SIEMENS

Syva®

Emit® II *Plus* Barbiturate Assay

See shaded sections:
Updated information from 2018-11 version.

10871369_J

Barbiturate Assay

1 Intended Use

The Emit® II Plus Barbiturate Assay is a homogeneous enzyme immunoassay with a 200 ng/mL or 300 ng/mL cutoff. The assay is intended for use in the qualitative and semiquantitative analyses of barbiturates in human urine. Emit® II Plus assays are designed for use with a number of chemistry analyzers.

The Emit® II Plus Barbiturate Assay provides only a preliminary analytical test result. A more specific alternative chemical method must be used to obtain a confirmed analytical result. Gas chromatography/mass spectrometry (GC/MS) is the preferred confirmatory method.[1] Other chemical confirmation methods are available. Clinical consideration and professional judgment should be applied to any drug-of-abuse test result, particularly when preliminary positive results are used.

2 Summary and Explanation of the Test

Barbiturates, a class of nervous system depressants, are usually taken orally, but are sometimes injected intravenously or intramuscularly. They are absorbed rapidly; 30–40% is bound to plasma protein, and the rest is distributed to muscle, fat, and to the liver (where they are ultimately inactivated).[2] They are classified based on their duration of action, ranging from very short acting (approximately 15 minutes) to long acting (a day or more). Some of the most commonly abused barbiturates are the short-acting ones, including pentobarbital and secobarbital. An example of a long-acting barbiturate is phenobarbital. The ratio of unchanged drug to metabolites varies depending upon duration of action. Short-acting barbiturates will generally be excreted in urine as metabolites, while the long-acting barbiturates will primarily appear unchanged.[3,4]

The Emit® II Plus Barbiturate Assay, an enzyme immunoassay technique, tests for both long- and short-acting barbiturates in human urine. Positive results for specimens containing other compounds structurally unrelated to barbiturates have not been observed. The cutoff levels for distinguishing positive from negative specimens are 200 ng/mL and 300 ng/mL.

Methods historically used for detecting barbiturates in biological fluids include thin-layer chromatography, gas chromatography, ultraviolet spectrophotometry, enzyme immunoassay, and radioimmunoassay.[5]

While confirmation techniques other than GC/MS may be adequate for some drugs of abuse, GC/MS is generally accepted as a vigorous confirmation technique for all drugs, since it provides the best level of confidence in the result.[1]

3 Principle

The Emit® II Plus assay is a homogeneous enzyme immunoassay technique used for the analysis of specific compounds in human urine.[6] The assay is based on competition between drug in the specimen and drug labeled with the enzyme glucose-6-phosphate dehydrogenase (G6PDH) for antibody binding sites. Enzyme activity decreases upon binding to the antibody, so the drug concentration in the specimen can be measured in terms of enzyme activity. Active enzyme converts nicotinamide adenine dinucleotide (NAD) to NADH, resulting in an absorbance change that is measured spectrophotometrically. Endogenous serum G6PDH does not interfere because the coenzyme NAD functions only with the bacterial *(Leuconostoc mesenteroides)* enzyme employed in the assay.

4 Reagents

REF	Product Description	Volume
9D039UL/	**Emit® II Plus Barbiturate Assay**	28 mL/
9D029UL/	**Antibody/Substrate Reagent 1**	115 mL/
9D129UL	Sheep polyclonal antibodies to secobarbital (3.2 µg/mL),* G6P (15 mM), NAD (12 mM), bovine serum albumin, preservatives, and stabilizers	1000 mL
	Enzyme Reagent 2	13 mL/
	Secobarbital labeled with bacterial G6PDH (0.47 U/mL),* Tris buffer, bovine serum albumin, preservatives, and stabilizers	50 mL/ 435 mL

****The antibody titer and enzyme conjugate activity may vary from lot to lot.***

Note: Reagents 1 and 2 are provided as a matched set. They should not be interchanged with components of kits with different lot numbers.

For *in vitro* diagnostic use.

Preparation and Storage of Assay Components

Reagents:

The Emit® II Plus Barbiturate Assay reagents are provided ready to use and may be used directly from the refrigerator. Close the reagent bottles when not in use.

Note: Caps must always be replaced on the original containers.

When not in use, store reagents at 2–8°C (36–46°F), upright and with screw caps tightly closed. If stored as directed, reagents are stable until the expiration date printed on the label. Refer to the analyzer-specific protocols for on instrument stability information. Do not freeze reagents. Avoid prolonged exposure to temperatures above 32°C. **Improper storage of reagents can affect assay performance.**

5 Specimen Collection and Preparation

- Urine specimens may be collected in plastic (ie, polypropylene, polycarbonate, polyethylene)or glass containers. Some plastics can adsorb certain drugs.
- Internal testing has shown that, if not analyzed immediately, specimens may be stored unrefrigerated for up to 7 days. Specimens may be stored refrigerated for 30 days before analysis. After 7 days unrefrigerated or 30 days refrigerated, samples should be stored frozen.
- Frozen specimens must be thawed and mixed thoroughly prior to analysis.
- Specimens with high turbidity should be centrifuged before analysis.
- The recommended pH range for urine specimens is 3.0–11.0.
- Adulteration of the urine specimen may cause erroneous results. If adulteration is suspected, obtain another specimen.
- Human urine specimens should be handled and treated as if they are potentially infectious.

6 Procedure

Materials Provided

Emit® II Plus Barbiturate Assay
- Reagent 1
- Reagent 2

Materials Required But Not Provided

9A509UL	Emit® Calibrator/Control Level 0
9A549UL	Emit® Calibrator/Control Level 2
9A569UL	Emit® Calibrator/Control Level 3
9A589UL	Emit® Calibrator/Control Level 4
9A609UL	Emit® Calibrator/Control Level 5

Commercially available controls (see Quality Control, Semiquantitative Analysis)

Instruments

Siemens Healthcare Diagnostics provides instructions for using this assay on a number of chemistry analyzers. Contact the Technical Assistance Center in the USA or your local Siemens representative for application sheets.

Analyzers must be capable of maintaining a constant reaction temperature, pipetting specimens/reagents and measuring enzyme rates precisely, timing the reaction accurately, and mixing reagents thoroughly.

Daily Maintenance

Refer to the instrument operator's manual for maintenance instructions.

Assay Sequence

To run the assay, see the instrument operator's manual and the analyzer-specific protocol from Siemens.

Calibration

Note: These reagents are qualified for use with these calibrators only. However, other material may be used for quality control purposes.

Table 1 — Emit® Calibrators/Controls for Use in Qualitative or Semiquantitative Analysis

Desired Cutoff Level (ng/mL)	Required Calibrators/Controls for Qualitative Analysis (ng/mL)	Required Calibrators/Controls for Semiquantitative Analysis (ng/mL)
200	Level 0 (0)	
	Level 3 (200)	Level 0 (0)
	Level 5 (800)	Level 2 (100)
		Level 3 (200)
300	Level 0 (0)	Level 4 (300)
	Level 4 (300)	Level 5 (800)
	Level 5 (800)	

Note: For any individual cutoff level, a calibrator/control is used either as a calibrator or as a control when the assay is used for qualitative analysis. When a calibrator/control is used as a calibrator for an individual cutoff level, the other level calibrators/controls (above or below it, as listed above) are used as controls.

Qualitative Analysis

200 ng/mL CUTOFF

Run the Emit® Calibrator/Control Level 3 (200 ng/mL) in duplicate. Validate the calibration by running controls (see Quality Control). Refer to the Emit® Calibrators/Controls instructions for use and the analyzer-specific protocol for additional information and instrument settings. Recalibrate as indicated by control results.

300 ng/mL CUTOFF

Run the Emit® Calibrator/Control Level 4 (300 ng/mL) in duplicate. Validate the calibration by running controls (see Quality Control). Refer to the Emit® Calibrators/Controls instructions for use and the analyzer-specific protocol for additional information and instrument settings. Recalibrate as indicated by control results.

Semiquantitative Analysis

Prepare a calibration curve by running Emit® Calibrators/Controls Level 0 (0 ng/mL), Level 2 (100 ng/mL), Level 3 (200 ng/mL), Level 4 (300 ng/mL), and Level 5 (800 ng/mL). Validate the calibration by running controls (see Quality Control). Refer to the Emit® Calibrators/Controls instructions for use and the analyzer-specific protocol for additional information and instrument settings. Recalibrate as indicated by control results.

Quality Control

Qualitative Analysis

200 ng/mL CUTOFF

Validate the calibration by assaying controls. Ensure that the result from Emit® Calibrator/Control Level 0 (0 ng/mL) or Emit® Calibrator/Control Level 5 (800 ng/mL) relates appropriately to the result from Emit® Calibrator/Control Level 3 (200 ng/mL). That is,

- If Emit® Calibrator/Control Level 0 (0 ng/mL) was run, ensure that the result is negative relative to Emit® Calibrator/Control Level 3 (200 ng/mL).
- If Emit® Calibrator/Control Level 5 (800 ng/mL) was run, ensure that the result is positive relative to Emit® Calibrator/Control Level 3 (200 ng/mL).

Once the calibration is validated, run urine specimens.

300 ng/mL CUTOFF

Validate the calibration by assaying controls. Ensure that the result from Emit® Calibrator/Control Level 0 (0 ng/mL) or Emit® Calibrator/Control Level 5 (800 ng/mL) relates appropriately to the result from Emit® Calibrator/Control Level 4 (300 ng/mL). That is,

- If Emit® Calibrator/Control Level 0 (0 ng/mL) was run, ensure that the result is negative relative to Emit® Calibrator/Control Level 4 (300 ng/mL).
- If Emit® Calibrator/Control Level 5 (800 ng/mL) was run, ensure that the result is positive relative to Emit® Calibrator/Control Level 4 (300 ng/mL).

Once the calibration is validated, run urine specimens.

Semiquantitative Analysis

200 ng/mL CUTOFF

Validate the calibration curve by assaying commercial controls. Ensure that control results fall within acceptable limits as defined by your laboratory.

Once the calibration curve is validated, run urine specimens.

300 ng/mL CUTOFF

Validate the calibration curve by assaying commercial controls. Ensure that control results fall within acceptable limits as defined by your laboratory.

Once the calibration curve is validated, run urine specimens.

Qualitative and Semiquantitative Analysis

1. Follow government regulations or accreditation requirements for quality control frequency. At least once each day of use, analyze two levels of Quality Control (QC) material with known Barbiturate concentrations. Follow your laboratory internal QC procedures if the results obtained are outside acceptable limits.
2. Refer to the instrument operator's manual for appropriate instrument checks.

7 Results

Qualitative Analysis

200 ng/mL CUTOFF

The Emit® Calibrator/Control Level 3 (cutoff), which contains a concentration of 200 ng/mL secobarbital, is used as a reference for distinguishing "positive" from "negative" specimens.

Positive Results. A specimen that gives a change in rate value equal to or higher than the Emit® Calibrator/Control Level 3 rate value is interpreted as positive: The specimen contains barbiturates.

Negative Results. A specimen that gives a change in rate value lower than the Emit® Calibrator/Control Level 3 rate value is interpreted as negative: Either the specimen does not contain barbiturates or barbiturates are present in concentrations below the cutoff level for this assay.

300 ng/mL CUTOFF

The Emit® Calibrator/Control Level 4 (cutoff), which contains a concentration of 300 ng/mL secobarbital, is used as a reference for distinguishing "positive" from "negative" specimens.

Positive Results. A specimen that gives a change in rate value equal to or higher than the Emit® Calibrator/Control Level 4 rate value is interpreted as positive: The specimen contains barbiturates.

Negative Results. A specimen that gives a change in rate value lower than the Emit® Calibrator/Control Level 4 rate value is interpreted as negative: Either the specimen does not contain barbiturates, or barbiturates are present in concentrations below the cutoff level for this assay.

Semiquantitative Analysis

The semiquantitation of positive results enables the laboratory to determine an appropriate dilution of the specimen for confirmation by GC/MS. Semiquantitation also permits the laboratory to establish quality control procedures and assess control performance. Refer to the Analytical Recovery section for the semiquantitative range.

Using the Emit® II Plus Barbiturate Assay, it is possible to make semiquantitative determinations of barbiturates. An estimate of relative total drug concentrations may be obtained by running the appropriate Emit® Calibrators/Controls: Levels 0 (0 ng/mL), 2 (100 ng/mL), 3 (200 ng/mL), 4 (300 ng/mL), and 5 (800 ng/mL). Refer to the analyzer-specific protocol for instructions.

Results of this test should always be interpreted in conjunction with the patient's medical history, clinical presentation and other findings.

Siemens has validated use of these reagents on various analyzers to optimize product performance and meet product specifications. User defined modifications are not supported by Siemens as they may affect performance of the system and assay results. It is the responsibility of the user to validate modifications to these instructions or use of the reagents on analyzers other than those included in Siemens Application Sheets or these instructions for use.

8 Limitations

- The assay is designed for use only with human urine.
- A positive result from the assay indicates only the presence of barbiturates.
- Boric acid is not recommended as a preservative for urine.
- Other substances and/or factors not listed (eg, technical or procedural errors) may interfere with the test and cause false results.
- Interpretation of results must take into account that urine concentrations can vary extensively with fluid intake and other biological variables.
- Immunoassays that produce a single result in the presence of a drug and its metabolites cannot fully quantitate the concentration of individual components.

9 Expected Values

When the Emit® II Plus Barbiturate Assay is used as a qualitative assay, the amount of drugs and metabolites detected by the assay in any given specimen cannot be estimated. The assay results distinguish positive from negative specimens—positive indicating specimens that contain barbiturates.

When used semiquantitatively, the assay yields approximate, cumulative concentrations of the drugs detected by the assay (see Section 7, Results).

10 Specific Performance Characteristics

The data appearing in this section were collected on the SYVA®-30R Biochemical System using the Emit® II Plus Barbiturate Assay and the Emit® II Barbiturate Assay (comparative method). Positive specimens were confirmed by GC/MS.

Accuracy

Qualitative Results

200 ng/mL CUTOFF

One hundred seventy (170) specimens were analyzed by the Emit® II Plus Barbiturate Assay and by the comparative method.

Both the Emit® II Plus Barbiturate Assay and the comparative method use an optional cutoff level of 200 ng/mL for distinguishing positive results from negative results.

One hundred nine (109) specimens showed positive results by both methods; 50 specimens showed negative results by both methods.

All specimens that showed positive results by both methods were confirmed by GC/MS to contain between 300 and 1000 ng/mL of the following individual or combined barbiturates: amobarbital, butalbital, butabarbital, pentobarbital, phenobarbital, and secobarbital. The total barbiturate concentration determined by GC/MS is greater than the GC/MS limit of quantitation of 50 ng/mL.

Eleven (11) specimens showed positive results by the Emit® II Plus Barbiturate Assay and negative results by the comparative method. These specimens were confirmed by GC/MS to contain only phenobarbital concentrations of at least 661 ng/mL. The Emit® II Plus Barbiturate Assay is much more sensitive to phenobarbital than is the Emit® II Barbiturate Assay.

No barbiturates were detected by GC/MS in 20 negative specimens that were randomly selected from the 50 negative specimens.

Data are summarized in Table 2.

Table 2 — Accuracy of Qualitative Results for the 200 ng/mL Cutoff

		Emit® II Plus Barbiturate Assay	
		Comparative Method	
		+	−
Emit® II Plus Barbiturate Assay	+	109	11*
	−	0	50

Shown to contain at least 661 ng/mL phenobarbital as determined by GC/MS.

300 ng/mL CUTOFF

The 170 specimens tested at the 200 ng/mL level were also analyzed at the 300 ng/mL level by the Emit® II Plus Barbiturate Assay and by the comparative method on the SYVA®-30R Biochemical System.

For distinguishing positive results from negative results, both the Emit® II Plus Barbiturate Assay and the comparative method use an optional cutoff level of 300 ng/mL.

Forty-nine (49) specimens showed positive results by both methods, and 121 specimens showed negative results by both methods.

All specimens that showed positive results by either method were confirmed by GC/MS to contain between 259 ng/mL of phenobarbital and/or cumulative concentrations of amobarbital, butalbital, butabarbital, pentobarbital, phenobarbital, and secobarbital up to greater than 1000 ng/mL. The total barbiturate concentration determined by GC/MS is greater than the GC/MS limit of quantitation of 50 ng/mL.

No barbiturates were detected by GC/MS in 20 negative specimens that were randomly selected from the 121 negative specimens.

Data are summarized in Table 3.

Table 3 — Accuracy of Qualitative Results for the 300 ng/mL Cutoff

		Emit® II Plus Barbiturate Assay	
		Comparative Method	
		+	−
Emit® II Plus Barbiturate Assay	+	49	0
	−	0	121

Analytical Recovery

Qualitative Results

In qualitative spike analysis, the Emit® II Plus Barbiturate Assay using a 200 ng/mL cutoff correctly identified the mean rate of spiked specimens containing less than 200 ng/mL secobarbital as negative and the mean rate of spiked specimens containing greater than 200 ng/mL secobarbital as positive.

In qualitative spike analysis, the Emit® II Plus Barbiturate Assay using a 300 ng/mL cutoff correctly identified the mean rate of spiked specimens containing less than 300 ng/mL secobarbital as negative and the mean rate of spiked specimens containing greater than 300 ng/mL secobarbital as positive.

Semiquantitative Results

Negative human urine specimens were spiked with concentrations of secobarbital at levels throughout the semiquantitative range of 75 to 720 ng/mL. For each known concentration, drug recovery was calculated using the average concentration obtained by the Emit® II Plus Barbiturate Assay. Semiquantitative results are shown in Table 4.

Table 4 — Accuracy by Analytical Recovery of Semiquantitative Results

Nominal Secobarbital Concentration (ng/mL)	Average Secobarbital Concentration by Emit® II Plus Barbiturate Assay (ng/mL)	Recovery (%)
75	86	114
100	106	106
150	149	99
175	176	101
200	197	99
225	222	99
250	248	99
275	274	100
300	304	101
325	338	104
375	397	106
450	493	110
600	652	109
720	746	104

Precision

Qualitative analysis of precision was determined by assaying calibrators and controls on 20 days, 2 runs per day in replicates of 3 (N = 120). Semiquantitative precision was determined by assaying calibrators and controls on 20 days, 2 runs per day in replicates of 3 (N = 120). Precision data were calculated according to the National Committee of Clinical Laboratory Standards (NCCLS) Guideline EP5-A (February 1999). Results are summarized in Tables 5 and 6.

Table 5 — Qualitative Analysis of Precision

Calibrator or Control	Mean (mAU/min)	SD	CV (%)
Within-Run Precision			
0 ng/mL Calibrator	205.8	0.9	0.4
Control Level 1 (150 ng/mL)	242.1	1.0	0.4
200 ng/mL Calibrator	258.4	1.2	0.5
Control Level 2 (225 ng/mL)	266.9	1.1	0.4
Control Level 3 (250 ng/mL)	276.4	1.2	0.4
300 ng/mL Calibrator	295.8	1.4	0.5
Control Level 4 (375 ng/mL)	326.4	1.2	0.4
Total Precision			
0 ng/mL Calibrator	205.8	1.2	0.6
Control Level 1 (150 ng/mL)	242.1	1.4	0.6
200 ng/mL Calibrator	258.4	1.5	0.6
Control Level 2 (225 ng/mL)	266.9	1.7	0.6
Control Level 3 (250 ng/mL)	276.4	1.7	0.6
300 ng/mL Calibrator	295.8	1.9	0.6
Control Level 4 (375 ng/mL)	326.4	2.3	0.7

Table 6 — Semiquantitative Analysis of Precision

Calibrator or Control	Mean (mAU/min)	SD	CV (%)
Within-Run Precision			
Control Level 1 (150 ng/mL)	144.0	5.5	3.8
200 ng/mL Calibrator	191.4	3.5	1.8
Control Level 2 (225 ng/mL)	215.7	3.2	1.5
Control Level 3 (250 ng/mL)	242.6	3.4	1.4
300 ng/mL Calibrator	297.9	4.0	1.3
Control Level 4 (375 ng/mL)	390.1	3.8	1.0
Total Precision			
Control Level 1 (150 ng/mL)	144.0	6.0	4.2
200 ng/mL Calibrator	191.4	4.5	2.4
Control Level 2 (225 ng/mL)	215.7	4.1	1.9
Control Level 3 (250 ng/mL)	242.6	5.8	2.4
300 ng/mL Calibrator	297.9	6.2	2.1
Control Level 4 (375 ng/mL)	390.1	7.3	1.9

Specificity

The Emit® II Plus Barbiturate Assay detects both long- and short-acting barbiturates in human urine.

Table 7 lists the concentrations of compounds that produce a result approximately equivalent to the 200 ng/mL and 300 ng/mL calibrator/control cutoffs, respectively. Each concentration represents the reactivity level for the stated compound when it is added to a negative urine specimen. These concentrations are within the range of the levels found in urine following use of the compound or, in the case of metabolites, the parent compound. If a specimen contains more than one compound detected by the assay, lower concentrations than those listed in Table 7 may combine to produce a rate approximately equivalent to or greater than that of the cutoff calibrator.

Table 7 — Concentrations (ng/mL) of Barbiturate Compounds That Produce a Result Approximately Equivalent to the 200 ng/mL and 300 ng/mL Secobarbital Cutoff

Compound	Concentration (ng/mL) at 200 ng/mL Cutoff	Concentration (ng/mL) at 300 ng/mL Cutoff
Allobarbital	345	744
Alphenal	284	354
Amobarbital	555	923
Aprobarbital	275	478
Barbital	1278	4148
5-Ethyl-5-(4-hydroxyphenyl) barbituric acid	927	4719
Butabarbital	274	523
Butalbital	304	475
Butobarbital	349	875
Cyclopentobarbital	304	527
Pentobarbital	252	447
Phenobarbital	1087–1631*	2675–4013*
Talbutal	194	262
Thiopental	1109	10174

*Observed Range

Table 8 lists the compounds that produce a negative result by the Emit® II Plus Barbiturate Assay. Specificity testing was performed at the 200 ng/mL cutoff, which represents the greatest potential for cross-reactivity. Positive results for compounds structurally unrelated to barbiturates have not been observed.

Table 8 — Concentrations of Compounds Showing a Negative Response

Compound	Concentration Tested (µg/mL) at the 200 ng/mL (0.2 µg/mL) Cutoff
Acetaminophen	1000
α-Acetyl-*N*,*N*-dinormethadol (dinor LAAM)	25
L-α-Acetylmethadol (LAAM)	25
N-Acetylprocainamide (NAPA)	400
Acetylsalicylic Acid	1000
Amitriptyline	1000
D-Amphetamine	1000
Benzoylecgonine	1000
Buprenorphine	1000
Caffeine	1000
Cimetidine	1000
Clomipramine	2.5
Clonidine	1000
Codeine	500
Cotinine	100
Cyclobenzaprine	1000
Desipramine	800
Diphenhydramine	1000
Doxepin	1000
2-Ethylidene-1,5-dimethyl-3,3-diphenylpyrrolidine (EDDP)	1000
Fluoxetine	1000
Glutethimide	300
Ibuprofen	1000
Ketamine	100
Ketorolac Tromethamine	1000
Lormetazepam	1
LSD	10 ng/mL
Meperidine	1000
D-Methamphetamine	35
Methaqualone	1500
Morphine	1000
Naproxen	1000
Nortriptyline	1000
Oxazepam	300
Phencyclidine	1000
Phenytoin	1000
Promethazine	1000
Propoxyphene	1000
Ranitidine	1000
Scopolamine	500
11-nor-Δ^9-THC-9-COOH	100
Thioridazine	100
Tramadol	1000
Tyramine	100
Zidovudine (AZT)	2 mg/mL
Zolpidem	100

Non-Interfering Substances

Each of the following compounds when added to urine at ± 25% concentration of the cutoff do not yield a false response relative to the 200 ng/mL cutoff:

Table 9 — Non-Interfering Substances

Compound	Concentration
Acetone	1.0 g/dL
Ascorbic Acid	1.5 g/dL
Bilirubin	0.25 mg/dL
Creatinine	0.5 g/dL
Ethanol	1.0 g/dL
Gamma Globulin	0.5 g/dL
Glucose	2.0 g/dL
Hemoglobin	115 mg/dL
Human Serum Albumin	0.5 g/dL
Oxalic Acid	0.1 g/dL
Riboflavin	7.5 mg/dL
Sodium Chloride	6.0 g/dL
Urea	6.0 g/dL

Sensitivity

The sensitivity level of the Emit® II Plus Barbiturate Assay is less than 20 ng/mL. This level represents the lowest concentration of secobarbitol that can be distinguished from 0 ng/mL with a confidence level of 95%.

11 Risk and Safety

H317
P280, P272, P302 + P352, P333 + P313, P501
Warning!
May cause an allergic skin reaction.

Wear protective gloves/protective clothing/eye protection/face protection. Contaminated work clothing should not be allowed out of the workplace. IF ON SKIN: Wash with plenty of soap and water. If skin irritation or rash occurs: Get medical advice/attention. Dispose of contents and container in accordance with all local, regional, and national regulations.

Contains: 5-chloro-2-methyl-3(2h)-isothiazolone mixture with 2-methyl-3(2h)-isothiazolone.

Safety data sheets (MSDS/SDS) available on siemens.com/healthcare

12 Bibliography

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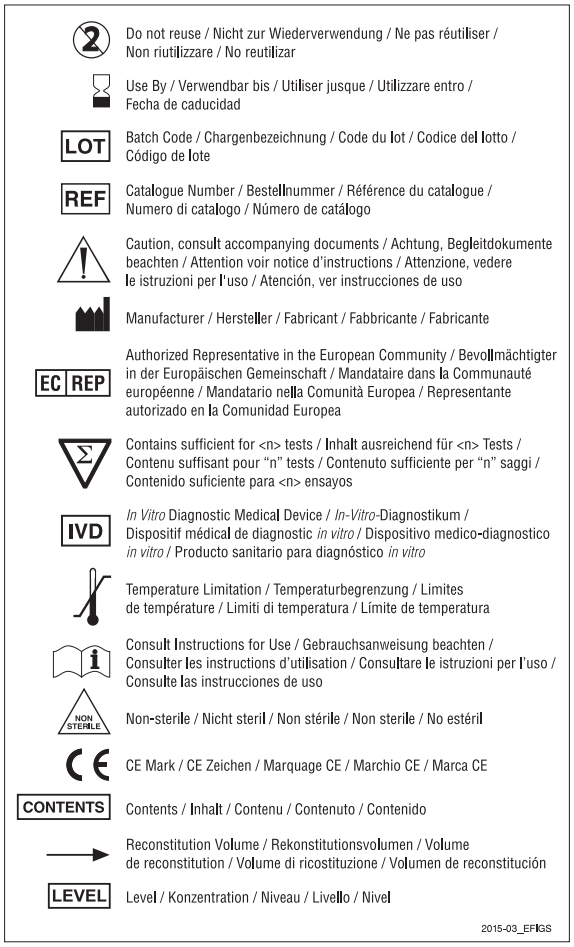
13 Symbols Key



For technical assistance, call Siemens Healthcare Diagnostics:
1-800-227-8994 in the USA
1-800-264-0083 in Canada
Outside the USA and Canada, call your local Siemens representative.

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