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Fabrication tolerances

Sheet metal fabrication tolerances

Chinasavvy are accurate metal fabricators. We produce high quality fabrications ranging from wall dispensers to radar housings; from protective covers to generator cabinets; from air conditioning housings to brackets.

To maintain our high standard of quality we use the latest technologies including CNC Laser Cutting, CNC Punch machines, CNC Bending machines, Robot Welding, Automated and Manual Powder Coating lines, etc. These machines are not cheap! Many of them are German or American machines imported into China recently.

Experienced engineers and purchasing officers will know, however, that the tolerances specified in drawings have a direct correlation to the manufacturing price of the part or product. Unnecessary blanket tight tolerances on a drawing may well double or treble the manufacturing cost!

This is why we work to two or three different levels of tolerances so that purchasers can benefit from lower prices where looser tolerances permit. This does not mean a drop in quality - simply a broader tolerance where applicable and where specified by our customers. This is how the grades affect pricing:

- **Grade A - Tightest tolerances:**
 - Higher scrap rate allowance
 - Greater and more frequent QC inspections
 - Better tooling and jigs
 - More specialized QC equipment
- **Grade B - Standard tolerances:**
 - Standard scrap rate
 - Standard QA inspections
 - Standard tooling
 - Standard QC equipment
- **Grade C - Broader tolerances:**
 - Low scrap rate allowances
 - Random sample QC inspections
 - Possible low cost tooling
 - Limited QC equipment required

Laser Cutting Tolerances:

Grade A		Laser Cutting			© 2012 Chinasavvy		
Workpiece Thickness		Basic Dimension					
		>0<3	≥3<10	≥10<35	≥35<125	≥125<315	≥315<1000
over	up to	Tolerance (mm)					
-	1	0.04	0.1	0.1	0.2	0.2	0.3
1	3.15	0.1	0.2	0.2	0.3	0.3	0.4
3.15	6.3	0.3	0.3	0.4	0.4	0.5	0.5
6.3	10		0.5	0.6	0.6	0.7	0.7

Grade B		Laser Cutting			©Chinasavvy		
Workpiece Thickness		Basic Dimension					
		>0<3	≥3<10	≥10<35	≥35<125	≥125<315	≥315<1000
over	up to	Tolerance (mm)					
-	1	0.1	0.3	0.4	0.5	0.7	0.8
1	3.15	0.2	0.4	0.5	0.7	0.8	0.9
3.15	6.3	0.5	0.7	0.8	0.9	1.1	1.2
6.3	10		1	1.1	1.3	1.4	1.5

Punching Tolerances:

Punching	Unit:mm	© 2012 Chinasavvy		
Basic Dimension	Work piece Thickness	Grade A	Grade B	Grade C
>0.5~3	1	0.05	0.1	0.15
	>1~3	0.15	0.2	0.3
>3~6	1	0.1	0.15	0.2
	>1~4	0.2	0.3	0.4
	>4	0.3	0.4	0.6
>6~30	1	0.15	0.2	0.3
	>1~4	0.3	0.4	0.55
	>4	0.45	0.6	0.8
>30~120	1	0.2	0.3	0.4
	>1~4	0.4	0.55	0.75
	>4	0.6	0.8	1.1
>120~400	1	0.25	0.35	0.5
	>1~4	0.5	0.7	1
	>4	0.75	1.05	1.45
>400~1000	1	0.35	0.5	0.7
	>1~4	0.7	1	1.4
	>4	1.05	1.45	2.1

Bending Tolerances:

Bending Unit:mm	© 2012 Chinasavvy		
Length from short edge	Grade A	Grade B	Grade C
	Angle tolerance		
≤10	1°15'	2°00'	3°00'
>10~25	1°00'	1°30'	2°00'
>25~63	0°45'	1°00'	1°30'
>63~160	0°30'	0°45'	1°15'
>160	0°15'	0°30'	1°00'

Bending Unit:mm	© 2012 Chinasavvy			
Basic Dimension	Workpiece Thickness	Grade A	Grade B	Grade C
>0.5~3	1	0.2	0.35	0.5
	>1~3	0.45	0.6	1
>3~6	1	0.3	0.5	0.7
	>1~4	0.6	1	1.6
	>4	0.9	1.4	2.2
>6~30	1	0.4	0.6	1
	>1~4	0.8	1.3	2
	>4	1.3	2	3.2
>30~120	1	0.5	0.8	1.3
	>1~4	1	1.6	2.5
	>4	1.6	2.5	4
>120~400	1	0.7	1.1	1.8
	>1~4	1.4	2.2	3.5
	>4	2	3.3	5
>400~1000	1	0.9	1.4	2.2
	>1~4	1.7	2.8	4.5
	>4	2.8	4.5	7

Stamping Tolerances:

Stamping Unit:mm	© 2012 Chinasavvy			
Basic Dimension	Workpiece Thickness	Grade A	Grade B	Grade C
>0.5~3	1	0.15	0.2	0.35
	>1~3	0.3	0.45	0.6
>3~6	1	0.2	0.3	0.5
	>1~4	0.4	0.6	1
	>4	0.55	0.9	1.4
>6~30	1	0.25	0.4	0.6
	>1~4	0.5	0.8	1.3
	>4	0.8	1.3	2
>30~120	1	0.3	0.5	0.8
	>1~4	0.6	1	1.6
	>4	1	1.6	2.5
>120~400	1	0.45	0.7	1.1
	>1~4	0.9	1.4	2.2
	>4	1.3	2	3.3
>400~1000	1	0.55	0.9	1.4
	>1~4	1.1	1.7	2.8
	>4	1.7	2.8	4.5

Welding Tolerances:

Welding				© 2012 Chinasavvy		
Basic Dimension	Grade A	Grade B	Grade C	Grade A	Grade B	Grade C
	Linear dimension tolerance			Straightness/Flatness/Parallelism tolerance		
2~30	1	1	1			
>30~120	1	2	3	0.5	1	1.5
>120~400	1	2	4	1	1.5	3
>400~1000	2	3	6	1.5	3	5.5
>1000~2000	3	4	8	2	4.5	9

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