

# THE HANDLING, STORING AND SETTING OF GLASS POTS<sup>1</sup>

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## ABSTRACT

"A glass pot is a wonderful piece of engineering:" It is an expensive article and deserves the most careful treatment. The precautions indicated are; careful packing for shipment in *rain proof* box cars, well padded pot carriages equipped with the spring suspensions, storage in a *warm, dry* room, careful preparation of furnace bench to insure an *even distribution of load* on the bottom of the pot and to make certain that the pot is *level*, or tilted slightly forward. Unnecessary jolts often result in damage which only becomes apparent when the pot is heated up.

## Introduction—Preliminary Precautions

The point that should always be held uppermost in mind concerning a glass melting pot is that it is really a marvelous piece of engineering. A mass of clay weighing around one and one-half tons, moulded, shaped and carefully dried, which will stand the rough treatment necessitated in shipment is remarkable. This body of clay has been nursed and petted from the laying of the bottom to the state of final drying in the pot room and from its very nature is fragile, and its mechanical strength, weak.

The fact that the pot must be shipped by box car, is an unfortunate necessity but all possible means should be used to protect this mass of unburned clay both in the car and up to final setting in the furnace.

## Shipment

The presumption is that a water tight box car has been selected for shipment and it may be well to have water from a hose flow over the roof of the car to fully demonstrate that it is rain proof.

The pots should be set on dry packing hay and well braced so that they can not shift position or be jarred during transit.

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### Unloading and Storage

When the car is received in good order it is well to have a yoke or block and tackle arrangement to raise the bottom of the pots up to the level of the pot carriage. Carriages should be well padded with canvas strips or rubber hose, and it has been found advantageous to have spring suspensions and roller bearings to avoid jolts when crossing thresholds, rough flooring and other irregular surfaces. All straining, jolting and jarring should be eliminated whenever possible.

Possibly the careless maner in which pots are sometimes handled is due to the fact that the result of jars or strains is ofttimes not apparent while handling the pot but shows up at later stages, for instance during the heating-up period in the pot arch. In such cases cracks due to the release of strains set up in handling can be very easily accounted for by a number of different causes and the real origin remain a mystery.

Pots should be stored in a dry place selected for this sole purpose, such as beneath the furnace room. This space should be fenced off with wire netting and provided with a door and lock so that only the furnace man has access to the room. The bottoms should be raised on blocks to give opportunity for air to circulate beneath. Naturally the oldest pots should be used first and the storage room should be so arranged that they will be withdrawn in natural sequence.

A card record giving the life history of each pot from the time it is received until it is removed from the furnace is advisable so that the individual performance of each pot is known, its inferior or superior qualities may be traced and the results transferred to a summary sheet.

A typical card may be arranged as follows:

POT RECORD	Glass Co.	DATE
Furnace No.	Arch	No.
Pot Broken	Maker	No.
Remarks		
	How Broken, etc.	
	Size, etc.	
Pot Set	Maker	No.

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Summary Pot Record—————Glass Co.					Arch No.——
Maker's Name	Set	Broke	Life	Remarks	Melts.
and No.	/	/	/	/	// / / / /
					Total——

Etc.

The majority of plants have only hand drawn pot carriages. If the volume of business warrants, however, it is advisable to adopt power driven carriages, either electric trucks, or, for furnace room work, steam driven pot handling machines.

A successful departure from usual practice followed at one plant was to construct a pot room alongside of a checker chamber by merely enclosing the space for a few bays with a brick or tile wall. The waste radiated heat from the checker chamber kept this room warm and pots were transferred here from the storage room preliminary to introduction in the pot arch, so that they were evenly and well dried out and somewhat heated when ready for the pot arch.

Contrast this care with what is sometimes found around glass works: pots stored in cold warehouses, or any odd space in the plant, sometimes near broken windows where snow and rain beat in and other exposure to moisture is present.

A glass pot is a wonderful piece of engineering skill when we consider the great weight, thick walls, long time required to manufacture and severe treatment to which it is to be subjected. There is no other appliance or tool worth one hundred dollars around a glass house which is not given better care or more closely watched lest it be damaged, and yet the pots are the main-springs of the business. Considering the loss of production and the arduous labor resulting from the loss of pots, is there any reason why all precautions should not be taken to prolong the life of the pot? Consequently elimination of every cause of jolts, jars and rough handling is most desirable.

### Pot Setting

The setting of pots is an operation carried out by a well trained crew in fifteen or twenty minutes where a skillful foreman is in

charge and a proper subdivision of labor is maintained so that each man knows his specific duties. It is one of the most spectacular features in connection with glass house operation.

It is well to remove the regular sheet metal doors just before pot setting, and to hang on the hinges an old set of doors which have been warped and scaled by exposure to the high temperatures and which are used only at the time of pot setting. The jack bricks composing the breast wall are torn out and piled conveniently at one side of the arch. Lastly the breast wall bricks are loosened by leverage, a carriage is inserted under them and they are wheeled to one side of the opening. The sheet metal doors serve as shadow pans in retaining heat within the furnace and thus protect the operators. Chain screens or wire gauze screens may be used advantageously for heat protection, comfort, and retention of heat within the furnace.

When the breast wall is clear the old pot is attacked. If glass has leaked out through a crack and frozen the pot to the bench considerable exertion may be required to remove this glass with rakes, shovels and hoes. Finally a pry is applied beneath the mouth of the pot until it can be raised and the prongs of the pot carriage forced beneath the bottom. Then the long handle of the pot carriage serves as a lever and the wheels as a fulcrum and the pot is lifted and carted off to the dump.

Meanwhile the other men start cleaning the bench and removing all traces of any glass that has leaked out. When they have an even clay bottom a cushion of clean sand is thrown over the bench and it is ready to receive the new pot. This is brought from the pot arch on the pot carriage and placed in approximate position and then gently lowered into place and the pot carriage withdrawn.

Care must be exercised that the pot is level. This is usually accomplished by the foreman taking special pains when the bench is cleaned to see that sufficient sand is used so that when the pot has settled into place only a small amount, if any, additional filling will be necessary.

The arduous labor of raking, hoeing, and spreading of sand in the above operations is greatly lessened if the leverage principle is used to full extent. This may be done by having extra long

handled tools and employing a "Lazy Bones" as the fulcrum point.

Carelessness in cleaning the bench will result in the bench gradually becoming so high that the pot will not enter the arch of the furnace while still on the carriage. This means that the pot must be unloaded in the arch opening and shoved on the bed of sand into the furnace. Bunting the pot just under the hood with the pot carriage is the usual method of accomplishing this end. Although the pot at this point has been burned and possesses considerable mechanical strength vibrations set up by such rough treatment ought certainly to be discouraged.

The method practiced by one old hand at setting pots is to have the bench thoroughly cleaned and enough sand placed at the back of the pot so that the pot can be settled down to the proper level. The front of the pot can be easily barred up and sand thrown under to raise it but it is next to impossible to do this at the back. When the pots are not completely worked out it is a good plan to tilt the pot slightly towards the mouth thus relieving the back, or the weakest part of the pot when in the furnace, of the added pressure of the glass.

After the pot is properly leveled the breast wall bricks are wheeled into position on the block carriage. The jack bricks are lifted by means of forked rods into their proper positions so that a neat fitting breast wall results and the few interstices between the blocks are mudded up with clay in order to make a gas tight closure around the pot. Accurate placing of these jack brick is easily accomplished by using a bar as fulcrum for the jack brick fork. The bar can be held by two men or a stand for the same purpose may be employed.

It will be seen that only the very greatest pains can be advocated in all handling of pots if the best service is desired. Plants pursuing such care may be exceptional, but records from such plants prove that the results attained will justify the precautions taken.

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