







ing for a response.

- Recovering from a leak (recovery time).

The roughing capacity and the test crossover pressure effect points 1 and 2.

## Test Crossover (hard vacuum method only)

In order for helium to be introduced into the leaking part, the part must be low enough in pressure to be connected to the leak detector detection cell. This is done by providing a vacuum pump capable of pumping to this pressure (roughing pump), which is automatically, controlled by the HLD electronics. This phase is called the roughing or pumping down time. The size of this pump must be sufficient to evacuate the part to be tested in a small enough amount of time, which is required by the demands of the application and the number of parts to be tested. (see Figure 1).

## Spraying Helium and Waiting for a Response

Once the part is under vacuum and is "connected" to the analyzer cell, helium is sprayed around the

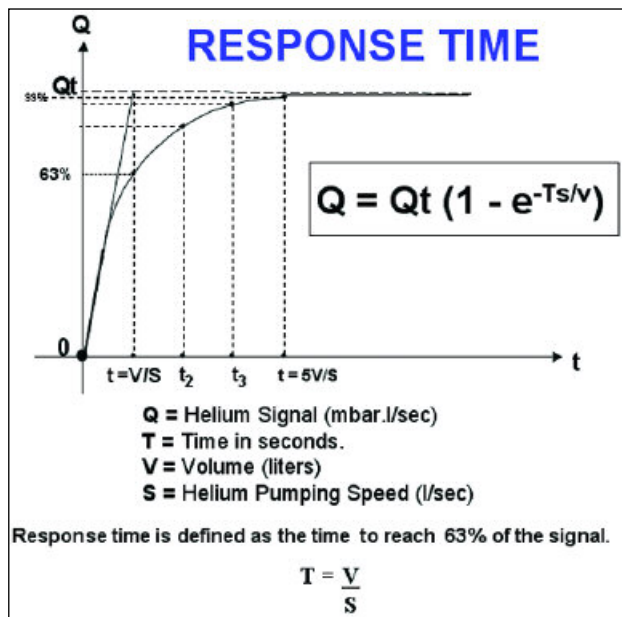


Figure 2. Response time

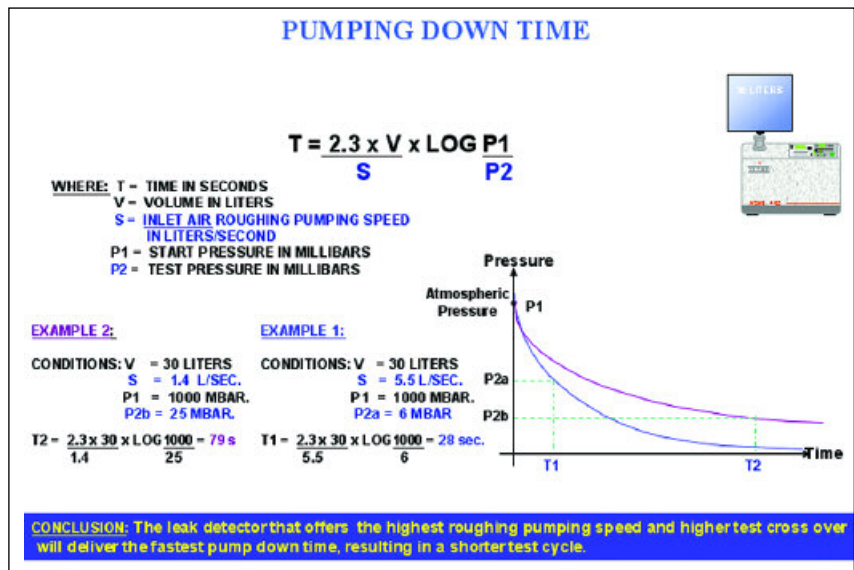


Figure 1. Pumping down time

item to be tested. In the presence of a leak, some helium molecules reach the inside of the part, and then are transferred to the HLD to be analyzed and a corresponding leak rate is displayed.

The transfer time for helium to go from the inlet of the leak detector to the analyzer is usually quite fast, generally less than one second. Conversely, the time required for the molecules of helium to travel from the leaking part to the inlet of the leak detector can be quite long. This will depend on the helium pumping

speed of the leak detector. The greater the helium pumping speed, the faster the response time (see Figure 2).

## Recovery Time

Helium pumping speed also effects the disappearance of the helium (see Figure 3). The recovery time after a leak has been found will largely depend on the helium pumping speed. The higher the helium pumping speed, the faster the HLD will recover, in other words, the quicker the next test can be performed.

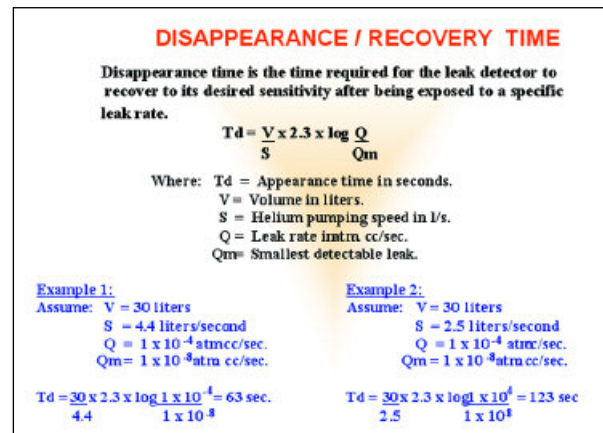


Figure 3. Disappearance/Recovery time

**The higher the  
helium pumping  
speed...the quicker  
the next test can be  
performed.**

## **Conclusion**

A leak detector can serve more than one need, for example, production or maintenance providing it has the appropriate features. Regardless of the application or the leak test method, the above criteria should be on the checklist of anyone in search of the right HLD for their needs. Often a demonstration and evaluation of the HLD in the “working environment” is possible to make sure the best unit will be selected.

Should “dry” (oil-free) versus “wet” (oil-sealed) be another consideration? This is further topic that we will cover soon in a future Gases and Technology issue.

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