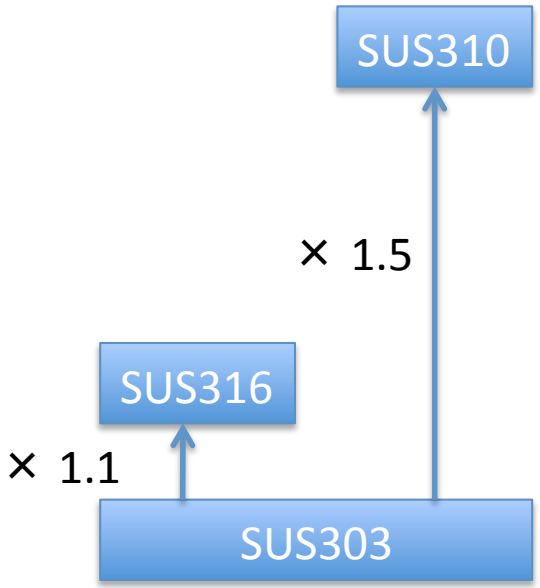
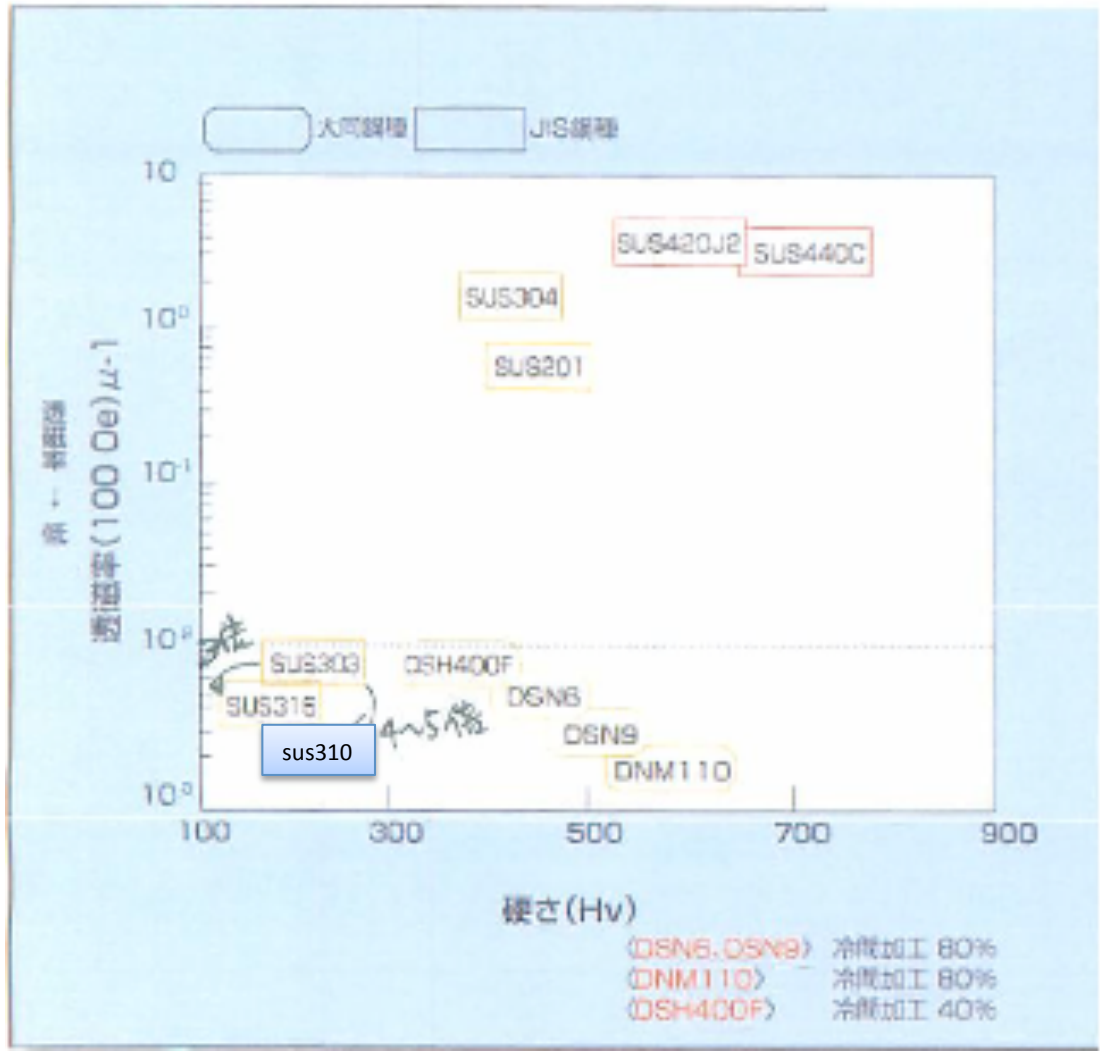
Absorber Design Concept

RIKEN/RBRC
Itaru Nakagawa

Stainless

Unit Price



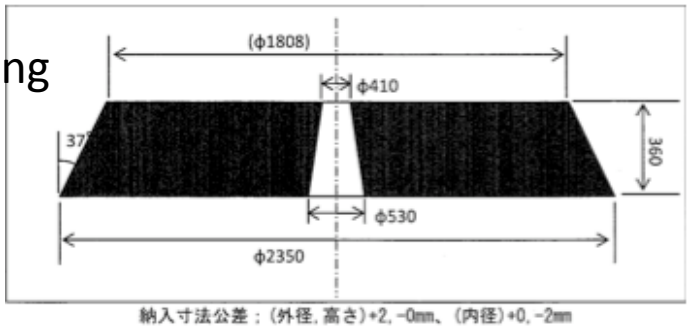


Material (SUS310) Supplier

Very likely no stock available. Need to produce. Production ~ 1 week. Waiting > 7 weeks.

	Metal Plate [mm]	Production	Quote	Delivery [week]
Daido Steel Co.	350^{t}mm (1body)	Forging (1layer)	$252k	12 weeks
Nippon Yakin Co. via TIME	**50^{t}**x1200x4000 (4) **45^{t}**x1200x3300(4)	Plate (8layers)	$144k	6 weeks
Shima Metals	**50^{t}**×1170×2340 (14)	Plates (7layers)	$157k ($9.1/kg)	8 – 10 weeks
Fuji Kogyo (via Giken)	210^{t}x1120x1120 (4) 180^{t}x987x987 (4)	Forging (2layers)	$320k	4 weeks
	70t	Plates	Next week	
NAS Trading Co.				

Daido Steel Forging

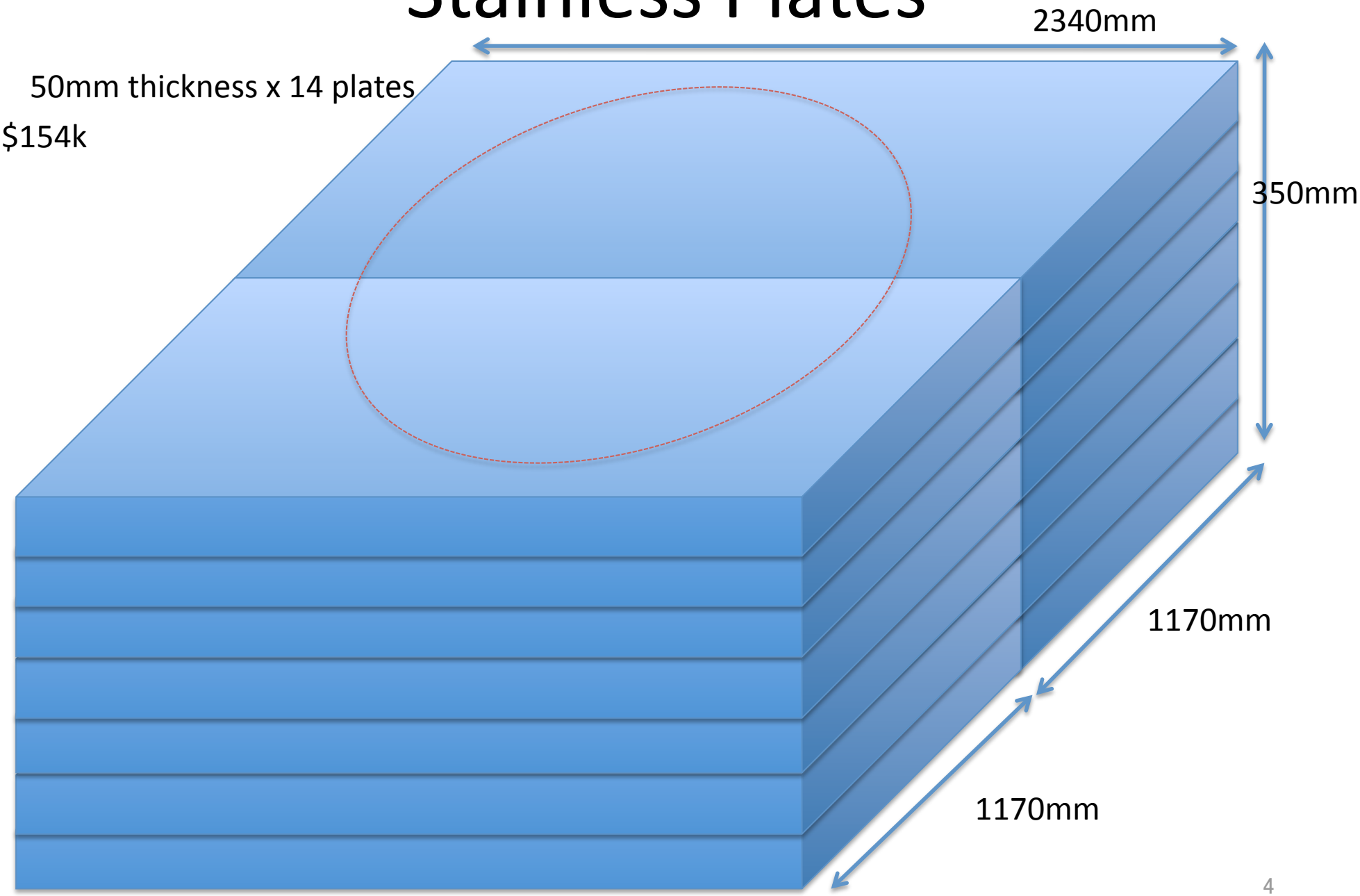


Brass Plate: ~$8/kg

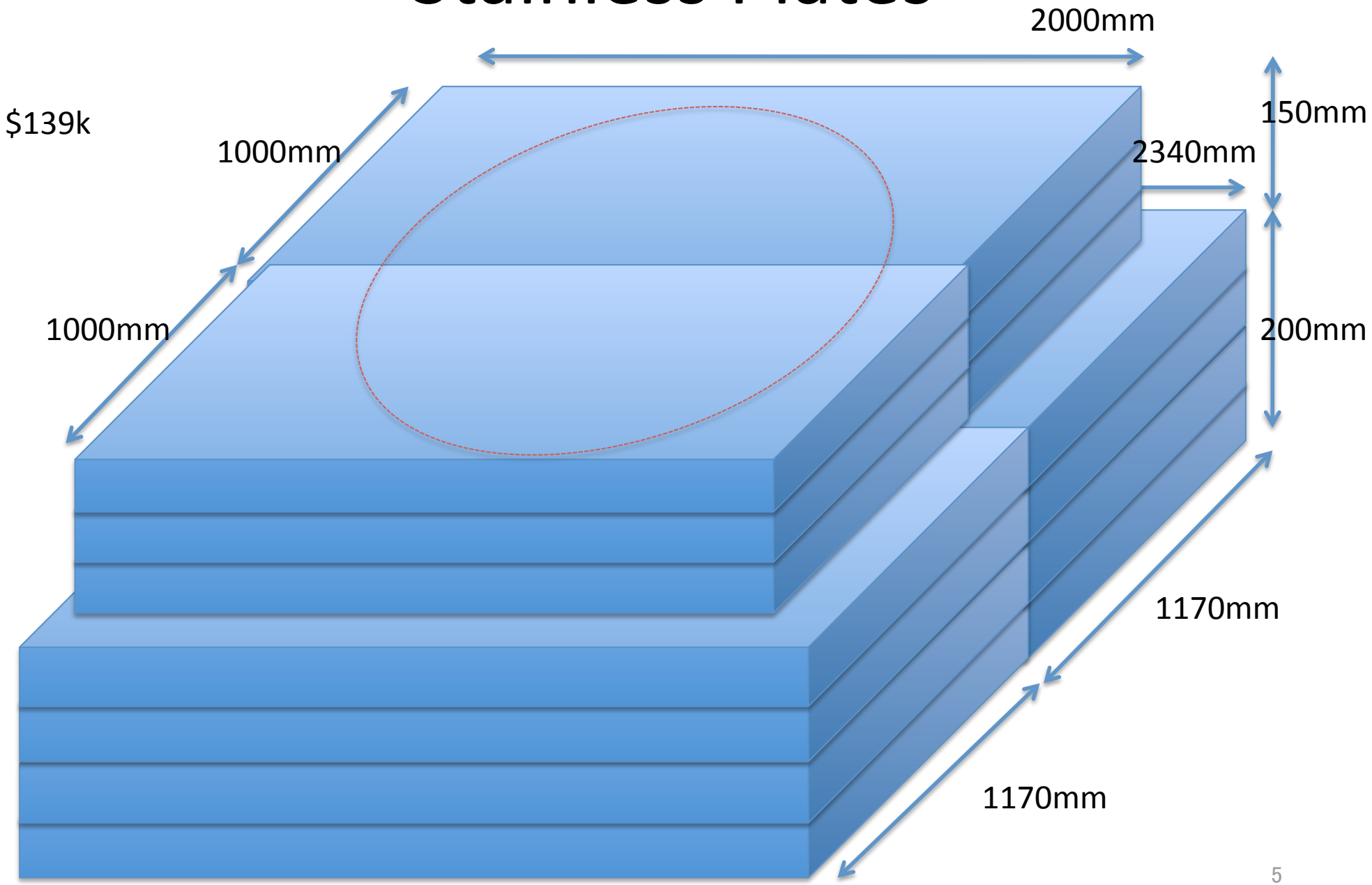
Stainless Plates

50mm thickness x 14 plates

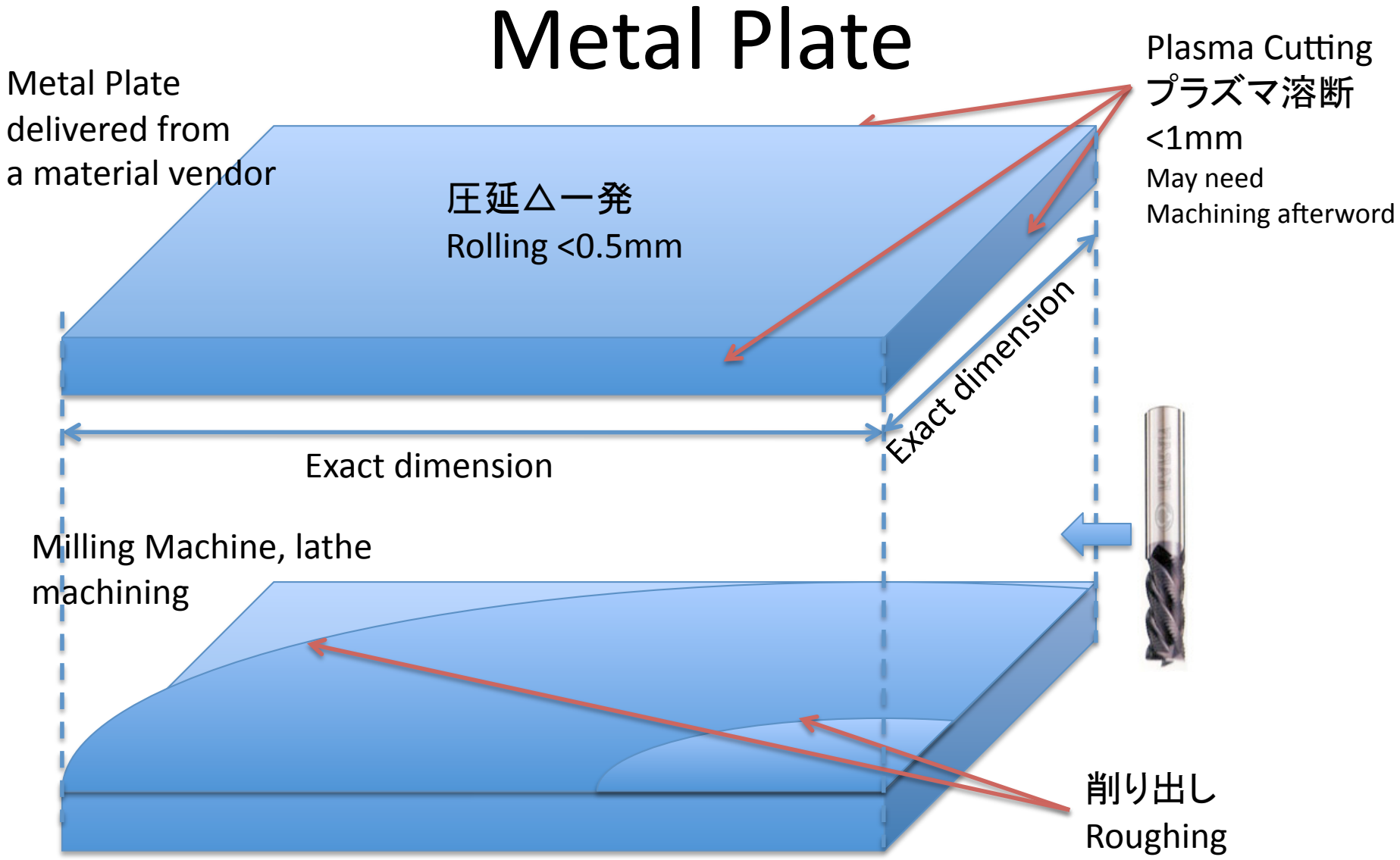
$154k



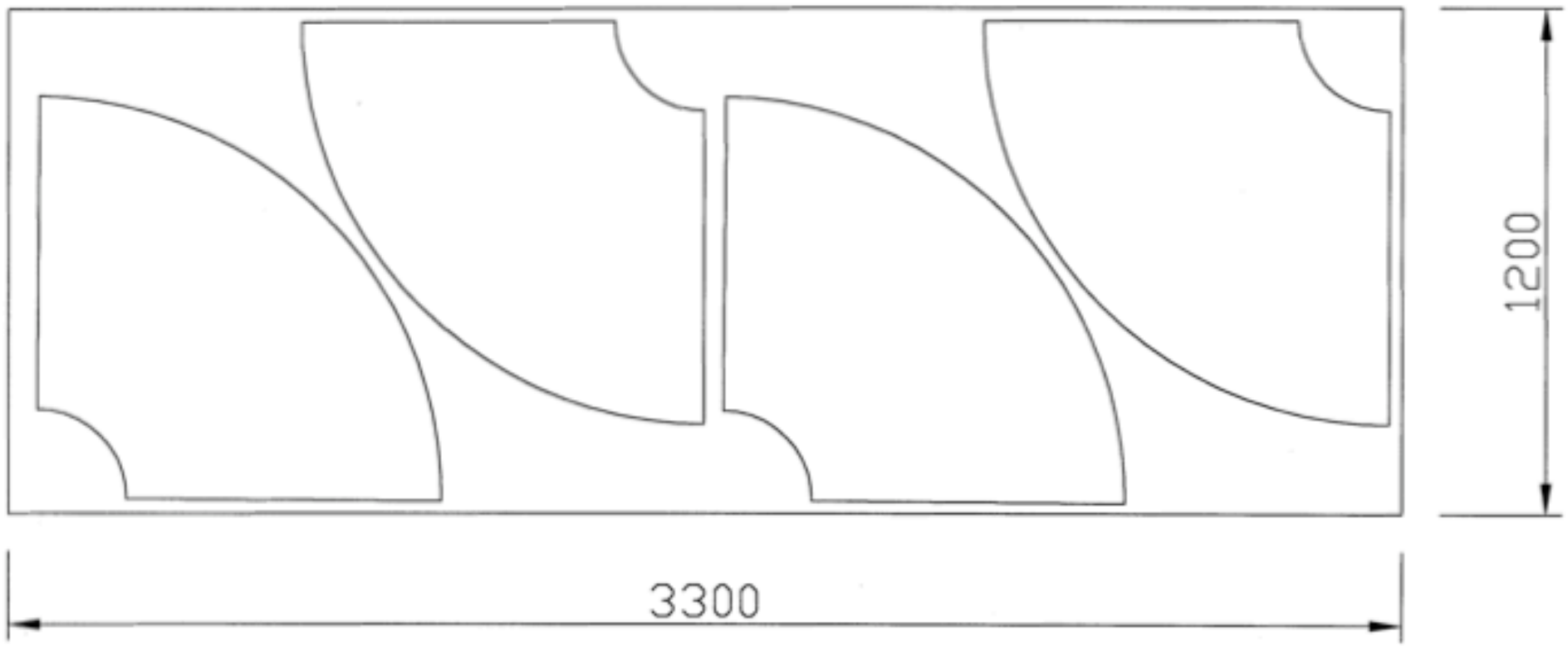
Stainless Plates



Metal Plate


Metal Plate
delivered from
a material vendor
圧延△一発
Rolling <0.5mm
Plasma Cutting
プラズマ溶断
<1mm
May need
Machining afterword
Exact dimension
Exact dimension
Milling Machine, lathe
machining
削り出し
Roughing

More Effective Way …



Idea from Total Integrator Machinery & Engineering (TIME)

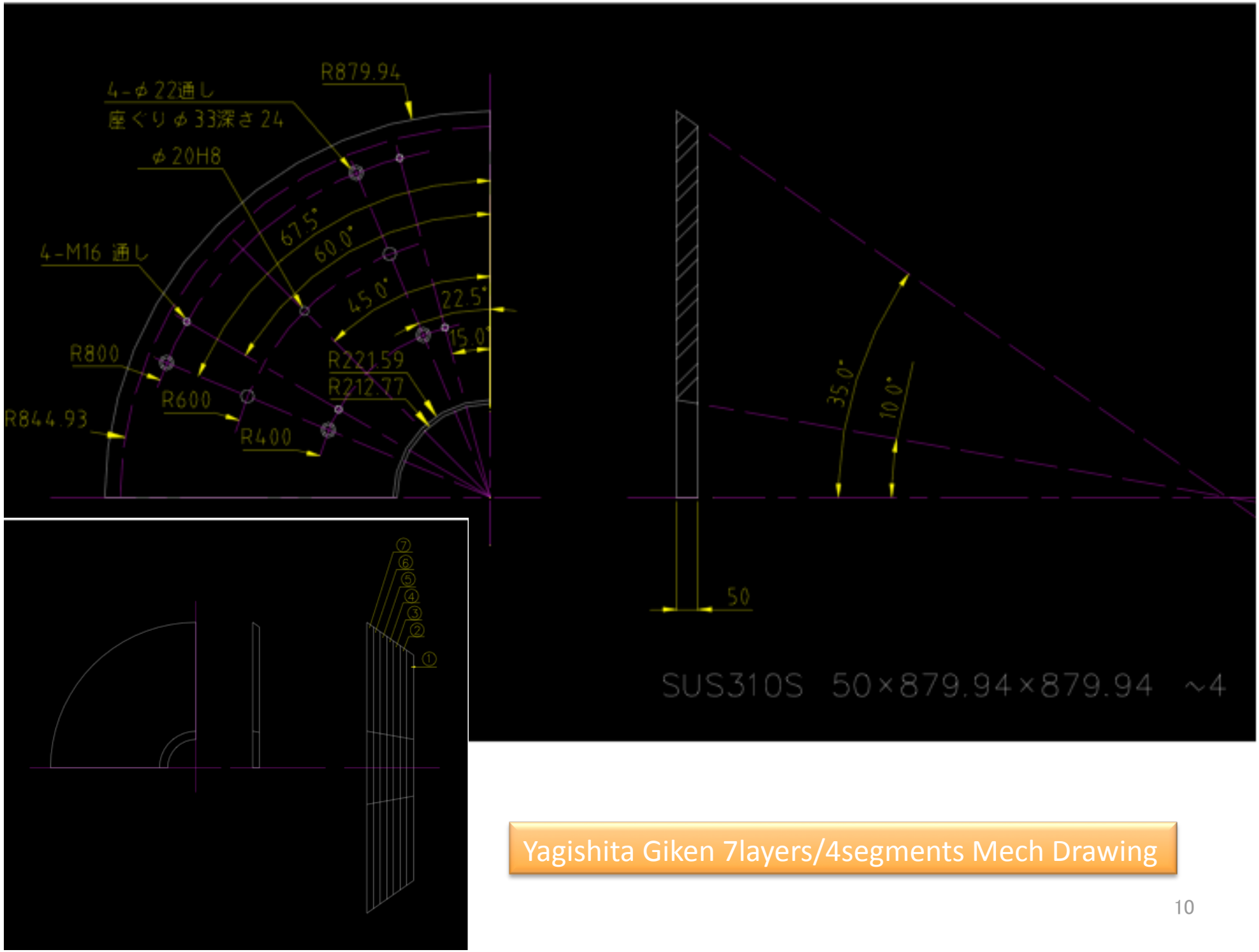
SUS310 Machining

Company	Machining	Quote	Location	Comment
Giken-Seiki	Lathe Turning/ plate		Itabashi/Tokyo	Experienced w/ SUS316 B<40uT
Iijima Machinary	Plate	$66.2k	Furukawa/ Ibaragi	
Yagishita Giken	50^tx1090x1090 (16) 50^tx987x987 (12)	$23.5k	Tochigi	Delivery in 3weeks
Inoue Material				
Ube Steel	Casting Only	ASAP	Ube/Yamaguchi	
Kawakin Sangyo	Appointment this week?		Kawaguchi/ Saitama	
Total Integrator Machinery & Engineering (TIME)	50^tx1090x1090 (16) 50^tx987x987 (12)	$33k (including surface machining)	Hiroshima	6 – 8 weeks
Izumi Metal		Next week		
Yuasa ltd.		Next week		

Yagishita Giken

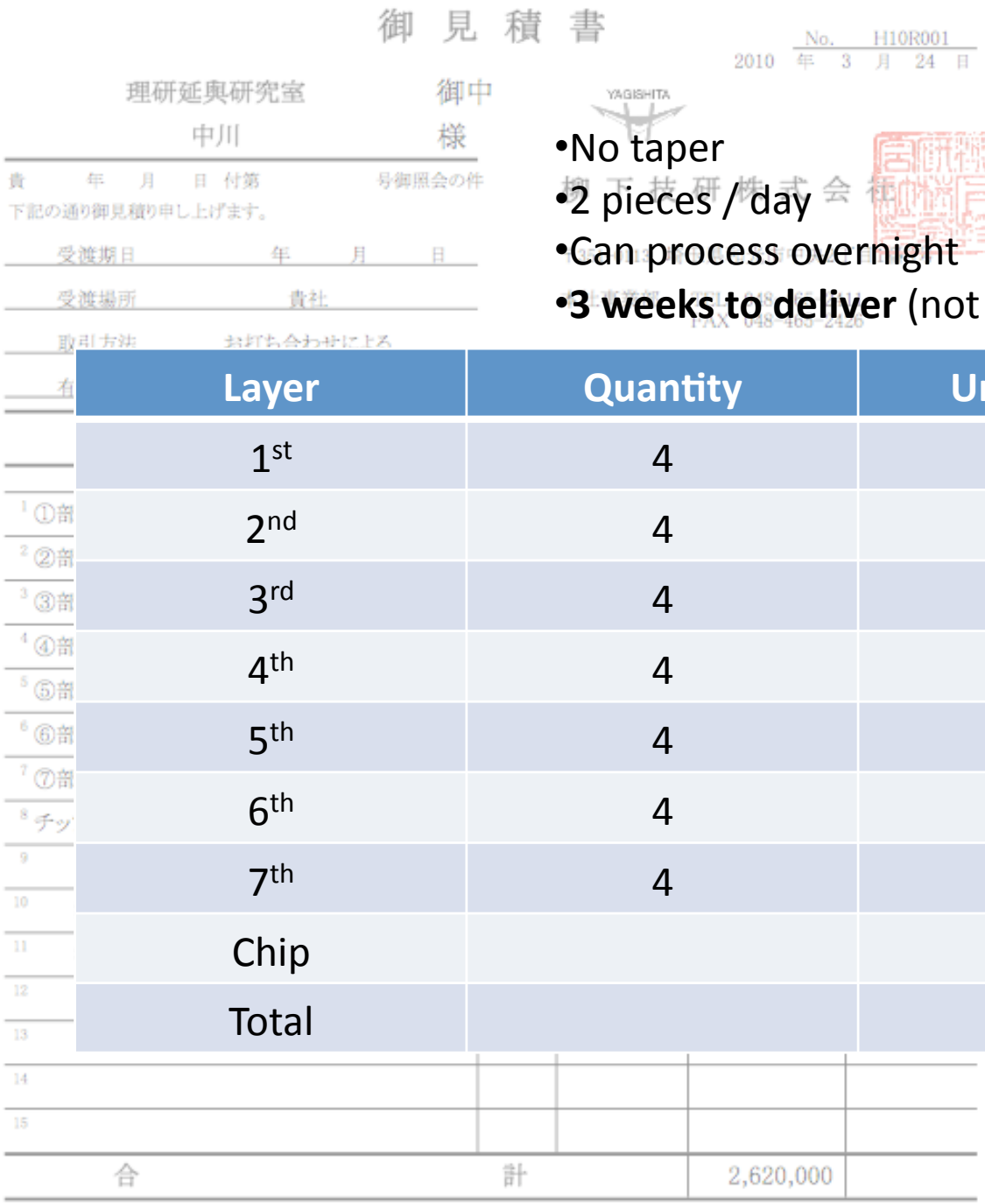
- Office in Wako (10min. Walk from RIKEN)
- Factory in Tochigi Prefecture (1.5 hour drive from RIKEN)
- Visited factory in 3/29 and confirmed production capability
- Fraise Machine (OOKUMA MCR-II) x 2
- No experience on SUS310S

Fraise Machine : Capacity 3x5 m



Yagishita Giken 7layers/4segments Mech Drawing

Yagishita Quote



- No taper
- 2 pieces / day
- Can process overnight
- **3 weeks to deliver** (not aggressive)

- 2/5 of price is for drilling and tapping
- M20 30 ~ 30 min. / hole

Layer	Quantity	Unit Price $	Total
1st	4	800	3,200
2nd	4	800	3,200
3rd	4	850	3,400
4th	4	900	3,600
5th	4	950	3,800
6th	4	1,000	4,000
7th	4	1,000	4,000
Chip		1,000	1,000
Total			26,200

Exchange Rate: 100Yen=$1

Shipping

- CALBRIDGE TRADING CORP.
  - 5 weeks
  - $2k (Tokyo->NY port)

- Maruwn Corporation
  - $3.75k (Tokyo->NY port including TAX, storage, etc) + $0.9k (Ground Transport) = $4.65k

Tariff exemption will be applied for import TAX > $1,000.
(3 to 4 weeks for paper work)

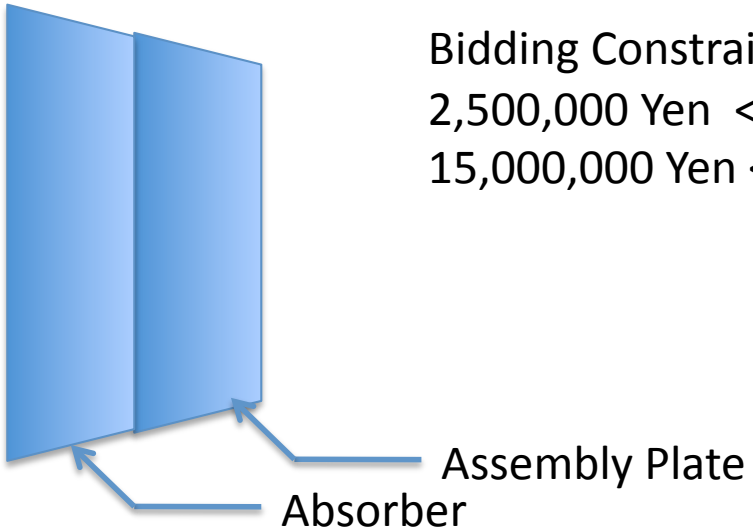
Summary

Case-1	Company	Cost	Delivery
Material	Shima Kogyo	$157k	8 – 10 weeks
Machining	Yagishita Giken	$23.5k	3 weeks
Shipping	Maruwn	$4.65k	4 – 5 weeks
Total		**$185k**	**15 – 18 weeks**

Case-2	Company	Cost	Delivery
Material	Nippon Yakin	$144k	6 weeks
Machining	TIME	$33k	6 - 8 weeks
Shipping	Maruwn	$4.65k	4 – 5 weeks
Total		**$182k**	**16 – 19 weeks**

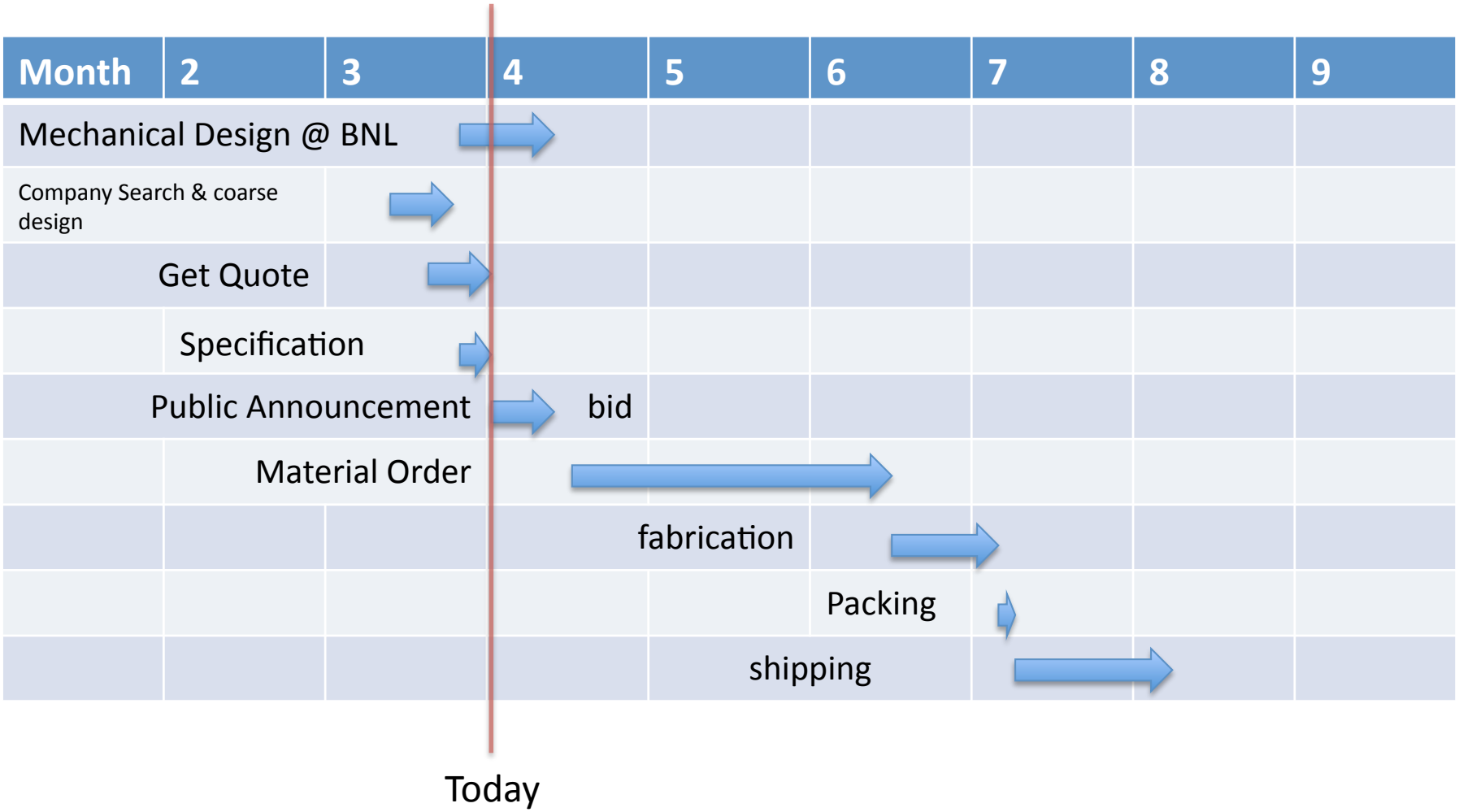
Summary

	Company	Cost	Delivery
Material	Shima Kogyo	$157k	8 – 10 weeks
Machining	Yaghishita Giken	$23.5k	3 weeks
Shipping	Maruwn	$4.65k	4 – 5 weeks
Total		**$185k**	**15 – 18 weeks**



Bidding Constraint:
2,500,000 Yen < Product < 15,000,000 Yen : Domestic (2 weeks)
15,000,000 Yen < Product : International Bidding (3 months)

Schedule


Month
2
3
4
5
6
7
8
9
Mechanical Design @ BNL
Company Search & coarse design
Get Quote
Specification
Public Announcement
bid
Material Order
fabrication
Packing
shipping
Today

Copper/Brass/Bronze

Japanese Companies

Company	Material	Manufacture	Quote	Delivery
Izumi Metal / Akahoshi co. ltd.	Bronze	Casting	$270k	10 weeks
Sumitomo Heavy Industrial ltd.	Brass	Casting	$300k	10 weeks
	Brass	Brass Plate (4layers)	$108k + machining	10 weeks
Hitachi Engineering	Oxygen Free Copper	Forging (2layers)	$265k	12 ~ 14 weeks
Yuasa Ltd.	Gunmetal (brass)	Casting (2layers)	$170k	9 weeks
Tohoku Oye Industry	Gave up			
Takano Giken	Brass			
Okamoto	Brass	Casting	$200k + machining	6 to 8 weeks
	Brass	Forging	$144k + machining	4 to 5 weeks

Hitachi Quote Breakdown

cost

Total	Forging	Machine	Misc
$266k	$99k	$149k	$18k

Duration (week)

Total	Design	Forging	Machine	QA/packing
12 ~ 14	1	6 ~ 8	4	1

- Pure Copper
- 2 layers x 4 Segments = 8 total segments
- 3 mm space between pieces
- Surface roughness < 100um
- Finer segmentation wouldn't help in price and duration wise.

Akahoshi Quote Breakdown

cost

Total	Casting	Machine	Misc
$170k	$135k	$27k	$8k

Duration (month)

Total	Design	Casting	Machine	QA/packing
2.5 ~ 3		1.5 ~ 2	1	

- Bronze CAC403+CAC404
- 2 layers x 4 Segments = 8 total segments
- Exact matching between segments.
- Finer segmentation wouldn't help in price and duration wise.

Yuasa Quote Breakdown

cost

Total	Casting	Machine	Misc
$270k	$135k	$27k	$8k

Duration (month)

Total	Design	Casting	Machine	QA/packing
8 ~ 9		4	3 ~ 4	1

- Brass CAC201 (Cu:90% + Sn:10%)
- 2 layers x 4 Segments = 8 total segments
- ¼ mold.
- 3 layers x ¼ mold won't impact on price nor delivery neither.

Breakdown of Sumitomo Quote

Casting

- Material : $100k (casting)
- Casting (Including Mold) : $100k
- Machining Design and Machining : $100k
- Tax + Shipping to BNL : $40k

Blass Plate

Material : $108k ~ 130k (Brass Plates) + Machining Cost

	材質	寸法	数量	金額(円:税抜き)
案_1	C1100P-F	100t×1,000×1,000	8	9,000,000
	(タフピッチ銅)	85t×880×880	8	6,000,000
案_2	C2801P-F	100t×1,000×1,000	8	7200,000
	(真鍮)	85t×880×880	8	4800,000