Characteristic Time (CT): What It Is and Why It Matters in Golf

How CT is measured for drivers — and what is being measured

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"Characteristic time" (CT) is what golf's governing bodies — the USGA and R&A — measure to determine whether drivers conform to the limits within the Rules of Golf on "spring-like effect." Most simply put, characteristic time is the amount of

time, measured in microseconds, there is contact between the clubface of a driver and the ball used in the testing apparatus at the moment of impact.

Measuring Spring-Like Effect

What's spring-like effect? Really, it's just what it sounds like: the springiness of a clubface. The springier the clubface is, the farther the golf ball can fly (other things being equal). But the governing bodies set a limit on spring-like effect and test equipment to make sure that limit is observed by manufacturers.

Prior to 2004, the USGA and R&A tested spring-like effect by measuring coefficient of restitution, commonly known by the acronym COR. And COR became a very well-known acronym to golfers, since there were battles in the early 2000s, including some disagreements between the R&A and USGA, over what the COR limit should be.

But in 2004, the governing bodies developed a new way of testing spring-like effect. Characteristic time, or CT, is the name given to the results of that test.

How Characteristic Time Is Tested

The CT test used by the governing bodies involves using a pendulum device to drop a steel ball so that it strikes the

face of the driver being tested. Very precise sensors within that steel ball measure the amount of time there is contact between the two objects.

The governing bodies have set a CT limit for drivers of 239 microseconds. A microsecond is one-millionth of a second, so 239-millionths of a second is the prescribed limit on how much time that steel ball and the driver face can be in contact. However, the governing bodies allow a tolerance of 18 microseconds, so as long as the characteristic time measures at 257 microseconds (239 plus the tolerance of 18), a driver is ruled conforming for spring-like effect. A CT reading above 257 means the driver is non-conforming.

You can find an in-depth description of the characteristic time testing procedure, complete with drawings of the testing apparatus, in the "Procedure For Measuring The Flexibility Of A Golf Club Head" report linked from the Test Protocols for Equipment page on the USGA website.

Note that the USGA and R&A test characteristic time only for drivers; COR continues to be the method of measuring spring-like effect in fairway woods, hybrids and irons. (Manufacturers, however, might cite CT for clubs other than drivers.)