

Pot Life, Working Life and Gel Time of Epoxies

Pot life, working life, and gel time are properties of an epoxy that can vary greatly from product to product. These properties play a vital role in material selection in choosing an adhesive for a specific manufacturing environment or process. When selecting an epoxy, pot life may be an important concern for one application, but not for another. When it matters, it is important to know how to interpret product test data on a product's datasheet concerning these properties.

What > Understanding the terms pot life, working life, and gel time with regards to EPO-TEK adhesives.

Why > Knowing the difference will help with material selection for a specific application.



Pot Life vs. Working Life

Pot life and working life are often taken to mean the same thing, but that is not always the case. **Pot life** is defined as the amount of time it takes for an initial mixed viscosity to double, or quadruple for lower viscosity products (<1000 cPs). Timing starts from the moment the product is mixed, and is measured at room temperature (23°C).

Working life, on the other hand, is the amount of time an epoxy remains low enough in viscosity that it can still be easily applied to a part or substrate in a particular application. For that reason, working life can vary from application to application, and even by the application method of the epoxy, so there is *no uniform method* for quantifying this property.

Pot life can act as a guide in determining working life by providing a rough timeline of viscosity growth, remembering that viscosity doubles for every pot life value.

One example for review is the pot life determination of EPO-TEK H70E, see Table 1 below. It starts with an initial viscosity of 5632 cPs and doubles after 56 hours. You can estimate that in another 56 hours, the viscosity will be at least 22,000 cPs.

Table 1

EPO-TEK H70E Pot Life		
Time (hrs)	Time (min)	Viscosity (cPs)
0	0	5632
24	1440	6349
48	2880	8397
51.5	3090	9523
54	3240	10137
56	3360	11059

Pot life is an important value and is one of many searchable parameters on our epotek.com website. Table 2 quantifies pot life related terminology, as it is used on our EPO-TEK website.

Table 2

Pot Life Length	Approximate Duration
Quick	< 1 hour
Short	1 – 4 hours
Medium	4 – 8 hours
Long	8 – 24 hours
Days	> 2 Days

Gel Time

Gel time is another term that is often used interchangeably with pot life, although there are some differences. Both terms are used to describe the thickening of an epoxy after it is mixed, but gel time is often tested at elevated temperatures as well.

Gel time is determined by heating the epoxy and observing when it starts to become stringy, or gel-like, though not quite fully cured. It will most likely be at a higher viscosity the end of its pot life measurement.

This value can be useful for manufacturing purposes if one needs to move a part before the cure is complete, but does not want any shift in a component placement. It is not, however, a standard quality control test and should be determined experimentally in each application, if needed.