

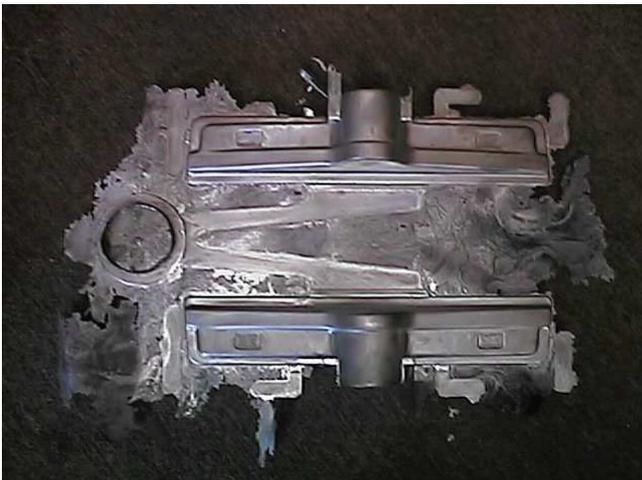
SuperShot III Cold Chamber Shot End

The Tymac SuperShot III CNC Shot End has the ability to handle applications far beyond the capability of conventional die casting machinery as a result of the high efficiency design, precise closed loop control system, and the advantages of a low inertia injection cylinder with independent multiplier and intensifier. The SuperShot III CNC Shot End virtually eliminates flash and increases the effective machine tonnage, so larger castings can be produced at a higher rate with lower scrap. The Tymac SuperShot III Shot End typically pays for itself within 1 year.

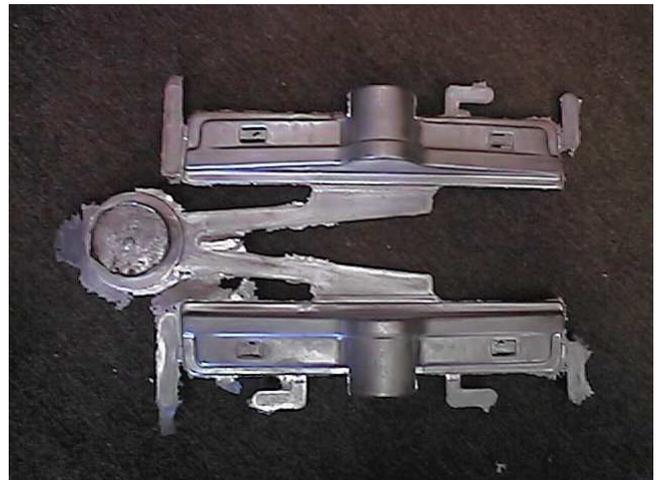


Tymac SuperShot 680K Specifications:

Max Pressure	2,350 PSI
Injection Force	70.6 tons
Cylinder Dia.	5.5 inches
Adjustable Stroke	18-24"
Optional Stroke	24-30"
Shot Positions Adjustable	0" up to 12"
Multiplier Ratio	2.53 : 1
Dry Shot Speed	>500 ips



Casting without benefit of SuperShot III Low Impact



Flash Eliminated with SuperShot III Low Impact

Tymac Controls Corp

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US Patents: 3,911,419, 3,878,375, 4,094,490, 4,249,186 4,383,449, 4,504,920, 4,734,869 Canadian Patent: 1-234-902 European Patent: 0 126 174

SuperShot III Cold Chamber Shot End

Case Study:

The capability of a Tymac SuperShot 680K shot end was tested on a 400 ton cold chamber aluminum die casting machine. It used a two cavity die with a moving core producing vacuum nozzles each weighing about 1 pound. The total weight cast was 3.67 pounds. Three castings were inspected both with and without low impact being used. The shots produced without low impact had substantial flash. The sample shots taken with low impact had very little flash.

As seen in the table below the total weight as cast was lower without low impact. This is because significant spitting occurred when low impact was disabled. The amount of metal ladled remained the same during the test. The amount lost due to spitting was 0.06 pounds per shot.

Measurements were taken in several areas of the casting. These measurements included part thickness and distance to the core. Parting line variation less than 0.002 inches was noted in the castings produced with low impact. The castings that did not have the benefit of low impact averaged 0.007 - 0.009 inches thicker in almost every measurement, and the average flash thickness was .012 inches. The castings produced with low impact were 0.060 pounds lighter. After accounting for the flash and spitting, low impact saved 0.21 pounds of metal per shot. To make castings without low impact, more metal would have to be ladled to return the biscuit length to the 0.83 inch original average from 0.39 inches. The additional amount ladled calculates to 0.233 pounds. In melting this additional metal, melt losses (assuming a loss factor of 10%) amount to .019 pounds. The total metal savings with low impact is 0.229 pounds per shot.

Conclusion:

The SuperShot III's low impact feature accounted for a savings of 0.229 pounds per shot, and improvements in dimensional control of the part by virtually eliminating flash. Average cycle time decreases as less time is spent cleaning the die and core. The effectiveness of the low impact permits the use of higher fill velocities, which in turn permits the use of lower metal temperatures. This reduces melting and holding energy costs, and permits the reduction of chill time as well. The lower metal temperature also imposes less thermal shock on the die and thereby extends die life a minimum of 15% and often 30%. The use of low impact and faster fills resulted in a total savings of \$215,154 per year in addition to die amortization and maintenance savings.

	without Low Impact	with Low Impact
Cycle Rate per hour	51	68
Expected Die Life	100,000	115,000
Melting / Holding Cost	\$0.060	\$0.054
Metal Cost	\$0.60	\$0.60
Scrap Rate	10.0%	1.0%
Total Part Cost	1.74	1.29
Parts Shipped	91,980	173,547

**Total Yearly
Savings
\$215,154.00**

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