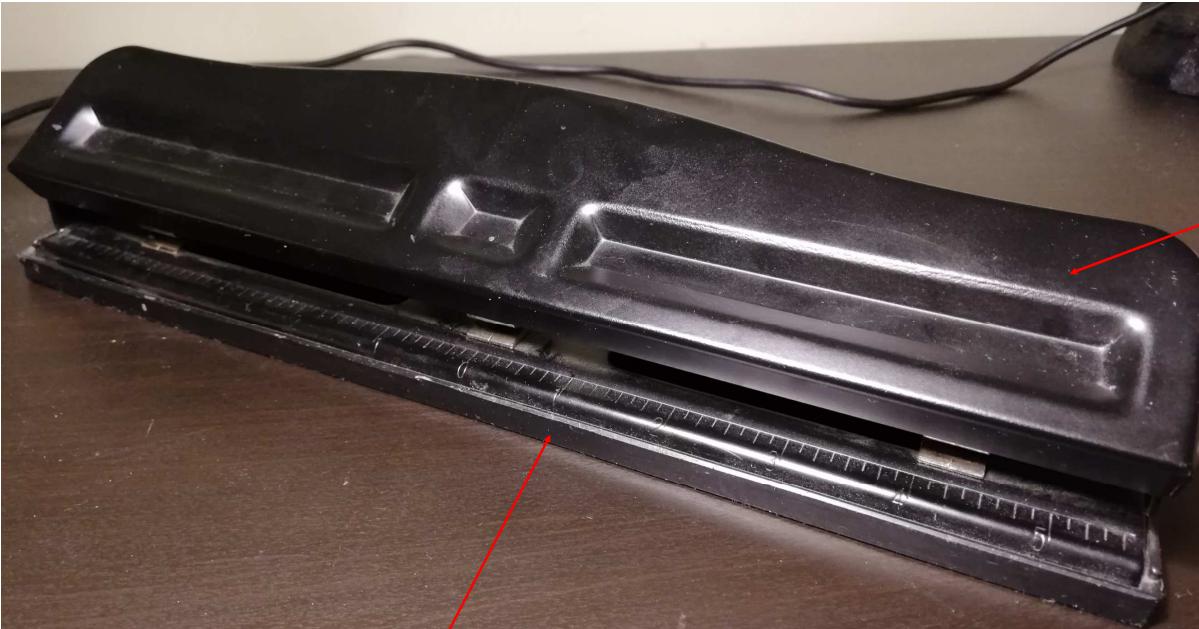
Rubber Strain Relief
(Rubber Extrusion)

Dynamic Drivers
(Vacuum Forming)

Wires (Drawn)

3-HOLE PUNCH

1



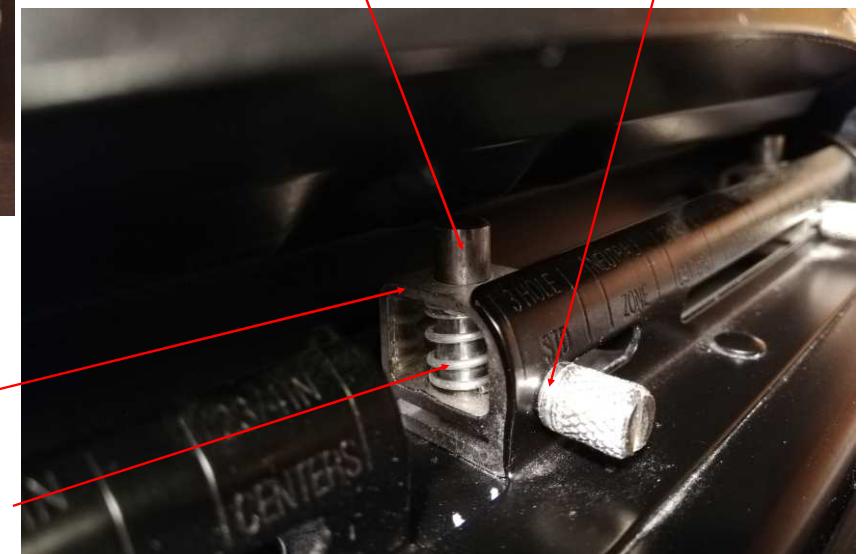
Injection Molding (thermoplastic)

Sheet Metal Forming (steel)

Die Casting (steel)

Forging/Extrusion (steel)

Wire Forming (spring steel)



PART

1

Injection Molding (Thermoplastic)

Hydraulic Press (Steel)

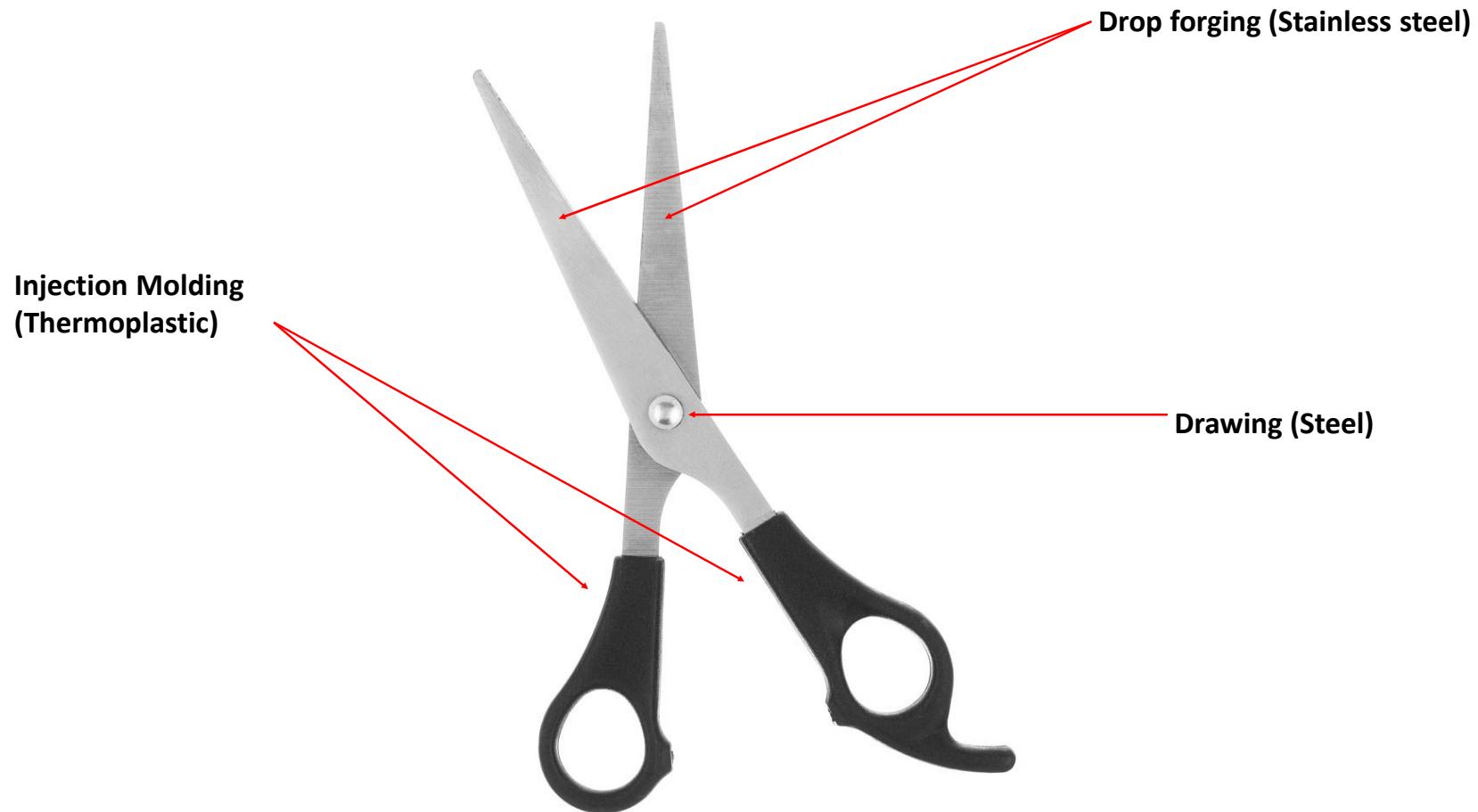


How It's Made?

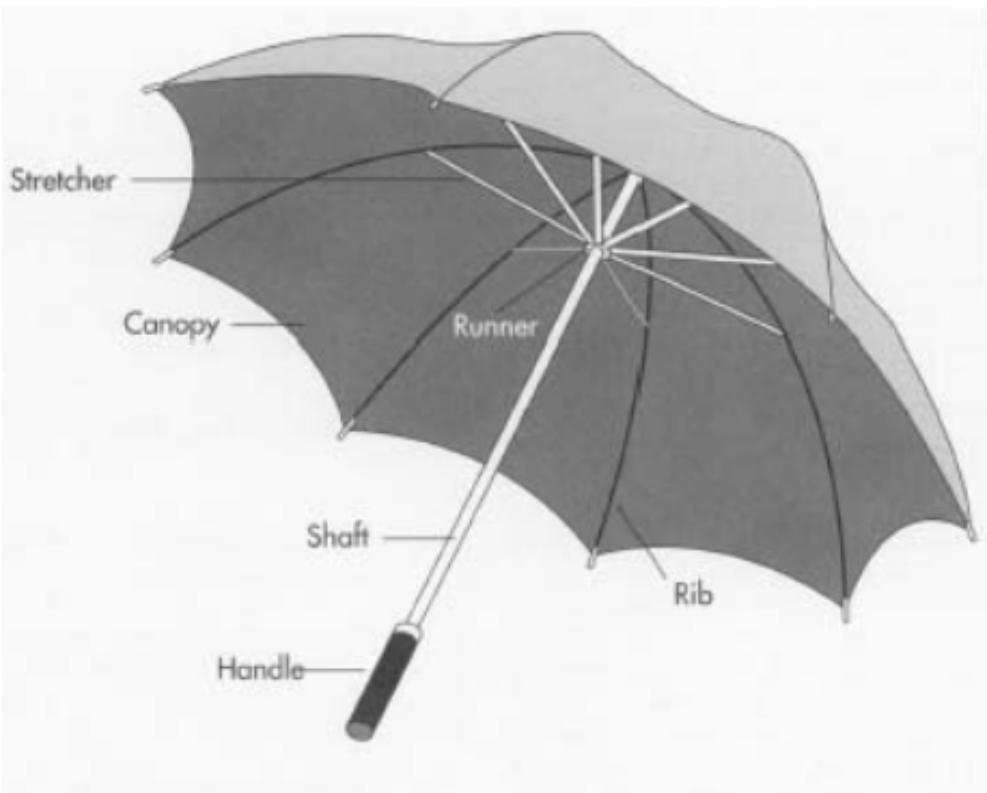


PART

2



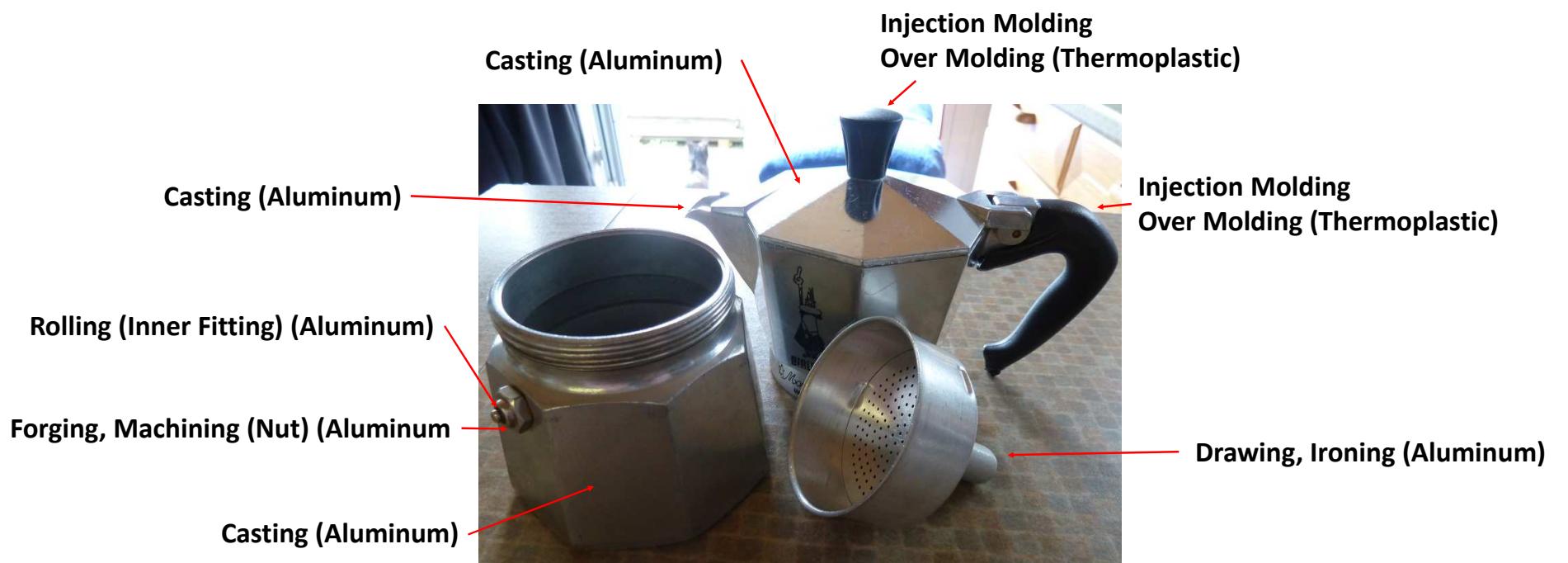
UMBRELLA



- Shaft
 - Extrusion (Metal/Plastic)
 - Lathe Turning (Wood)
- Ribs & Stretchers
 - Sheet Metal Forming & Machining (Channeled Structural Steel)
- Runner
 - Injection Molding (Plastic)
 - Shape Casting (Metal)
- Handle
 - Lathe Turning (Wood)
 - Injection Molding (Rubber)
- Canopy
 - Weaving/Knitting/Braiding (Textiles)

ESPRESSO MAKER

1

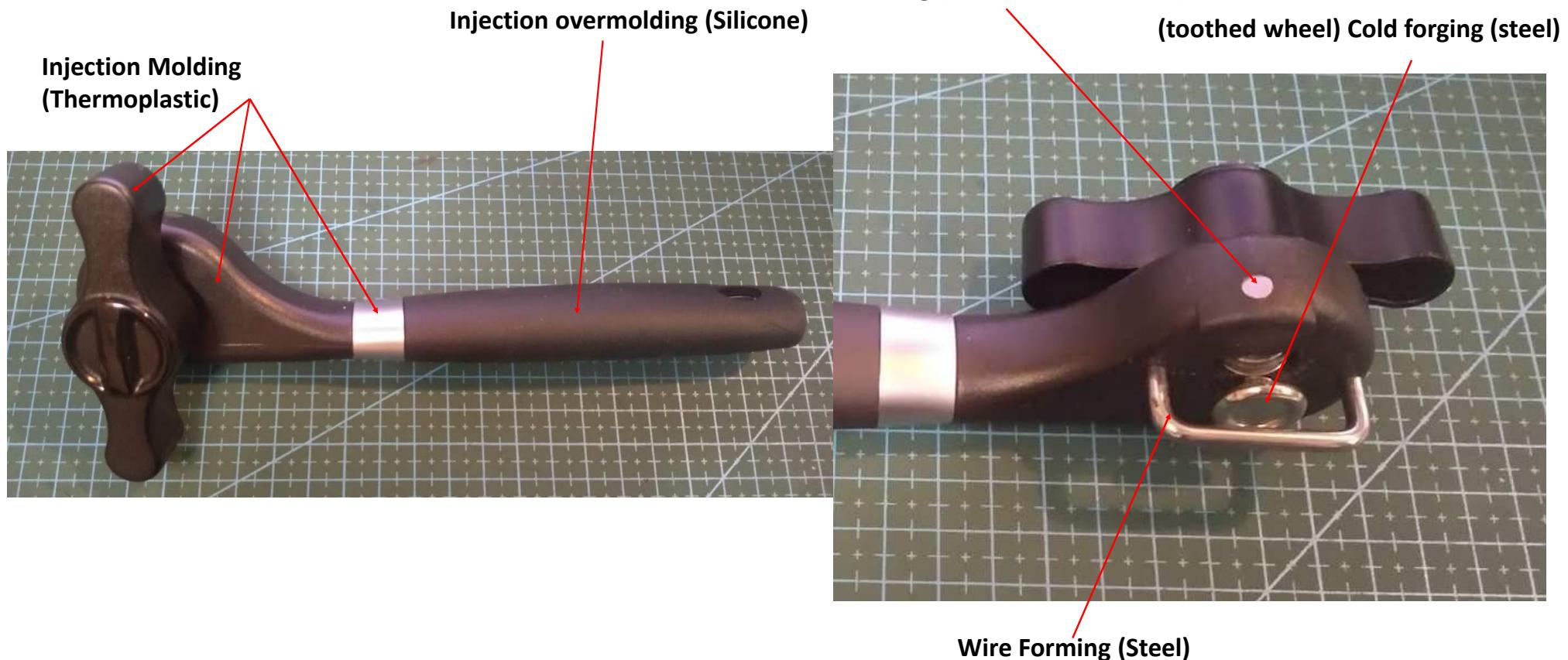


WATER BOTTLE (DOUBLE WALL VACUUM INSULATED STAINLESS STEEL)



CAN OPENER

1



KEYCHAIN & TRINKET

1

Sheet Metal Forming(Blanking)

Nickel & Silver Alloy

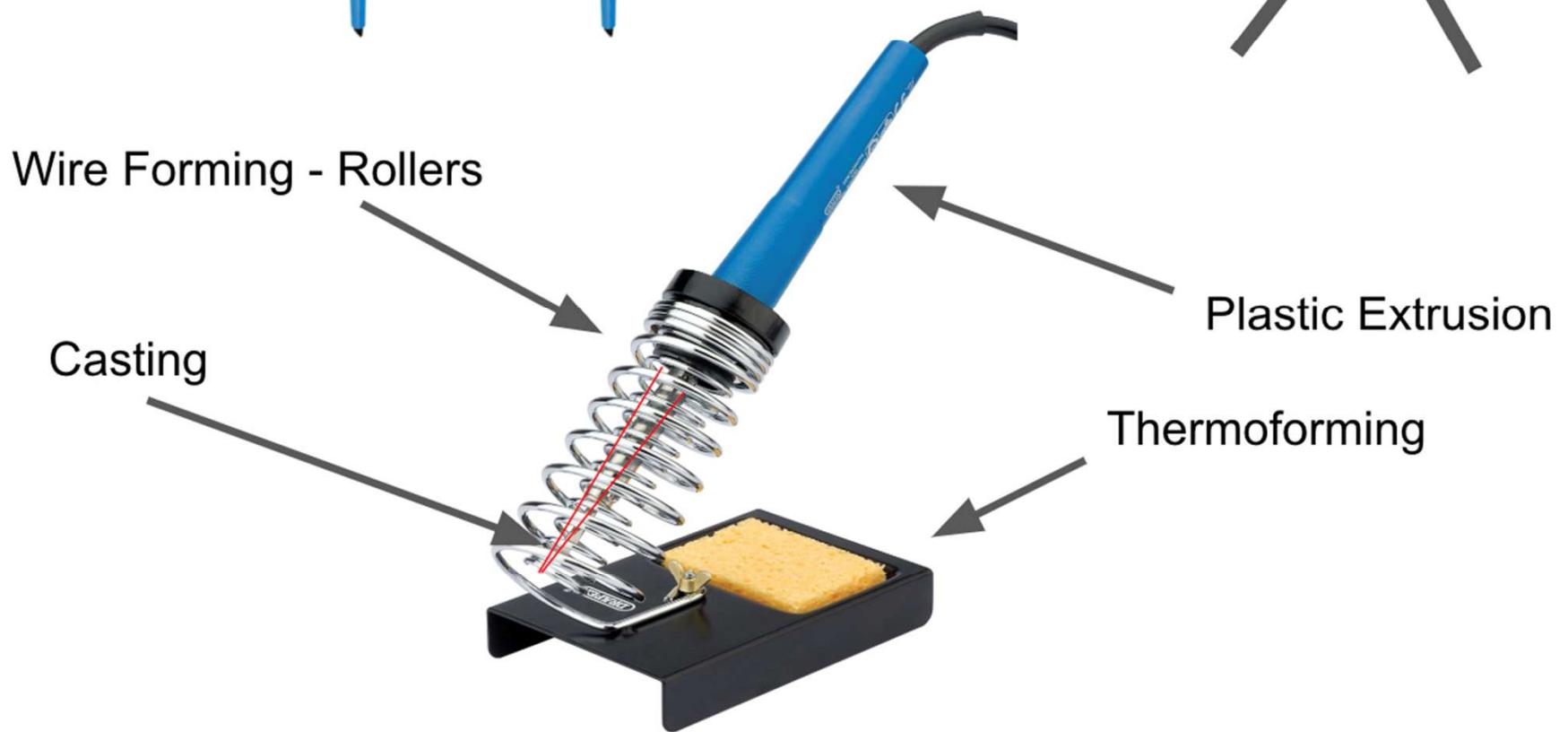
**Sheet Metal Forming
(Extrusion + Shearing)**

Nickel-plated Steel

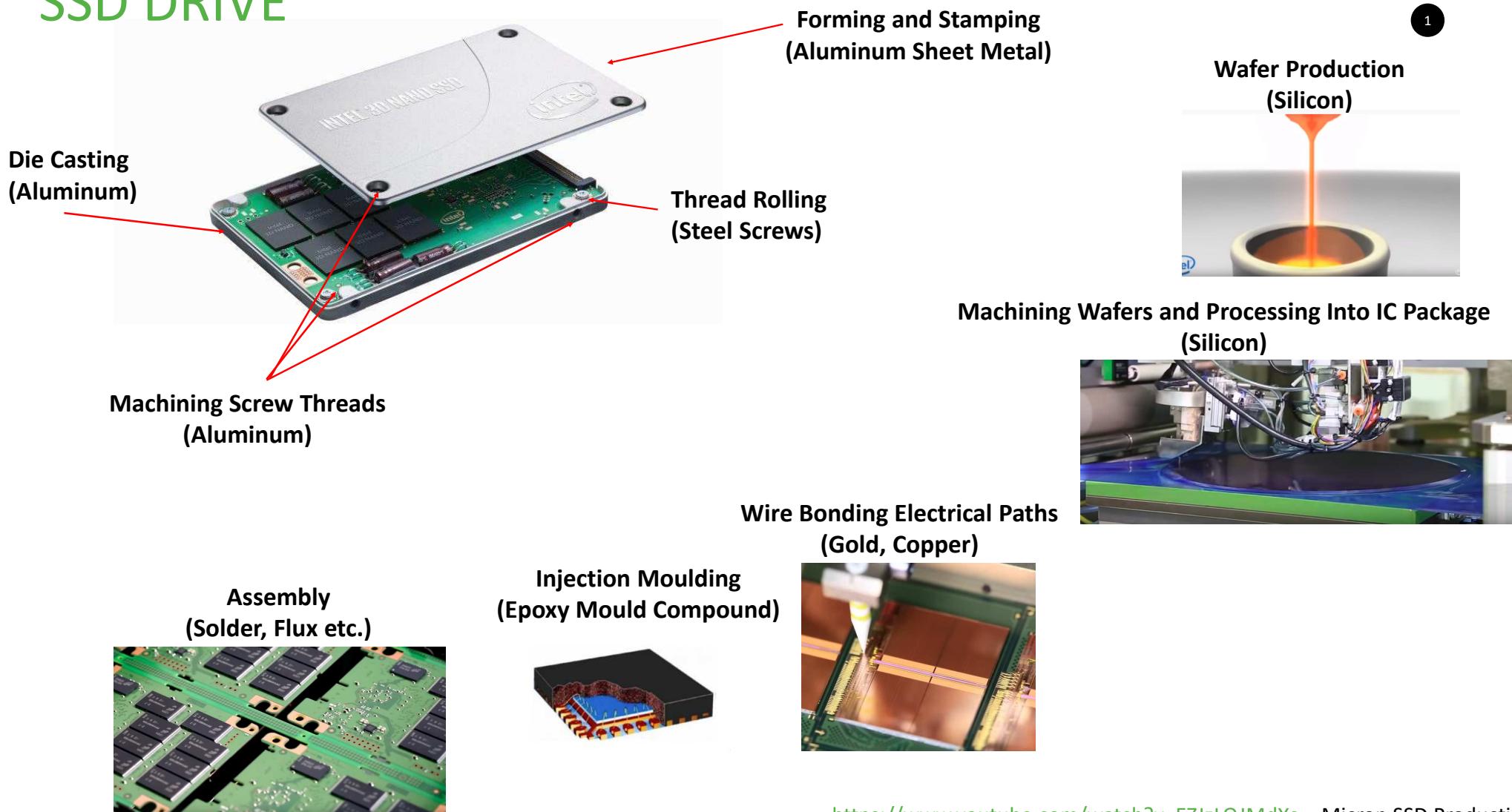
Additive Manufacturing(FDM)
Polylactic acid



SOLDERING IRON and STAND



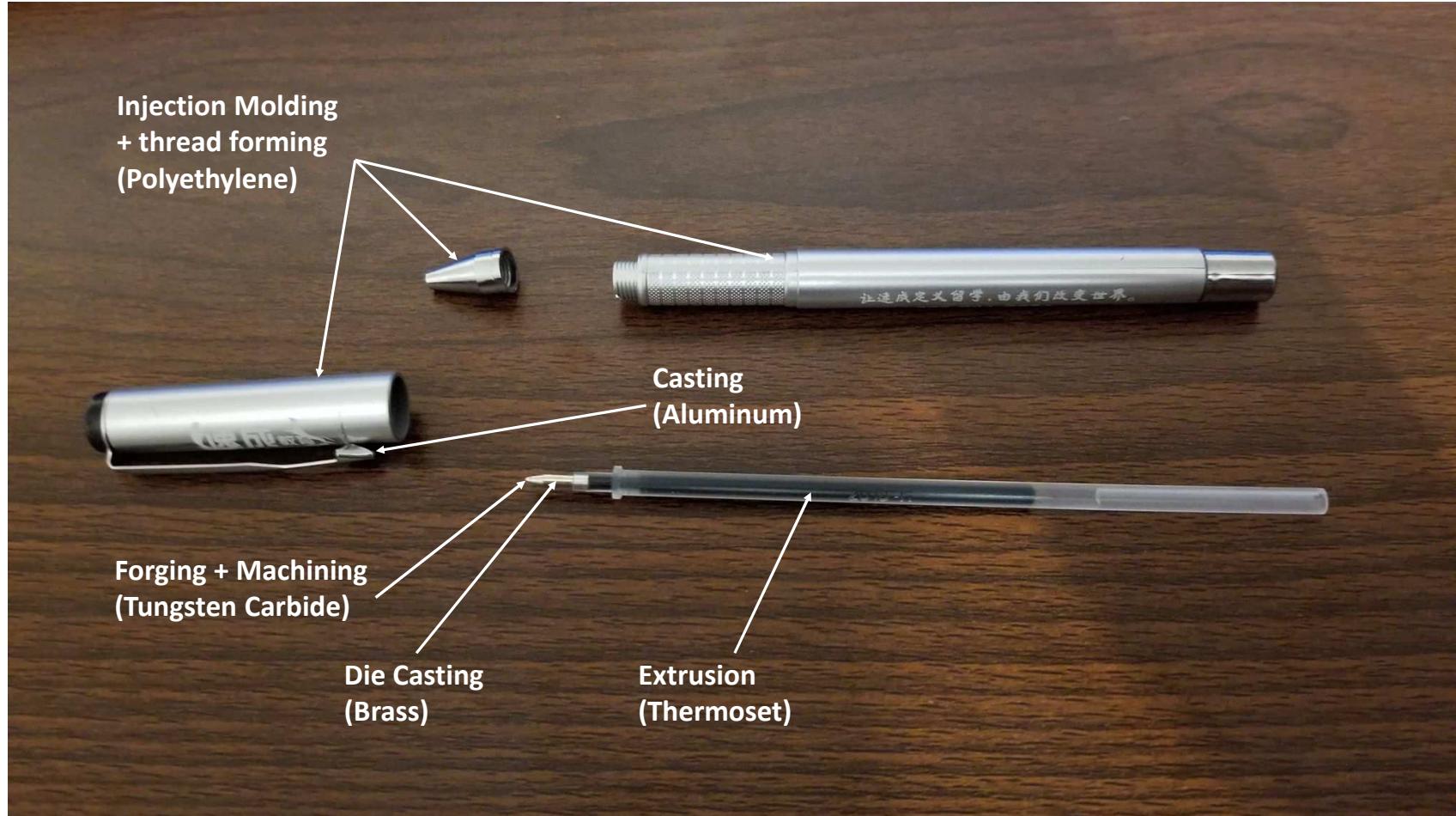
SSD DRIVE



<https://www.youtube.com/watch?v=EZJzLQJMdXs> – Micron SSD Production

BALLPOINT PEN

1



STAPLER

1

Injection Molding
(Thermoplastic
Case and Base)



Drawing and Wire Forming (Staple and Spring Steel)



Sheet Metal Bending
and Cutting
(Aluminum Magazine)

Sheet Metal Punching
(Magazine Holes)

Sheet Metal
Stamping
(Plate
Dents)

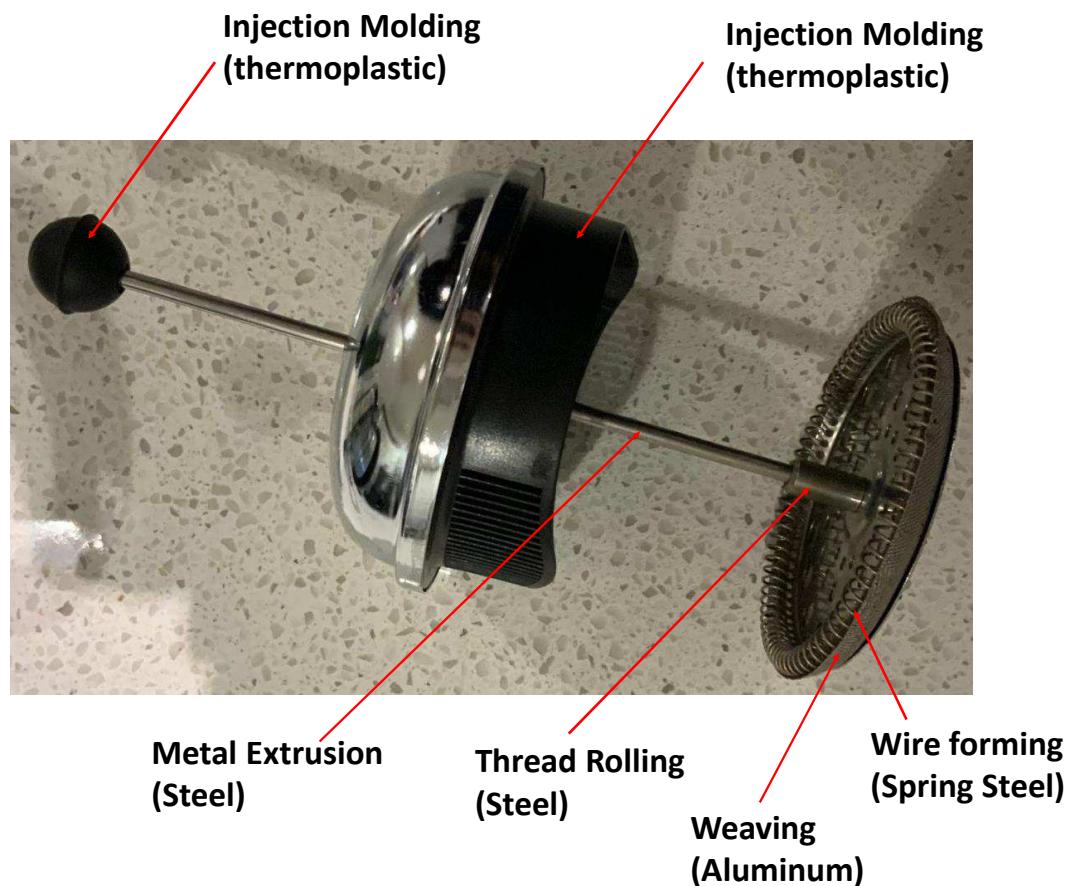
Forging (Rivet)



Sheet Metal
Blanking
(Plate
Outline)

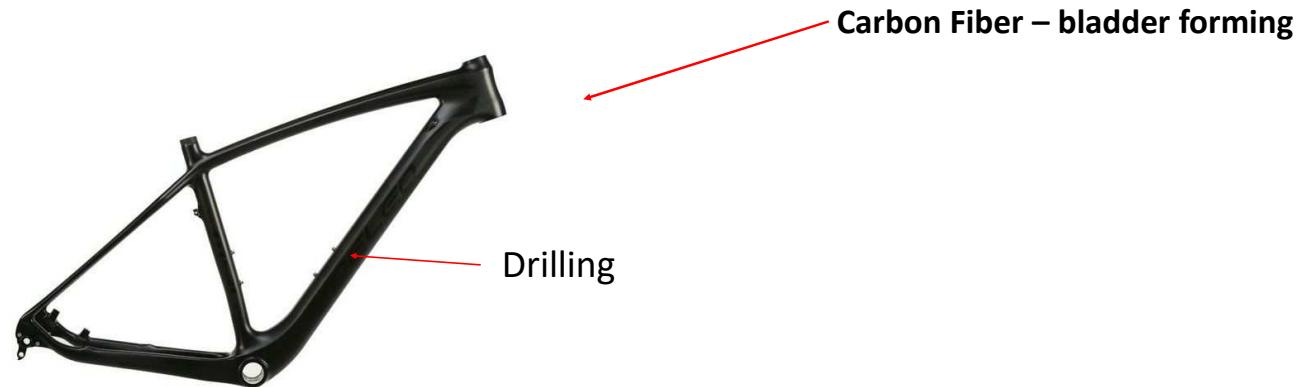
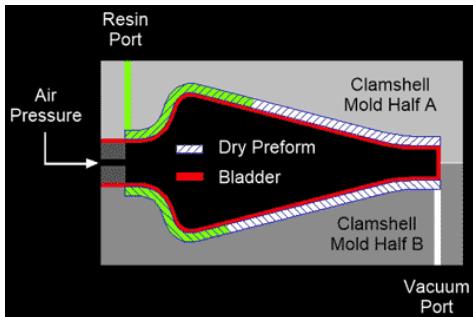
FRENCH PRESS

1



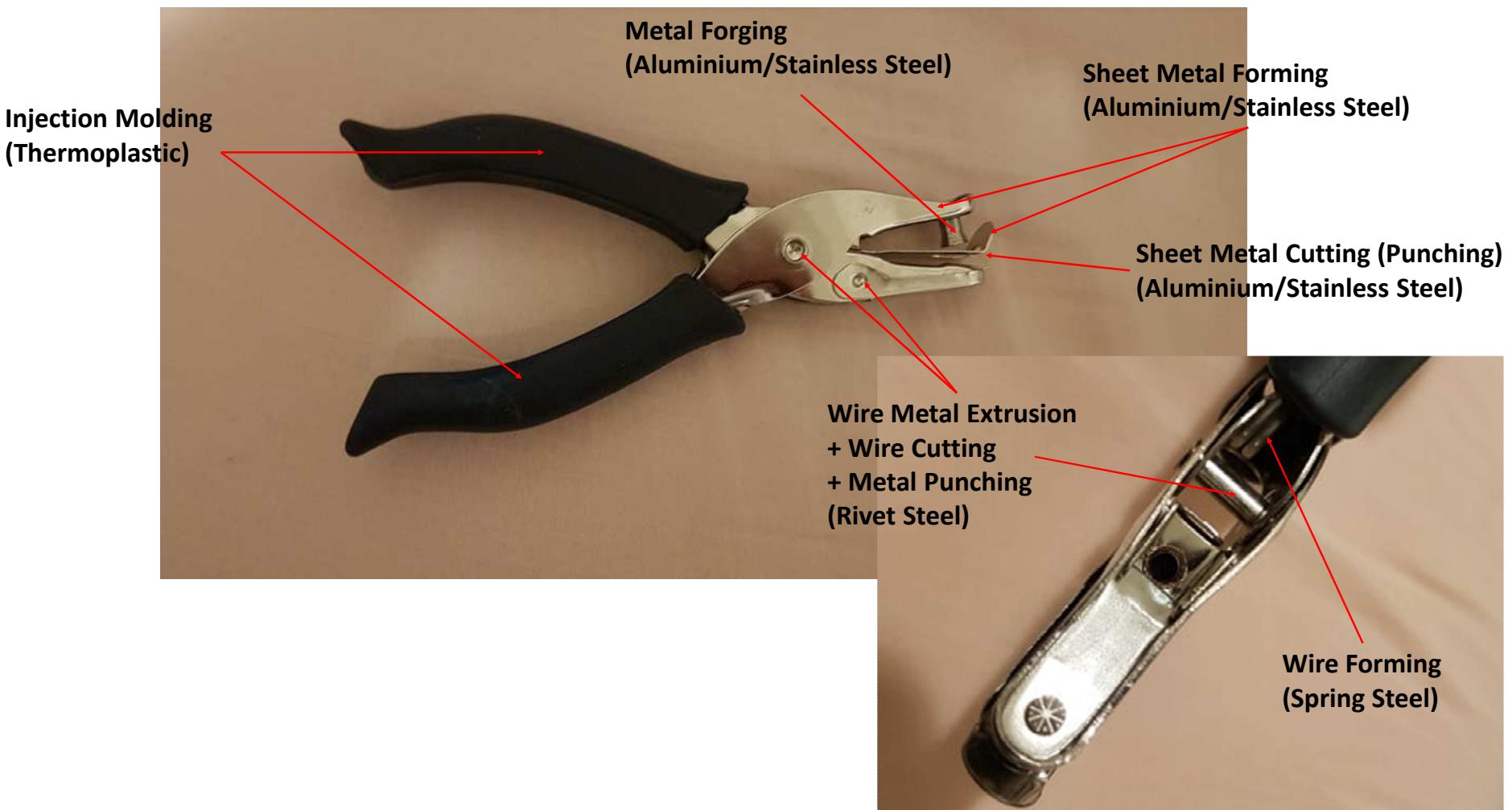
CARBON FIBER BIKE FRAME

1



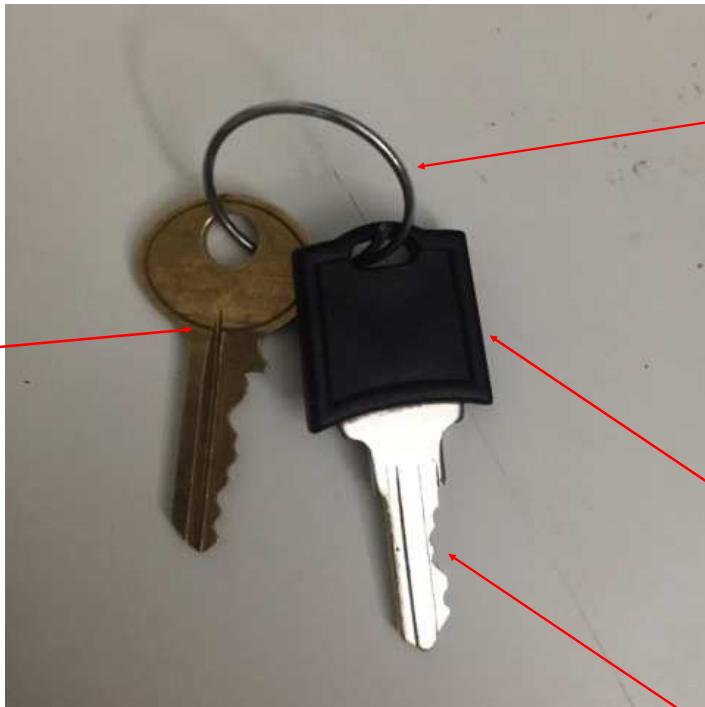
SINGLE HANDHELD 1-HOLE PUNCH

1



KEY RING, COPIED KEY, GENERIC KEY

1



Copy of a key:
Sheet metal blanking
Machining (key cutting)
(Aluminum)

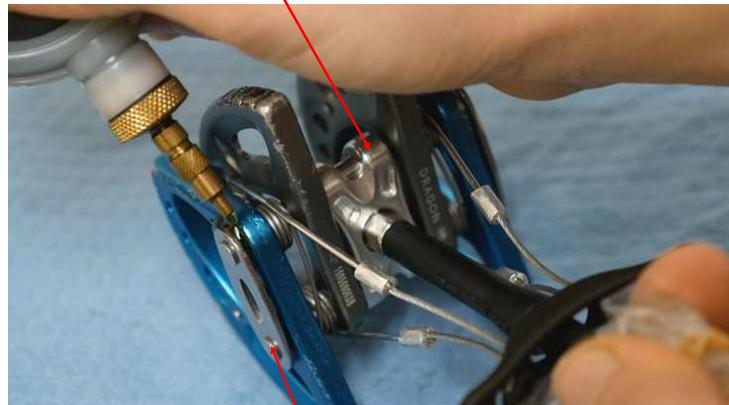
Key ring:
Drawing
Dereeling
(Aluminum)

Generic key handle:
Injection molding
(thermoplastic)

Generic key:
Stamping
Blanking
(Aluminum)

BLACK DIAMOND CLIMBING CAM

1



Forging (Aluminum)

Sheet Metal Forming (Aluminum)

Forging (Aluminum)

Injection Molding (Thermoset)

Injection Molding
(Thermoplastic)

Machining (Aluminum)

Wire Forming (Spring Steel)

Injection Molding (Thermoset)

Rope forming

High Pressure Autoclave (Dyneema Composite Fabric)

DISPOSABLE RAZOR

1

Sheet Metal Forming (Steel)



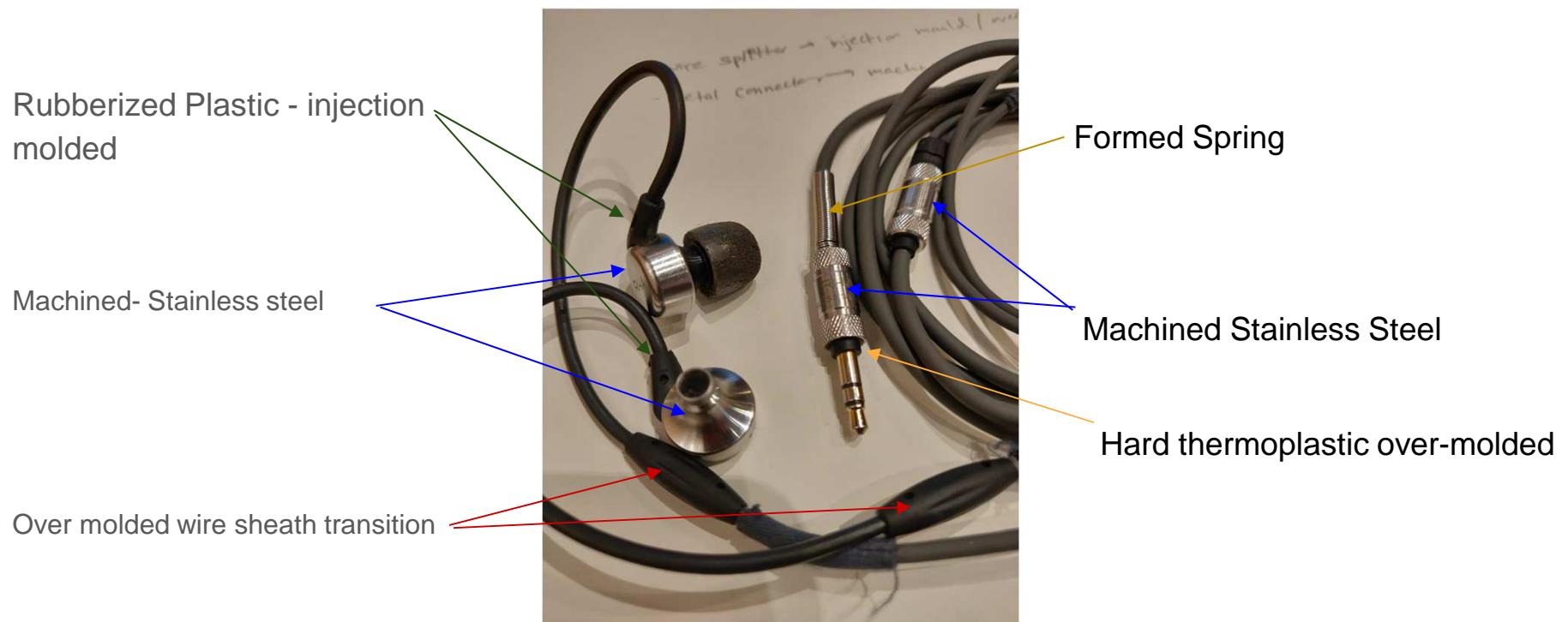
Thermoforming
(Plastic)



Injection Molding
(Thermoplastic)

Over Molding
(Thermoset)

Earbuds



PLASTIC CHAIR

1

Injection Molding
(thermoplastic)



Metal Extrusion (steel tubing)



Welding (stainless steel)



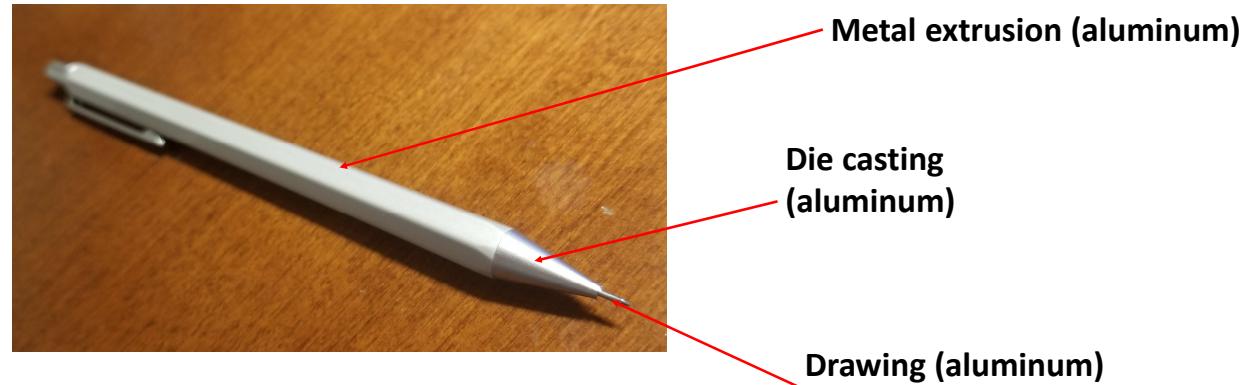
Bending (steel tubing)



Thread Rolling (Steel)

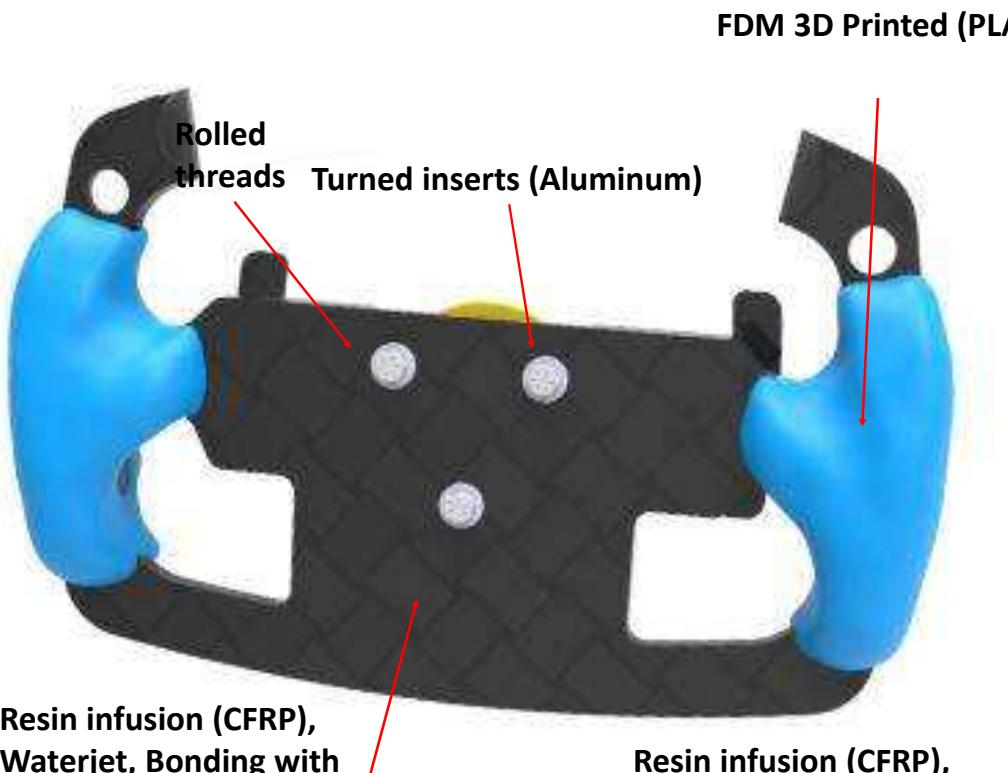
MECHANICAL PENCIL

1



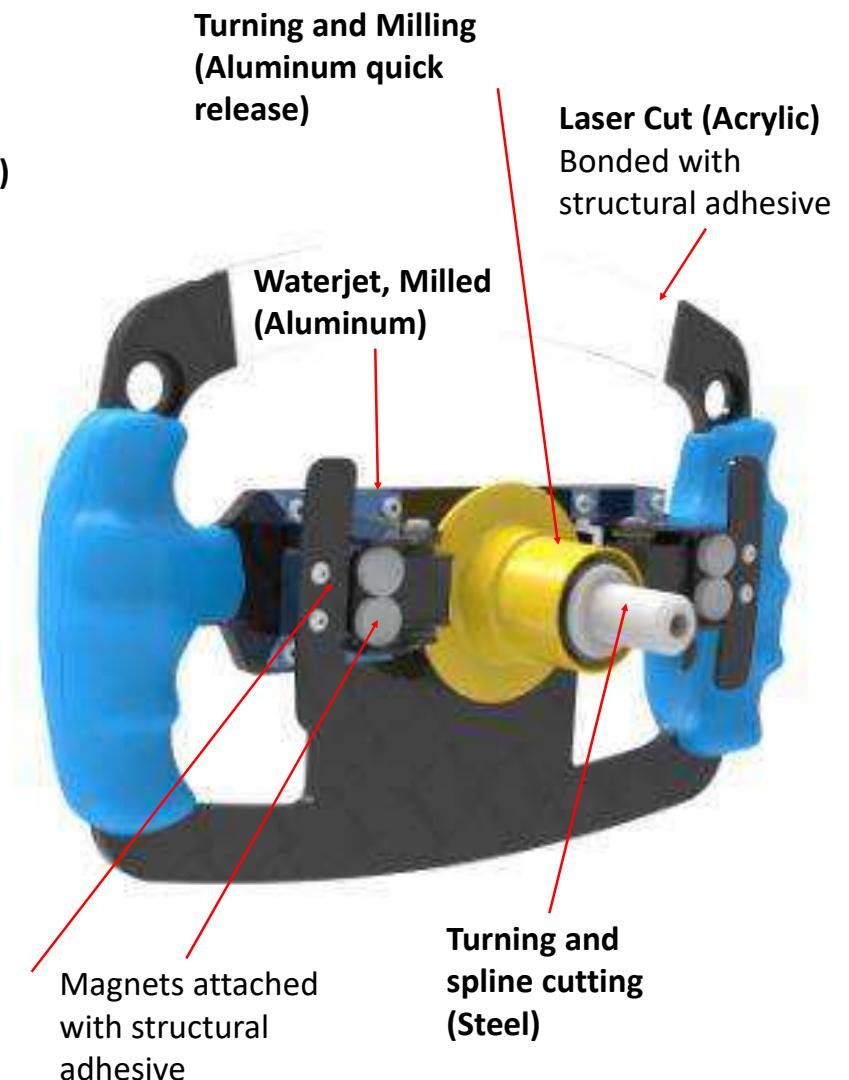
F24-C STEERING WHEEL

1



FDM 3D Printed (PLA)

Resin infusion (CFRP),
Waterjet, Bonding with
structural adhesive,
Aluminum pop rivets



Turning and Milling
(Aluminum quick
release)

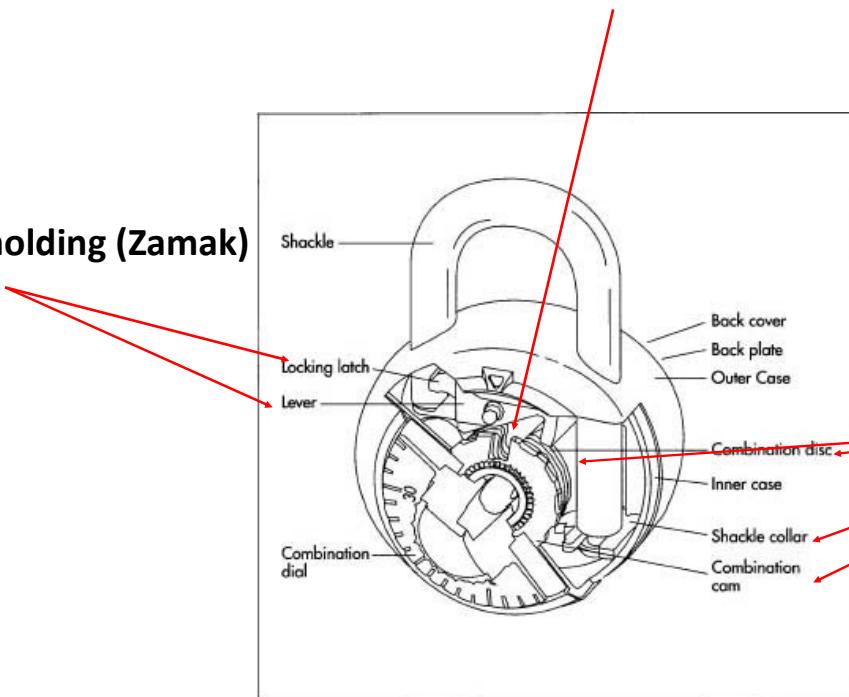
Laser Cut (Acrylic)
Bonded with
structural adhesive

COMBINATION LOCK

1

Machined on a screw machine, then formed to its U-shape and notched (Stainless round bar stock)

Spring winder (stainless steel round wire)



Injection molding (Zamak)

Cold-rolled, blanking die (Steel)

Blanking Die (Stainless Steel)



Injection (Plastic)

BICYCLE

1



Thermoforming
(Rubber Shift Covers)

Injection Molding
(Plastic Barrel Adjusters)

Forging (Wheel
Ball Bearings)

Extrusion
(Aluminum Tubes)

Machining and Welding
(Tube Joining)

Wire Forming (Spring Steel
Brake and Shift Cables)

Plastic Extrusion (Plastic
Cable Housings)

Sheet Metal Forming
(Chain Link Plates)

Rolling (Steel
Machine Screw
Threads)

Casting (Aluminum
Crank Arms)

Machining (Internal
Threads)

CANDLE LIGHTER

1

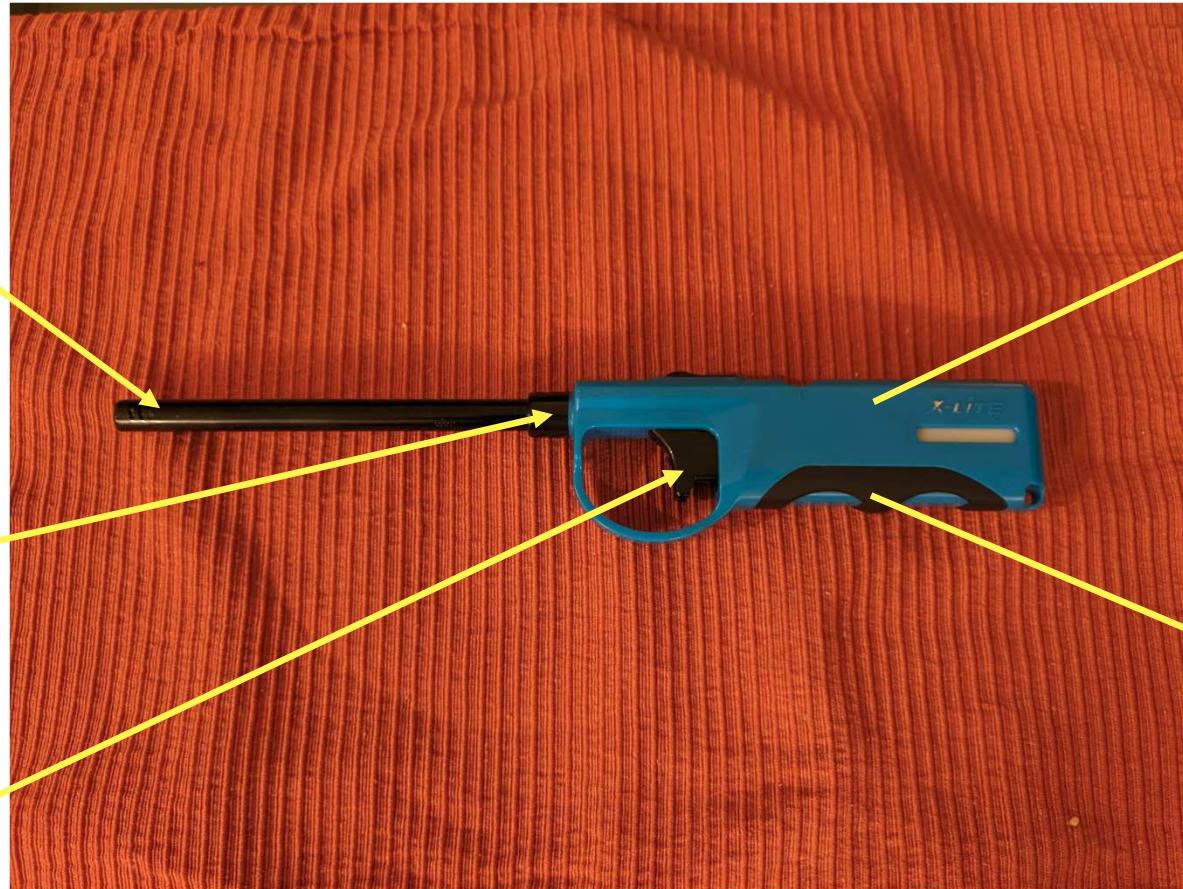
Extrusion
(Polyethylene)

Thread Rolling
(Steel)

Injection Molding
(Thermoplastic)

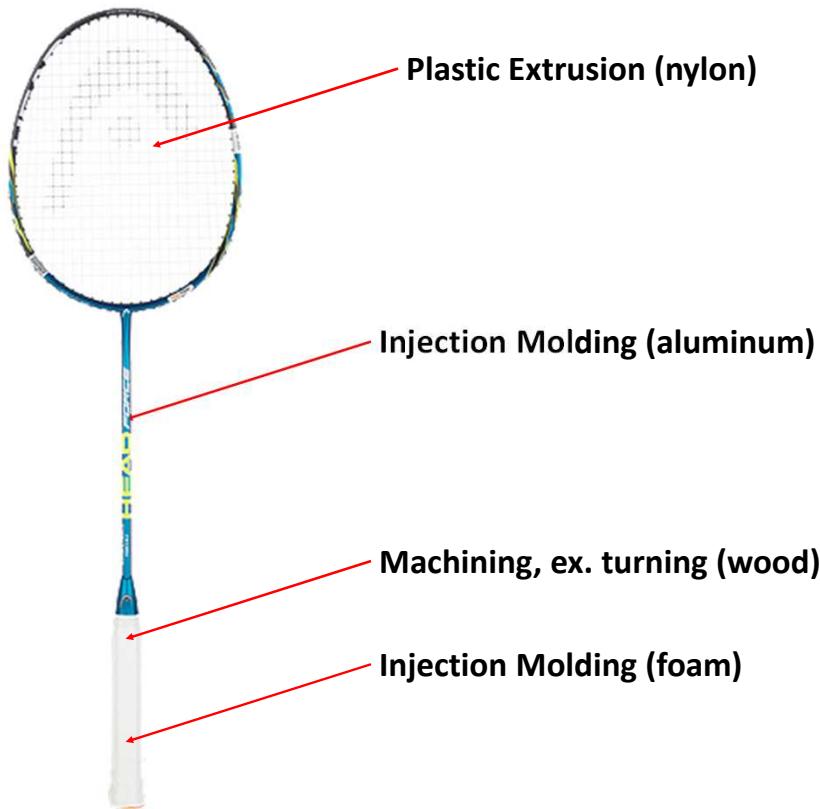
Injection Molding
(Thermoplastic)

Overmolding
(Rubber)

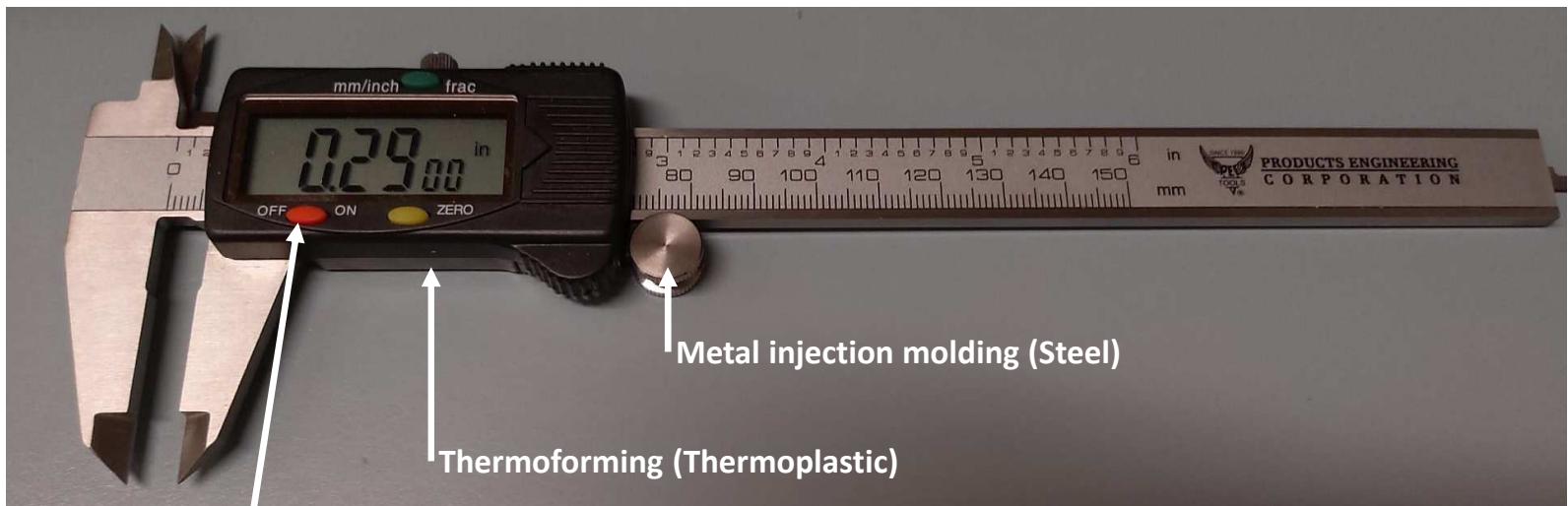
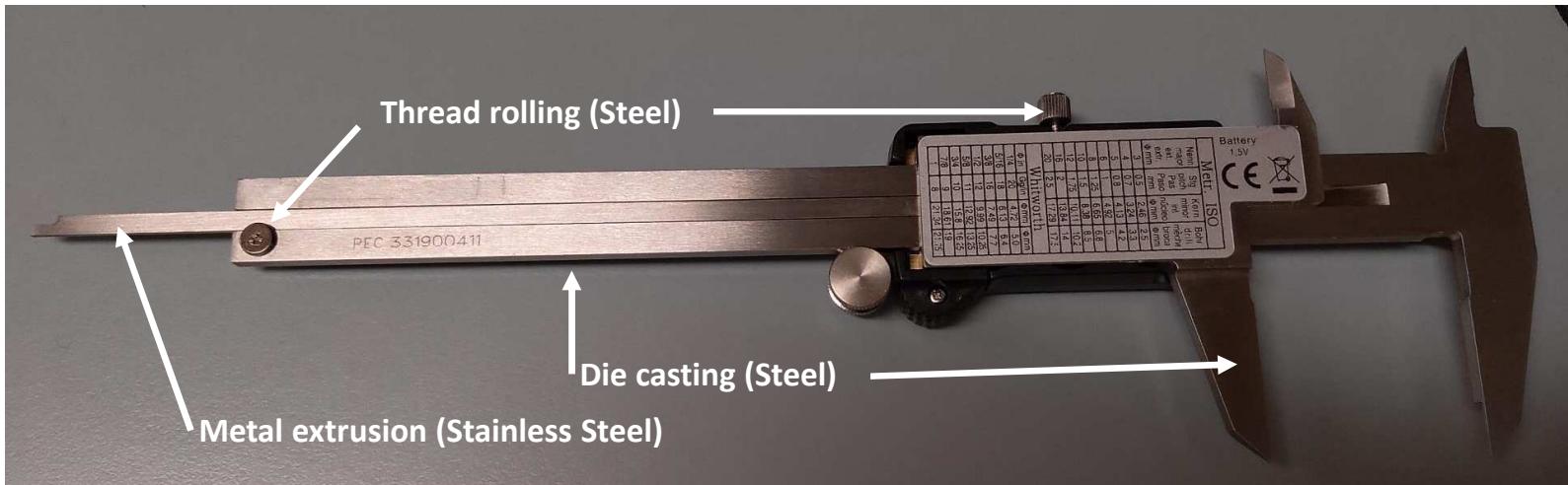


PART

1



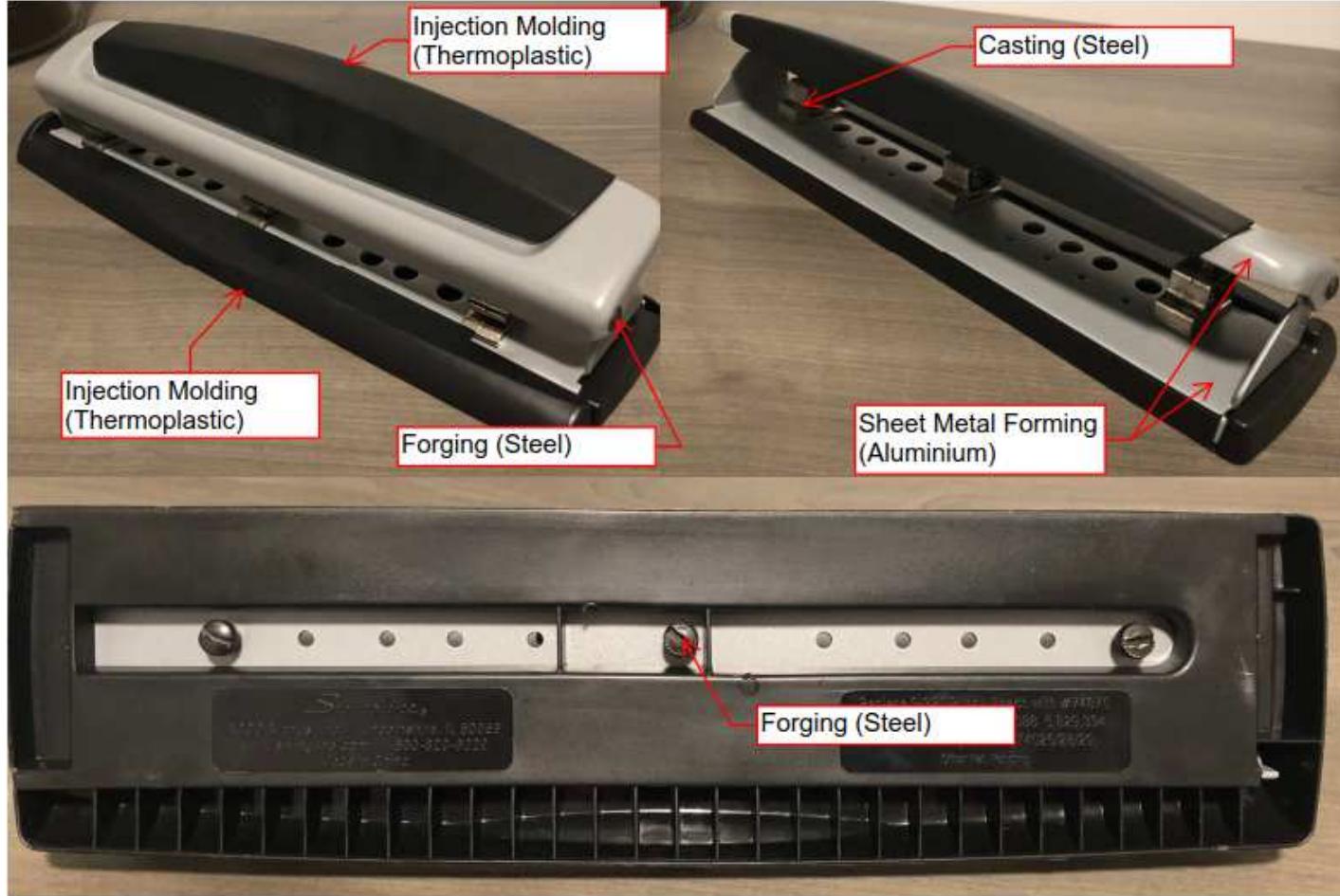
DIGITAL CALIPERS



Injection molding (Thermoset)

HOLE PUNCH

1



OLYMPIC RECURVE

1

Lamination (Carbon/Fibreglass/Wood)



Injection Molding (Plastic)



CNC (Anodized Aluminum Alloy)

Cold Rolling (Aluminum)
Wrap (Carbon Fiber)

Thermoforming (Plastic)
Injection Molding (Plastic)

X10™



Bike Helmet

By Emma Starr

Thermoforming (PolyCarbonate
vacuum forming)

Injection molding
(expanded polystyrene
EPS to make foam liner)

Injection molding
(thermoplastic)

Injection molding (thermoplastic)

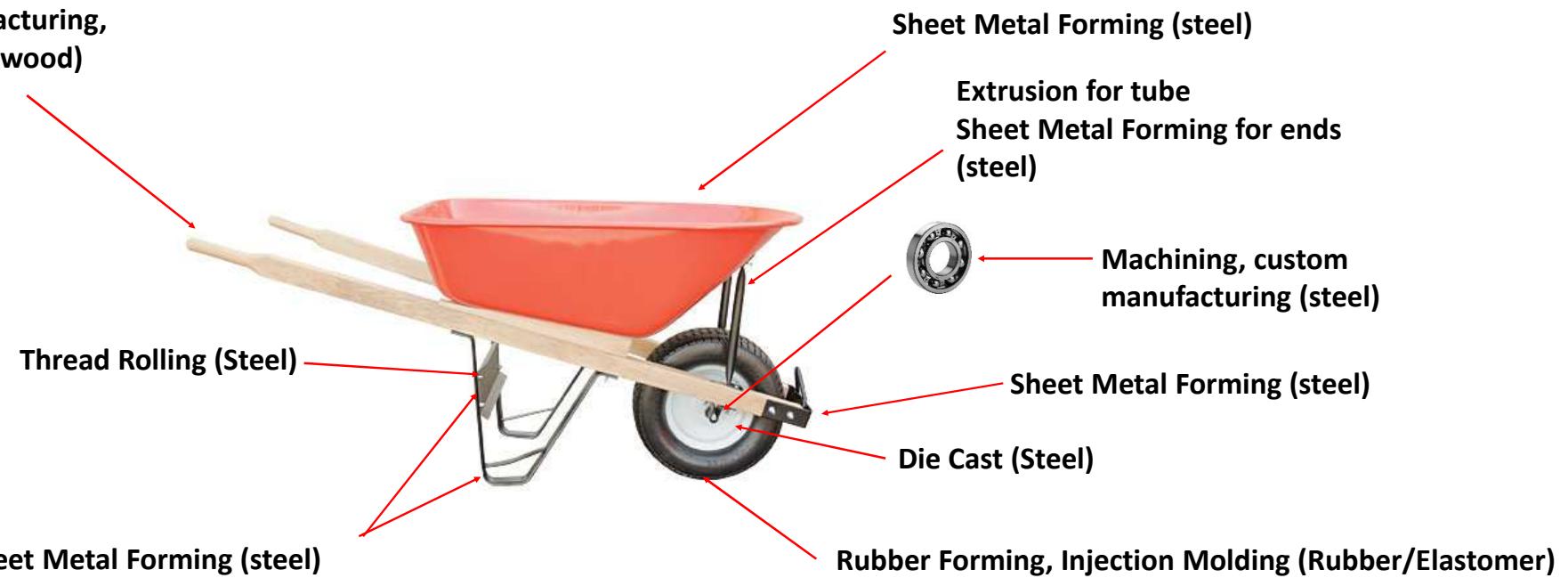
Textile stitching (nylon strap)



PART

1

Lumber Manufacturing,
Woodworking (wood)



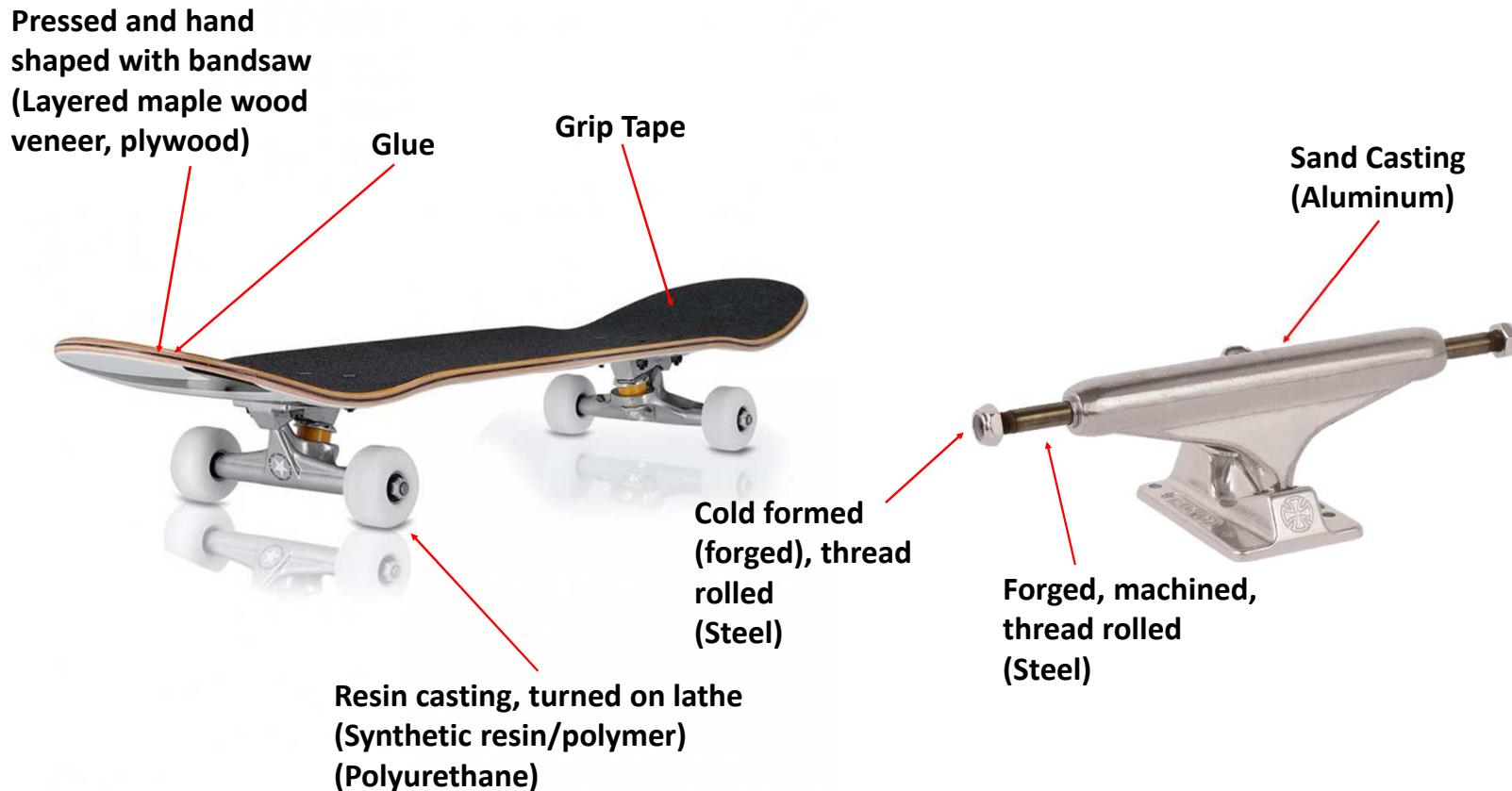
Lugged Steel Road Bike Frame

1



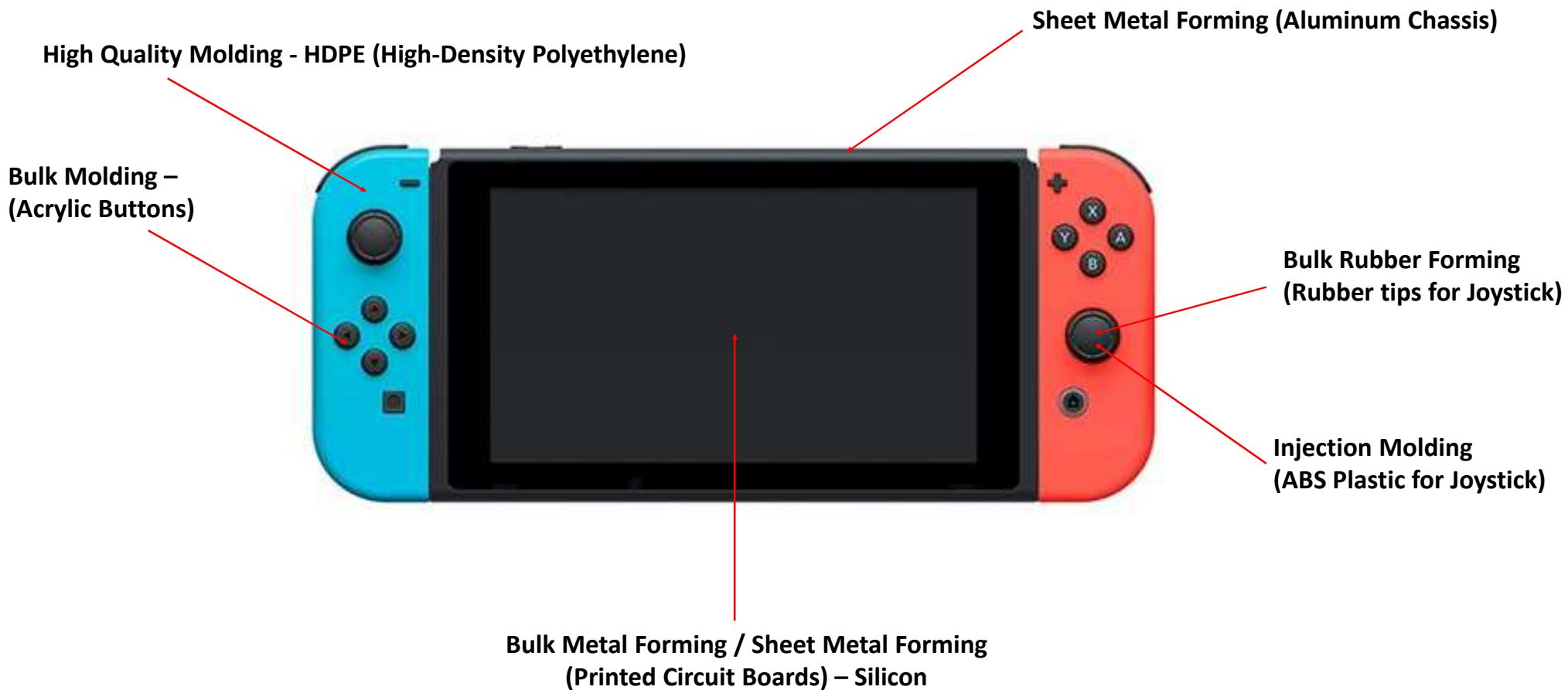
PART YOU CHOOSE

1



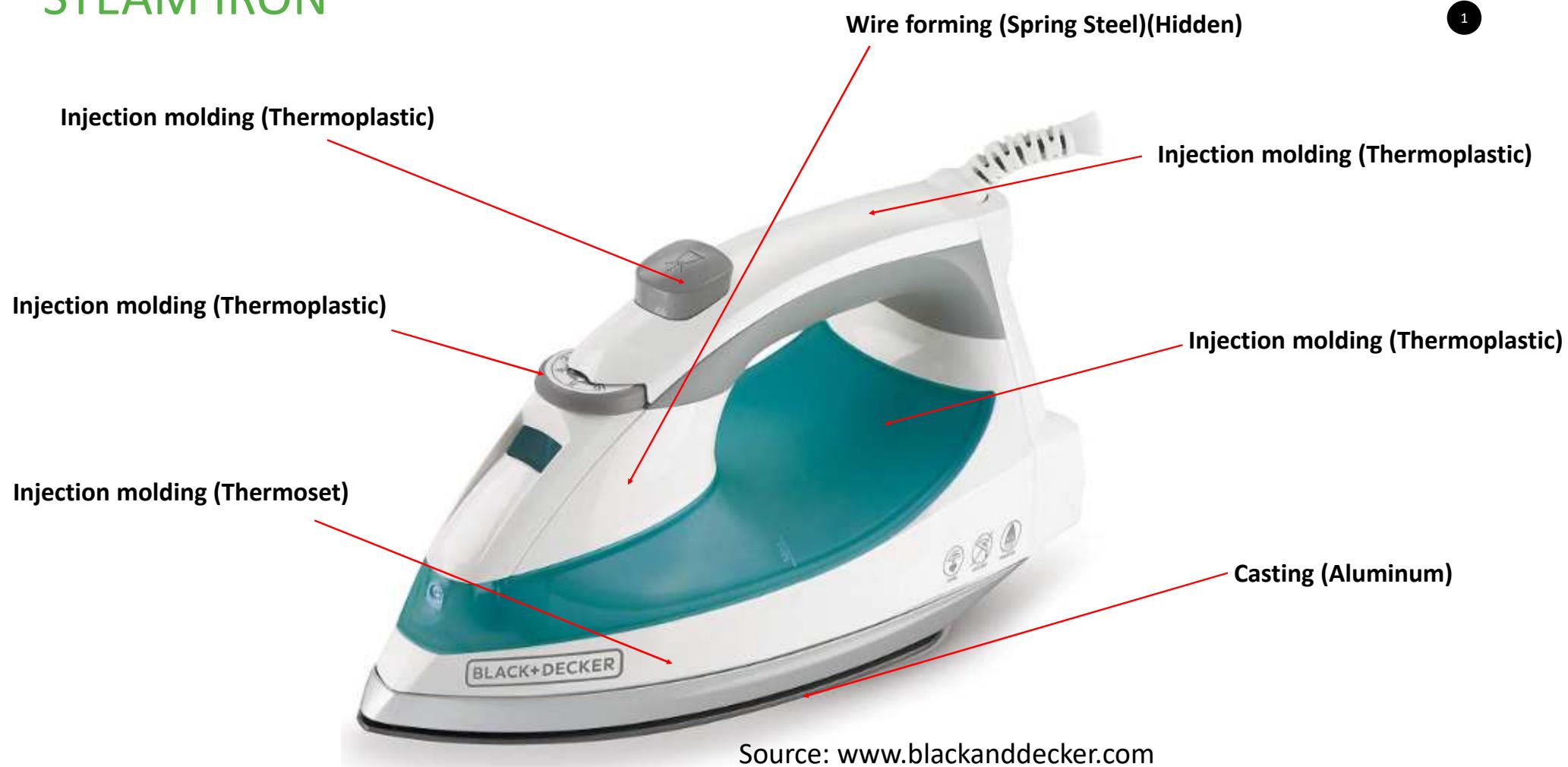
NINTENDO SWITCH

1



STEAM IRON

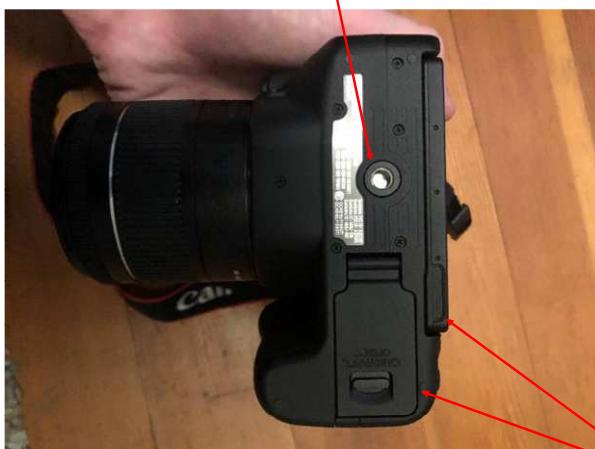
1



Source: www.blackanddecker.com

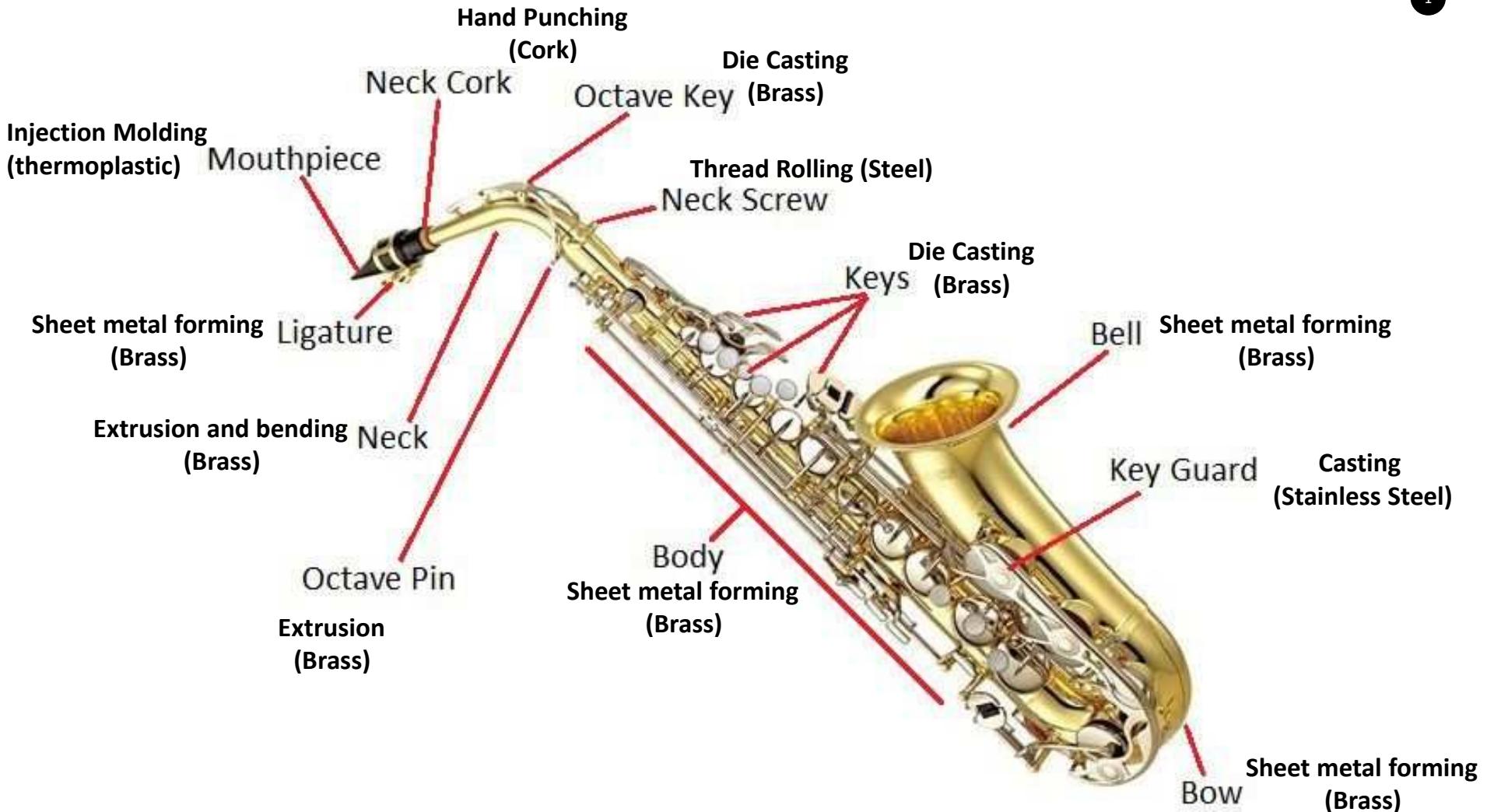
DSLR CAMERA

1



PART YOU CHOOSE

1

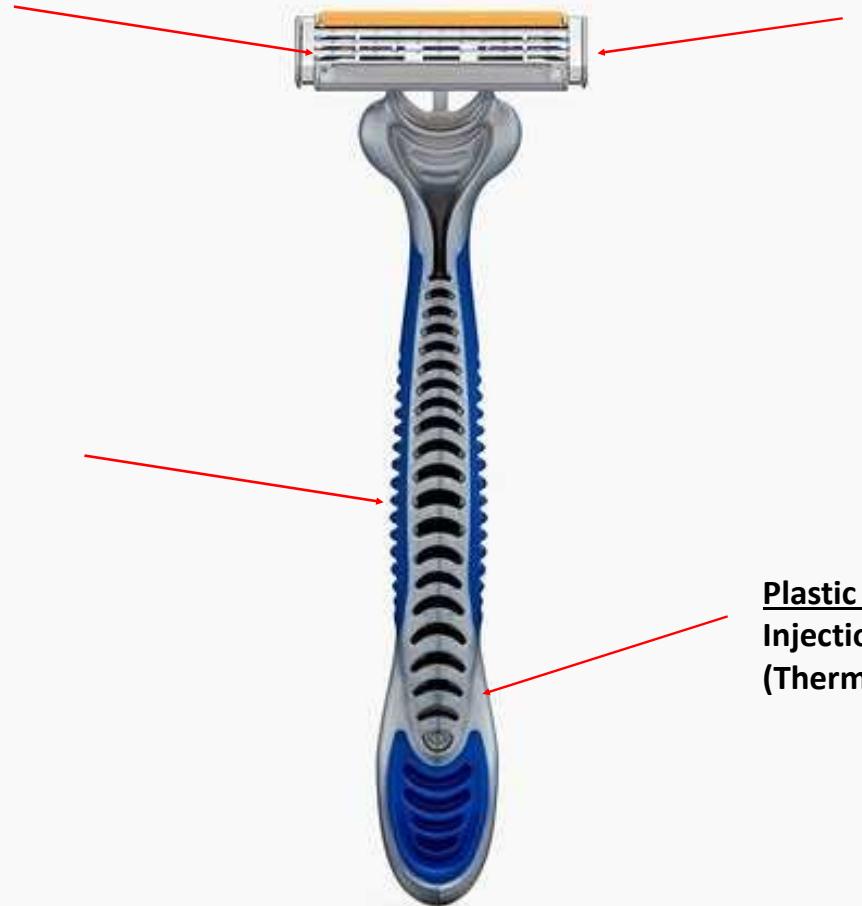


DISPOSABLE RAZOR

1

Steel Blades

- Heat Treated (annealing)
- Punched (Shape)
- Grinded (Sharpness)
- Coating Treatments (Prevent Rust etc)



Plastic Cartridge

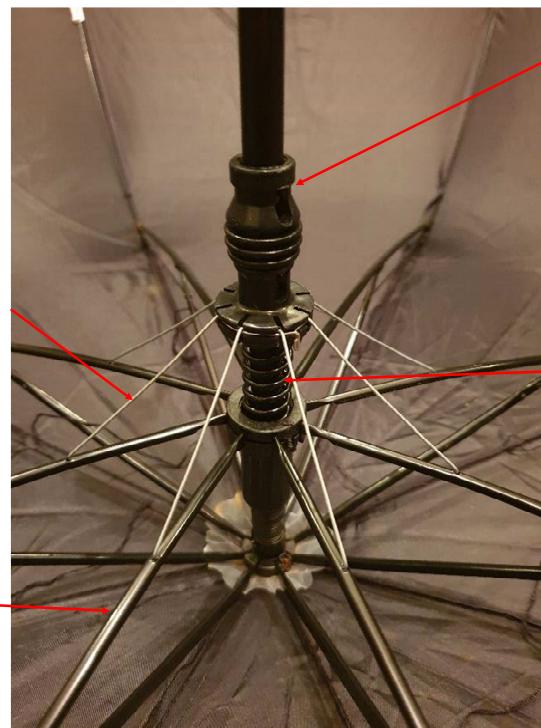
Injection Molding (Thermoplastic)

UMBRELLA

1



Wire forming



Casting
(Aluminium)

Thread Rolling



Injection Molding
(Thermoplastic)

Wire forming

Casting
(Aluminium)

Metal extrusion
(Aluminium)

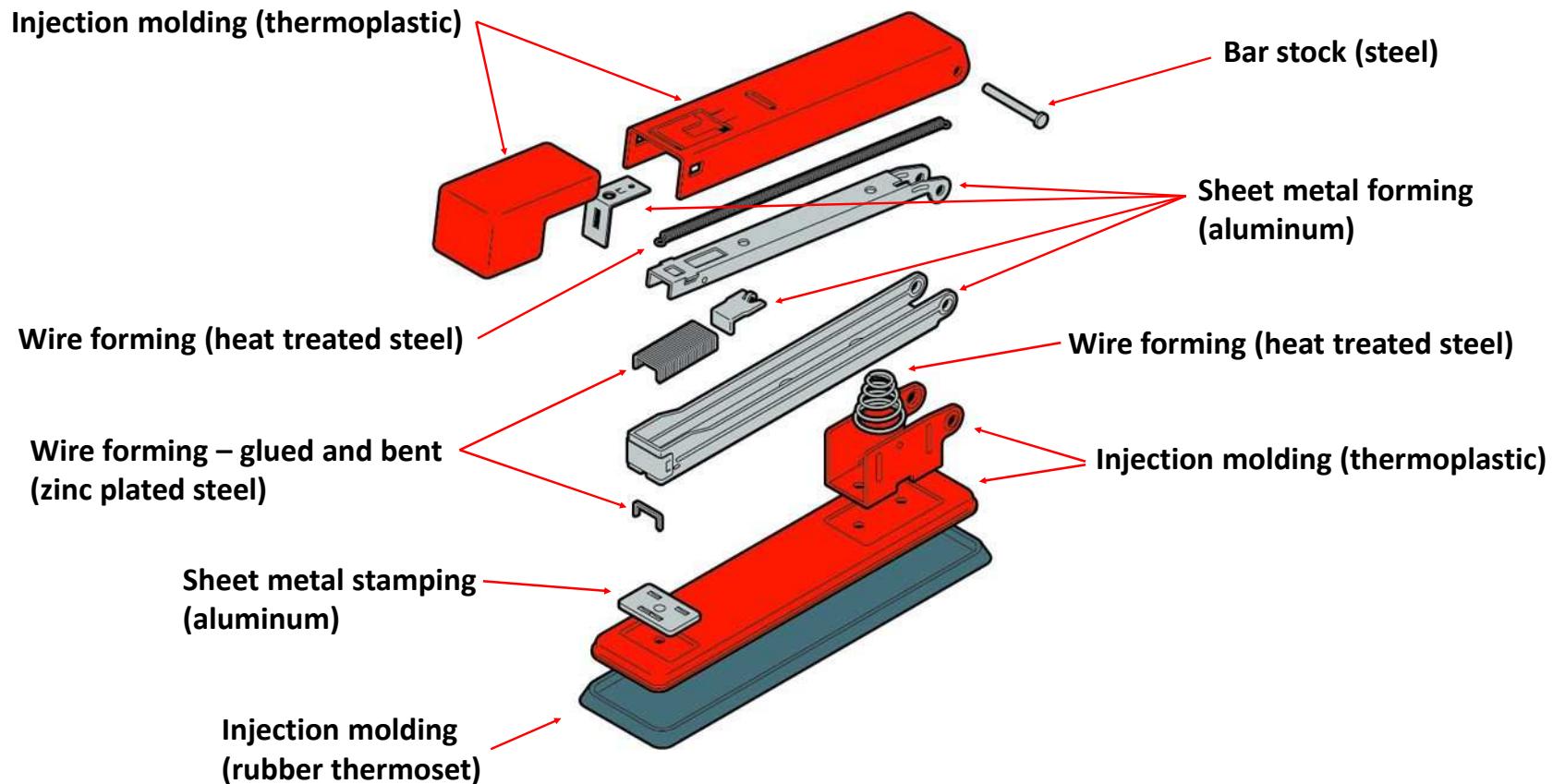
GOLF CLUB (7 IRON)

1



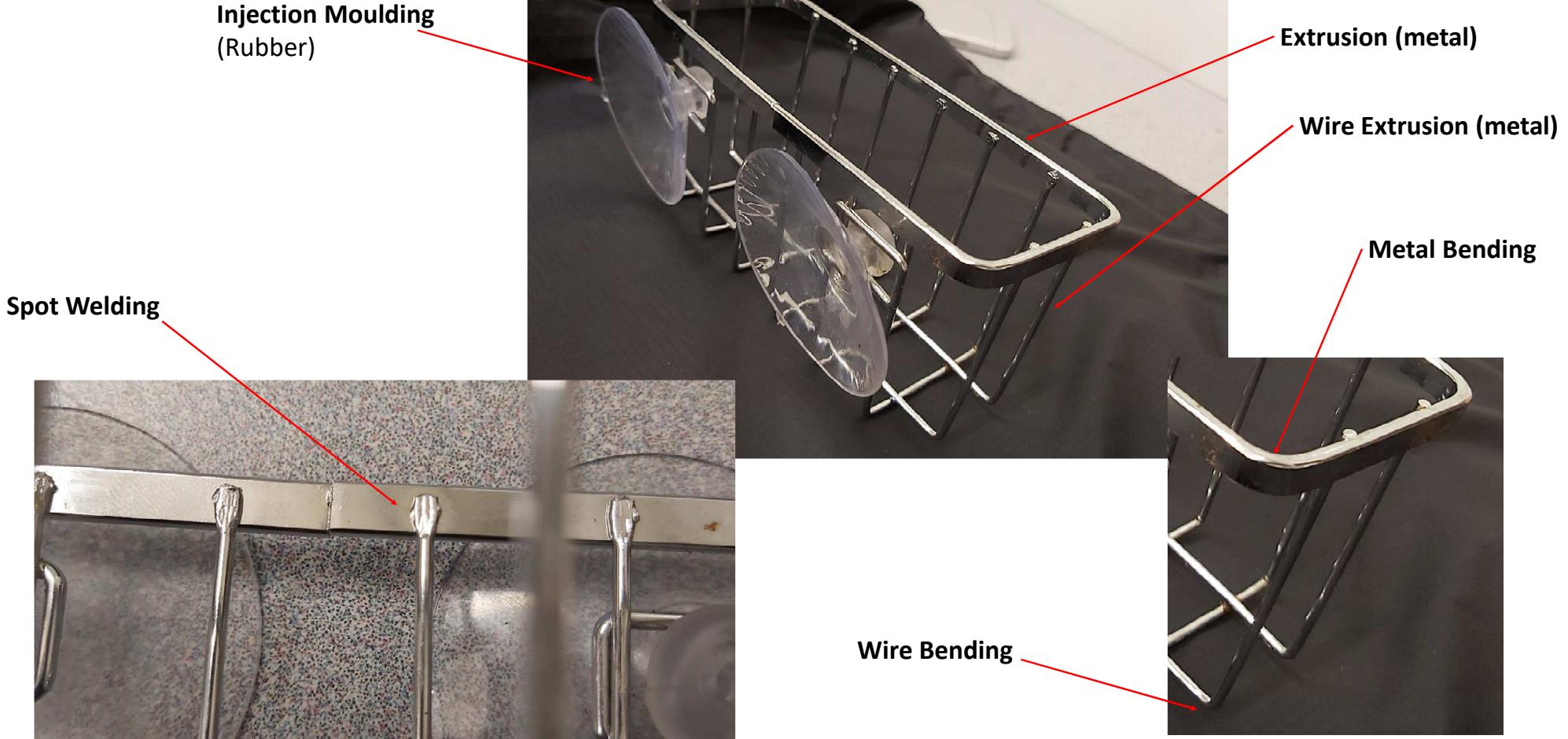
STAPLER

1



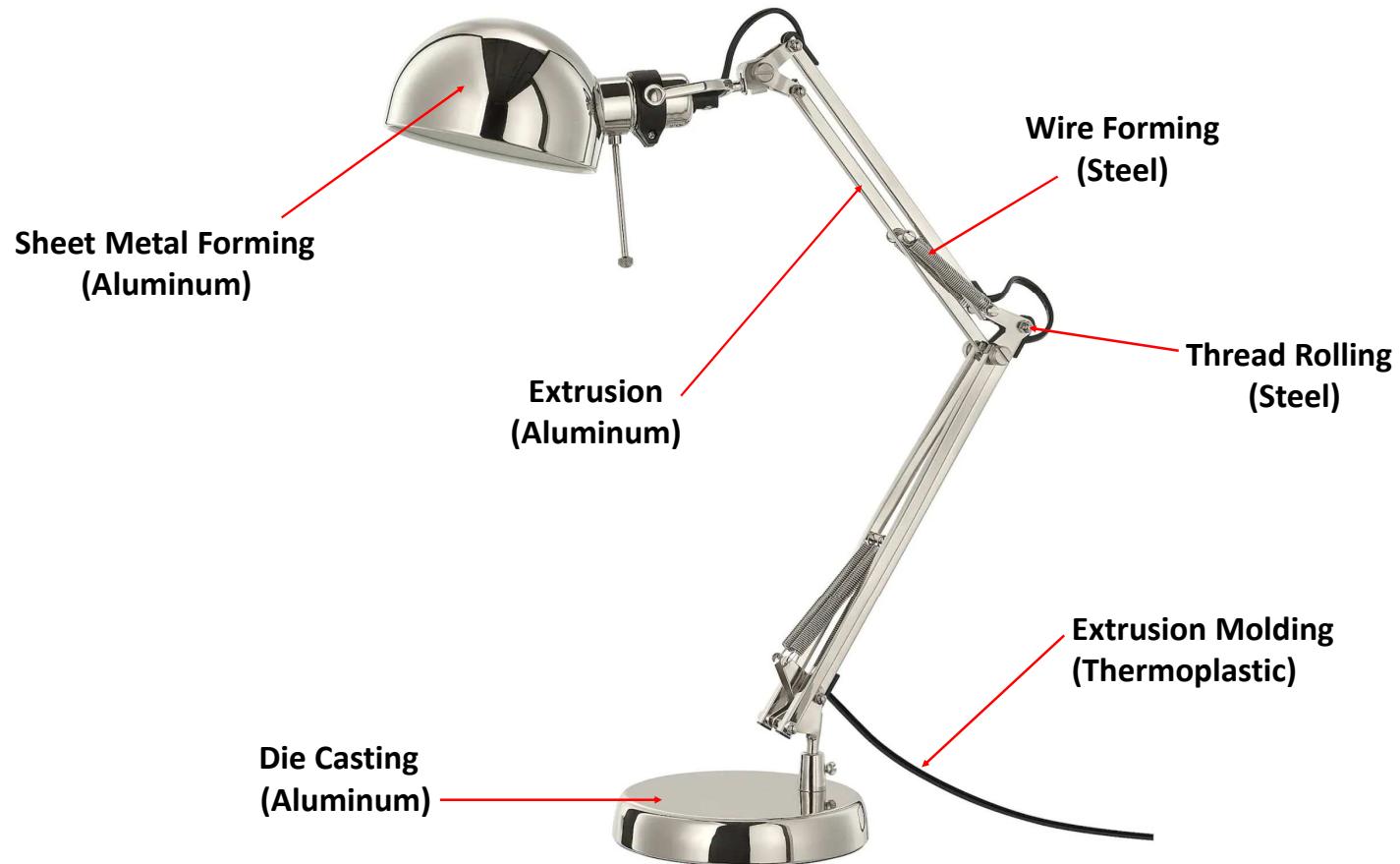
DRY-ERASE MARKER/ERASER HOLDER

1



DESK LAMP

1



CHISEL

1

Polished to Remove discoloration

Ground Sharp

Die Forging (High Carbon Steel)

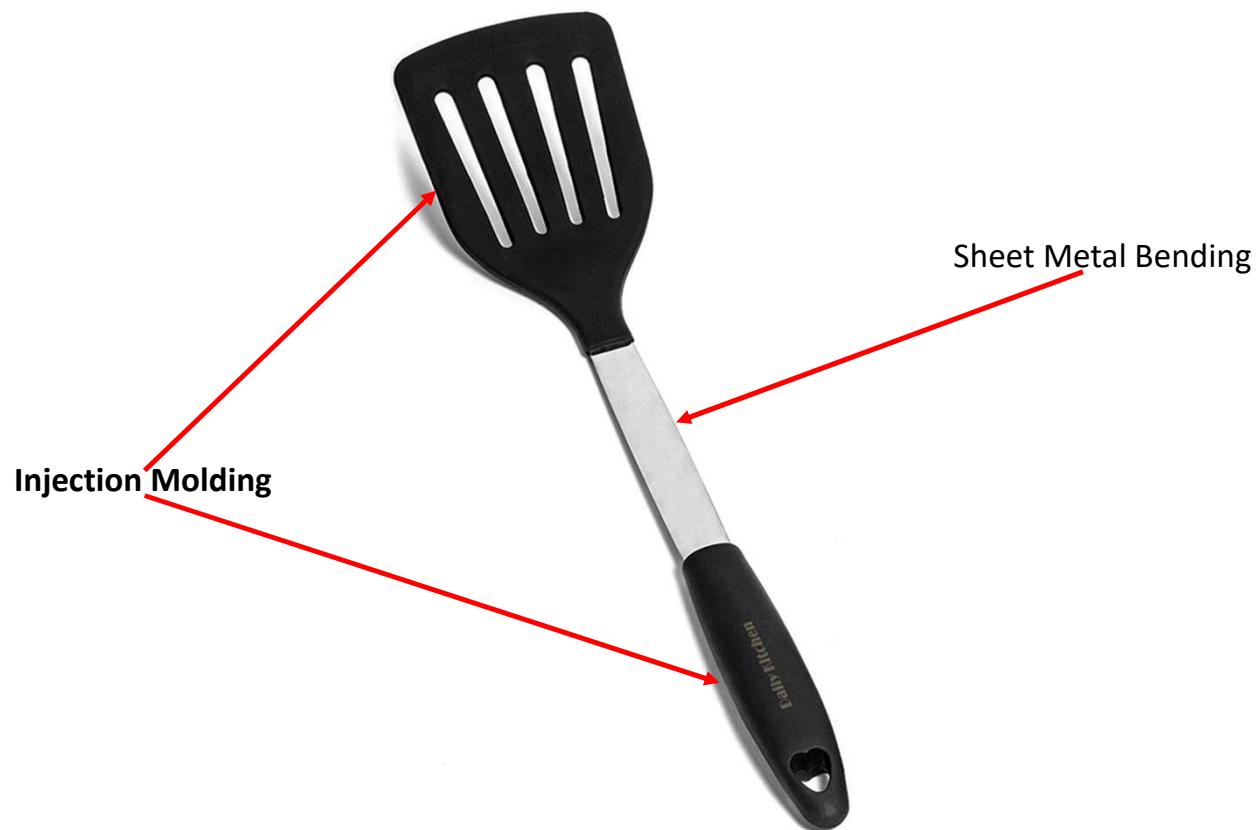
Label Punched on

Interference Fit

Extruded (Plastic)



Spatula



BALL POINT PEN

1



STAPLER

1

Punching (Steel)

Sheet Metal Forming
(Steel)



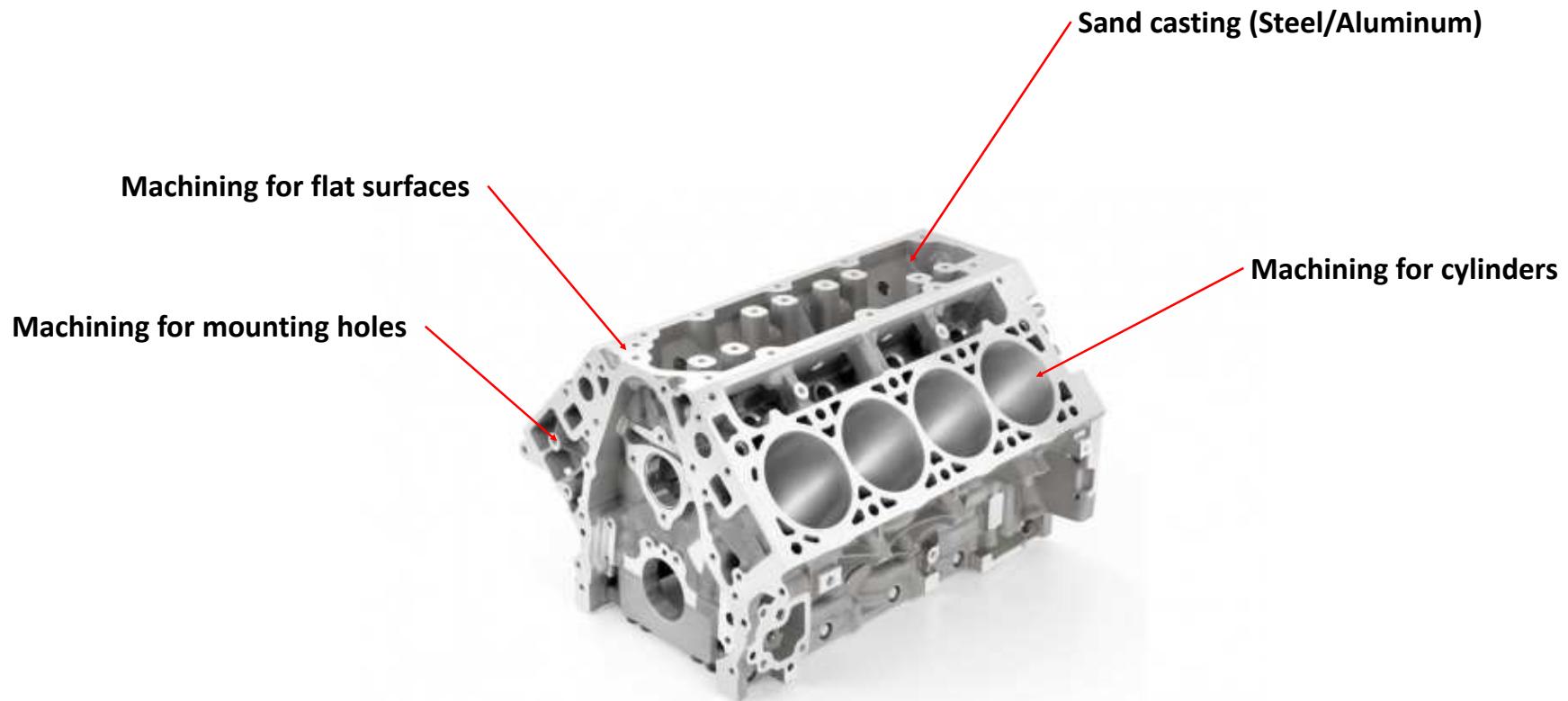
Drawing and Forming (Steel)

Injection Molding
(Thermoplastic)



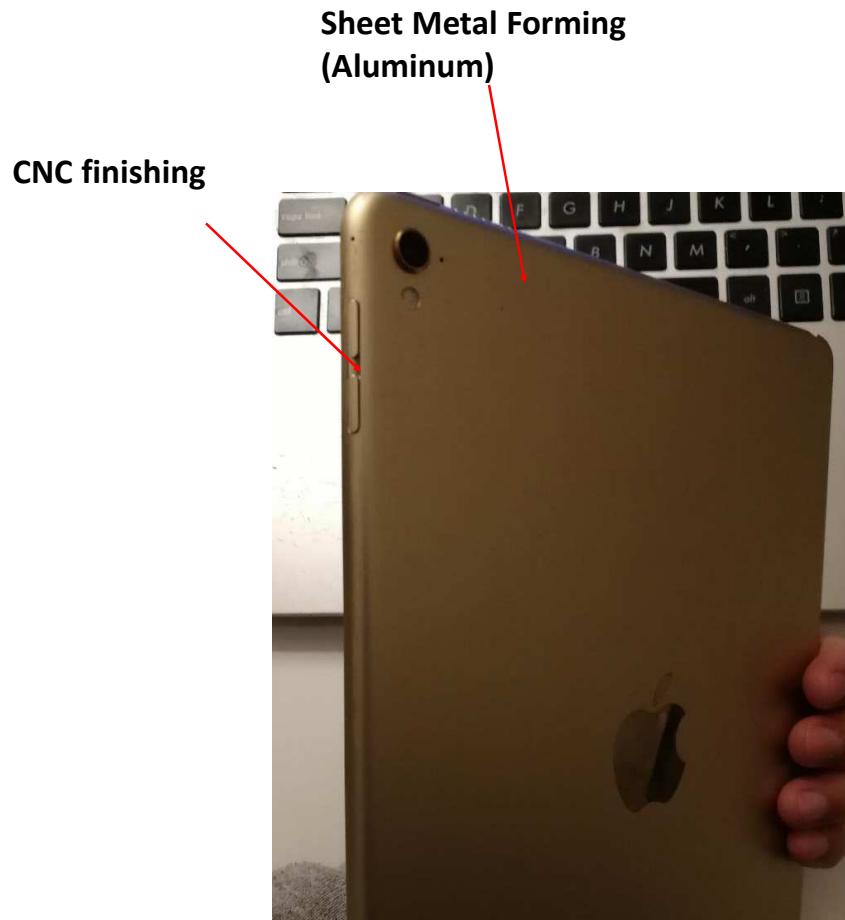
ENGINE BLOCK

1



IPAD PRO AND COVER

1



Injection Molding (Glass) Thermoforming (Plastic)



PART YOU CHOOSE

1



WATER BOTTLE

1

Injection
Molding
(Thermoplastic)



Extrusion (Rubber)

Over Molding
Casting
(Steel Insert)

CNC Machining
(Torsion Spring)



TALL CHAIR

1



Injection Molding (Thermoplastic)



Centrifugal Casting (Aluminum)

Bending (Aluminum)

Welding (Aluminum)

Over Molding (Thermoplastic)