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Old Jar Sealants
**- Simon Moore, Hampshire County Council Museums,
 Libraries & Archives Service**

Abstract

Apart from storing fluid-preserved specimens in a multitude of different types of jar, there are also many different types of sealant. Most guardians of these do not have easy access to spectro-photometry and have to rely on more basic senses. This guide aims to help.

Introduction

In these days of preserving as much of the past as possible, people are often asking about re-sealing jars using the closest equivalent to the original jar sealant as possible.

Although these are also diverse and some are home-spun without any known provenance, a handful of recipes still exist but firstly require some basic analysis and recognition.

Until the marketing of the ground glass closure, sometime c. 1850, jars for displaying fluid-preserved specimens were cylindrical, of circular or oval cross-section and a few were rectangular or square. Later (c. 1900), the jars with right-angled corners became more commonplace. All of these had simple glass closures that fitted onto a ground glass surface to give key for the sealant, and were then sealed using a diversity of recipes according to the period favourite.



Fig 1: 19th century ground glass jar lids with attached glass



Fig 2: Neck of a very scarce, later 17th century preserving bottle with cork closure. Ashmole collection.
 (Courtesy of Oxford University Natural History Museum.)

Basic analysis of permanent sealants for jars

17th century jars are rare, not many having survived the long passage of time. These were hand-blown and would have been sealed with a plug of cotton waste and either tallow, candle wax, sealing wax or just a simple a cork.

18th century jars followed in much the same way, although some have ‘luting’ caps (sealing caps) of lead foil in between two pig bladders, which are ligatured on to the neck of the jar and extend over the glass lid giving it a tent-like appearance. By the end of the 18th century an orange paste, comprising a mix of Stockholm tar and red lead (lead sesquioxide) was being used. (See figs 3 and 4). Despite the obvious hazards of using a lead salt, this paste was effective for about 10 to 20 years, after which the viscosity of the tar dried out. This is recognisable as a dull orange-brown sealant (below left) with a resinous-tarry smell.



Fig 3: Dried out Stockholm Tar



Fig 4: Red lead sealant

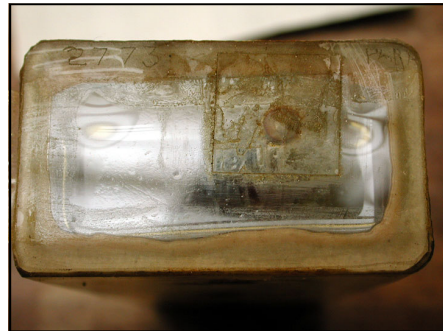


Fig 5: Gutta Percha seal on battery jar, applied c. 1930. The brown colour is from the brown-stained IMS that was in the jar.

By the mid 19th century the sealing arsenal had extended to include gutta percha adhesive (also used in the bookbinding and golf ball industries) and comestible gelatin, which is a favourite of mine. Gutta percha can be recognised as a whitish-grey and crumbly crust around the edge of the jar whereas gelatin is slightly yellow and more flakey.

A good GP seal will last for 30 or more years but can deteriorate quite quickly and without any change in appearance whereas gelatin has the advantage of 50 plus years if the seal is good. If a gelatin seal is not good it will form into a white mastic combining slightly with the IMS in the jar (fig 6). A good gelatin seal appears as if frosted (fig 6) since it has bound into the texture of the ground glass so it appears like the ground glass edge of the jar.

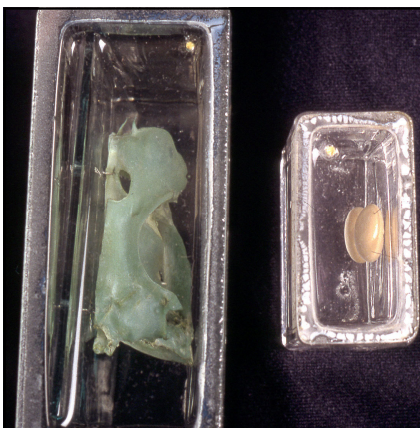


Fig 6: Gelatin seals on battery jars. Left jar has a good seal that will last at least 20 years. The right jar has a poor mastic-contaminated seal that is useless

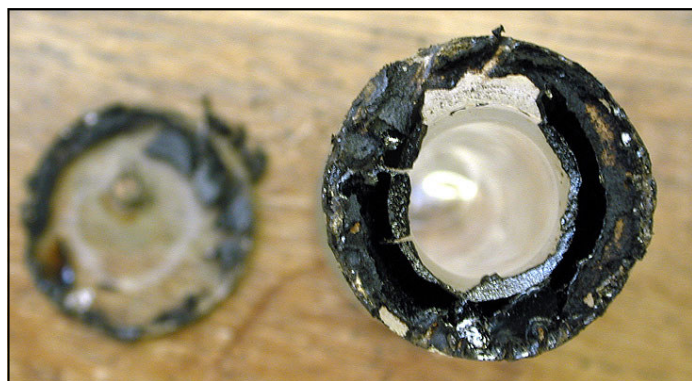


Fig 7: Remains of a rather crumbly bitumen seal about 80 years old.

Bitumen is another long-lasting seal used much in the early 1900s and throughout the latter half of the 19th century too. It is characterised by being black and hard but requires specialised knowledge for successful application and a heated spatula. (see fig 7).

Since the 1960s, silicone has come on the market. This can be a reliable sealant although I have not yet found a jar effectively sealed after 20 years. The IMS, like other low-density fluids, will eventually find a way (capillary action) through a weakening silicone seal since it does not bind itself so successfully to glass.

Semi-permanent jar sealants.

Most of these are vaseline-like in consistency and provide a useful leakproof seal to ground glass closures. Not all are reliable in the longer term however.

Vaseline itself is alright to use in the shorter term but it becomes denatured through molecular cross linkage with the IMS and starts to become granular or colloidal.

Murrayite is a sticky brown-ish grease that was used in the 1950s and 60s but discolours and can stain the IMS. It gradually loses its sealing capability after about 5 years.

Vacuum silicone grease can be effective in the longer term but will often solidify, making the lid impossible to remove!

Paraffin soft white is physically similar to vaseline and so far (up to 30 years) has shown none of the problems of the above sealants. It used to be obtainable through Merck but since that changed to VWR only commercially-viable products are sold and many of the minority saleable items are regrettably no longer available.



Jar containing preserved snake in IMS.
Note the floating blobs of lipid (centre of meniscus) or is it softened grease from the lid? The lid grease is also quite oxidised (left of lid).

Conclusions

Bearing all of this in mind, I still favour gelatine as a permanent jar sealant since it is clean, easily applied and the constituents can still easily be purchased. For semi-permanent closures I still use Paraffin Soft White and still have a reasonable stock. Once that stocks have gone I will have to find some suitable alternative.

Help please?