

RMA Tolerances for Molded Rubber Products*

Using the industry standard callouts for rubber tolerancing is good practice and provides for a common understanding between the design engineer and the manufacturer. By simply calling out the standard can eliminate the need to tolerancing each specific feature on a print. There are 3 components for a full callout. RMA A2-F3-T.80mm (.032”) is typically the standard for CRS when quoting Commercial Engineered Rubber Components. Weigh the cost and effect and be cautious not to over-engineer by using precision and commercial tolerancing.

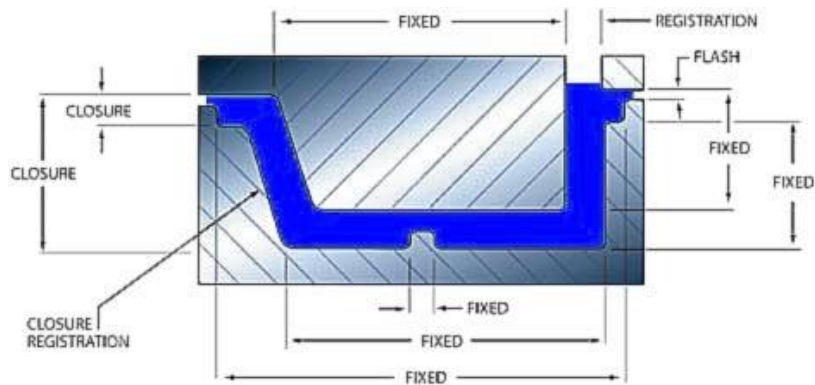
1. RMA A1- A4 refers to the tolerancing description and tables below.
2. Finish: The F1-F4 Define the part Finish per Table 6. (default F3)
3. Flash Extension: Define flash per Table 7. (if not specified T.80mm default for engineered rubber)

"A1" High Precision- (NOTE: Very Expensive and rarely used in commercial applications.)

A1 is the tightest tolerance classification and indicates a high precision rubber product. Such products require expensive molds, fewer cavities per mold, costly in-process controls and inspection procedures. The exact method of measurement should be agreed upon in advance between the manufacturer and the customer, as errors in measurement may be large in relation to the tolerance. Some materials, particularly those requiring post curing, (i.e.. fluoroelastomers); do not lend themselves to A1 tolerances.

"A2" Precision – Standard (NOTE: Callout for Engineered Rubber components)

The A2 tolerance indicates a precision product. Molds must be precision machined and kept in good repair. While measurement methods may be simpler than the drawing dimension A1, careful inspection will usually be required. (A2 are typically assumed to be the standard rubber tolerances for engineered rubber components unless otherwise indicated.)



"A3" Commercial – (Defaulted at the manufacturing level if defined on the print)

The A3 tolerances indicate a commercial product and will normally be used for non-critical applications for which precision molding is not required.

"A4" Basic

When cost, not dimensional control, is of overriding importance, this tolerance is used.

*The information and tables are standards published by the RMA (Rubber Manufacturer’s Association) Handbook for molded parts.

Metric Tolerances (mm)

Nominal Dimension		A1		A2		A3		A4	
above	up to and including	Fixed	Closure	Fixed	Closure	Fixed	Closure	Fixed	Closure
0	10	0.1	0.13	0.16	0.2	0.2	0.32	0.32	0.8
10	16	0.13	0.16	0.2	0.25	0.25	0.4	0.4	0.9
16	25	0.16	0.2	0.2	0.32	0.32	0.5	0.5	1
25	40	0.2	0.25	0.32	0.4	0.4	0.63	0.63	1.12
40	63	0.25	0.32	0.4	0.5	0.5	0.8	0.8	1.25
63	100	0.32	0.4	0.5	0.63	0.63	1	1.1	1.4
100	160	0.4	0.5	0.63	0.8	0.8	1.25	1.25	1.6
160 & over				x .004	x .005	x .005	x .008	x .008	x .010

(Multiply by)

Inch Tolerances (in)

Nominal Dimension		A1		A2		A3		A4	
above	up to and including	Fixed	Closure	Fixed	Closure	Fixed	Closure	Fixed	Closure
0	0.4	0.004	0.005	0.006	0.008	0.008	0.013	0.013	0.032
0.4	0.63	0.005	0.006	0.008	0.01	0.01	0.016	0.016	0.036
0.63	1	0.006	0.006	0.01	0.013	0.013	0.02	0.02	0.04
1	1.6	0.008	0.01	0.013	0.016	0.016	0.025	0.025	0.045
1.6	2.5	0.01	0.013	0.016	0.02	0.02	0.032	0.032	0.05
2.5	4	0.013	0.016	0.02	0.025	0.025	0.04	0.04	0.056
4	6.3	0.016	0.02	0.025	0.032	0.032	0.05	0.05	0.063
6.30 & over				x .004	x .005	x .005	x .008	x .008	x .010

(Multiply by)

Table 6 - RMA Drawing Designation for Finish

Drawing Designation	
F1	A smooth, polished and uniform finish completely free of tool marks, dents, nicks and scratches, as produced from a highly polished steel mold. In areas where F1 is specified, the mold will be polished to a surface finish of 10 micro-inches (250nm) or better.
F2	A uniform finish as produced from a polished steel mold. In areas where F2 is specified, the mold will be polished to a surface finish of 32 micro-inches (800nm) or better but with very small tool marks not polished out.
F3	Surfaces of the mold will conform to good machine shop practice and no micro-inch finish will be specified. This is "Commercial Finish".
F4	Satin finish.

Table 7 - RMA Drawing Designation for Flash Extension

Drawing Designation	
T .00mm	(T .000) No flash permitted on area designated. (Standard notation regarding other surfaces must accompany this notation.)
T .08mm	(T .003) This tolerance will normally require buffing, facing, grinding or a similar operation.
T .40mm	(T .016) This tolerance will normally require precision die trimming, buffing or extremely accurate trimming.
T .80mm	(T .032) This tolerance will normally necessitate die trimming, machine trimming, tumbling, hand trimming, or tear trimming.
T 1.60mm	(T .063) This would be the normal tear trim tolerance.
T 2.35mm	(T .093) This tolerance will normally require die trimming, tear trimming, or hand trimming of some type.
T ∞	(T ∞) No flash limitation.

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