



**SENSISCREEN® LIQUID READY-TO-USE QUICK GUIDE**  
**SensiScreen® assays for sensitive detection and identification of mutations in cancer**



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## 1. INTRODUCTION

This quick guide is meant for experienced users. Please review the full “Instructions for use” carefully before using the kit. The assay is comprised of one or more reference assays and one or more mutation assays. The reference assay is used for determination of total amplifiable DNA input and thus validity of the sample, whereas the existence of mutation(s) is identified by a positive signal in the mutation specific assay(s). Furthermore, an internal control is present in all the mixes to verify the PCR amplification has taken place.

## 2. CONTENT

The kit comprises 12 or 60 x 0.2 mL (regular profile) or 0.1 mL (low profile) strips suitable for most standard 96-well plate format real-time PCR instruments. All reagents needed for the analysis of extracted human DNA are included and pre-loaded into the strips.

## 3. STORAGE AND STABILITY

The unopened product is stable at -20°C for a minimum of 9 months, but no longer than the expiry date.

**Important:** Keep frozen until use and thaw at room temperature. Avoid repeated freeze/thaw cycles.

## 4. DNA EXTRACTION

- Use human DNA from liquid or fresh frozen biopsies
- DNA can be extracted using any valid DNA extraction kit
- Follow the instructions for DNA extraction recommended by the kit supplier
- Determine the quantity and quality of DNA prior to real-time PCR. Do not use DNA of a low quality
- Use up to 5 ng DNA per reaction/tube

## 5. KIT PREPARATION

Thaw one strip per sample to be analysed and spin down before removing lids gently

## 6. SETUP

1. Add 5 µL of the extracted patient DNA (up to 1 ng/µL) to all tubes in the strip
2. Gently mix with a pipette, re-seal tubes and spin down
3. Perform the real-time PCR using the protocol described in Table 1

**Table 1: SensiScreen® PCR protocol**

Protocol	Temperature	Time	Cycles	Data (channel)
Hold	95°C	2 min	1	-
Cycling	94°C	15 sec	45	FAM™/SYBR® (470 nm/510 nm)
	60°C	60 sec		HEX™/VIC™/TET™ (538 nm/551 nm)
				Measure fluorescence intensity at the end of each cycle

## 7. NOTES

- All test components should be stored as described in "Instructions for use" (storage section)
- Do not mix reagents from different lots
- Use one full strip per patient sample. Never mix patient material in one strip
- Always spin down before removing the lids
- Be careful not to damage lids when opening/closing
- Add patient DNA into all tubes in a strip
- Make sure that all tubes are properly sealed and spin down the strips to remove air bubbles
- Tube number one (closest to strip annotation) comprises the (first) reference assay

## 8. DATA ANALYSIS

- Correct for "baseline drift" before setting the threshold. Please refer to the "Instructions for use" for details
- Set the threshold for PentaGreen™ at 10% of the fluorescence signal of the reference assay at cycle 45. Add any significant assay baseline fluorescence at cycle 20 to the threshold value
- Read the Ct value for the reference assay and validate that the reference sample is suitable for analysis according to Table 2

**Table 2: Reference Ct validation**

Ct for reference	Quality	Comments
Ct, reference <29	Not valid	The amount of input DNA is too high which might affect the assay. The analysis should be repeated with lower input of DNA or using the SensiScreen® FFPE version
29 ≤ Ct, reference ≤ 40	Acceptable	The amount of input DNA is acceptable for the mutation analysis. <b>Please note that the closer the reference Ct is to 29, the higher is the number of DNA templates analysed.</b>
Ct, reference >40	Not valid	The amount of amplifiable input DNA is too low. The analysis should be repeated with higher amount of input DNA

- A sample is positive for a given mutation if the reference Ct is valid (Table 2) and the Ct of the mutation assay is at or lower than 40 cf. Table 3.

**Table 3: Data analysis for assay**

ΔCt for assay	Conclusion	Comments
Ct ≤ 40	Positive	The sample is positive for the mutation if Ct ≤ 40 for the mutation assay
Ct > 40	Negative	The sample is negative for the mutation if Ct > 40 for the mutation assay

- For mutation negative samples, it should be validated that amplification has taken place by examining the fluorescence from the internal control assay (yellow channel). An amplification curve (in contrast to a flat line) is evidence that amplification has taken place. Although the Ct value of the internal control assay will reflect the amount of DNA in the sample, there are no specific requirements to the signals in the yellow channel.

- Samples giving no signal for neither the assay (PentaGreen™) nor the internal control (PentaYellow™) are invalid. Rerun the real-time PCR
- Optional: For quantification of the mutation load in a sample, the  $\Delta Ct$  value can be calculated for each mutation-specific analysis and is calculated as the difference between the Ct value from the given mutation analysis subtracted the Ct value from the corresponding reference analysis.  $\Delta Ct$  can be calculated for all mutation assays having a Ct value lower than 40. The theoretical mutant allele frequency based on the calculated  $\Delta Ct$  value is described in Table 4.

$$\Delta Ct = Ct_{\text{Mutation}} - Ct_{\text{Reference}}$$

**Table 4: Theoretical mutant allele frequencies and absolute copy number (approximated)**

$\Delta Ct$	Mutant allele frequency	Ct	Copies (using 5 ng DNA)
$\Delta Ct$ 3	≈ 10 %	≈ 32	≈ 160
$\Delta Ct$ 7	≈ 1 %	≈ 35	≈ 16
$\Delta Ct$ 8	≈ 0.5 %	≈ 36	≈ 8
$\Delta Ct$ 8.5	≈ 0.3 %	≈ 37	≈ 5
$\Delta Ct$ 9	≈ 0.2 %	≈ 38	≈ 3
$\Delta Ct$ 10	≈ 0.1 %	≈ 39	1-2

## 9. TROUBLESHOOTING

This short troubleshooting guide may assist in solving the most frequent encountered problems that can occur. Please refer to the “Instructions for use” for further troubleshooting.

- If no signal in neither PentaYellow nor PentaGreen is present, no amplification has taken place indicating that there is no amplifiable DNA in the patient sample (e.g. degraded DNA or contamination with PCR inhibitors). Check DNA quality and if possible, repeat PCR with higher DNA quality/input
- Too low Ct value in PentaGreen for the reference assay indicates that the amount of DNA is too high. If possible, repeat PCR with lower DNA input
- High Ct value in PentaGreen for the reference assay indicates that the amount of DNA is low. If possible, repeat PCR with higher DNA input
- Fluorescence drift could result from either sample or instrument instabilities or air bubbles