



# PLATE DESIGN GUIDELINES FOR LSR MANIFOLD SYSTEM

**HUSKY<sup>®</sup>**

12107619-0

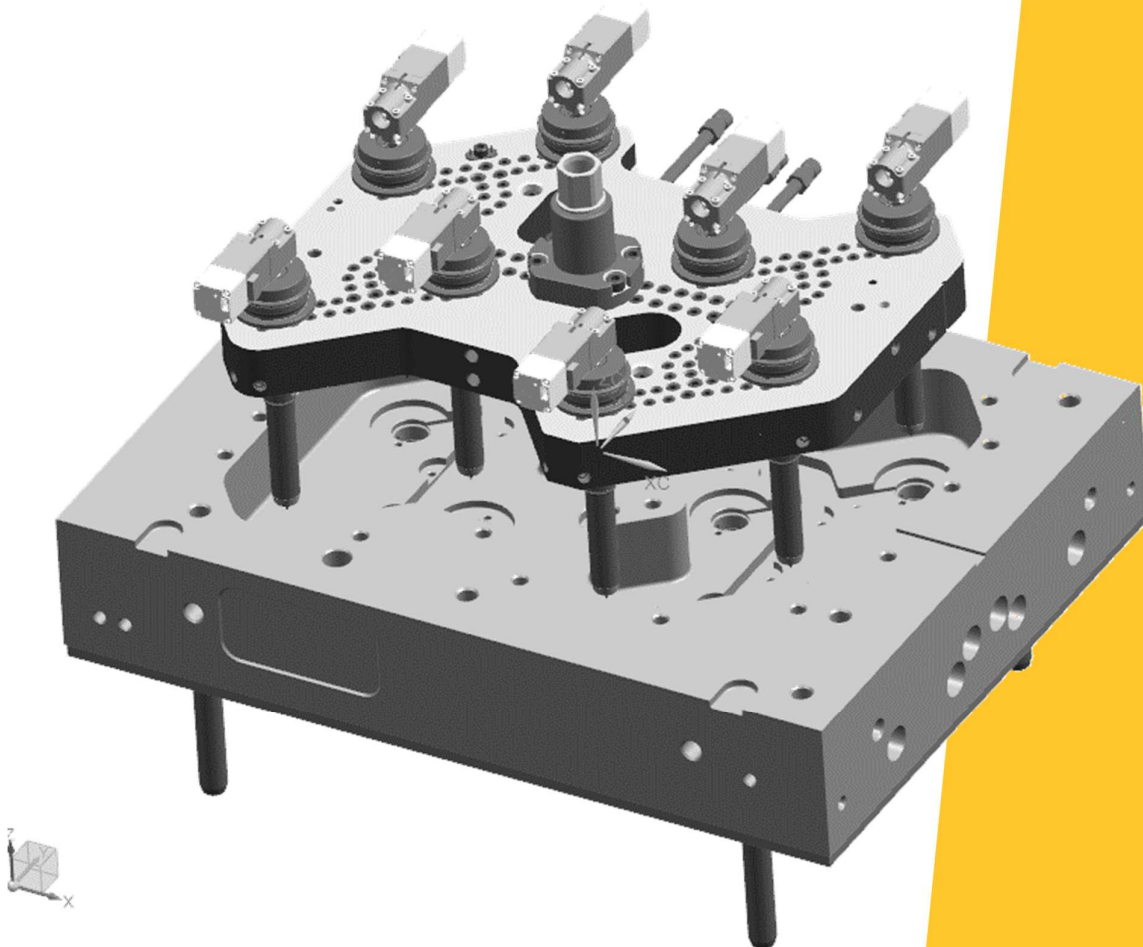
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# How to use this guide

This guide is designed to help a mold maker integrate a Husky Cold-Manifold System into their plate and mold design. The guide is divided into three main sections:

- 1.) Terminology used with Husky Cold-Manifold Systems
- 2.) General recommendations
- 3.) Plate design steps including the addition of:
  - Guide-Pins and Cavity-Plate-Interface-Taps
  - Nozzle Bore, Cooling, Manifold-Pocket
  - Plate Bolts
  - Plate Alignment Dowels
  - Wire Channels
  - Pry Slots
  - Lift-Taps and Platen-Mounting
  - Nameplate



# Design Package

The following design items are provided by Husky with all Cold-Manifold Systems

## 3D Models

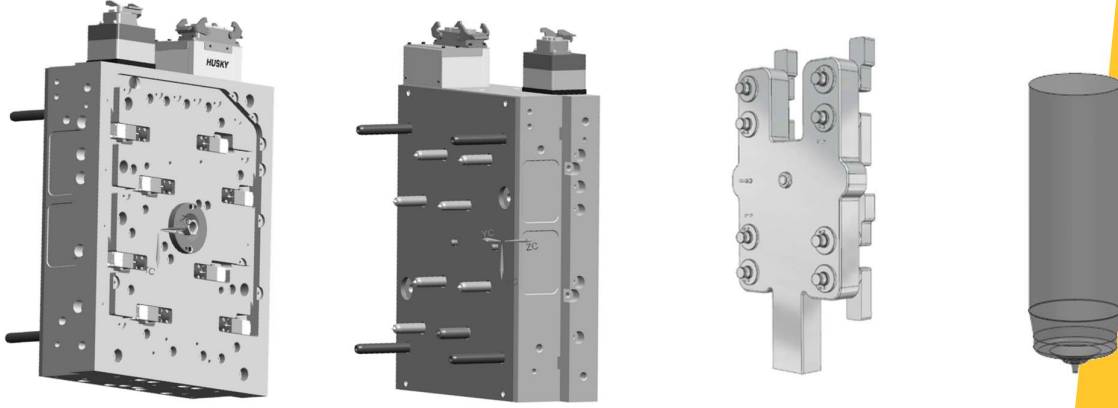
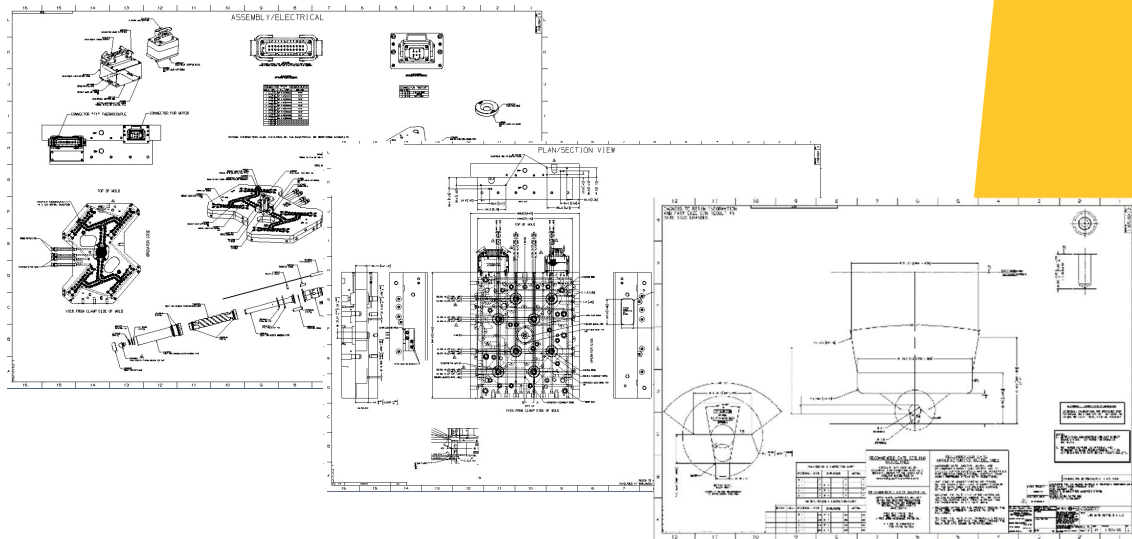


Plate Assembly

Manifold Pocket Inverse Gate Detail

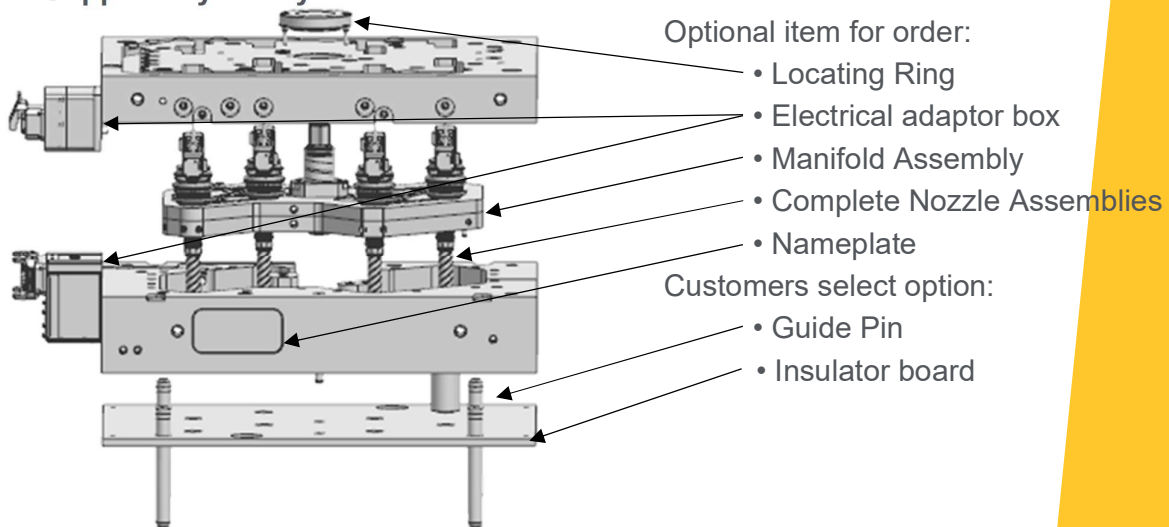
## 2D Print Package



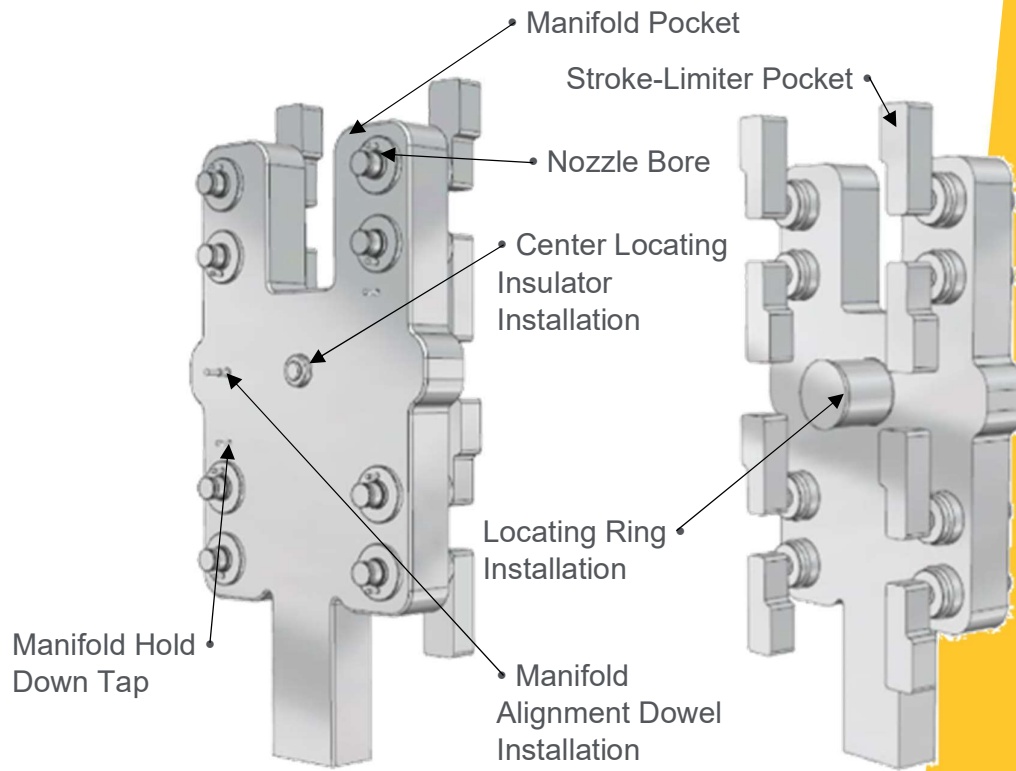
- Plate Installations
- Assembly Electrical
- Gate Detail

# Nomenclature

Supplied by Husky



## 3D Pocket Geometry



# General Recommendations

## Plate Steel

Stainless steel is the recommended material for plate manufacture.

Recommended plate material properties:

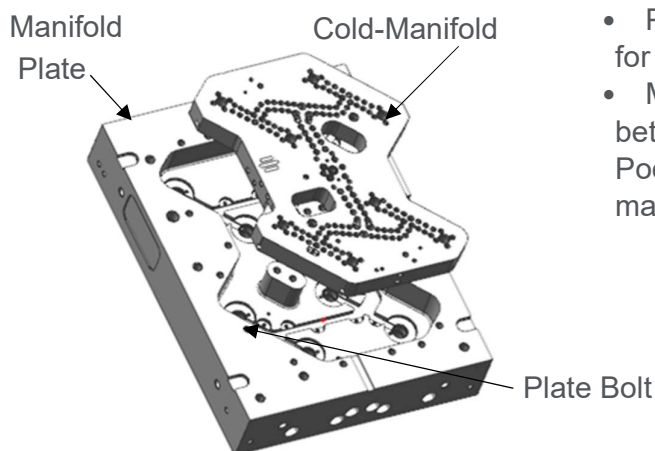
- Minimum Yield Strength 640 Mpa
- Hardness 24-36 HRC

Examples of suitable steel types are listed below:

Type	Hardness (HRC)
AISI 4140	30-35 HRC
AISI P20	30-35 HRC
AISI 420	30-35 HRC
DIN 1.2316	30-35 HRC

## Manifold Pocket

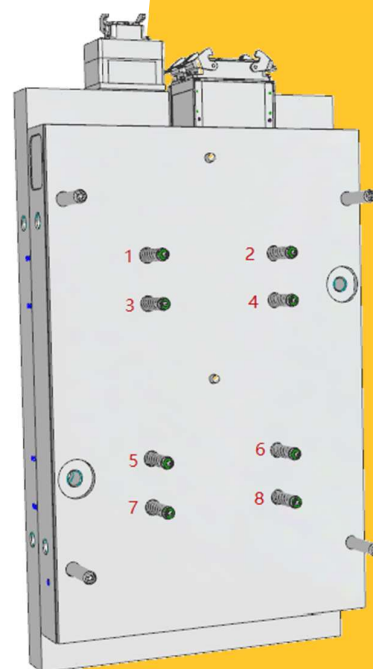
Husky recommends machining a pocket into the Manifold-Plate for the Cold Manifold. The 3D model provided by Husky includes all necessary geometry. A pocket profiled to match the Manifold:



- Provides superior structural support for the mold and cavities.
- Maintains a consistent air gap between the Manifold and Manifold-Pocket to thermally insulate the manifold from the surrounding plates

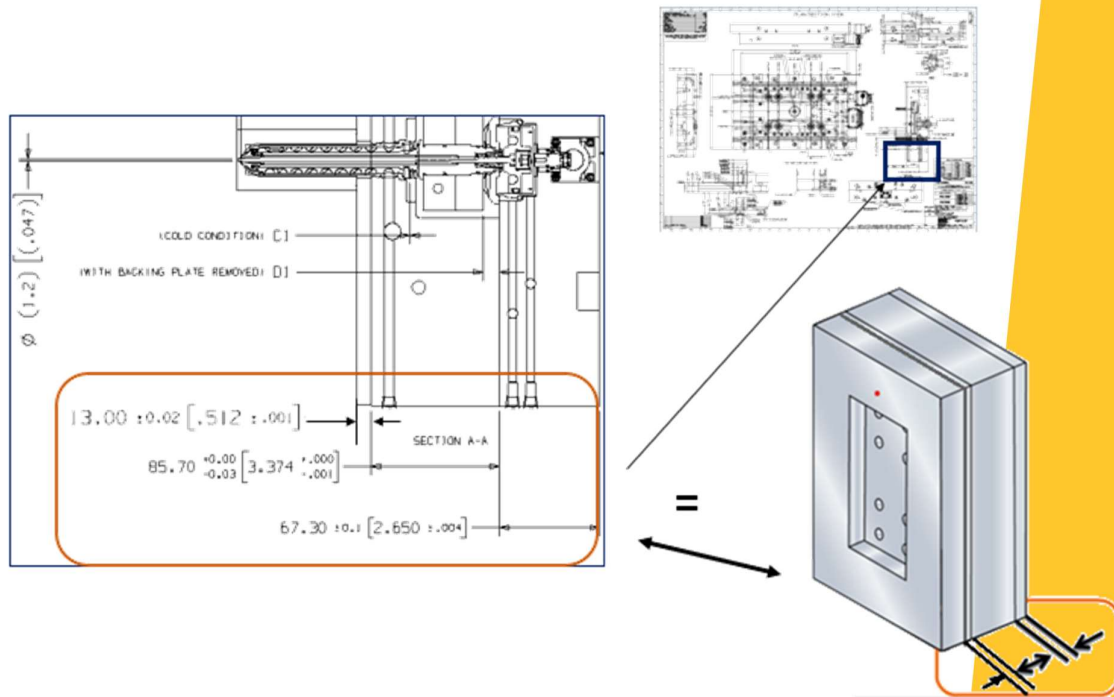
## Cavity Numbering

Clear nozzle identification is necessary to ensure the Cold-Deck properly interfaces with the mold and that the Nozzle-Thermocouples are mapped correctly.

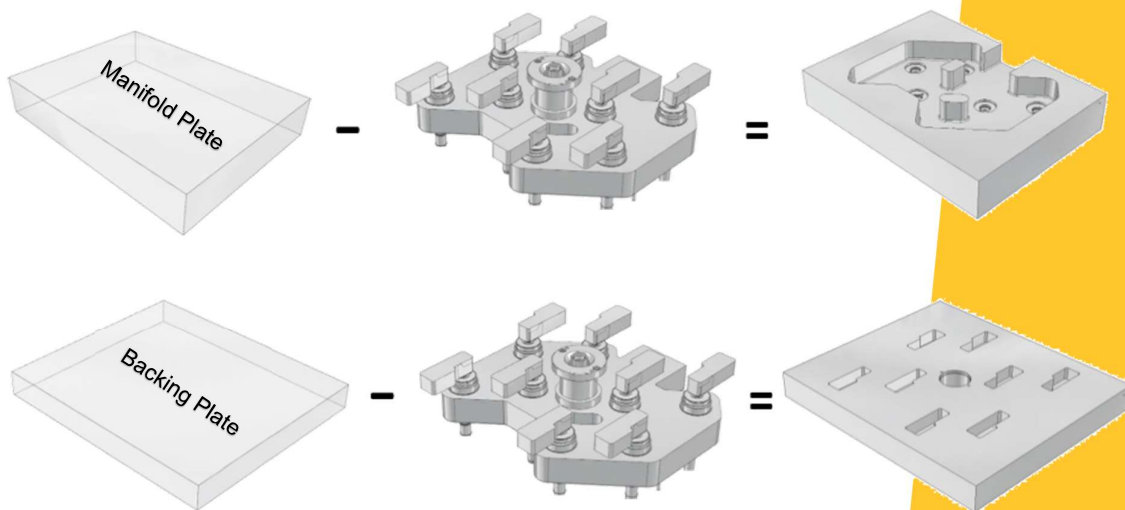


# Installing Manifold Pocket in Plates

## Step 1 – Adjust Plate Thicknesses



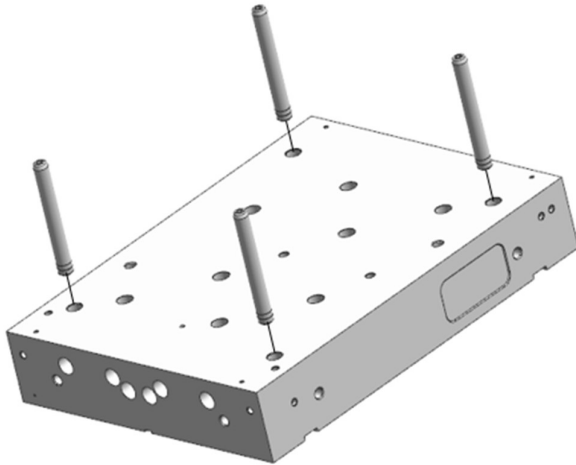
## Step 2 – Subtract Pocket Inverse from Plates





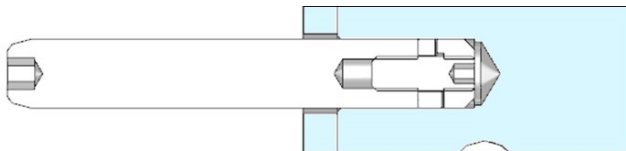
# Mold Interfaces

## Step 1 – Add Guide Pin Installations



Guide-Pins align the Cold-Deck Manifold-Plate to the Cavity-Plate and protect Nozzle-Tips during lifting and handling (if Cold Deck built “hot half” style). Husky recommends Guide-Pin protrusion greater than or equal to 5mm [0.19”] longer than the nozzle length in order to protect the tips.

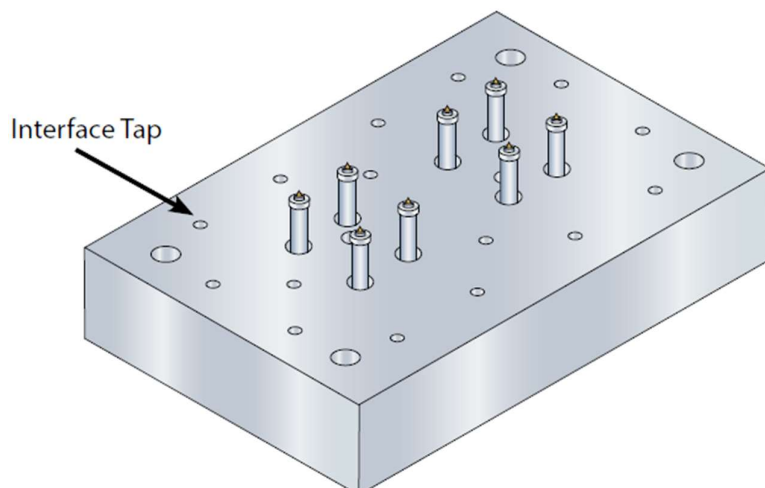
Guide-Pins should be removed after the system has been assembled. In case the Guide-Pins are not removed, additional clearance needs to be provided around the Guide-Pin.



Husky recommends clamp side alignment for Guide-Pins

## Step 2- Add Cavity Plate Interface Taps

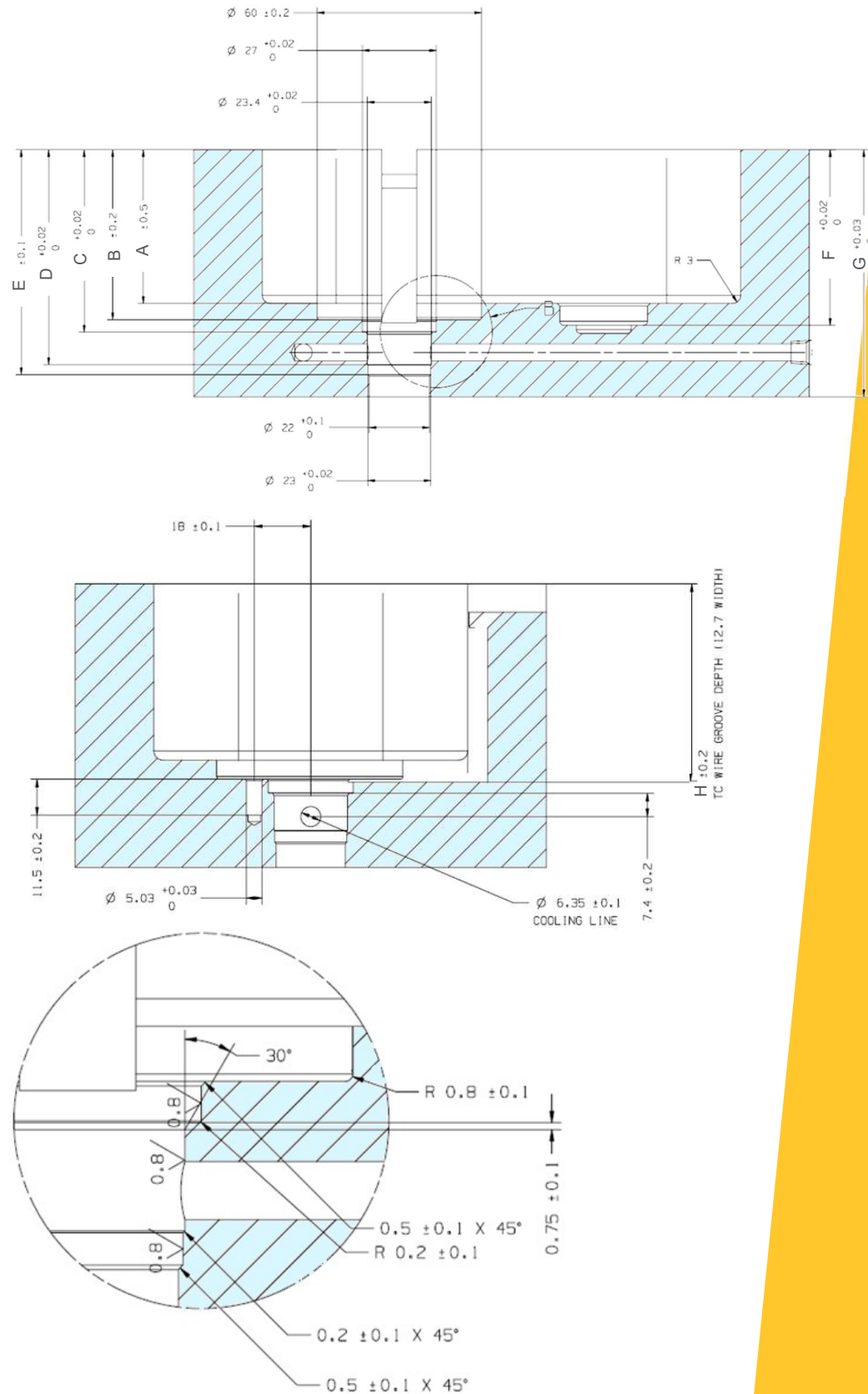
Interface taps secure the Cavity-Plate to the Cold-Deck-Manifold-Plate





# Nozzle bore, Cooling and Pocket Details

For A-B-C-D-E-F-G-H nominal value refer to 3D.



# Bolting

Bolting will keep plates flat to maintain sealing between components in production condition with the machine force applied.

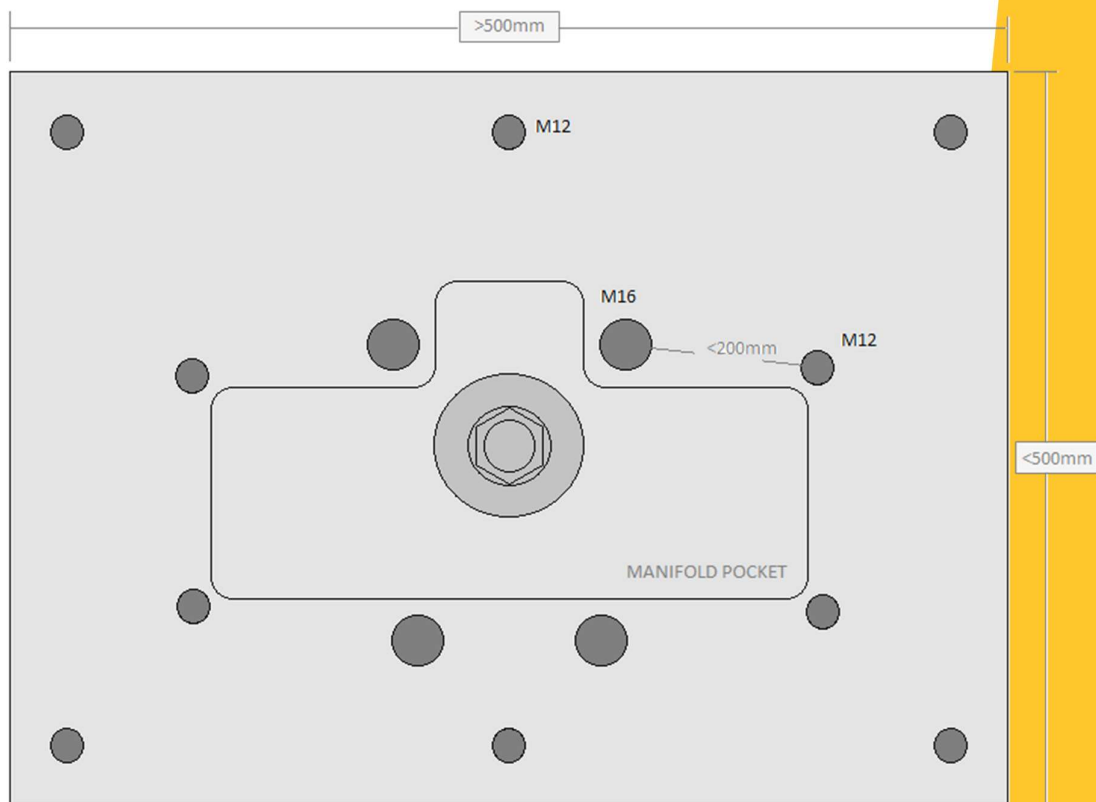
## Perimeter bolting:

Place one M12 (1/2"-13) bolt per corner and add bolt in between if plate size is longer than 500mm.

## Pocket Bolting:

Place 4x M16 bolts around sprue bushing to handle carriage force and add M12 along the pocket to fill larger than 200mm gaps with no bolts.

## Example:



# Cold-Deck Plate Alignment

The alignment dowel provides precise alignment between the Manifold-Plate and the Backing-Plate. In doing so, the following are maintained:

- Clearance fit between the sprue bushing and locating ring.
- Alignment between the sprue bushing and the machine nozzle (via the locating ring).
- In Valve Gate systems, alignment between valve gate piston cylinders and their installation in the Backing-Plate.

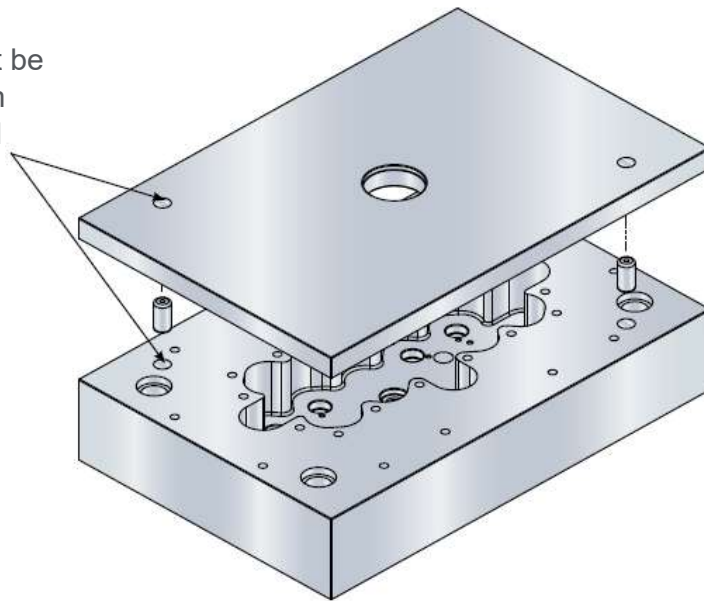
## Step 1 – Add dowel installation to Manifold-Plate

Husky recommends press fit installation in Manifold-Plate

## Step 2- Add dowel installation to Backing-Plate

Husky recommends locational fit installation in Backing-Plate

Alignment must be within 0.010mm [0.0005in] Total Indicator

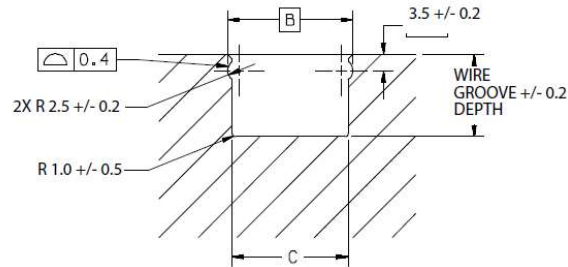


# Wiring

## Step 5a - Add Wire Clip Installations (if using Wire Clamps see Step 5b)

Note: Wire clips are available from Husky

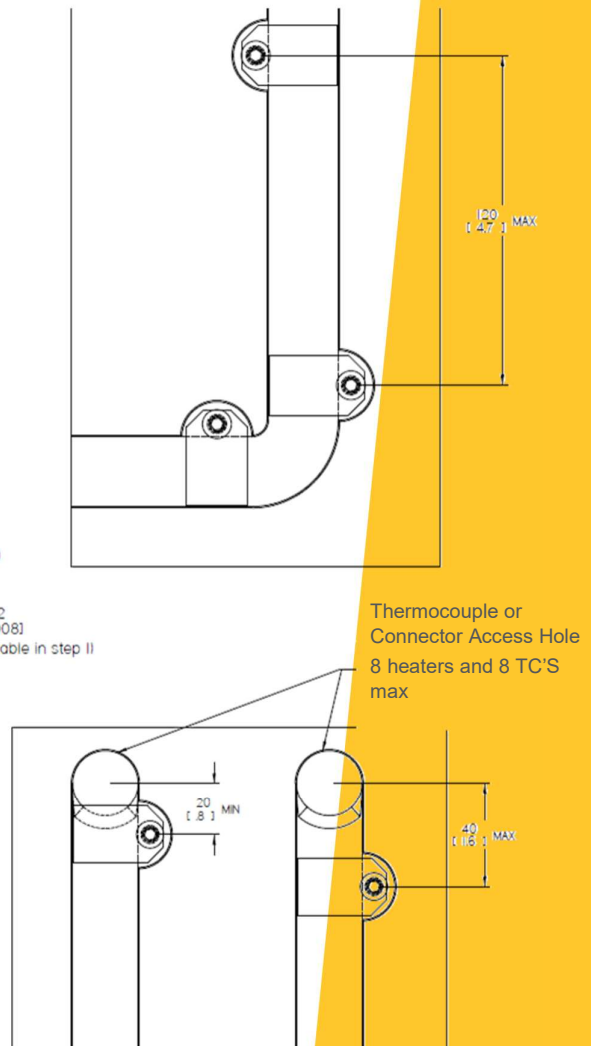
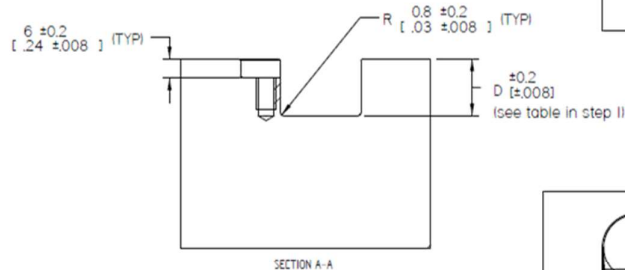
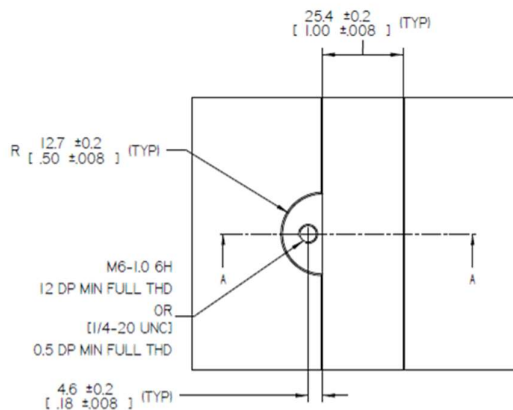
B	C +/-0.2
14.7	12.7
21.1	19.05
27.4	25.4
40.1	38.1



## Step 5b - Add Wire Clamp Installations (if using Wire Clips see Step 5a)

Clamps should be positioned as close to the nozzle as possible and at every bend and/or interval of 120mm [4.7"]

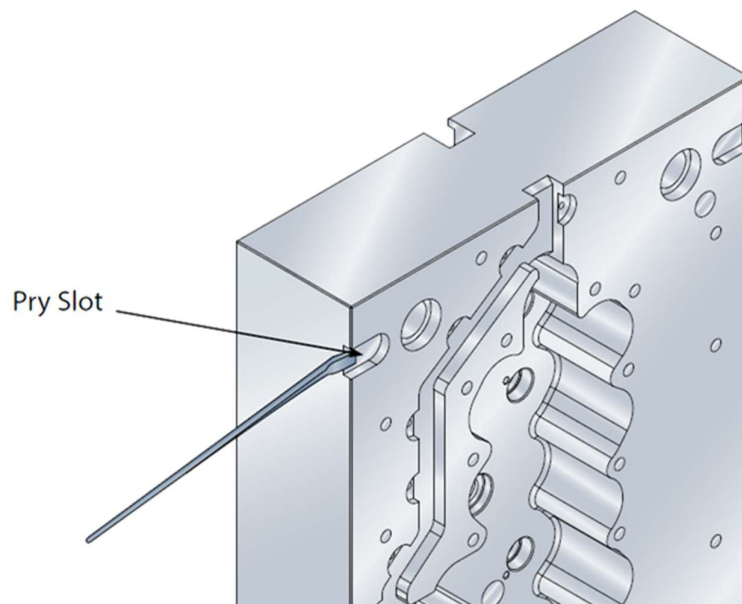
Wire clamps for 25.4mm [1.0"] wire grooves are available for Husky Cold-Manifold-Systems



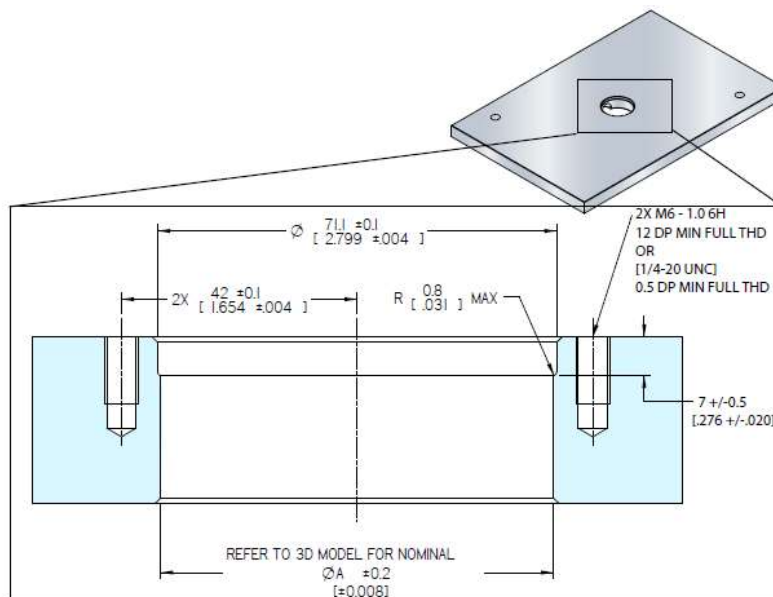
# Pry Slots

## Step 1 – Add Pry Slots

Pry slots allow easier separation of the plates. Position pry slots between all plate interfaces, near plate alignment features (Guide-Pins, Alignment-Dowels)



# Locating Ring Installation



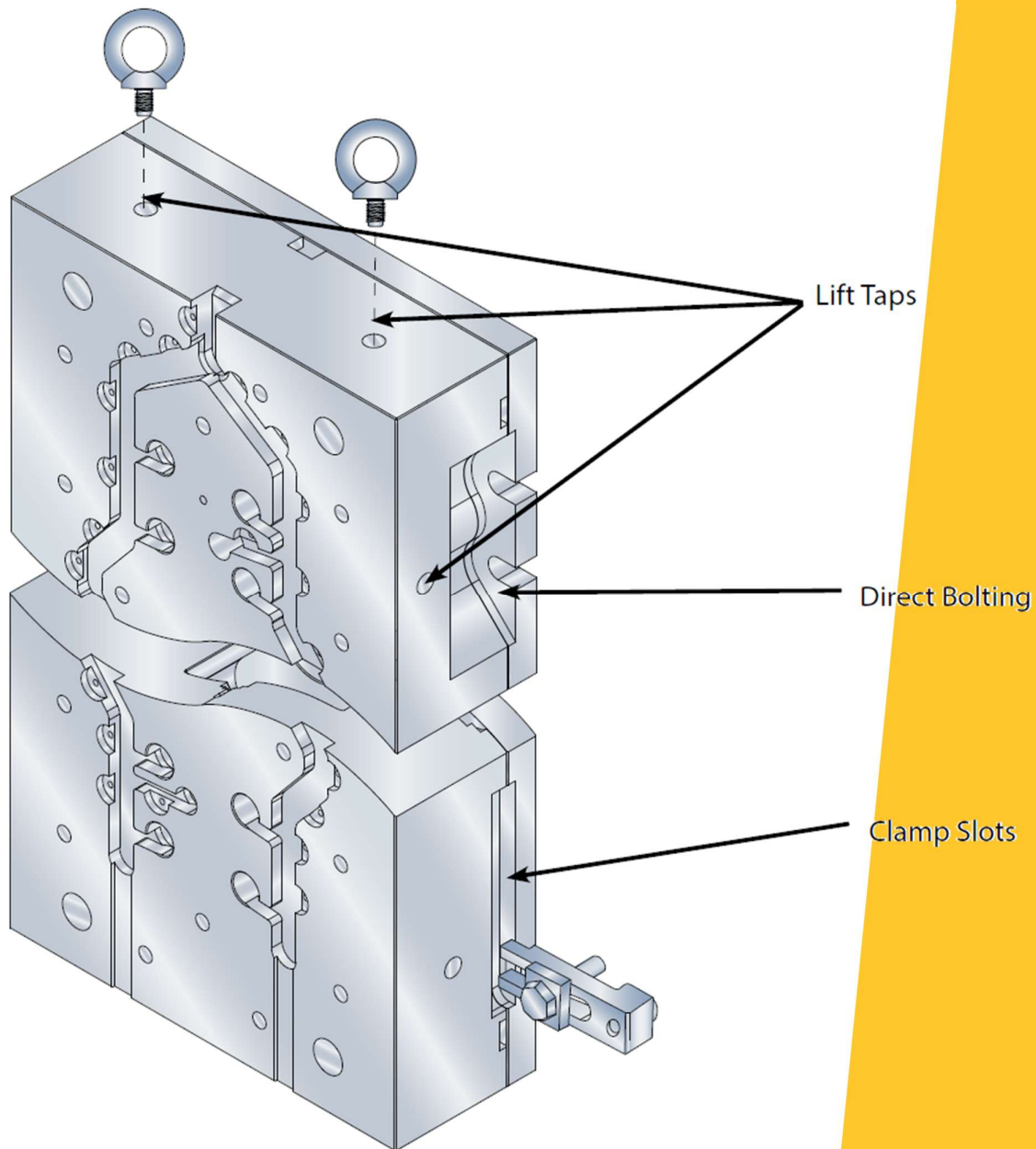
# Lift Taps and Platen Mounting

## Step 1 – Add Lift Taps

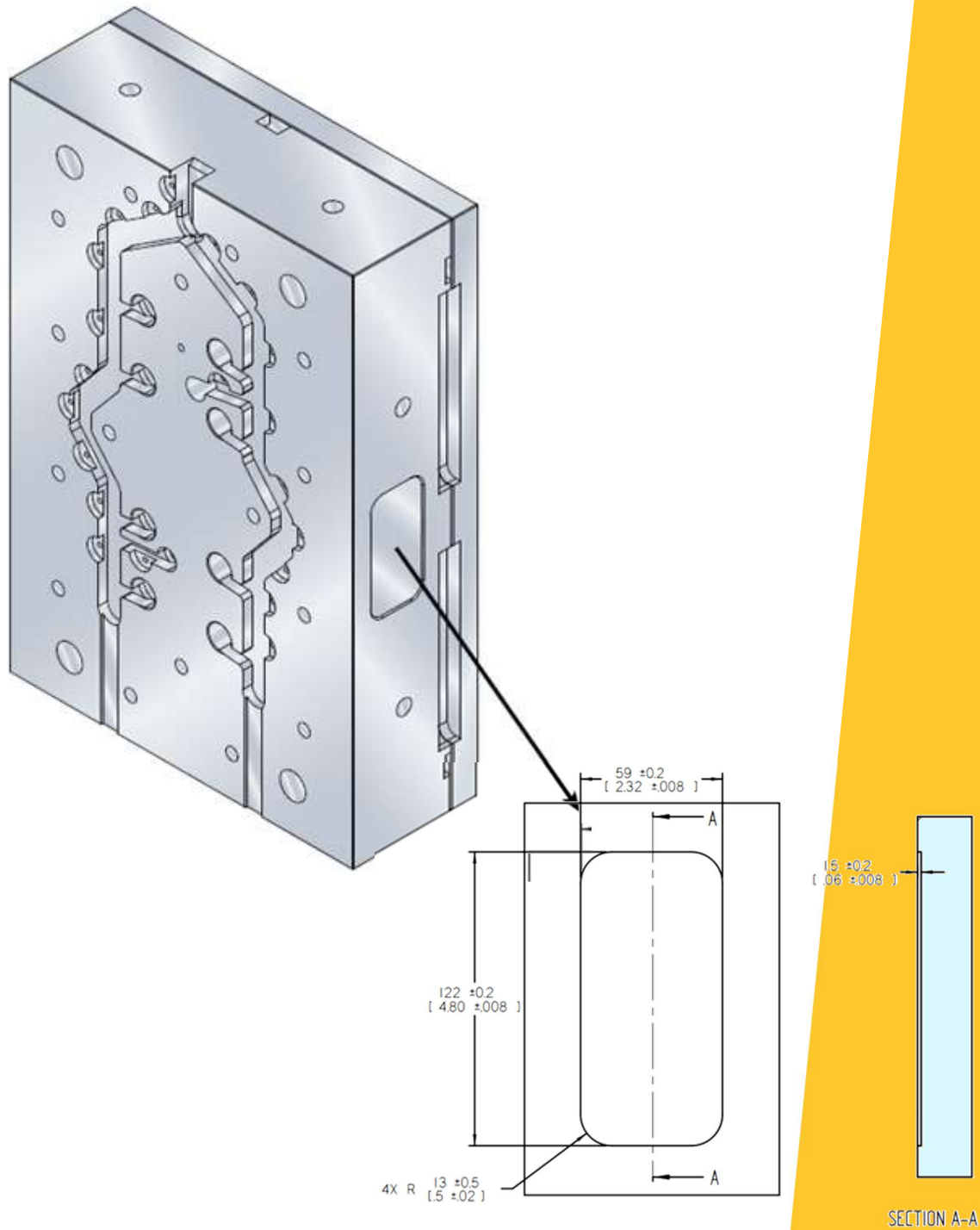
Add sufficient lift taps for handling individual plates as well as the assembly.

## Step 2 – Add Platen Mounting

Platen mounting can either be clamp slots or direct bolting through an overhanging Backing-Plate or cutouts.



# Nameplate Installation

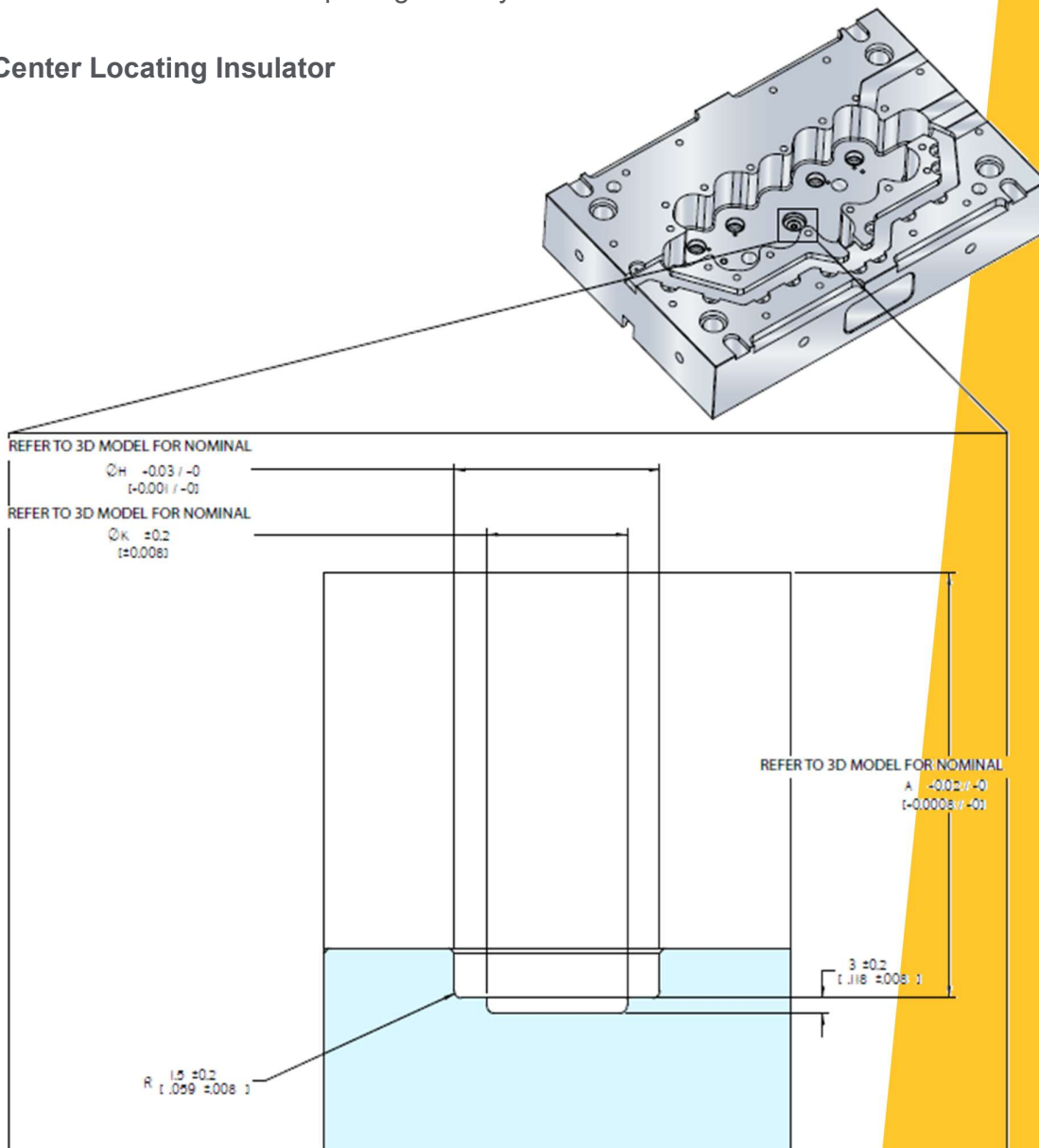




# Tolerance Reference

Refer to 3D model for complete geometry

## Center Locating Insulator



**Manifold Alignment Dowel**

8  $\begin{smallmatrix} +0.015 \\ 0 \end{smallmatrix}$   
 $\begin{bmatrix} .315 \\ +.001 \\ -.000 \end{bmatrix}$

REFER TO 3D MODEL FOR NOMINAL  
 A  $\pm 0.2$   
 $\begin{bmatrix} \pm 0.008 \end{bmatrix}$

6.8  $\pm 0.2$   
 $\begin{bmatrix} .268 \\ \pm 0.008 \end{bmatrix}$

**Manifold Hold Down Tap**

M6 x 1.0 6H  
 $\begin{bmatrix} 1/4-20 \text{ UNC } 2B \end{bmatrix}$

LOCATION (X AND Y)  $\pm 0.1$   $\begin{bmatrix} \pm 0.004 \end{bmatrix}$

**Manifold Thermocouple Thru Hole**

$\varnothing 22$   $\begin{bmatrix} 0.87 \end{bmatrix}$  THRU MIN  
 $\varnothing 25.4$   $\begin{bmatrix} 1.00 \end{bmatrix}$  THRU PREFERRED

**Backup Pad Installation**

Only required on select designs – refer to 3D model sent with project information to determine if required

1.5  
 R  $\begin{bmatrix} .059 \end{bmatrix}$  MAX

1  $\pm 0.2$   
 $\begin{bmatrix} .039 \\ \pm 0.008 \end{bmatrix}$

REFER TO 3D MODEL FOR NOMINAL  
 C  $\begin{bmatrix} +0.6 \\ +0.02 \end{bmatrix}$

REFER TO 3D MODEL FOR NOMINAL  
 B  $\begin{bmatrix} -0.03 \\ -0.01 \end{bmatrix}$

REFER TO 3D MODEL FOR NOMINAL  
 $\varnothing A$   $\pm 0.2$

12.7  $\pm 0.2$   
 $\begin{bmatrix} .500 \\ \pm 0.008 \end{bmatrix}$





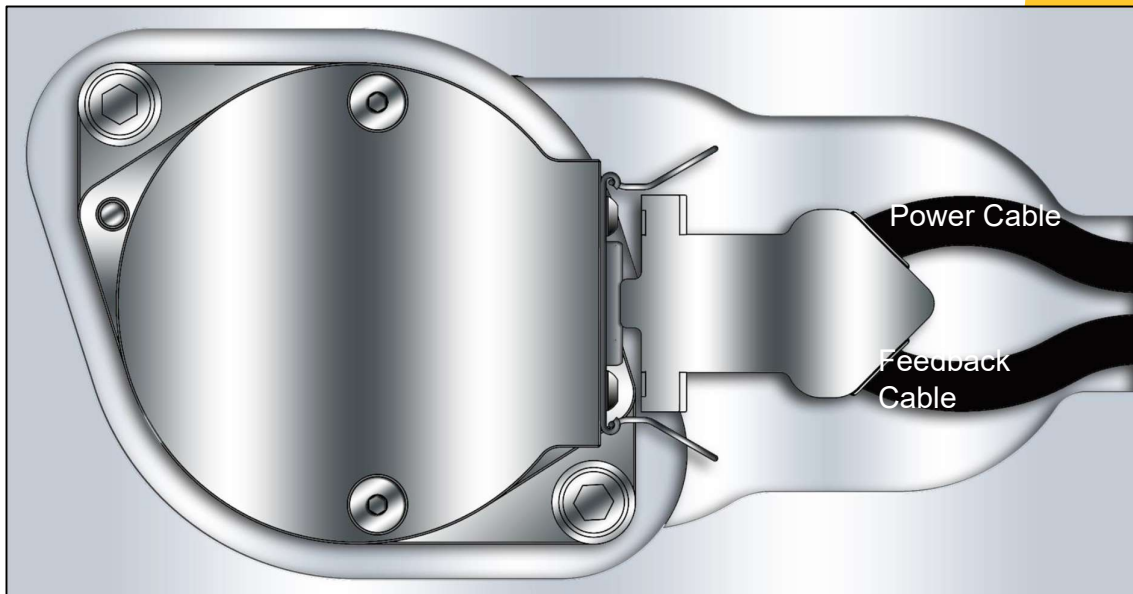
# ISVG Specific Requirements

## Wire Grooves

Each actuator has two cables exiting from it, one for power and one for feedback. These cables are cut to length and terminate in the electrical adapter box.

Power cable: 4.9mm OD nominal – Area 18.8mm<sup>2</sup>

Feedback cable: 6.5mm OD nominal – Area 33.2mm<sup>2</sup>



## Wire groove depth:

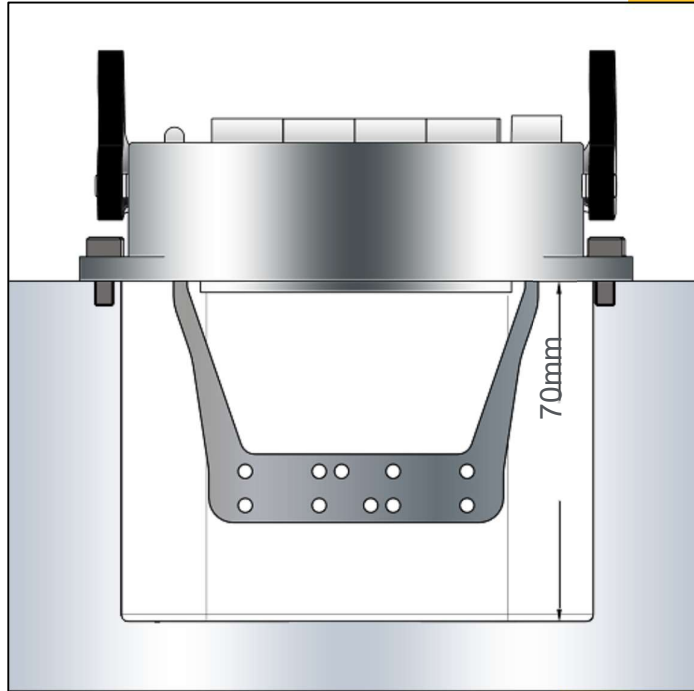
Drop Count*	Recommended Groove Depth	Drop Count*	Recommended Groove Depth
1	9	5	33
2	15	6	40
3	21	7	46
4	27	8	52
*Drop Count: number of drops that share a single wire groove			

### Electrical connector & box requirements:

It is recommended that the actuator power and feedback cables are routed to the backing plate adapter box, while the manifold, sprue, nozzle heaters and T/C's are routed to the manifold plate adapter box.

The power connector for the ISVG actuators utilizes a ground bar for attaching ground wires from the actuators. This ground bar protrudes from the underside of the connector so care must be taken when designing connector layout. If the connectors are directly mounted on the backing plate, a minimum pocket depth of 70mm is recommended to accommodate the ground bar and associated wiring.

If an electrical adapter plate is used for the actuator connectors, it must be at least 75mm (or 3") thick. Thinner adapter plates should be avoided as they do not provide adequate clearance between the ground bar and backing plate.



# Questions?

Contact your Husky Project Engineer or the general inquiry numbers below

Americas Vermont - Tel. (802) 859 8000

Brazil São Paulo - Tel. (55) 11 4589 7200

Europe Luxembourg - Tel. (352) 52 11 51

Asia China – Tel. (86) 21 3850 8000