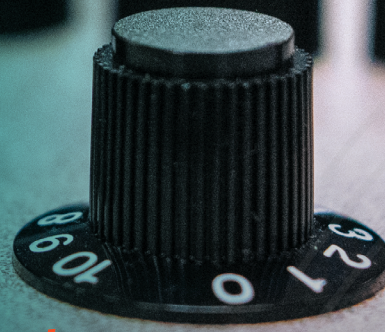


# CONTROL KNOBS



## Proprietary Products – Standard Features

The following standard features are available (as they apply to specific product offerings):

### Body – Injection Molded Plastic

Material (*Varies by knob style*)

- ABS
- Polypropylene – unfilled
- Polypropylene – 10% glass filled
- Thermoplastic Elastomer – for soft touch

Surface Finish (*Varies by knob style*)

- Gloss
- Matte
- Satin
- Textured Pattern

### Body – Compression Molded Plastic (Thermoset)

Material (*Varies by knob style*)

- Phenolic
- Melamine

Surface Finish (*Varies by knob style*)

- Gloss
- Matte

### Metal Inserts

Material

- Brass, Zinc-Plated
- Brass, Un-Plated
- Aluminum

### Flat Dials and Tapered Skirts

Plastic (*Varies by knob style*)

- Opaque Acrylic, Gloss or Matte Finish
- Transparent Acrylic

Aluminum Dial Thickness (*Varies by style*)

- Plastic: 0.06"
- Aluminum: 0.03" or 0.06"

### Skirt Thickness

- Varies depending on skirt style and diameter

### Metal Inlays and Caps

Material

- Aluminum

### Surface Finish

- Radial spun with clear epoxy coating
- Bright with clear anodized coating
- Matte with clear anodized coating

### Set Screws

Type Available

- Hexagon socket with cup point, steel with corrosion resistant finish
- Slotted headless with cup point, steel with corrosion resistant finish

### Location (*Nominal*)

- One Screw - 180° from indicator or adjacent flat on shaft hole (*varies by knob style*)
- Two Screws - 90° and 180° from indicator (*clockwise from top view*)

### Spring Clips

Material

Spring steel, medium temper, phosphate/oil finish

Markings

- Hot Stamp
- Pad Printing

# CLAMPING KNOBS & HANDLES

**Proprietary Products – Standard Features**

The following standard features are available (as they apply to specific product offerings):

## Body – Injection Molded Plastic

### Material (Varies by knob style)

- Polypropylene – unfilled
- Polypropylene – 10% glass filled
- Polypropylene – 30% glass filled
- Thermoplastic Elastomer – for soft touch

### Surface Finish (Varies by knob style)

- Gloss
- Matte
- Satin
- Textured Pattern

## Female Threaded Inserts

### Material

- Brass, zinc-plated or un-plated
- Mild steel, zinc-plated
- Stainless steel, passivated  
(non-standard but available)

### Thread sizes (2B gauge):

- 8-32 UNC
- 10-32 UNC
- 1/4-20 UNC
- 5/16-18 UNC
- 3/8-16 UNC
- 1/2-13 UNC
- M5
- M6
- M8
- M10
- M12

## Male Threaded Inserts

### Material

- Mild steel, zinc-plated
- Brass, unplated or zinc-plated
- Stainless steel, passivated (non-standard but available)

### Length Tolerance

- +0.010/-0.020 for studs up to 1.0" in length
- +0.010/0.050 for studs over 1.0" in length

### Thread Sizes (2A Gauge)

- Same as female threaded inserts



# QUALITY STANDARDS

## Proprietary Products – Standard Features

The following standard features are available (as they apply to specific product offerings):

### Plastic Dimensional Tolerances

- Tolerances for the plastic portion of both control knobs and clamping knobs range from +/-0.005" to +/-0.020" depending on the wall thickness and length of the dimension as well as the shrinkage rate of the material used

### Shaft Hole Diameters

- Round Shaft Hole: +0.0035" / -0.0000"
- Round Shaft Hole with Flat: +/-0.0035"

### Push/Pull Specifications (Control Knobs)

Maximum force required to securely fit a press-fit knob onto a potentiometer shaft and the minimum force required to remove the knob from the shaft.

- Plastic Shaft Hole  
Push: 15 lbs. Maximum Pull: 4 lbs. Minimum
- Spring Clip Shaft Hole  
Push: 20 lbs. Maximum Pull: 4 lbs. Minimum
- Knurled Type Shaft Hole  
Push: 20 lbs. Maximum Pull: 4 lbs. Minimum

Custom shaft hole fit per customer specifications can be provided for an additional tooling charge. Sample shaft and tension requirements must be submitted to Rogan's customer support team – sales@roganinc.com.

### Torque Specifications

Minimum rotational force required to break item from molded plastic part:

Female thread inserts and male thread studs:

- Below values are expressed in inch lbs.

Knob Diameter	8-32	10-32	1/4-20	5/16-16	3/8-16	1/3-13	M5	M6	M8	M10	M12
0.5"-1.25"	15	30	50	70	80	NA	30	50	70	80	NA
>1.25"-2.0"	20	40	60	70	90	100	40	60	70	90	100
Over 2.0"	25	50	65	70	90	100	50	65	70	90	100

### Spring Clips (Control Knobs)

- 0.125" diameter: 10 inch lbs
- 0.187" diameter: 15 inch lbs
- 0.250" diameter: 25 inch lbs
- 6mm diameter: 25 inch lbs

### Set Screws (Control Knobs)

- #4 (40 threads/inch): 4.75 inch lbs
- #6 (32 threads/inch): 8.75 inch lbs
- #8 (32 threads/inch): 18 inch lbs
- #10 (32 threads/inch): 32 inch lbs

### Pull Out Specification (Clamping Knobs and Handles)

Axial force required to remove a molded in insert or stud head from a clamping knob or handle. All knobs: 100 lbs minimum.

### Marking Alignment and Set Screw Location Tolerance (Control Knobs)

The following tolerances govern marking location for all knobs and set screw location for pointer knobs:

- 0.37" to 0.86" knob diameter : +/- 7 degrees
- 0.87" to 2.50" knob diameter : +/- 5 degrees

# QUALITY STANDARDS CONT.

## Proprietary Products – Standard Features

### Visual Defects (*Control and Clamping Knobs*)

Show surfaces will be free of the following obvious visual defects when observed with the unaided eye while viewed for approximately 3 seconds at a distance of approximately 18 inches in daylight (or fluorescent light of 80-120 ft candles), in the normal viewing plane:

- Dirt, grease, loose particulates and foreign materials
- Splay
- Black specs and other imbedded contamination
- Burnt or discolored material
- Flow lines or knit lines
- Moderate-to-gross sinks (minor sink is allowed at the intersection of thick wall sections)
- Scratches and scuffs

### Color Match (*Control and Clamping Knobs*)

- Color match is visually determined using color plaque standards. Color within lots and between lots may vary slightly due to material variations.

### Flash (*Control and Clamping Knobs*)

- Show surface flash: 0.010" max and firmly attached
- Non-show surface flash: 0.020" max and firmly attached
- Parting line mismatch: 0.010" max

### Gate Protrusion

- Size and visual appearance may vary depending on material and color; however, gate protrusion should not feel sharp to the touch.

### Marking (*Control and Clamping Knobs*)

- Appearance: All marking graphics will be complete and legible. Shade and density will be consistent within a manufacturing lot but slight variations between manufacturing lots are allowable.
- Adhesion: Marking cannot be lifted from surface by 3M Scotch™ cellophane tape.

### Functional Defects (*Control and Clamping Knobs*)

- Missing components
- Misassembled components
- Incomplete or damaged threads (male threads must conform to SAEJ1061-4.9 specification)
- Burrs or nicks on threads affecting function
- Short Shots
- Knit lines and voids affecting function

### Notes

- Rogan uses ANSI Z1.4 with a 2.5 AQL to determine quality acceptance.
- Unless agreed to in writing, Rogan reserves the right to change specifications on the standard elements of our products without notice.
- Customer requirements for more stringent visual, dimensional, physical properties must be specified in writing by customer and approved by Rogan.
- Rogan's Engineering team will work with customers to optimize the insertion and removal force between control knobs and potentiometer shafts at the beginning of each program. However, because each fit is dependent on the dimensional consistency of the knob and customer sourced potentiometers, and because changes can be made to shaft size as a result of potentiometer sourcing, customer assumes ongoing responsibility for suitable fit.

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# PACKAGING & LABELING

**Proprietary Products – Standard Features**

*The following standard features are available (as they apply to specific product offerings):*

Parts are packaged to ensure quality is not compromised during shipping. Depending on the need to protect parts, various packaging methods are available:

- Blister packed on pads
- Bagged
- Protective covers over male threads
- Layer packed on pads
- Bulk packed

Carton labeling includes:

- Customer Part Number
- Quantity
- Lot Number
- Custom Formats Available

