

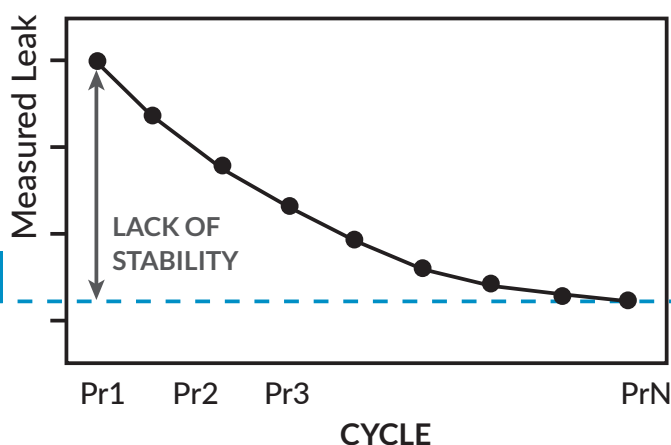
EARLY-DECISION TOOL

SAVE UP TO 50% OF THE GLOBAL CYCLE TIME

➔ The objective of the early-decision tool is to shorten the leak test cycle time, allowing to take a decision earlier and gain time.

The long original cycle is divided into a succession of N short cycles.
For example (with N=5): Pr (original): FILL + STABILISATION + TEST + DUMP becomes:

- Pr1: FILL + STABILISATION + TEST
- Pr2: STABILISATION + TEST
- Pr3: STABILISATION + TEST
- Pr4: STABILISATION + TEST
- Pr5: STABILISATION + TEST + DUMP



➔ Learning Mode

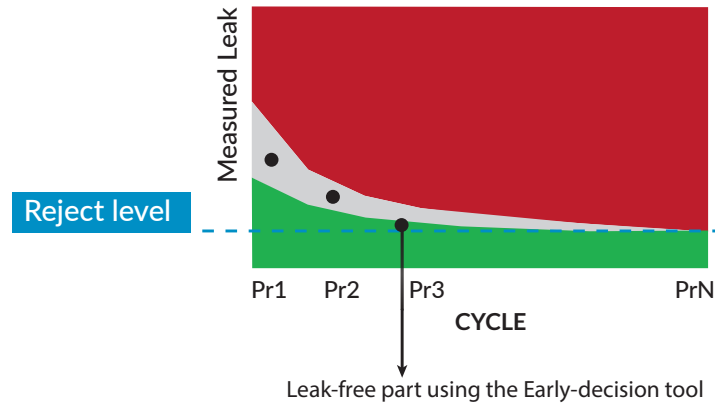
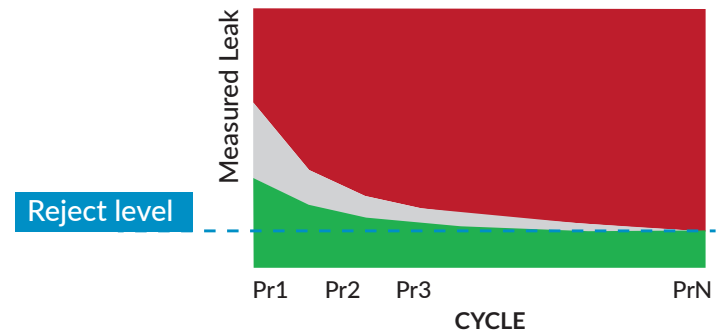
Thanks to a **learning phase** done on thousands of produced parts, the measurement curves are collected, and an uncertainty zone is defined.

➔ Production mode

After defining the uncertainty zone, the **production mode** is initiated: Pr1 is launched, followed by Pr2.

- If the value measured in Pr2 is in the **grey zone**, **no decision can be taken (undecided)**, Pr3 is launched.
- If the value measured in Pr2 is in the **green zone**, **the part is leak-free**. A decision is taken: **PASS** and the test is stopped.
- If the value measured in Pr2 is in the **red zone**, **the part is leaking**. A decision is taken: **FAIL** and the test is stopped.

The same procedure is followed until a decision (PASS or FAIL) is taken.



CONFORMITY PARAMETERS FOR THE PRODUCTION PHASE

- ➔ Conformity parameters are added to **limit the influence of unpredictable phenomena** that can interfere with the measurement, such as a human intervention, an external air flow, a sudden change in temperature.

During the production mode if these parameters do not fall in between the imposed calculated limits for every one of the programs, a warning message is displayed.

EXAMPLE

➔ Parameters

Pr (original): FILL (20s) + STAB (150s) + TEST (10s) + DUMP (20s) = 200s
We can divide into N = 5 with S(1) = 4s → S(N) = 26.5s

- Pr1: FILL (20s) + STABILISATION (4s) + TEST (10s)
- Pr2: STABILISATION (26.5s) + TEST (10s)
- Pr3: STABILISATION (26.5s) + TEST (10s)
- Pr4: STABILISATION (26.5s) + TEST (10s)
- Pr5: STABILISATION (26.5s) + TEST (10s) + DUMP (20s)

➔ Production phase: 1000 parts

If the **early-decision tool is not activated**, the total time needed to test the 1000 parts is equal to 1000 times the duration of Pr (original) (200s) → **200000 s**

If the **early-decision tool is activated** → **99179.5 s**
(Hypothetical distribution)

Optimized time = 50.4% On average, the test passes from 200s to around 99.18s		
Decision taken at the end of cycle	Number of parts (Percentage %)	Total time needed per cycle (s)
Pr1	0 (0%)	0
Pr2	902 (90.2%)	81631
Pr3	53 (5.3%)	6731
Pr4	5 (0.5%)	817.5
Pr5	30 (3%)	6000
Early-decision default	10 (1%)	4000
Total	1000 (100%)	99179.5

Specifications subject to change without notice, non-contractual photos, March 2025.



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