

# ACETARC

## ENGINEERING

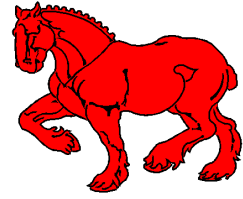


## FOUNDRY LADLES

MOLTEN METAL POURING EQUIPMENT



Established in 1967, Acetarc Engineering is an ISO 9001 registered company specialising in the design and manufacture of foundry ladles and associated molten metal pouring & handling equipment.



Our symbol is the **WORKHORSE**; *solid, reliable and enduring.*

We provide a range of heavy-duty products, manufactured by craftsmen engineers, using long proven designs combined with the latest manufacturing techniques.

Our full design & manufacturing capabilities enable us to provide tailor-made and cost effective solutions for your molten metal pouring and handling requirements.

From initial consultation , through to final design, manufacture and commissioning.

We can offer:

- **Geared crane ladles for metal transfer and casting.**
- **Teapot spout ladles.**
- **Treatment ladles for the production of ductile (S.G.) iron.**
- **Motorised ladles.**
- **Bottom pouring ladles.**
- **Lip-axis pouring ladles.**
- **Drum & U shaped ladles.**
- **Ladles for auto-pour units.**
- **Lining formers for ladles.**
- **Ladle pre-heaters.**
- **Crucible handling equipment.**
- **Molten metal pouring systems for high speed moulding lines**
- **Molten Metal handling equipment**
- **Furnace charging equipment.**
- **Monorail & crane systems**



50t motorised ladle at Rolls Royce Naval Marine foundry USA



21t capacity ladle with twin bottom pour gear at Weir Minerals foundry UK



## Acetarc Foundry Ladles General Information

Proven in foundries around the world and backed by over 45 years of practical experience Acetarc Foundry ladles are designed and manufactured to give many years of reliable service when used in the typical foundry environment.

Our ladles are designed and manufactured to either comply with or exceed current British and European standards. Equipment is CE certified and is supplied with a letter of conformity where applicable.

All Acetarc ladles are made to order using a range of standard and long proven assemblies. This means that we can quickly and cost effectively adapt the basic designs to suit your specific requirements. The more information you can give us, the more accurately we can interpret your requirements.

It will therefore greatly assist us if you can supply the following information when asking for a quotation:

- Working capacity of the ladle.
- Type and density of the molten metal the ladle is to be used with.
- Type and purpose of the ladle (i.e. casting, transport, treatment etc).
- Pouring type (Lip-pour, bottom pour, teapot spout , etc.)
- Type of gearing required ( Un-gearred, manually operated gearbox, motorised gearbox)



### Ladle Shell Sizes, Lining Allowances, Freeboard and Working Capacity

As standard Acetarc ladle shells are designed and sized to take into account modern castable refractory linings which are usually thicker than traditional firebrick or ganister linings.

A ladle quotation will state the lining thickness Acetarc have allowed for when sizing the ladle.

However if the suggested lining allowances do not match your requirements then we are happy to amend the sizes to correspond with your actual requirements.

The shell size is calculated for the required working capacity, for a given molten metal density, taking into account the lining allowance for both sidewalls and base plus a minimum freeboard. (Distance from the top of the molten metal to the rim of the ladle ) Acetarc ladles are therefore designed to achieve the required working capacity of the ladle, or a given type of metal, without compromising on the freeboard.



**Ladles should never be filled to the brim to achieve the required capacity**

## Workhorse Heavy duty Geared Crane Ladle.

The Workhorse foundry ladle is the result of many years of experience in the design and manufacture of heavy-duty ladles for all foundry applications.

For ladles with a working capacity from 450Kg (990lbs) and up to 75,000Kg (165,000lbs) capacity molten C.I.

The Workhorse ladle is intended for continuous use in all types of foundries and with all types of molten metal. It is designed to give long and trouble free service for many years whilst also being easy for a foundry's own personnel to maintain so that downtime is minimised.

Workhorse ladles can be fitted with the option of either a manually operated gearbox or a motorised gearbox (electric or pneumatic drive) for the controlled rotation and pouring of the ladle.

The Workhorse ladle design forms the basis for

- **All types of Casting/ transfer ladles**
- **Ductile iron Treatment ladles.**
- **Bottom pouring Ladles**
- **Drum & U shaped Ladles**
- **Ladles fitted with motor drive**
- **Special ladles**



**Acetarc Workhorse heavy-duty geared crane ladle with fork pockets, sidearm counterweights and extended lifting hook**



**50t capacity Workhorse ladle with motor drive  
Undergoing commissioning trials at  
Rolls Royce Naval Marine foundry in the USA**

The Workhorse ladle is fitted with bolt-on trunnions as standard.

This has advantages over trunnions that are welded directly to the ladle shell.

- It reduces heat transference from the ladle shell to the sidearms and gearbox, thereby reducing the likelihood of parts becoming tight due to thermal expansion.
- If a trunnion gets damaged or worn, it then becomes a relatively easy task to replace the bolt-on trunnion by the foundry's own maintenance team.

It should be noted that the load is not taken on the fixing bolts.

There is a large diameter spigot at the rear of the bolt-on trunnion that actually carried the load thereby removing the shear off the fixing bolts. The bolt-on trunnion is then fixed to the machined pad using grade 8.8 HT screws.



## Westminster Medium duty Geared Crane Ladle

For ladles with a working capacity up to 4500Kg (9900lbs) molten cast iron the Westminster ladle is designed for continuous use in non-ferrous foundries and for intermittent use in ferrous foundries.

The Westminster medium duty ladle is a simpler design when compared to the Workhorse heavy-duty ladle and whilst built to the same quality is not recommended for use in foundries where the molten metal is at elevated temperatures such as steel and/or special alloys.

However, it is ideal for foundries that require a robust dependable ladle for occasional rather than daily usage and for non-ferrous foundries that are casting lower temperature metals such as Aluminium.

The Westminster Ladle is fitted with the same range of Acetarc Oil-bath gearboxes as the Workhorse heavy-duty ladle.

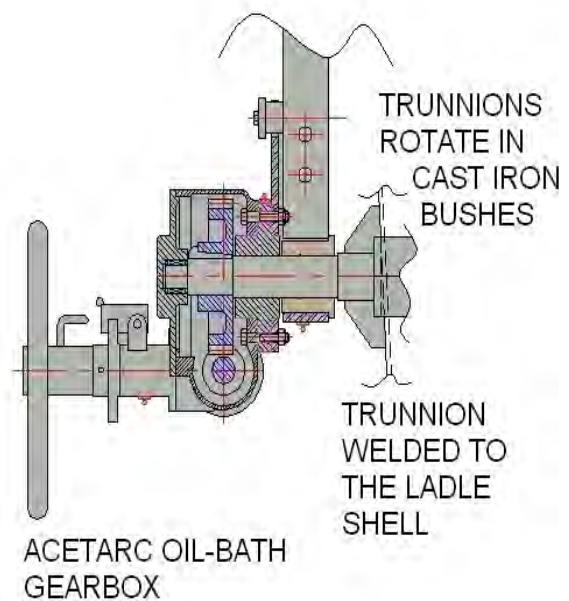
Ladle shells can be sized to suit pre-formed linings such as the Foseco Insural® ladle liners

All ladles designs can incorporate features such as special pouring spouts and/or covers etc.

Westminster medium duty ladles are often supplied with Vee bails



Acetarc Westminster medium-duty geared crane ladle



The trunnions are welded to the ladle shell and rotate in replaceable cast iron bushes.

## Manually rotated Acetarc oil-bath gearbox

All manually rotated geared ladles are each fitted with an appropriately sized Acetarc oil-bath gearbox. The Oil-bath gearbox is of our own design and manufacture. A robust unit that can withstand much abuse with the need for only the most basic maintenance, specifically intended for use with foundry ladles and to operate in the foundry environment. All moving parts rotate in bearings with either grease or oil lubrication.

The Acetarc oil-bath gearbox can be considered as self-locking in normal operation and will not back drive. The gearbox will hold the ladle at any degree of rotation regardless of the amount of metal in the ladle.

The Acetarc gearbox is not bolted directly to the ladle sidearm but is fitted with a slotted drive plate that engages with the ladle sidearm via a drive peg. This reduces wear on the gearbox and leaves it unaffected by crane vibration. It also means that if the sidearm becomes bent then this will not cause tight spots in the gears.



## Acetarc Motorised Gear Assembly

All Acetarc Workhorse ladles can be fitted with a motor gear assembly for powered rotation of the ladle. The motor gear assembly comprises of an Acetarc Oil-bath gearbox linked via a clutch to a motor gear unit. The motor gear unit can be fitted with either an electric or pneumatic motor depending on what most suits the foundry's requirements. Powered rotation speeds can be set to suit a customer's requirements at the design stage.

If required, the motor gear unit can be quickly disengaged, without the need for special tools, and the ladle rotated manually.

The Acetarc oil-bath gearbox fitted to the motor gear ladle is the same size unit that would be fitted to a manually rotated ladle of the same capacity.

Electric motor units also incorporate a torque limiter safety overload as standard.

### Control Equipment

We can offer a number of options with regard to control equipment, including two-speed motors or Inverter control for variable speed rotation.

Radio remote control for electric drives.  
Pendant or lever control for pneumatic drives.

Electric motor drives can be supplied to suit your Specific 3 phase power supply voltage and frequency.



**Contact our design office for full details of all the motor gear options available.**



## Treatment ladles for the production of ductile (S.G.) iron

Any ladle can be used to make S.G. (Ductile) iron but the small investment in buying a ladle that is specifically designed for the in-ladle treatment process will soon pay for itself by offering:

- **Consistent results**
- **Better casting quality**
- **Improved yield**
- **Reduced alloy costs**
- **Reduced fume**
- **Reduced slag creation**
- **Lower temperature losses**
- **Safer ladle operation**
- **Ease of ladle operation**



Acetarc can offer treatment ladles for all in-ladle Treatment processes including:



- **Deep Treatment (open top) sandwich process**
- **Tundish cover** (All variations)
- **Teapot Spout treatment ladle**  
(sometimes referred to as tundish/teapot treatment ladle)
- **Wire feed treatment ladles**
- **Ladles for plunging ductile treatment stations**
- **Porous Plug desulphurising Ladles**  
(For both batch and continuous)

**Contact the Acetarc Design office for more details.**



## Bottom Pour Ladles.

Workhorse ladles can be fitted with either a single or twin bottom pour gear assemblies (depending on the size of the ladle) for slag free tapping of the ladle from the base of the ladle.

The standard bottom pour assembly is manually operated with lever control. However we can offer a powered assembly that enables the operator to work at a safe distance. The powered assembly is covered by a separate data sheet. ***Please contact the Acetarc Design office for further details.***

The bottom pour ladle incorporates a number of modifications to the standard heavy-duty design:

- A detachable nozzle box is set in the base of the ladle
- The ladle has three feet on the base of the ladle to give clearance to the nozzle box.
- The ladle shell is adjusted to ensure that the working capacity is maintained after taking into account the displacement of the stopper rod.
- The stopper rod mounting and nozzle box can be manufactured to suit your preferred choice of stopper rod/nozzle refractories.
- The manually operated articulated bottom pour gear can have the operating lever set to be used at a number of positions over a 180° degree arc so that the operator can be in the best position.



## Drum and U shaped ladles

Acetarc drum and U shaped ladles can be supplied for capacities up to 10,000Kg (22,000lb) C.I. as standard. Larger capacities can be offered as specials.

Drum & U shaped ladle designs can offer advantages where headroom is limited, typically being shorter than a geared crane ladle of the same capacity.

Drum ladles have an enclosed shell, with a filling slot and a pouring spout, thereby offering a high degree of protection to the operator. Both end plates, and a section of the drum body can be un-bolted to aid with the refractory lining process.

U shaped ladles are often open at the top but can be supplied with bolt-on covers to both guard against metal splash and to reduce temperature losses.

This type of ladle is often fitted with an extended teapot spout so that the ladle can be fully emptied without needing to rotate the ladle through 90° degrees. Spout movement is therefore usually less than it would be with a standard crane ladle.

Both the drum and U shaped types of ladle are often supplied on a stand to create an un-heated receiver





## Acetarc Foundry Equipment



**Charging bucket  
For furnace charging**



**Monorail & ladle system  
For bulk transfer and  
pouring Aluminium**



**Skip bucket furnace  
charging system**

**Foundry equipment designed to suit your exact requirements**



**Un-gearred ladle with  
hydraulic tilting frame**



**Large capacity ladles for  
steelworks**  
(Supplied to the Davy corporation)



**Vacuum tapping ladle  
for transporting Aluminium**

Many of our designs are special applications, and are built to meet a foundry's specific requirements. Therefore our sales literature can only give a small indication of the scope of our supply. Further information is available on our website and customers are always welcome to contact our design office to discuss their application directly with one of our experienced project engineers.





## **Acetarc Pouring Systems for High Speed Moulding lines**

### **Designed to suit your exact requirements**

It may be difficult for crane ladles to keep up with the molten metal demand required by large capacity high speed moulding lines unless several ladles are in use at the same time. Over a full working shift operator fatigue can also be a significant factor in both slowing down production and in causing variable casting quality.

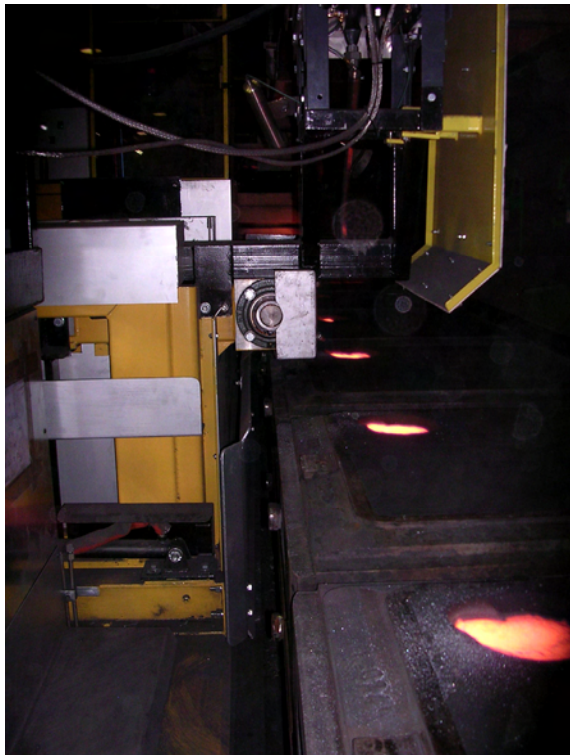
A fully automatic pouring system such as a heated pressure pour unit will overcome these issues but is both expensive and may not give the flexibility that a foundry needs, especially if the foundry is pouring different types or grades of metal such as grey iron and ductile iron.

Acetarc can offer cost effective un-heated semi-automatic pouring systems that enable high pouring rates to be consistently achieved, reducing operator fatigue and giving the foundry the flexibility to change the specification of the metal being poured as the foundry needs to.

The Acetarc un-heated pouring systems are based on either lip-axis or bottom pouring processes, depending on which method most suits the foundry's requirements.



**Examples of un-heated semi-automatic pouring systems designed, manufactured and installed by Acetarc Engineering .**



All of our un-heated semi-automatic pouring designs are specially built to meet a foundry's specific requirements.

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## Acetarc Ladle Pre-Heaters

For optimum life and performance modern refractory linings need to be properly pre-heated prior to the ladle being filled with molten metal.

Many foundries still use basic pre-heat methods based on either a gas flame poker with a "lazy flame" or a simple gas/air burner without a cover. These basic systems lack control and their energy efficiency is notoriously poor with most of the energy heating the surrounding area rather than the actual ladle. Basic pre-heating system can also be prone to uneven distribution of the heat inside the ladle so that the ladle has both hot & cold spots in the refractory lining that lead to premature lining failure and variable metal quality.

Neither is it usual for the basic pre-heat methods to incorporate safety systems such as automatic flame failure protection or push button flame ignition. These basic pre-heat systems often require ignition from a secondary flame source such as a burning rag or taper which can lead to safety issues.

A properly designed Ladle pre-heater provides a solution to all the above and gives a far more safe, cost effective, efficient and controlled method of pre-heating a ladle than the methods outlined above.

### **A properly designed Acetarc ladle Pre-heater can help to:**

Improve safety by incorporating automatic flame failure protection systems and remote ignition systems.

Save Money, by being far more fuel-efficient than the traditional pre-heat methods.

Reduce refractory lining damage caused by thermal shock.

Reduce skull & dross formation caused by pouring metal into a cold ladle.

Help to minimise the reduction of the temperature loss of the metal whilst it is in the ladle.

Ensure that the ladle is evenly pre-heated so that the refractory lining life is maximised.

Allow the furnace melting temperature to be reduced.



### **Downward firing pre-heater with thermal feedback control.**

The pre-heater is designed to match the ladle it is used with so that maximum efficiency is achieved

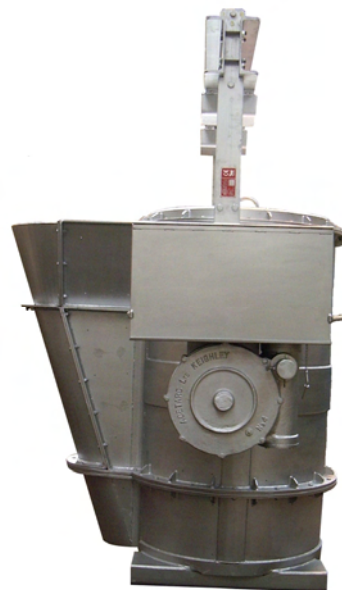


### **Bed Type pre-heater**

#### **With thermal feedback control**

The bed type pre-heater be used with a wide range of ladle sizes without compromising on efficiency.

# ACETARC FOUNDRY LADLES



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**ACETARC**

*Proudly Manufactured in Yorkshire and used in foundries  
around the world*

Contact your local representative  
(visit our website for details)