



HETTICH LAB TECHNOLOGY EDUCATIONAL SERIES

UNDERSTANDING YOUR HETTICH EQUIPMENT

Predictive Maintenance: Life Cycle Counts/ Maximum Cycles

Like most mechanical devices, such as a car or truck, centrifuges follow a maintenance program and part replacement schedule based on maximum cycle counts. Although this can take many years, eventually the materials used in your rotor, buckets, and centrifuges will reach the end of their useful life. By performing mechanical stress tests, we have determined the maximum amount of cycles our products should undergo before being retired.

Below we have explained how you can determine the number of cycles your equipment has undergone, so that you can prepare to replace your equipment if necessary. It is important that you are aware of the maximum life cycles of your equipment, because running expired equipment could lead to user safety concerns and loss of productivity.

Life Cycle Counts (Max. Cycles)

All metal parts such as rotors and buckets are subject to stress, which ultimately makes the lifespan of the part finite. The faster the speed and the heavier the load the greater this stress is.

The stress on a centrifuge rotor and its carriers (buckets) occurs when the system accelerates, reaches max load and then decelerates (one cycle).

We use the maximum allowed speed and maximum allowed load (for the rotor/ bucket combination) to physically test max cycle counts. Through better CAD design and an improvement in materials the cycle count of rotors and buckets has dramatically increased over the years.

The choice of materials used balances on the physical strength characteristics. The goal is to find the best materials for the application, understand their life cycle limits and to replace them when they reach their limit. Exactly the same principle is applied to aircraft components (turbines, etc.), which are also subject to similar stresses.

Since 2009, Hettich has provided information about the useful life of rotors and buckets used in its centrifuges (this information is etched or engraved on each rotor and bucket). The term “cycles” refers to the number of times a rotor and its buckets can be spun. This falls in line with requirements of continuous improvement and awareness of safety and reliability. One cycle is one centrifugation run.



ROTOR

Sample of max. cycle count printed on a Rotor (manufactured after 2009).



BUCKET

Sample of max. cycle count printed on a Bucket (manufactured after 2009).

Centrifuge rotors and buckets put into service prior to 2009 usually do not have this information etched or engraved on them. This does not mean that they are not subject to the same limitations. We maintain a list of

Hettich
CENTRIFUGES



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approved cycle counts for each rotor and bucket and encourage you to contact us should you be unaware of your cycle counts. Please contact us at: 1-866-370-4388 (toll free) or email service@hettweb.com.

It is important to know (or be able to calculate) the number of cycles a rotor and its buckets have experienced. Appropriate replacement steps can be planned for, when the max cycle count has been reached. Using a simple calculation, the cycle count can be determined or estimated.

Note: Current centrifuges will provide a count via the control panel, however older centrifuges, prior to 2009, require the user to calculate the cycles themselves).

Example:

A centrifuge is set to run for 5 minutes at 5000 RPM. It has 7,950 control hours.

7,950 (hrs) = 477,000 minutes

477,000 (mins) / 5 (mins) = 95,400 cycles

Note: speed has no relevance in the calculation.

The accuracy of this cycle count calculation depends on the centrifuge settings staying the same for its entire use. If there are multiple programs and multiple settings, the accuracy diminishes.

The control hours of some centrifuges can be retrieved at the control panel of the centrifuge. Consult the repair manual for your particular model or contact Hettich at 1-866-370-4388 (toll free) or email service@hettweb.com.

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