

A Collection of Star Formulations

by K.L. and B.J. Kosanke

At one time, we were engaged in the commercial manufacture of stars. During that time we assembled (developed, borrowed or modified) a series of star formulations. It was felt that the formulations were reasonably safe and cost effective, while at the same time, performed well (relatively easy ignition and fairly good color or comet effects). Over the years, when asked for advice concerning useful star formulations, we frequently supplied copies of these formulations. In the thought that there are others that might wish to have access to them, this short article has been assembled.

Following are the formulations, given in parts by weight. Unless otherwise noted, water was the solvent used to activate the binder. Normally round stars were manufactured in a star-rolling

machine. However, the formulations should work equally well to make cut or pressed stars. Where needed, notes have been included for clarity.

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Table 1. Color Star Formulations.

Chemical	Red	Blue	Purple	Green	Red Strobe	White Strobe	Green Strobe
Potassium perchlorate	68	61	61	—	—	—	—
Ammonium perchlorate	—	—	—	—	34	—	—
Barium nitrate	—	—	—	56	—	53	49
Copper carbonate	—	12	5	—	—	—	—
Strontium carbonate	13	—	8	—	15	—	—
Sulfur	—	—	—	9	24	23	18
Parlon	—	13	12	14	—	—	—
Hexachlorobenzene	—	—	—	—	5	—	6
Red gum	14	9	9	3	—	—	—
Mg/Al (60 mesh)	—	—	—	—	12	12	11
Mg/Al (200 mesh)	—	—	—	4	—	6	9
Aluminum (12 mic., atom.)	—	—	—	9	—	—	—
Dextrin	5	5	5	4	5	5	5
Boric acid	—	—	—	1	—	0.5	0.5
Potassium dichromate	0.5	—	—	—	5	2	2
Notes:					(A)	(B & C)	(B & C)
References:		(1)	(1)			(2)	(2)

Notes:

- (A) Do not prime with meal prime, use only red strobe prime.
- (B) Adjust strobe rate by using greater or lesser amounts of Mg/Al (200 mesh).
- (C) Priming consisted of a very heavy application of meal prime (30-50% of total star weight).

Table 2. Prime and Comet Formulations.

Chemical	Meal Prime	Red Strobe Prime	Willow	Gold Glitter	Soft Silver	Bright Silver	Pearl
Potassium perchlorate	—	68	—	—	—	—	—
Potassium nitrate	75	—	64	55	50	64	35
Barium nitrate	—	—	—	—	10	—	—
Charcoal (air float)	15	18	13	11	10	13	15
Charcoal (80 mesh)	—	—	9	—	—	—	—
Zinc dust	—	—	—	—	—	—	40
Aluminum (12 mic.,atom.)	—	—	—	5	—	—	—
Aluminum (50-120 mesh)	—	—	—	—	10	—	—
Titanium (20-40 mesh)	—	—	—	—	—	9	—
Red gum	—	9	—	—	—	—	—
Sulfur	10	—	9	17	15	9	5
Dextrin	5	4	5	5	5	5	5
Potassium dichromate	—	1	—	—	—	—	—
Sodium bicarbonate	—	—	—	7	—	—	—
Notes:	(D)	(D)					
References:				(3)	(4)		

Notes:

(D) Can also be mixed with nitrocellulose lacquer for use as a quick drying slurry prime.

References

- 1) T. Shimizu, "Studies on Blue and Purple Flame Compositions Made with Potassium Perchlorate," *Pyrotechnica VI*, 1980.
- 2) R. Winokur, Private communication.

- 3) T. Fish, "Glitter Stars without Antimony," *PGI Bulletin*, No. 24, 1981.
- 4) R. Sheard and others, Private communication.