

Mold size reduction obtained if  
using CUMSA Double Rack System



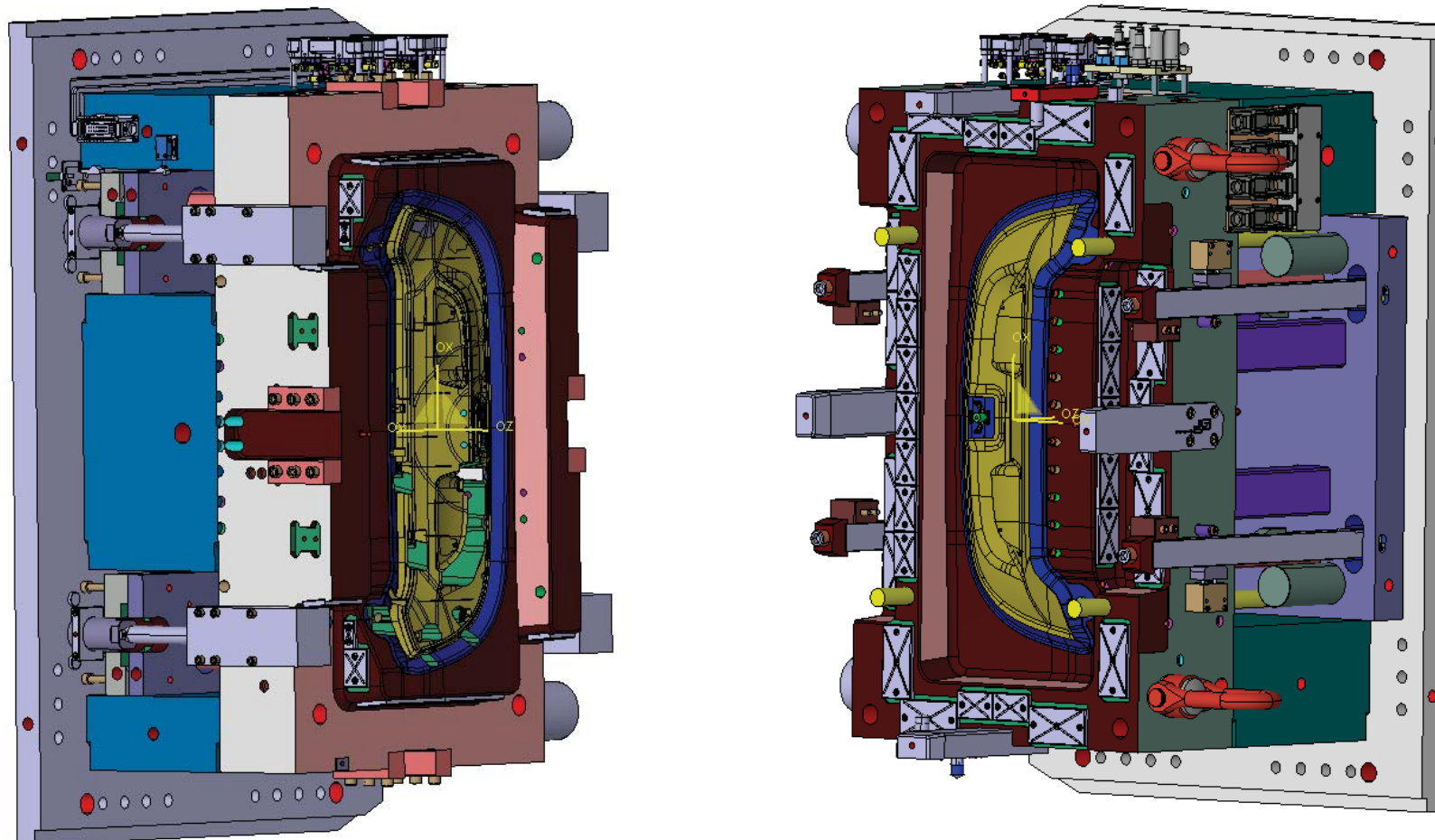
Double Rack Lifter

by **CUMSA**

# Case Study: Double Rack System

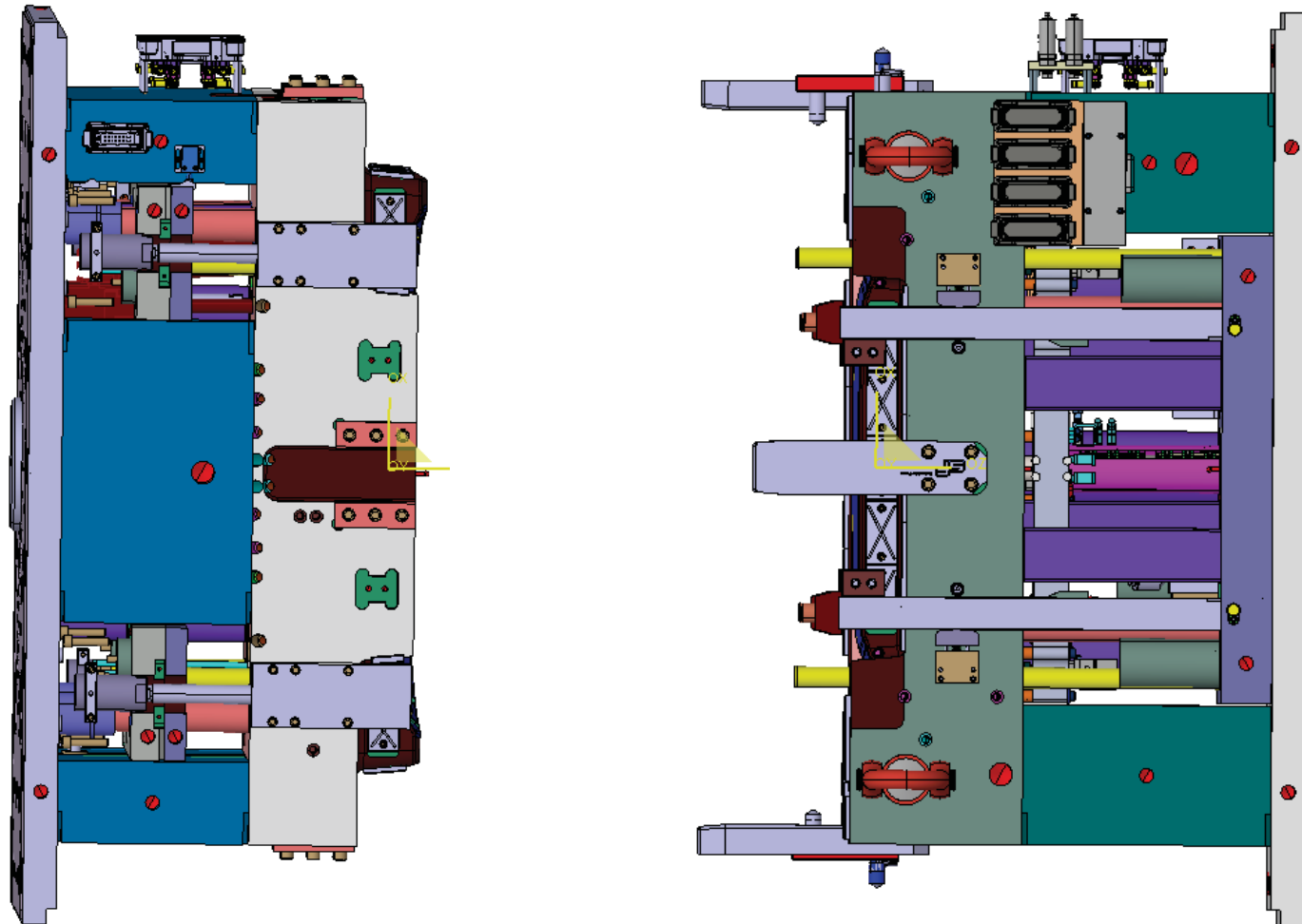
We will compare an existing mold, manufactured with traditional lifters, with the same mould if it has been manufactured using CUMSA Double Rack System.

The mold selected for this study is 1482mm height.



# Case Study: Double Rack System

To produce the part, we need an extended version of injection machine, due to mold dimensions.

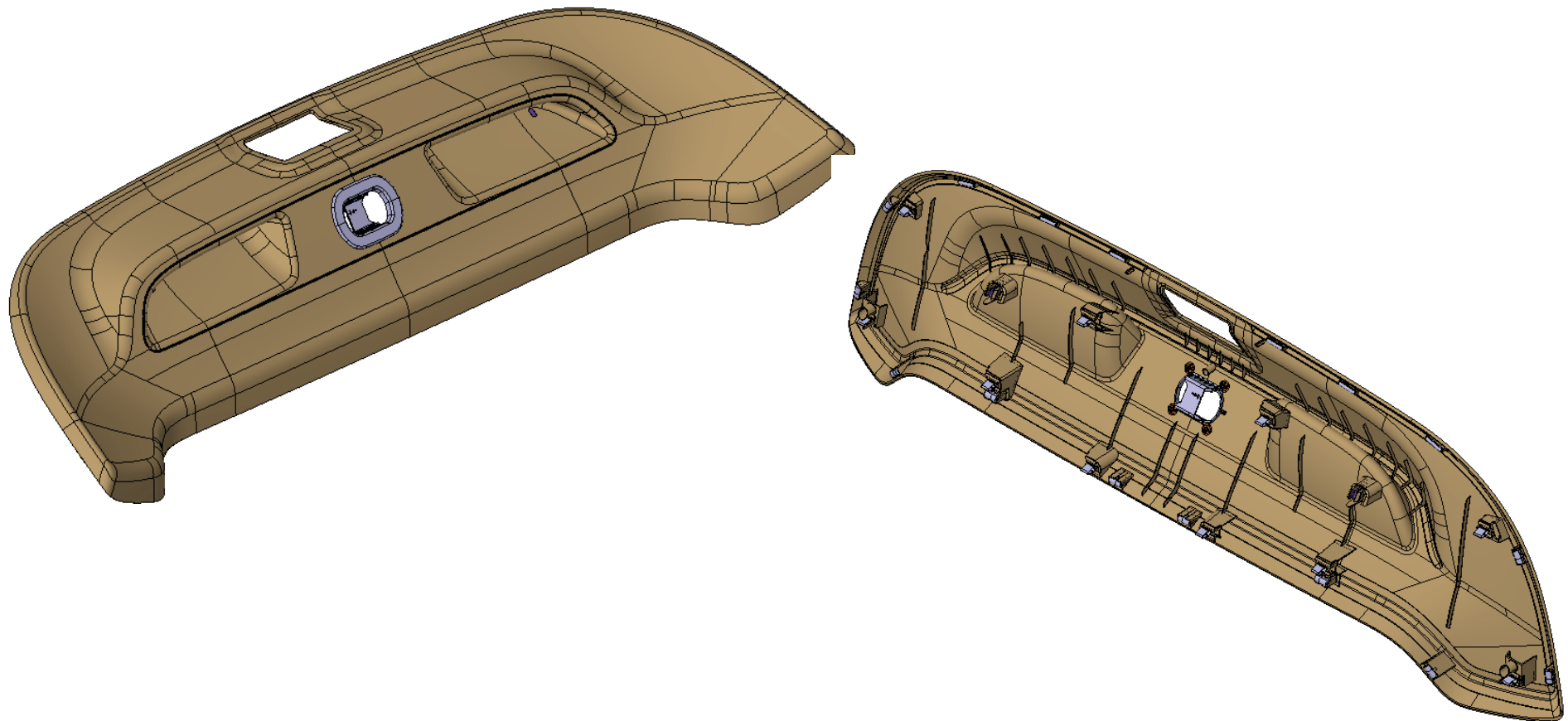


# Case Study: Double Rack System



The challenge is to make a smaller, but still reliable, well performing, great quality mold for this part using Cumsa Double Rack system.

Would that be more expensive? Let's take a look at the numbers!



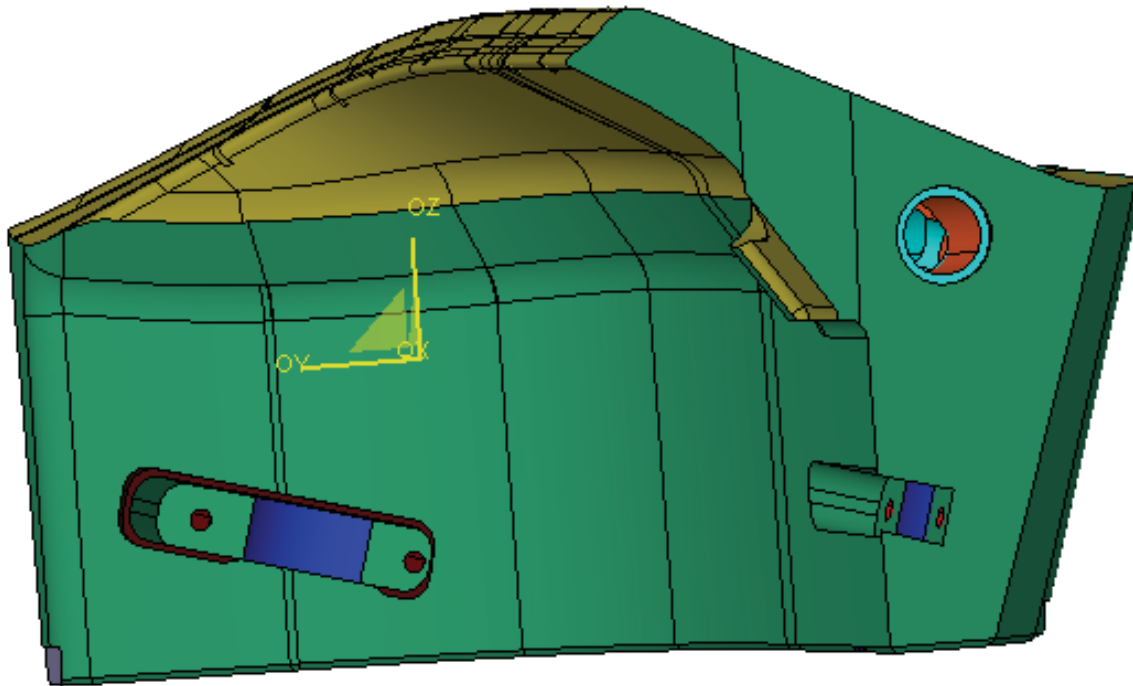
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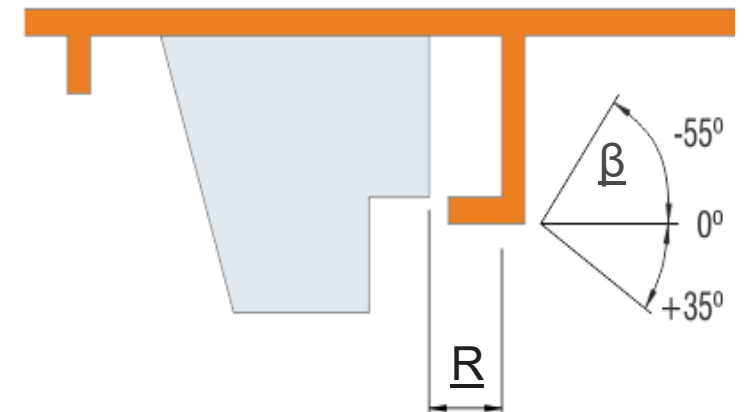
Core side:



Parameters of the  
deepest negative:

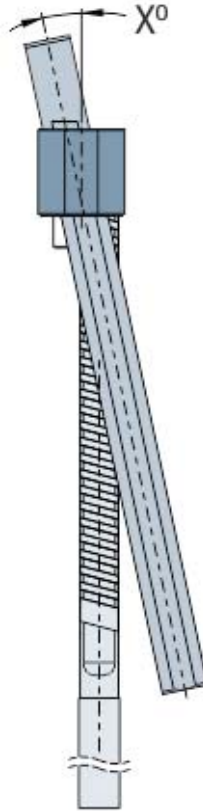
$R = 36\text{mm}$

$\beta = -29^\circ$



# Case Study: Double Rack System

DR Search application on CUMSA webpage, will tell us what DR we need for this undercut. Stating the required ejection stroke:

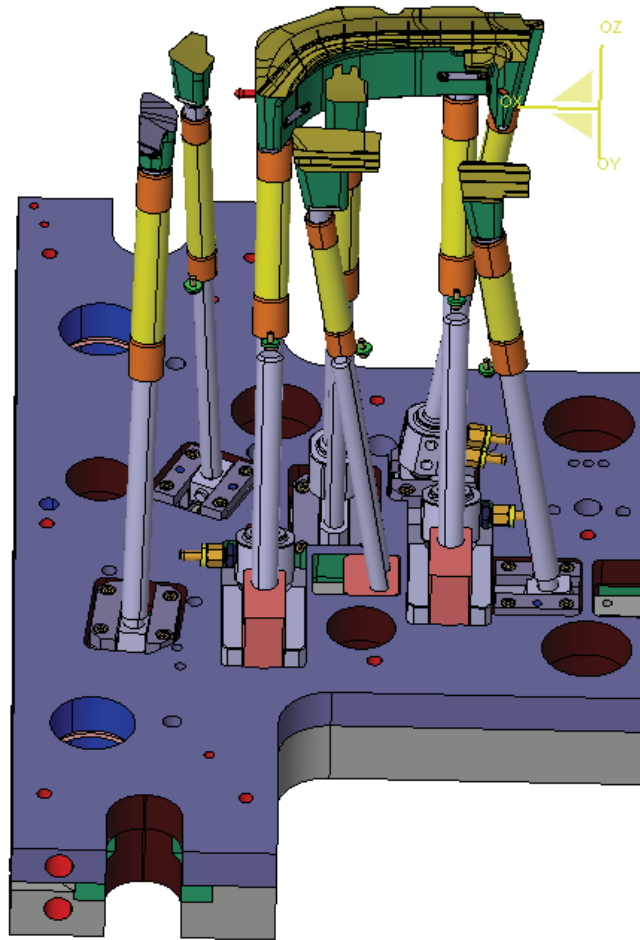


SHAFT ANGLE (X°)	REQUIRED EJECTION STROKE	STROKE 100 MM.	STROKE 125 MM.
8	-	-	-
12	-	-	-
16	-	-	-
20	119	-	DR22125L-20 (-29°) DR28125L-20 (-29°) DR34125L-20 (-29°) DR40125L-20 (-29°) DR46125L-20 (-29°)

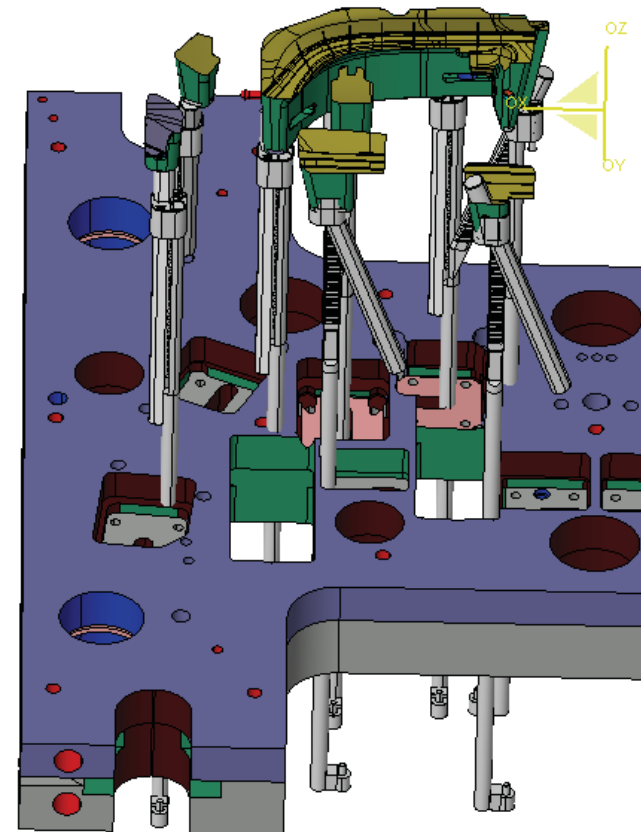
We can replace every angled lifter in the mold and achieve much smaller mold size.

# Case Study: Double Rack System

Traditional System:

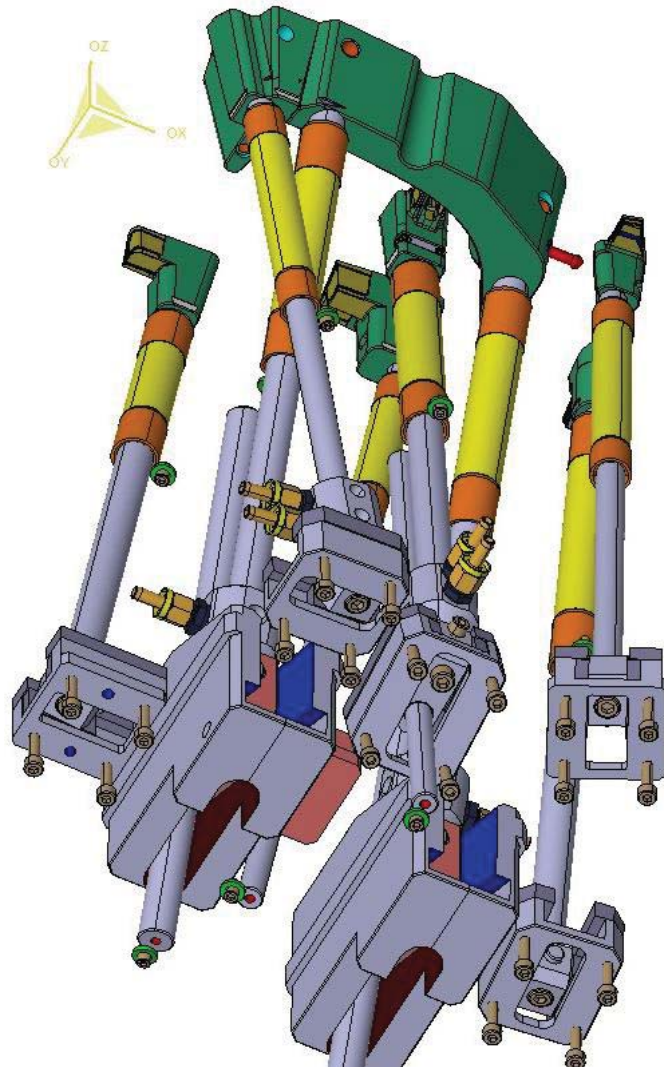


Double Rack System:

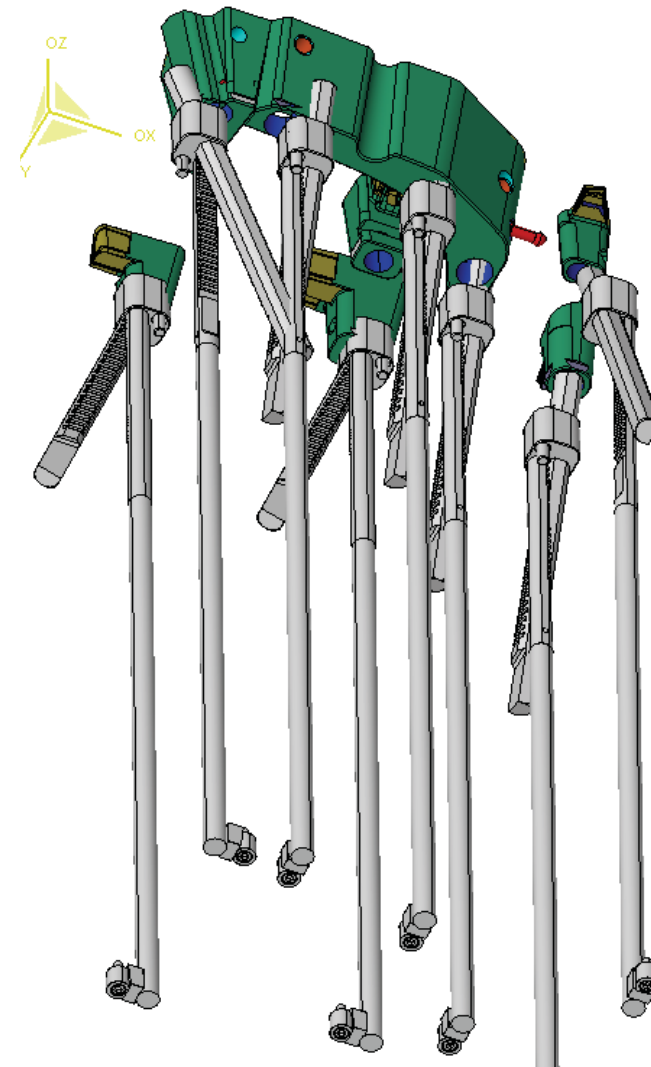


# Case Study: Double Rack System

Traditional System:



Double Rack System:





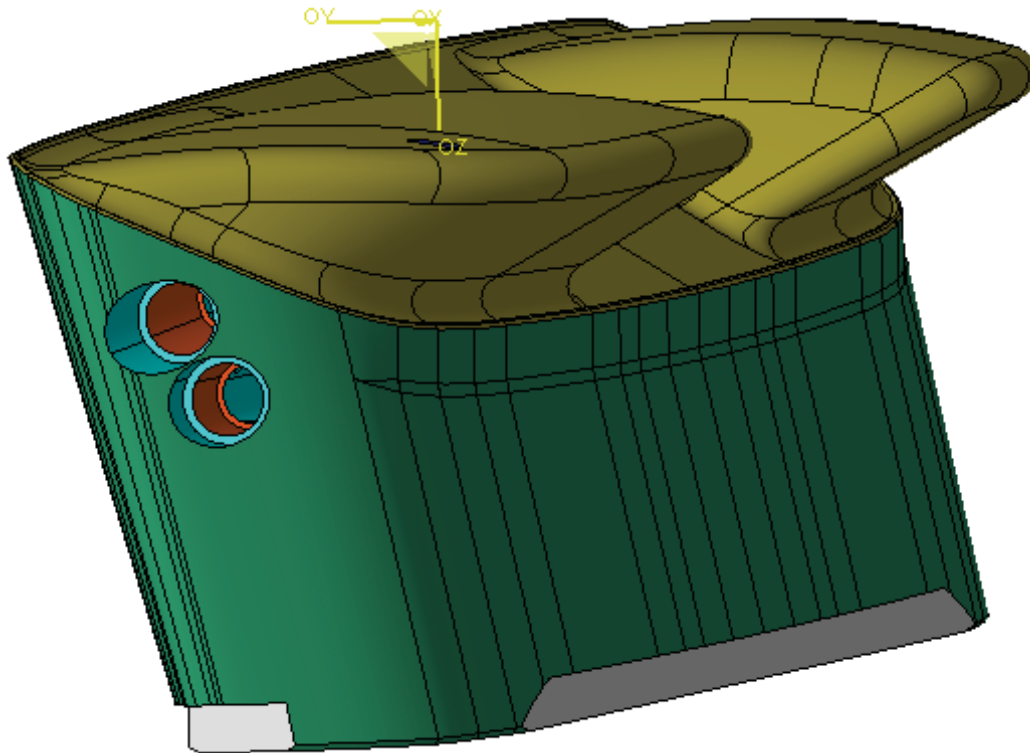
# Case Study: Double Rack System

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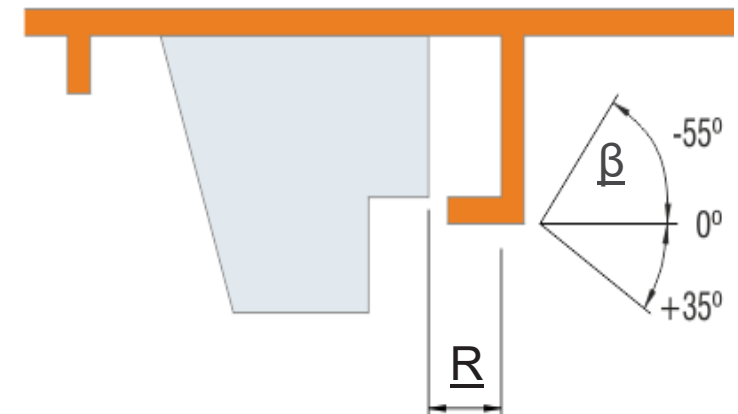
Cavity side:



Parameters of the  
deepest negative:

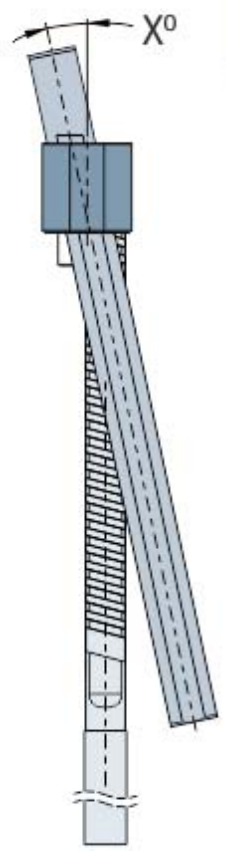
$$R = 32\text{mm}$$

$$\beta = -25^\circ$$



# Case Study: Double Rack System

DR Search application on CUMSA webpage, will tell us what DR we need for this undercut. Stating the required ejection stroke:



SHAFT ANGLE (X°)	REQUIRED EJECTION STROKE	STROKE 100 MM.	STROKE 125 MM.
8	-	-	-
12	-	-	-
16	-	-	-
20	103	-	DR22125L-20 (-25°) DR28125L-20 (-25°) DR34125L-20 (-25°) DR40125L-20 (-25°) DR46125L-20 (-25°)

And we proceed again to replace the angular lifters on the fixed side of the mold.

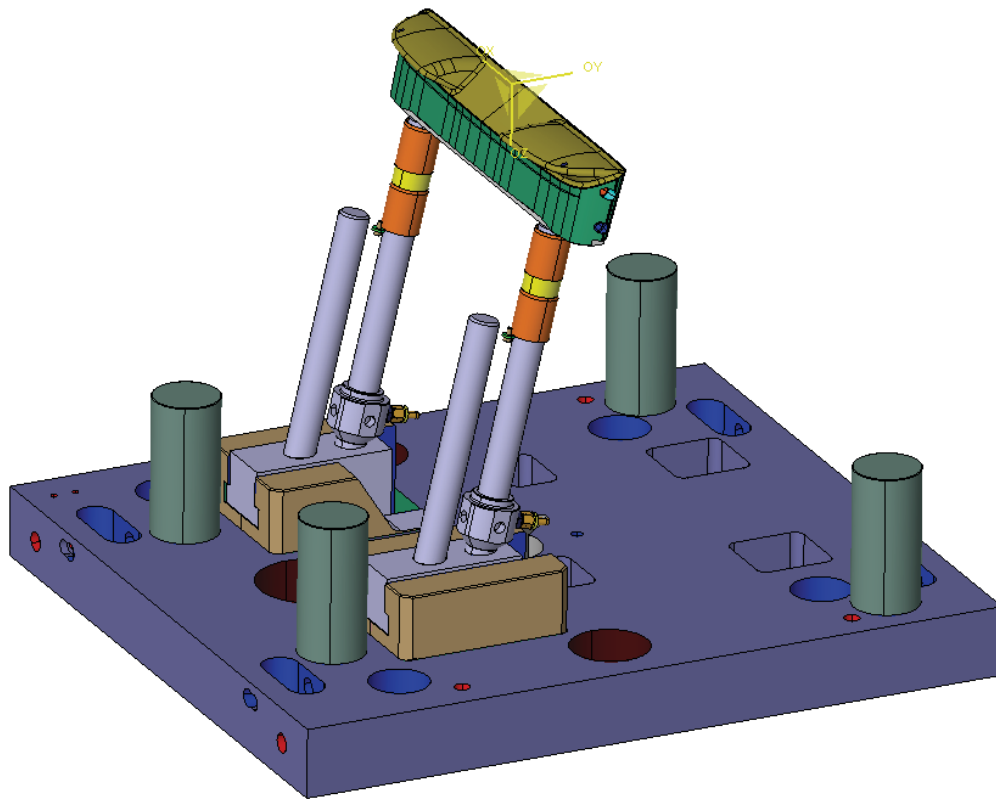
# Case Study: Double Rack System

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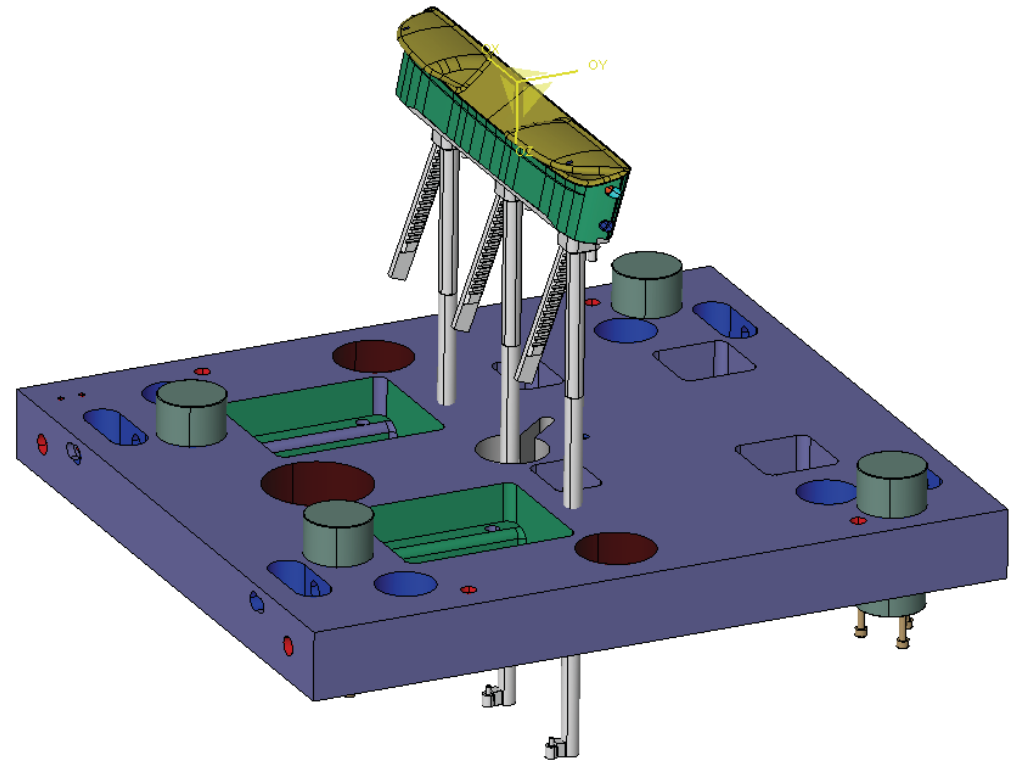
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Traditional System:



Double Rack System:



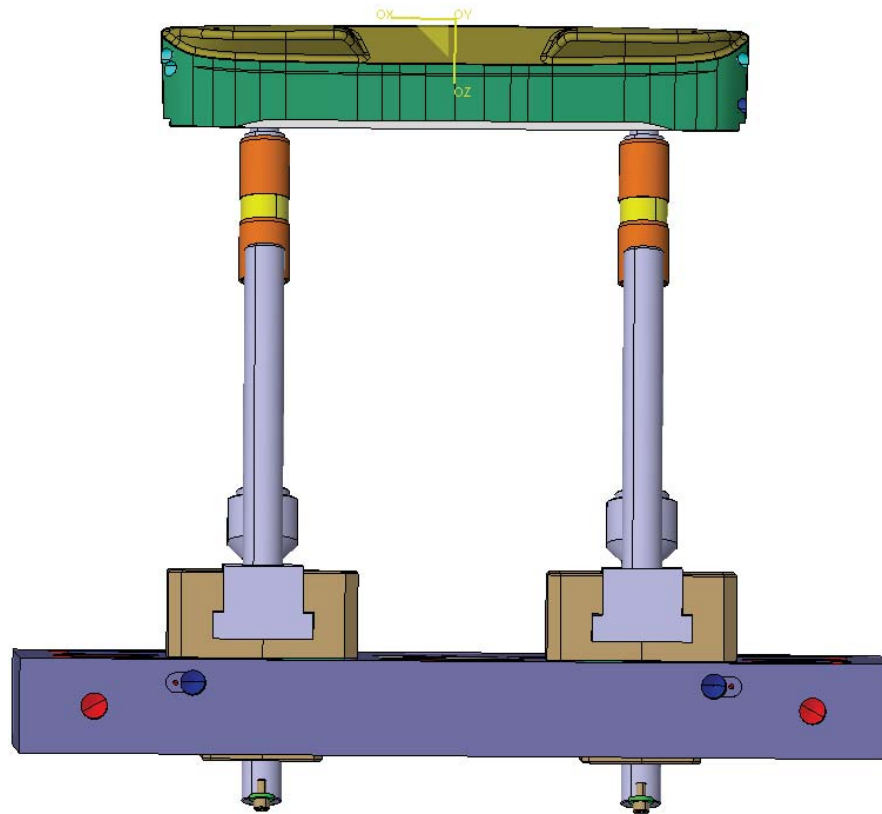
# Case Study: Double Rack System

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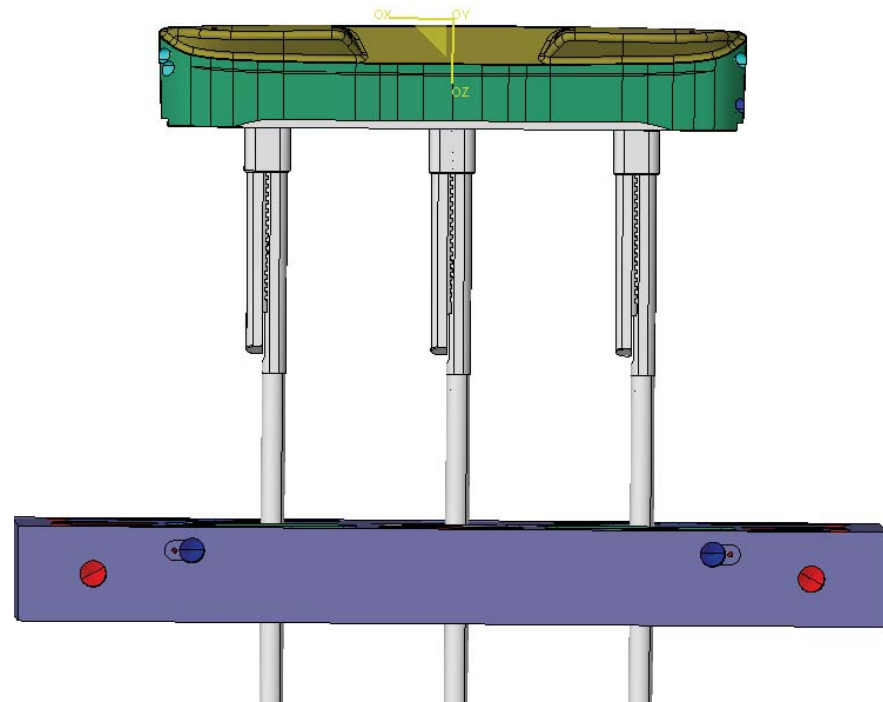
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Traditional System:



Double Rack System:



# Case Study: Double Rack System



Let's compare the dimension savings obtained:

	Cavity Half			Core Half		
	Traditional	DoubleRack	Savings	Traditional	DoubleRack	Savings
<i>Ejection stroke [mm]</i>	180	103	77	180	119	61
<i>Stopper [mm]</i>	190	135	55	68	10	58
<i>Plate Thickness [mm]</i>	95	56	39	103	53	50
<b>Total</b>	<b>465</b>	<b>294</b>	<b>171</b>	<b>351</b>	<b>182</b>	<b>169</b>

The tool could be **over 340mm smaller** in height if Cumsa DR is used. It is **nearly 1/4 of the current size** of the mold. Additional savings in space and size would be found during design of the tool.

Customer may not need expensive extended version of injection machine as they have now.

However it's not just about size of the mold, but about the cost and quality of the tool.

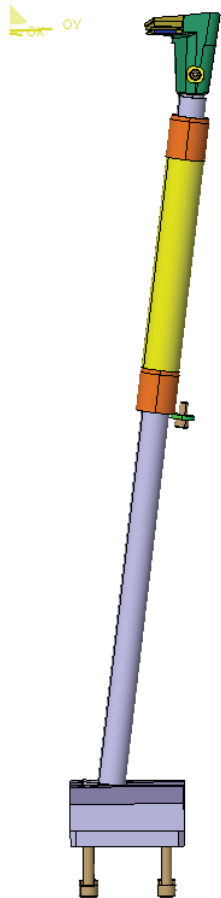
How much does it really cost? – The small one:





## Traditional System:

Sankyo base KOCU-S-20

Cost: 110€

Lots of difficult in machining and finishing



-  Difficult and time consuming alignment and finishing.
-  Accurate angled hole to guide the lifter in forming plate.
-  Long angled shaft must be perfectly aligned between the forming plate and ejection plate.
-  Very accurate milling in ejection plates. Need of thicker and stiffer ejection plates.

## Double Rack System:

CUMSA Double Rack Lifter - DR22125L-12

Cost: 438€

Simple vertical machining and adjusting.  
Few ejector plates machining.

Everything is led straight. ★

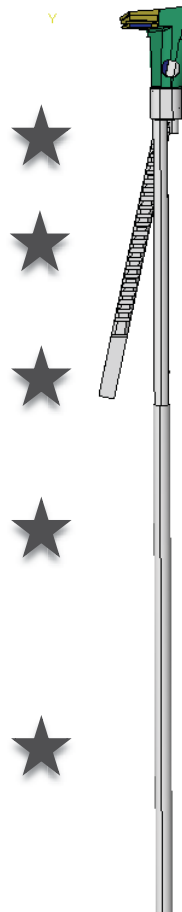
Easy to align and finish.

Angled hole is just a free pocket. ★

No need of costly five-axle accurate machining. ★

Shorter ejection stroke. ★

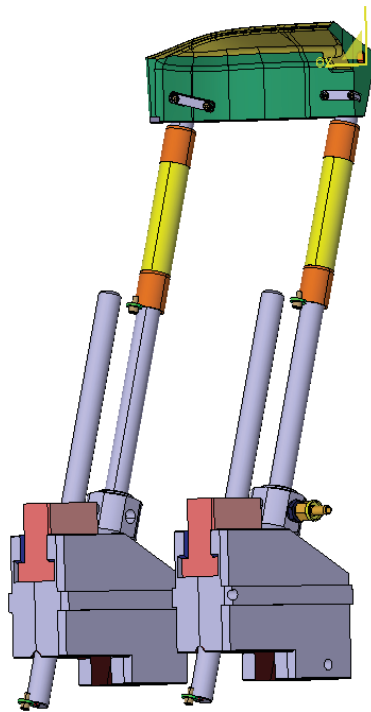
Very simple and stiff ejection plates. ★











How much does it really cost? – The big one with cooling:

## Traditional System:

Nobody knows in advance, but it's a lot more at the end.

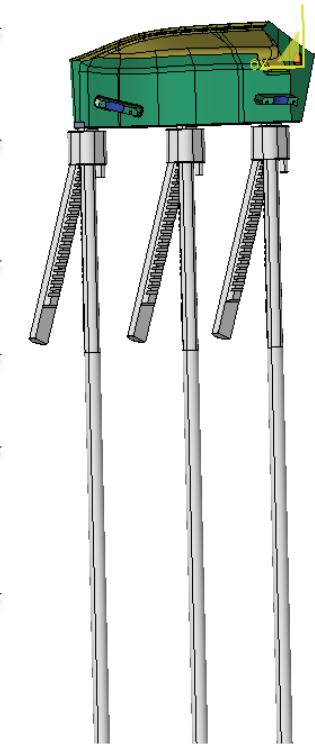


-  Difficult and time consuming alignment and finishing.
-  Accurate angled hole to guide the lifter in forming plate.
-  Long angled shaft must be perfectly aligned between the forming plate and ejection plate.
-  Complicated cooling.
-  Complicated design.
-  Difficult to maintain.
-  Very accurate milling in ejection plates. Need of thicker and stiffer ejection plates.
-  Cost of extra material and hardening operations.

## Double Rack System:

CUMSA Double Rack Lifter:  
3x DR46125L-20  
2x DK141818  
Cost: 1825€

- Everything is led straight. ★
- Easy to align and finish. ★
- Angled holes are free pockets. ★
- No need of costly five-axle accurate machining. ★
- Shorter ejection stroke. ★
- Easy to maintain. ★
- Quickly available standard parts with verified functionality and guaranteed quality. ★
- Very simple and stiff ejection plates. ★



## Conclusion:

- Mold could be **340mm smaller**, more simple, stiff and easy to maintain.
- Injection Machine used could be a standard one.
- 77mm ejection stroke savings at Cavity side and 61mm at Core side... that means  $77 \times 2 + 61 \times 2 = 266\text{mm}$  of movement saved EVERY SHOT!!!!
- Those savings have proven themselves in many tool-shops as being bigger than the investment into Double Racks, so the mold could be also cheaper than the current one.
- From past experience and feedback from many application in various tool-shop from all-around the world we know that the final finishing of the tool is easier and tool is also more simple to maintain.
- Double Rack have the advantage of being a standard part with guaranteed quality, verified functionality and short delivery time when there is a need of replacing it.



# CUMSA

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