

FUSIBLE ALLOYS



AIM is a leading supplier of fusible alloys for a broad range of Tool & Die applications.

AIM fusible alloys are low melting temperature alloys that contain bismuth, lead, tin, cadmium or indium. AIM's fusible alloys are utilized in a broad variety of tool & die applications, including casting, tube bending, machining parts for soft metal dies, fixturing, anchoring parts, toggle dies and supporting castings and interrupted cuts.

These silvery white alloys expand only ~3.3% of their volume when changing from liquid to solid form, which makes these alloys ideal for many industrial applications. AIM fusible alloys are rarely consumed in an operation and therefore can be remelted and used multiple times.

These alloys are normally used in gravity casting but also can be used in other casting methods.

Specifications & Applications Information On Commonly Used AIM Fusible Alloys

AIM Fusible Alloy	47	58	70
<u>Composition %</u>			
Bismuth	44.7	49	50
Lead	22.6	18	26.7
Tin	8.3	12	13.3
Cadmium	5.3		10
Indium	19.1	21	
Melting Temp. (°C)	47	58	158
Density lb/in ³	.32	.31	.339
Brinell Hardness Number	12	14	9.2
Tensile Strength lb/in ²	5400	6300	5990
% Elongation	1.5	50	200
Conductivity (% of IACS)	4.50%	2.43%	4.00%
CTE In/In PPM/°C	25	23	22
Liquid Specific Heat	.035	.032	.040
Solid Specific Heat	.035	.032	.040
Latent Heat of Fusion BTU/lb	6	8	14
<u>Growth-Shrinkage Time After Casting</u>			
2 Minutes	+0.0005	+0.0003	+0.0025
6 Minutes	+0.0002	+0.0002	+0.0027
30 Minutes	.0000	+0.0001	+0.0045
1 Hour	.0001	.0000	+0.0051
5 Hours	-0.0002	-0.0002	+0.0051
24 Hours	-0.0002	-0.0002	+0.0051
500 Hours	-0.0002	-0.0002	+0.0057

Fusible Alloys Applications Information

AIM 47 low-temperature solder; fixturing delicate parts for machining; lens blocking; proof casting of cavities; dental models; fusible element in safety devices and alarms; radiation blocking for x-rays

AIM 58 lens blocking; proof casting; fusible element in safety devices; anchoring parts for machining; sealing adjustment screws; holding jet engine blades for machining and broaching; filler for supporting castings in interrupted cuts.

AIM 70 punch and die in short run sheet metal forming; external and internal support for bending tubing extrusions; holding jet engine blades for machining and broaching; annealing and nitriding seals; nests for feeding stations.

AIM 124 fusible element in pressure safety plugs; anchoring metal parts in glass; filler for large diameter tubes for bending; proof casting forging dies; liquid metal in constant temperature and heat treating baths; duplicate patterns in pottery making and foundry; mechanical dentistry.

AIM 138 fusible element in safety devices; locator members in aircraft fixtures; holding jet engine blades for machining; joggle dies; foundry patterns; potting molds for electronic encapsulation; low temperature solder; soft metal dies for wax patterns in investment casting.

AIM 71 - 88 for many of the same applications as AIM 70 but where less growth is required; mechanical dentistry.

AIM 138 - 170 closely parallels AIM 138 applications but is normally preferred for fusible mandrels for electroforming; proof casting large dies and molds.

Other Compositions AIM can furnish other fusible alloy compositions to meet your unique requirements..

Whatever your application, AIM has the fusible alloys and technical support necessary to fulfill your most stringent requirements.

For additional information
please contact AIM at
1 800 CALL-AIM
1 401 463-5605
1 401 463-0203 Fax
or visit us on the web at
www.aimsolder.com