



Saw Evaluation Report

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Thank you very much for taking the time to meet with me and show me your operation. I am pleased to offer the following information which may help solve some of the problems you are having with your billet sawing operations.

Problem & Solution Snapshot

- Saw #1 cutting out of square – when the billets are out of square this causes significant problems in the furnace and in the de-scaling operations.
 - Check clamping system on Saw #1. The clamping blocks are lifting the billet off the table before cutting begins (see video).
 - Check the feed rate. The cut times are too fast. The chip load is too high and overfeeding can cause the blade to cut out of square. See table 1.1 for appropriate cut times based on billet diameter and available horsepower.
 - Check saw blades. The saw blades should have even bevels, sharp corners on the low teeth and positive tension in the saw body.
 - Check the saw blade clamping flanges. The faces should be undercut.
- Improve blade life and consistency.
 - Begin tracking blade life based on number of square inches achieved with each blade. Until you record and track this information, you will never be able to setup a true baseline of performance.
 - Reduce the chip load/feed rate to acceptable level.
 - Fix clamping problem on Saw#1.
- Control chip size and shape.
 - Change tooth form and/or feed rate to get the desired chip size and shape.

Application Information

Material Alloys: Aluminum - 6061, 6063, 6262, 1100, 1350

Material Sizes: Saw #1 – 7”, 8”, 12”, 14”, 16”, 18”, 21”; Saw 2 – 12”, 14”, 16”, 18”

Machine Type – Loma Saws, Saw #1 – 125 HP, Saw #2 – 150 HP

Saw Blade Type – Lennartz HSS Segmental Saw Blades

Coolant Type – Amcol 6000B Misting Lubricant

Clamping – Horizontal on both sides of the cut

Surface Speed – 4500 SFM

Feed System – Hydraulic cylinder with flow control valve



Saw Blade Observations & Recommendations

I checked the tooth geometry on several blades and it is correct. For aluminum sawing, you should use a 25 degree rake angle and a 12 degree clearance angle. The bevels on the teeth were even and consistent. It would help to have a better radius in the gullet of the teeth (see drawings). There does not appear to be any other significant problems with the saw blades. The only items I did not check that may affect performance include axial runout and the proper tension in the saw body.

Machine Observations & Recommendations

Temperature of the saw blade during cutting remains quite cold (68°F). Both sawing machines have clamping on both sides of the cut. This helps eliminate burrs. Both saws are running Amcol 6000B misting lubricant. Our experience has shown that Acculube LB2000 will give the best tool life and cut quality. Both saws have a hydraulically controlled feed cylinder with a flow control valve to change advance rate of the saw head. The clamping system on Saw #1 needs to be checked. It appears the clamping blocks are loose and are lifting off the table when they clamp the billet. This could cause or contribute to cutting out of square. Check saw blade clamping flanges to ensure they are undercut.

Table 1.1

<i>Machine</i>	<i>Billet Ø</i>	<i>Blade Ø</i>	<i>Teeth</i>	<i>SFM</i>	<i>RPM</i>	<i>Chip Load</i>	<i>Cut Time</i>	<i>HP Required</i>
Loma Saw No. 1 125 HP	7	1410	72	4500	309.6	0.0060	3.1	86.8
	8					0.0060	3.6	99.2
	12					0.0050	6.5	124.0
	14					0.0043	8.8	124.4
	16					0.0037	11.6	122.3
	18					0.0033	14.7	122.7
Loma Saw No. 2 150 HP	12	1510	72	4500	289.1	0.0060	5.8	138.9
	14					0.0055	7.3	148.6
	16					0.0048	9.6	148.2
	18					0.0043	12.1	149.3

Horsepower Requirement: 1HP / 3 in³ / minute

