Instructions for Use

IFU on our website / IFU sul nostro sito web / IFU en nuestro sitio web / IFU sur notre site web / IFU auf unserer Website
https://www.eiken.co.jp/en/ifu

380362-A

SSP available in EUDAMED

English

OC-SENSOR FIT Latex Reagent

for OC-SENSOR DIANA, PLEDIA REF V-PZ01
for OC-SENSOR io REF V-PH18
for OC-SENSOR MICRO REF V-PH33

OC- SENSOR FIT Buffer

for OC-SENSOR DIANA, PLEDIA REF V-PZ03
for OC-SENSOR MICRO, io REF V-PH46

OC- SENSOR FIT

for OC-SENSOR Ceres REF V-PH01

INTENDED USE

OC-SENSOR FIT reagents are *in vitro* diagnostic reagents intended for the quantitative measurement of human haemoglobin in faeces. OC-SENSOR FIT reagents aid in the diagnosis of colorectal cancer, neoplasia, dysplasia, polyps, and other disorders associated with gastrointestinal bleeding in conjunction with other clinical findings. The test can be utilized in colorectal cancer screening for asymptomatic population as well as in diagnostic aid and monitoring for symptomatic patients. The test is noninvasive, using stool/faeces as test sample. The reagents are used on the dedicated automated analysers by qualified personnel in clinical laboratories and hospitals.

SUMMARY

The amount of haemoglobin in faeces increases with illnesses that are accompanied by haemorrhagic lesions in the digestive tract, particularly in the lower digestive tract. Therefore, measuring the amount of haemoglobin in faeces is an effective means of screening for early detection and treatment of colorectal cancer and other lower digestive tract illnesses that are accompanied by haemorrhaging.[1-7]
OC-SENSOR FIT Reagents are immunoassay test reagents and used together with an automatic analyser for measurement of haemoglobin in faeces. OC-SENSOR FIT Latex Reagent contains the latex particles coated with anti-human haemoglobin A_0 (HbA_0) polyclonal antibodies for optical measurement of the latex agglutination reaction.

PRINCIPLE OF THE METHOD

The test method is based on a latex agglutination reaction. A latex reagent is prepared by coating polystyrene latex particles with anti-human HbA_0 antibodies. When this reagent is mixed with a sample, the anti-human HbA_0 antibodies on the latex particles react with the haemoglobin in the sample, and the latex aggregate is formed in the latex agglutination reaction. The change in absorbance per unit time resulting from the latex agglutination reaction is proportional to the concentration of haemoglobin in the sample. A dose response curve of the absorbance unit (OD) vs. concentration is generated using the results obtained from the calibrators. The concentration of haemoglobin in the patient sample is determined from this curve.

MATERIALS PROVIDED

Product code	*Product name*	*Contents*	*Storage*	*Compatible analyser*
V-PZ01	OC-SENSOR FIT Latex Reagent	5 x 15 mL	2-10 °C	DIANA, PLEDIA
V-PZ03	OC-SENSOR FIT Buffer	1 x 500 mL	2-10 °C	
V-PH18	OC-SENSOR FIT Latex Reagent	2 x 7 mL	2-10 °C	io
V-PH33	OC-SENSOR FIT Latex Reagent	2 x 7 mL	2-10 °C	MICRO
V-PH46	OC-SENSOR FIT Buffer	1 x 200 mL	2-10 °C	MICRO, io
V-PH01	OC-SENSOR FIT Latex Reagent Buffer	 2 x 6 mL 2 x 20 mL	2-10 °C	Ceres

MATERIALS REQUIRED BUT NOT PROVIDED

Product code	*Product name*	*Contents*	*Storage*	*Compatible analyser*
V-PH51	OC-FIT Calibrator	1 x 3 mL	2-8 °C	MICRO, DIANA
V-PH52	OC-FIT Calibrator	1 x 3 mL	2-8 °C	io, PLEDIA
V-PH02	OC-FIT Calibrator	6 x 1 mL	2-8 °C	Ceres
V-PH53	OC-FIT Control LV1	2 x 5 mL	2-8 °C	All
V-PH54	OC-FIT Control LV2	2 x 5 mL	2-8 °C	
V-PH59	OC-FIT Control LV3	2 x 5 mL	2-8 °C	
V-PZ25	OC-Auto Sampling Bottle 3	100 bottles	1-30 °C	All
V-PZ26	OC-Auto Sampling Bottle 3 without barcode	100 bottles	1-30 °C	
V-PH19	OC-SENSOR Sample Diluent	3 x 45 mL	2-8 °C	DIANA, PLEDIA, MICRO, io
V-PH08		2 x 20 mL		Ceres

REQUIRED MATERIALS NOT PROVIDED BY THE MANUFACTURER

Prepare these materials before measurement

- Wash solution: Sodium hypochlorite 0.15% (0.10%–0.30% is acceptable)
- Purified water for wash: Distilled or de-ionized water (1.0-10.0 MΩcm is acceptable)
- Sample cups
- Printer paper: Thermal printer paper which fits the analyser

REAGENTS

Reagents are stable until the date printed on the label assuming the container remains unopened at a storage temperature of 2-10 °C.

Latex Reagent (Suspension of latex particles coated with anti-human HbA_0 rabbit IgG)
for OC-SENSOR DIANA, PLEDIA ·····15 mL x 5 bottles; approx. 250 tests/bottle
for OC-SENSOR Ceres ·····6 mL x 2 bottles; approx. 115 tests/bottle
Stable for 4 weeks if stored back in a refrigerator after use with cap closed.
Stable for 4 weeks on-board with cap closed after use on DIANA, PLEDIA, and Ceres.

for OC-SENSOR MICRO, io ·····7 mL x 2 bottles; approx. 100 tests/bottle
Stable for 2 weeks on-board with cap closed after use on io and MICRO.

Buffer (50 mM N-2-Hydroxyethylpiperazine-N'-2-ethanesulfonic acid (HEPES))
for OC-SENSOR DIANA, PLEDIA ····· 500 mL x 1 bottle
for OC-SENSOR MICRO, io ····· 200 mL x 1 bottle
for OC-SENSOR Ceres ····· 20 mL x 2 bottles; approx. 115 tests/bottle
Stable for 4 weeks on-board on all analysers.
Note: The number of tests per bottle varies depending on the usage.

WARNINGS AND PRECAUTIONS

1. For *in vitro* diagnostic use only.
2. Before performing measurement, be sure to read the instruction manual of the analyser.
3. Fully prepare and adjust the analyser before measurement.
4. Use OC-FIT Calibrator (REF V-PH51, V-PH52, V-PH02) suitable for the analyser to create calibration curve. Follow its instruction for use when to create a new calibration curve.
5. If the measurement results exceed the measurement range, use Diluent of Calibrator or OC-SENSOR Sample Diluent (REF V-PH19, V-PH08) to dilute the sample and perform measurement again.
6. Store the reagents at 2-10 °C and avoid freezing.
7. Do not use reagents that have passed their expiration date.
8. On-board stability can vary depending on the conditions of measurement, such as tests/day and laboratory environment. It is advised to close the bottle of Latex Reagent with a cap when the measurement is not in process, especially with OC-SENSOR MICRO and io.
9. The test sample may contain pathogens. Handle with care. After use, all samples and other materials must be considered as medical waste and properly disposed of.
   Example of treatment: Soak for 1 hour or longer in a sodium hypochlorite solution (available chlorine concentration 1000 ppm or greater). (Neutralize any substances that contain acids before soaking.) Alternatively, treat in an autoclave at 121 °C for 20 minutes. (Do not treat any items which sodium hypochlorite have adhered to in this way.)
10. Dispose of used reagents and containers as medical waste in accordance with local regulations.
11. If the product is used in any way other than that specified here, the reliability of measurement results cannot be guaranteed. Be sure to follow the procedure.
12. A clinical diagnosis based on the measurement results must be a comprehensive judgment made by the attending physician, including factors such as clinical symptoms and other test results.

LIMITATIONS

The test has not been validated for testing of patients with all existing haemoglobinopathies. Clinical consideration is recommended.[8]

SAMPLE COLLECTION

- Use the following designated sampling device for collecting specimens.
  OC-Auto Sampling Bottle 3 (REF V-PZ25, V-PZ26) : Sold separately
- Collect faecal samples by scraping the surface of the stools in different areas.
- Collect the amount necessary to cover the groove of the probe.
- Check that the faecal sample has become fully suspended in the buffer solution inside OC-Auto Sampling Bottle 3.

PREPARATION OF REAGENTS

OC-SENSOR FIT Latex Reagent for OC-SENSOR PLEDIA, DIANA, MICRO, io
Ready to use.
Before use, bring it to room temperature (20-25 ℃) and invert the bottle gently several times to assure uniform suspension.
Do not mix reagent with another bottle.

OC-SENSOR FIT Buffer for OC-SENSOR DIANA, PLEDIA, MICRO, io
Ready to use.
Before use, bring the buffer to room temperature (20-25 ℃).
Do not mix buffer from another bottles.
Do not use precipitated buffer, as precipitate may cause problems on analysers.

OC-SENSOR FIT Latex Reagent for OC-SENSOR Ceres
Ready to use.
Before use, invert the bottle gently several times to assure uniform suspension.
Do not mix reagent with another bottle.

OC-SENSOR FIT Buffer for OC-SENSOR Ceres
Ready to use.
Do not mix buffer from another bottle.
Do not use precipitated buffer, as precipitate may cause problems on analysers.
Note: OC-SENSOR Ceres is equipped with refrigerated reagent slots so that the reagents do not need to be brought to room temperature.

TEST PROCEDURE

Perform measurements according to the instruction manual of the analyser.

1. Set the OC-SENSOR FIT Latex Reagent and Buffer on the designated locations in the analyser.
2. Input the parameters into the analyser.
3. Check water, wash solution and drain tank volumes.
4. Create calibration curve.
5. Set control materials, OC-FIT Controls as internal control and start measurement. Make sure the control values are within the acceptable range set by each laboratory.
6. Set samples sampled with OC-Auto Sampling Bottle 3 and start measurement.

RESULTS

The reaction of each sample is compared to the calibration curve that has been created previously. The concentration of human haemoglobin (ng/mL) is calculated.
Conversion of units in OC-SENSOR systems is done in the following equation:
μg Hb/g stool = 0.2 x (ng Hb/mL buffer)

INTERNAL QUALITY CONTROL

Each laboratory should establish a quality control program to monitor the performance of OC-SENSOR system. It is recommended to use OC-FIT Controls for the quality control in a laboratory.

OC-FIT Controls : Liquid, ready-to use controls sold separately
LV1 (REF V-PH53) LV2 (REF V-PH54) LV3 (REF V-PH59)

PERFORMANCE CHARACTERISTICS

1. Specificity
In comparison with haemoglobin A0, OC-SENSOR FIT reagents can measure human haemoglobin variants Hb-S and Hb-C. The reactivity of variants can vary.[8]

2. Accuracy
When control samples of known concentration were measured, the value obtained was within ±15% of the indicated value.

3. Cut-off value
It is recommended for each laboratory to establish the cut-off value suitable for purposes in screening programs or diagnostic use.[9-12]

4. Repeatability and Precision
When the same samples were measured in 2 replicates, twice a day, for 20 days (2x2x20), the coefficient of variation (CV) for the values obtained was 10% or less, using ANOVA analysis. Examples of measurement of controls and faecal samples (N=80 each) using OC-SENSOR PLEDIA and Ceres are shown below.

OC-SENSOR PLEDIA

Samples	Mean	Repeatability		Between-Run		Between-Day		Precision	
	(ng/mL)	SD	CV	SD	CV	SD	CV	SD	CV
LV1	148.7	2.0	1.4%	2.4	1.6%	2.0	1.3%	3.7	2.5%
LV2	450.2	8.1	1.8%	1.2	0.3%	1.3	0.3%	8.3	1.8%
LV3	71.4	1.1	1.5%	0.6	0.9%	0.8	1.2%	1.5	2.1%
S1	73.6	1.7	2.3%	3.2	4.4%	1.4	1.9%	3.9	5.3%
S2	109.4	2.3	2.1%	3.6	3.3%	1.6	1.5%	4.5	4.1%
S3	474.3	5.3	1.1%	6.4	1.3%	0.8	0.2%	8.2	1.7%

OC-SENSOR Ceres

Samples	Mean	Repeatability		Between-Run		Between-Day		Precision	
	(ng/mL)	SD	CV	SD	CV	SD	CV	SD	CV
LV1	145.7	1.6	1.1%	0.5	0.3%	1.7	1.2%	2.4	1.7%
LV2	453.0	3.4	0.8%	2.5	0.6%	5.4	1.2%	6.9	1.5%
LV3	73.9	0.9	1.2%	0.9	1.2%	1.1	1.5%	1.7	2.3%
S1	76.2	0.8	1.1%	1.4	1.8%	0.7	1.0%	1.8	2.3%
S2	124.3	1.0	0.8%	0.9	0.8%	1.1	0.9%	1.8	1.4%
S3	461.3	3.1	0.7%	3.4	0.7%	6.3	1.4%	7.8	1.7%

5. Measurement range
Up to 1000 ng/mL (200 µg/g stool)
Examples of measurement using OC-SENSOR PLEDIA result showed LOD of 9 ng/mL (1.8 µg/g), LOQ of 25 ng/mL (5 µg/g); OC-SENSOR Ceres showed LOD of 6 ng/mL (1.2 µg/g), and LOQ of 20 ng/mL (4 µg/g). The values can vary due to faecal samples and whether/how haemoglobin is spiked

6. Interference and Cross-reactivity
Following substances were added to sample and the test results showed no interference or cross-reactivity.
-Animal haemoglobin
600 ng/mL of bovine, equine, porcine, goat, sheep, rabbit, turkey and fish Hb
-Animal meat extracts
2.0% from beef, pork, chicken, lamb, and fish 2.5% rabbit
-Toilet cleaners
10 mg/mL of Nuriper 10 mg/mL Bleach 1.3 mg/mL of Blue Enzyme
-Co-existing substances
25 mg/dL Bilirubin (free and conjugated) 2.5 g/dL Protein
0.6% Lipids (intralipids) 4.0 g/dL Glucose
25 µg/mL Peroxidase
-Supplements and drugs
2 µg/mL Ascorbic acid 3.1 µg/mL Iron
25 mg/dL Barium sulphate 0.2 µg/mL Laxative
2 mg/mL Glycerol in enema

7. Sample Stability
Performance testing with the sample collection device demonstrated that samples stored at 2-10 °C for 28 days had 95±14.7%, at 25 °C for 7 days had 96±20.4%, for 14 days had 93±23.5%, and at 30 °C for 7 days had 89±20.5%, for 14 days had 84±23.6% of haemoglobin recovery (in-house data, recovery rate shown as mean±2SD). However, the haemoglobin in some samples may undergo rapid denaturation or degradation, resulting in decreased haemoglobin values or false negatives. Samples should be stored at 2-10 °C and analysed as soon as possible.

8. Comparison between analysers
When OC-SENSOR analysers, DIANA, MICRO, io and Ceres are compared with PLEDIA, there were no significant differences in measurement.

9. Traceability and Standard Material
WHO International Standard NIBSC code 98/708, Certified Reference Material (CRM) 522 is used as the standard material. The value was assigned using cyanmethemoglobin method from the standard material to the internal standard.

10. Clinical Performance
Reports from different screening programs using OC-Sensor systems are summarized.
Colorectal Cancer detection rate at cut-off 100 ng/mL (20 µg/g stool)

Country	Positive Rate (%)	PPV (%)	Detection Rate (per 1000)	N
Netherlands [13]	5.5	8.6	2.3	10,322
France [14]	3.5	7.2	2.2	19,797
Spain [15]	6.6	5.1	3.1	11,162
Taiwan [16]	3.8	6.8	2.1	747,076

Colorectal Cancer and Advanced Adenoma detection rate at cut-off 150 ng/mL (30 µg/g stool)

Country		PPV (%)	Detection Rate (per 1000)	N
France [17]	Cancer	8.5	2.3	88,796
	Advanced Adenoma	30.5	8.3	

One study showed the reference intervals are 25-45 ng/mL (N=739) in the population with normal colonoscopy findings, and 435-759 ng/mL (N=91) in that with cancer and advanced adenoma, respectively as 95% confidence interval.[2]

REFERENCES

1. Mandel JS, Bond JH, Church TR, et al. Reducing mortality from colorectal cancer by screening for fecal occult blood. Minnesota Colon Cancer Control Study [published correction appears in N Engl J Med 1993;329(9):672]. *N Engl J Med.* 1993;328(19):1365-1371.
2. Levi Z, Rozen P, Hazazi R, et al. A quantitative immunochemical fecal occult blood test for colorectal neoplasia. Ann Intern Med. 2007 Feb 20;146(4):244-55.
3. Ciatto S, Martinelli F, Castiglione G, et al. Association of FOBT-assessed faecal Hb content with colonic lesions detected in the Florence screening programme. Br J Cancer. 2007;96(2):218-221.
4. Halloran SP, Launoy G, Zappa M; International Agency for Research on Cancer. European guidelines for quality assurance in colorectal cancer screening and diagnosis. First Edition--Faecal occult blood testing. Endoscopy. 2012;44 Suppl 3:SE65-SE87.
5. Mowat C, Digby J, Strachan JA, et al. Faecal haemoglobin and faecal calprotectin as indicators of bowel disease in patients presenting to primary care with bowel symptoms. Gut. 2016 Sep;65(9):1463-9.
6. Lin JS, Perdue LA, Henrikson NB, Bean SI, Blasi PR. Screening for Colorectal Cancer: An Evidence Update for the U.S. Preventive Services Task Force [Internet]. Rockville (MD): Agency for Healthcare Research and Quality (US); 2021 May. Report No.: 20-05271-EF-1.
7. National Institute for health and Care Excellence. Quantitative faecal immunochemical tests to guide referral for colorectal cancer in primary care. Diagnostics guidance. Manchester, UK; 2017 July. DG-30.
8. Carroll MR, John C, Mantio D, et al. An assessment of the effect of haemoglobin variants on detection by faecal immunochemical tests. Ann Clin Biochem. 2018;55(6):706-709.
9. van Rossum LG, van Rijn AF, Laheij RJ, et al. Cutoff value determines the performance of a semi-quantitative immunochemical faecal occult blood test in a colorectal cancer screening programme. Br J Cancer. 2009;101(8):1274-81.
10. Grazzini G, Visioli CB, Zorzi M, et al. Immunochemical faecal occult blood test: number of samples and positivity cutoff. What is the best strategy for colorectal cancer screening? Br J Cancer. 2009;100(2):259-65.
11. Rozen P, Levi Z, Hazazi R, et al. Identification of colorectal adenomas by a quantitative immunochemical faecal occult blood screening test depends on adenoma characteristics, development threshold used and number of tests performed. Aliment Pharmacol Ther. 2009;29(8):906-17.
12. Fraser CG, Rubeca T, Rapi S, et al. Faecal haemoglobin concentrations vary with sex and age, but data are not transferable across geography for colorectal cancer screening. Clin Chem Lab Med. 2014;52(8):1211-1216.
13. van Rossum LG, van Rijn AF, Laheij RJ, et al. Random comparison of guaiac and immunochemical fecal occult blood tests for colorectal cancer in a screening population. Gastroenterology. 2008 Jul;135(1):82-90.
14. Raginel T, Puvinel J, Ferrand O, et al. A population-based comparison of immunochemical fecal occult blood tests for colorectal cancer screening. Gastroenterology. 2013;144(5):918-25.
15. Zubero MB, Arana-Arri E, Pijoan JI, et al. Population-based colorectal cancer screening: comparison of two fecal occult blood test. Front Pharmacol. 2014;4:175.
16. Chiang TH, Chuang SL, Chen SL, et al. Difference in performance of fecal immunochemical tests with the same hemoglobin cutoff concentration in a nationwide colorectal cancer screening program. Gastroenterology. 2014;147(6):1317-26.
17. Pellat A, Deyra J, Coriat R, et al. Results of the national organised colorectal cancer screening program with FIT in Paris. Sci Rep. 2018;8(1):4162.

NOTICE

In case of occurrence of any serious incident that has occurred in relation to the device shall be reported to the authorised representative, the manufacturer, and the competent authority of the Member State in which the user and/or the patient is established.

OC-SENSOR FIT Latex Reagent contains the following material.
ProClin300 CAS No. 55965-84-9

WARNING
May cause an allergic skin reaction.
Avoid breathing dust/fume/gas/mist/vapours/spray.
Wear protective gloves.
If on skin: Wash with plenty of soap and water.
If skin irritation or rash occurs: get medical attention.
Dispose of contents/container in accordance with local/regional/national/international regulations.

Eiken Chemical Co., Ltd.
4-19-9 Taito, Taito-ku, Tokyo, 110-8408 JAPAN
Tel: +81-280-56-1250 Fax: +81-280-56-2422

EXPLANATION OF SYMBOLS

LOT Batch code
Use by date
REF Catalog number
Manufacturer
IVD *In vitro* diagnostic medical device
Temperature limitation
Consult instructions for use
Biological risks
Contains sufficient for <n> tests

IVD CE 0123

EC REP **Advena Ltd.**
Tower Business Centre, 2nd Flr., Tower Street, Swatar, BKR 4013 Malta

EIKEN CHEMICAL CO., LTD.
4-19-9 Taito, Taito-ku, Tokyo, 110-8408 JAPAN
https://www.eiken.co.jp/en/

Date of issuance: 2022-05-26