

## Foundry Ladle Maintenance and Troubleshooting

### The Right Ladle for the Right Job

General ladle maintenance and trouble shooting is simpler if the basics are right to start with and the ladle is designed for the actual purpose it is used for. It is appreciated that over the years many foundries build up a stock of ladles, usually of different types and often in various states of repair. Typically only a few of the ladles may get regular use with the rest being held in storage on the off chance that one day they might be needed.

Therefore, if you are looking at changing or adding to your casting process it may seem unnecessary to get a new ladle especially if your spare ladles look like they could be used but this can be a false economy as it is better, and safer if the right ladle is used for the right job.

The ladle should be sized for the intended working capacity plus safe freeboard for a given refractory lining thickness. You should never fill a ladle to the brim either by accident or to squeeze a bit more capacity out of the ladle. This is especially true with ductile treatment ladles that have extended freeboards to contain the treatment reaction and, if over filled, can hold much more than their rated capacity. Ladles are designed with safety margins but this margin may vary from manufacturer to manufacturer and should not be used to allow a ladle to be persistently overfilled.

Over filling can upset the balance and handling of the ladle, and can also lead to accelerated wear on parts such as the gearbox and trunnions. Ladles should therefore be filled in a way that the contents can be measured and quantities known.

Conversely it is not good practice to use an oversized ladle. If you have a 2t capacity ladle going spare but find that you only need 1t capacity then it's not advisable to use the 2t ladle only half full. The ladle is going to be bottom heavy, difficult to rotate, and wear rates will be increased.

### Match the Ladle to the Refractory Lining

If you are looking to purchase new ladles, then discuss your refractory lining requirements with your ladle supplier as well as your refractory supplier. It is not my place to tell you what type of refractory or which refractory supplier you should use but it is my job to make sure that the ladle offered is designed to work most effectively with the refractory lining you wish to use.

One of the basics is to make sure that the ladle shell is sized to give the working capacity for the refractory lining used. In the past many ladles used to have firebrick linings which are typically half the thickness of today's



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### Article Takeaways:

1. How to select the correct ladle.
2. All about ladles and refractory linings.

In many foundries the ladle is still the most common method for transporting and pouring molten metal. Compared to many other pieces of foundry equipment, the typical ladle is still a fairly basic item with a design that hasn't changed greatly for decades. A workhorse of the foundry, it is expected to work when required, day-in and day-out, without fuss or drama. As such it is often taken for granted, overlooked until something goes wrong, and only getting attention when either production and/or safety is compromised.

The purpose of this article is to therefore give some guidelines on how a foundry can get the best use out of their ladles, and avoid unexpected breakdowns.

Much of what follows is common sense, and will already form part of a good foundry practice but it doesn't hurt to be reminded.

