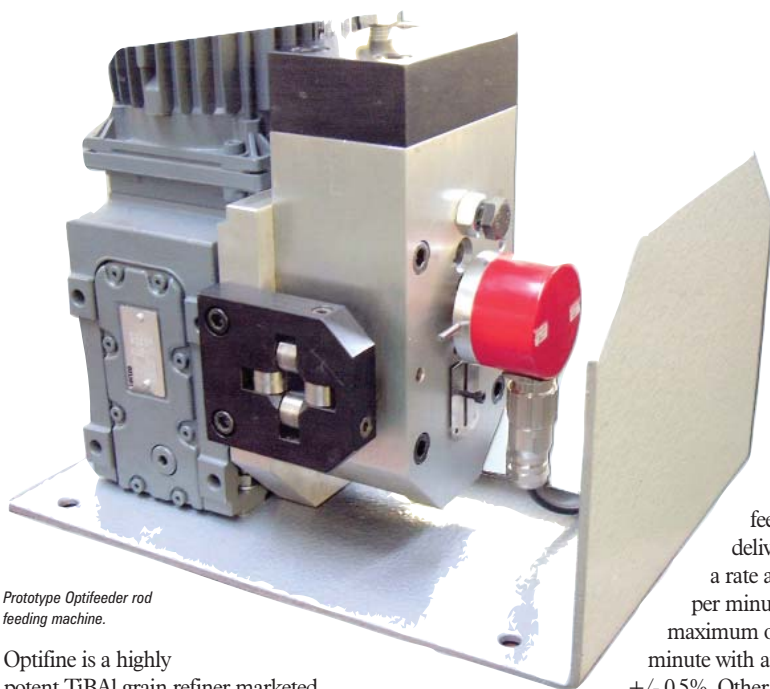


# Optifeeder rod feeding machine brings precision to Optifine TiBAL rod grain refining

The solution to the need for a precise rod feeding machine to complement the requirement for low Optifine grain refiner feed rates is described by Michael Bryant of The Melt Quality Partnership (MQP).



Prototype Optifeeder rod feeding machine.

Optifine is a highly potent TiBAL grain refiner marketed by MQP. It has been shown in several industrial trials, and more recently in full casthouse production (1), that targeted levels of grain refinement in a range of aluminium alloys can be achieved at far lower addition rates than is needed for conventional TiBAL grain refiners.

## Lower addition rates

For instance, addition rates of over 0.4 kg per tonne up to 1.0 kg per tonne are routinely used with conventional TiBAL grain refiners to obtain the level of grain refining needed to avoid ingot cracking in many alloys. Optifine has however been proven to achieve the same result with addition rates as low as 0.1 kg per tonne or even less.

Throughout the aluminium industry, TiBAL grain refiners in the form of 9.5 to 9.7 mm rod in coils, are added to molten aluminium alloys by means of specialised feeding machines. These single strand machines are designed to operate at a range of speeds which will deliver TiBAL rod at a rate as low as 10 cm per minute (equivalent to an addition rate of 0.24 kg per tonne for a 5 tonne/hr metal flow) and up to a maximum of 600 cm per minute for much higher metal flow. The accuracy of addition rates using these machines is normally quoted as +/- 3%.

## New feeding machine was needed

Since Optifine has been proven to be effective at much lower addition rates than conventional TiBAL rod there is a need for a rod feeding machine which will deliver Optifine rod at very slow speeds and at a

much greater accuracy than conventional rod feeding machines. MQP has therefore, in partnership with a vastly experienced producer of commercial rod feeders, commissioned a specially designed rod feeder. This will deliver Optifine rod at a rate as low as 4.0 cm per minute up to a maximum of 80 cm per minute with an accuracy of +/- 0.5%. Other speed ranges

can be provided on request.

The specially designed, single strand rod feeder, which will be marketed by MQP as Optifeeder, uniquely has the concept of a shaft encoder fitted to the geared motor to provide a speed reference. It also has a second shaft encoder on the drive top feed roll to provide the actual rod speed. This concept is illustrated in the picture.

The Optifeeder control panel will provide speed control using an inverter configured for encoder feedback. An Allen Bradley PLC will be incorporated with a touch screen HMI display for operator convenience. A high speed counter within the PLC will provide an independent display of actual rod feed rate.

Summing up, MQP believes that when Optifine is used in conjunction with the Opticast system to optimise the addition level and thereby minimise the cost of grain refinement, it is especially important to know precisely the amount of Optifine rod being added. The Optifeeder Rod Feeder machine, due to its unique mode of rod speed measurement, offers a highly accurate rod addition as well as the facility to conveniently monitor and store information relating to all Optifine treated casts.

**Reader Reply No.171**

## References

1 R Väinik, G Hornsby, J Courtenay and M Bryant. "Optifine potent grain refiner reduces risk of cracked ingots and billet." *Aluminium International Today*, March/ April 2010, pp24-25

Dross Engineering

PRESENTS  
TRF 'JUNIOR'



The Junior TRF is ideal for:

- Scrap sampling
- Process R&D
- Quality Control

Operates just like its big brothers but at a remarkably low price  
[www.dross-engineering.com](http://www.dross-engineering.com)

**Thailand company seeks sales co-operation with aluminium primary and secondary producers.**



Usetco is a privately owned company based in Bangkok, Thailand. The company has sales and marketing experience in primary and secondary non-ferrous metals. With over fifteen years experience Usetco are looking to co-operate with aluminium primary and secondary smelters to promote their products in the expanding market of Thailand. The company specialises in primary aluminium ingot 99.7%, A356.2 (wheel alloys), extrusion billet (6063, 6061) as well as secondary aluminium ingot for diecasting ADC12, ADC6, AC2B, AC4B etc. Usetco also supply aluminium scrap and alloy additives.

Usetco provide a consultancy service to Thai-based companies for the purchase of equipment and consumable supply.

More information concerning Usetco can be found on the company web site

**[www.usetco.com](http://www.usetco.com)**

Contact can be made to:-  
Apiwat Arkalephan, Managing Director  
Usetco Co. Limited  
98 Ramkhamhaeng Road, Soi 21  
Wangthonglang, Bangkok, 10310 Thailand  
Tel: +662 184 4044 Fax: +662 314 0489  
E-mail: [apiwat@usetco.com](mailto:apiwat@usetco.com)