It's a great time to be an extruder

This really is a great time to be an extruder. Just now the global market for light metal extrusion is expanding at a faster rate than at any time in the history of our industry. In the automotive, rapid transit, and high speed rail sectors, for example, there are a growing number of design engineers who will be using light metal extrusion for the first time. These designers will be in no way restricted by the conventional limits to productivity that are still generally accepted by extruders. They want to better utilise the benefits of extrusion by using more complex profiles, harder alloys, thinner walls, multivoid hollows, and intricate mandrel features. Their aim, of course, is to maximise structural characteristics with minimum weight. This creates increased demands on die design and requires higher pressures to extrude. High strength alloys, of course, are by nature harder to extrude. They require higher extrusion pressures and better temperature control. All this, however, has to be good for the extrusion industry because it challenges us to provide better product which broadens the available market globally.

Ongoing improvements in the technology of temperature measurement and control have made it possible for us to learn much more about how the extrusion cycle actually works than we previously knew. At Castool, we believe that knowledge of the extrusion process is not finite, and that every production system can be further improved. We believe also that the human factor may profitably be minimised, but never eliminated. No amount of sophisticated digitised automation can replace a talented experienced operator who has overall control of his system at all times. In our continuing study of the extrusion process, we gained some new knowledge regarding the heating of dies.

For example, until recently, the extent of the participation of the single cell die oven in the process of extrusion was thought to be limited to heating the die quickly and uniformly to the temperature of the billet. We have since learned that the real value of today's multitasked oven is in its programmable control system. If left unattended, a heated die will cool at the rate of 5°C per minute in air and +/- 10°C once in the die slide. A preprogrammed heater will heat the die safely, completely and rapidly to a temperature which, when the die is installed in the press, will equal the temperature last recorded for the 'best yet' rate of productivity for the die. A signal light will indicate to the operator when time at temperature has begun. This is kept to a minimum to limit oxidation of the die bearings. The time required to install the die will have previously been calculated. If the die is not installed within the allotted time, the operator will be signalled to return it for reheating.

	Standard Extruder	Good Extruder	Super Extruder
Production	1,600 kg/hr	2,000 kg/hr	2,400kg/hr
Ram Speed	585 mm/min	660 mm/min	735 mm/min
Contact Efficiency	60%	62%	65%
Net Recovery	80%	81.5%	83%

Table of typical results extruding 8" 6063 Billet

Our goal now is to have the die within +/- 5°C of this target temperature for the initial push.

Any extrusion system really can in fact be improved. Light metal extrusion is a conservative industry that for years has on average operated well below its potential. Many extruders still perceive extrusion as being partly an art as well as a science. Their vision is often further restricted by their adherence to the old adage, "This is how we've always done it." There are many ways to measure and compare the efficiency of extrusion systems. Individual improvements may be incremental, but combined they improve the productivity. Even an apparently small percentage increase in productivity can result in a worthwhile increase in profit, and that after all is the whole purpose of extrusion.

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