

# Yumizen G PT 5

- Yumizen G200
- Yumizen G400/G400 DDi/G405
- Yumizen G800/G800h/G850h
- Yumizen G1500/G1550/G1500h/G1550h

REF 1300036338

REAGENT 1 5 x 5 mL

REAGENT 2 5 x 5 mL

IVD CE

HORIBA ABX SAS  
Parc Euromédecine  
Rue du Caducée  
BP 7290  
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FRANCE

## *In vitro* diagnostic reagent for determination of prothrombin time test by coagulometry.

### Application Release <sup>a b</sup>

	Test name
Yumizen G1500/G1550	PT
Yumizen G1500h/G1550h	PT
Yumizen G800	PT
Yumizen G800h/G850h	PT
Yumizen G405	PT
Yumizen G400/G400 DDi	PT
Yumizen G200	PT

### Intended Use <sup>c</sup>

For *in vitro* diagnostic use only.

**Yumizen G PT 5** is a rabbit brain thromboplastin reagent with own solvent used for determination of Prothrombin Time (PT).

### Clinical Interest (1) <sup>d</sup>

The PT test according to Quick is a sensitive screening test for the common and extrinsic coagulation pathway.

**Yumizen G PT 5** as a reagent for PT is highly sensitive to VKA, decreased level of factors in common and extrinsic pathway (factor II, V, VII, and X), hereditary or acquired coagulation disorders and liver failure.

### Method <sup>e</sup>

**Yumizen G PT 5** reagent as a calcium thromboplastin, induces the formation of fibrin clot when added to patient's plasma.

The time of this clotting process is measurable manually or with optical and mechanical coagulation analyzers.

### Reagents <sup>b</sup>

#### Reagent 1

**Yumizen G PT 5** is freeze-dried.

This reagent is a tissue thromboplastin extract from rabbit brain, which contains tissue factor, lipid and preservative

Suspended rabbit brain powder	< 25 g/L
Sodium azide	< 1.0 g/L

#### Reagent 2

**Yumizen G PT 5- Solvent** is used for the reconstitution of **Yumizen G PT 5**.

This reagent is a buffer which contains calcium ions and preservative.

CaCl <sub>2</sub> *2H <sub>2</sub> O	< 2 g/L
Sodium azide	< 1.0 g/L

**Yumizen G PT 5** should be used according to this notice. The manufacturer cannot guarantee its performance if used otherwise.

<sup>a</sup>Modification: new instrument added.

<sup>b</sup>Modification: chapter added.

<sup>c</sup>Modification: new leaflet form.

<sup>d</sup>Modification: § "Clinical Interest" changed.

<sup>e</sup>Modification: § "Method" changed.

# Yumizen G PT 5

## Handling <sup>f</sup>

1. Allow the vial to stand for at least 5 min (20 - 25°C ) before reconstitution.
2. Reconstitute the content of one vial with 5 mL x **Yumizen G PT 5 - Solvent** (same lot).  
Be careful when opening the rubber cap as some lyophilized material may be lost.
3. Replace the cap and gently invert the bottle (8 - 10 times) to disperse the contents (avoid foaming).
4. Allow the vial to stand for at least 30 min (37°C).
5. Mix thoroughly the vial once more before use.
6. Add a magnetic stirrer in the vial (not for Yumizen G200).
7. **For automated analyzers only:** place the vial in the reagent holder without cap.

For optimal performance remove the reagent from the instrument after use, close the vial and store at 2 - 8°C. An analysis of the control must be carried out on a daily basis at the same time as the patient samples, including each time a calibration is carried out.

The frequency of the controls depends on the laboratory requirements.

Each laboratory must establish the quality assurance procedures to be followed. These must conform to the current accreditation requirements and pertinent regulations.

Care should be taken not to interchange the caps with others products.

## Calibrator <sup>b</sup>

For the calibration, use the master curve provided or the calibrator:

**Yumizen G CAL** (1300036416) (not included, optional)  
12 x 1 mL

To calculate the ratio of the test (PT), you could use the mean value (MNPT) provided in the enclosed annex.

According to the CLSI H47-A2 document every laboratory should determine its own MNPT value. (2)

## Control <sup>b</sup>

For internal quality control, use:

- **Yumizen G CTRL I & II** (1300036412) (not included)  
5 x 1 mL + 5 x 1 mL

The frequency of controls and the confidence intervals should correspond to laboratory guidelines and country-specific directives. You should follow federal, state and local guidelines for testing quality control materials. The results must be within the range of the defined confidence limits. Each laboratory should establish a procedure to follow if the results exceed these confidence limits.

Each control should be assayed daily and/or after a calibration.

## Semi-Automated Analyzers Procedure <sup>g</sup>

**Yumizen G PT 5** can be used on semi-automated analyzers (Yumizen G Line), according to the following procedure.

Duplicated measurement is recommended.

1	Incubate the <b>Yumizen G PT 5</b> at 37°C.	~30 min
2	Add the sample into the cuvette.	50 µL
3	Incubate at 37°C.	2 min
4	Add the <b>Yumizen G PT 5</b> .	100 µL
5	Start immediately the measurement at 640 nm.	~1 min

For manual testing use the same protocol with double volumes. (3)

In case of determination by any other hemostasis analyzers, please follow the instructions of the manual.

## Materials Required but not Provided <sup>h</sup>

- HORIBA analyzers (Yumizen G Line) are recommended.
- Third-party analyzers can also be used, where the clotting based method and free test setup access are allowed.
- Calibrator (optional): **Yumizen G CAL** (1300036416)
- Control: **Yumizen G CTRL I & II** (1300036412)
- Magnetic stirrer (not for Yumizen G200)
- Standard laboratory equipment

<sup>f</sup>Modification: § "Handling" changed.

<sup>b</sup>Modification: chapter added.

<sup>g</sup>Modification: § "Semi-Automated Analyzers Procedure" changed.

<sup>h</sup>Modification: § "Material Required but not Provided" changed.

# Yumizen G PT 5

## Specimen <sup>i</sup>

### Plasma

- 3.2% (109 mmol/L) sodium-citrate anticoagulated plasma in primary tube.
- 3.2% (109 mmol/L) sodium-citrate, theophylline, adenosine and dipyridole (CTAD) anticoagulated plasma in primary tube.

Mix the blood carefully.

### Specimen centrifugation

Speed	Time	Temperature
1500 g	15 min	room temperature

### Specimen Stability (4)

- At 20 - 25°C: 24 hours
- Between -22°C to -26°C: 12 months (only the plasma)

Do not store on ice or at 2 - 8°C as cold activation of factor VII may alter results.

If the patient is on both heparin and coumarin-based anticoagulant therapy, the results may vary with time of storage.

### To thaw plasma:

1. Place the sample in a water bath: not more than 5 min at 37°C.
2. Centrifuge the sample.

For additional information, please refer to CLSI document H21-A5.

## Reference Range (5) <sup>b</sup>

Each laboratory should establish its own reference ranges.

The values given here are used as guidelines only.

Normal range	Mean	From	To
INR	1.00	0.80	1.20

The therapeutic reference range for INR may vary depending on the clinical indication of OAT by VKA.

## Storage and Stability <sup>j</sup>

### Stability before opening

Stable up to the expiry date on the label if stored at 2 - 8°C.

### Stability after reconstitution

	20 - 25°C	2 - 8°C
Yumizen G PT 5	1 day	12 days

### Stability on board

#### Automated Analyzers

	15 - 19°C
Yumizen G PT 5	5 days

#### Semi-automated Analyzers

	37°C
Yumizen G PT 5	8 hours

## Expected Results <sup>b</sup>

PT test results can be reported in the following units:

- **Second:** observed clotting time of the sample.
- **Ratio (PT / MNPT):** clotting time of the sample divided by the mean normal prothrombin time (MNPT).
- **Percentage:** proportional part of the normal PT activity, which is calculable from the calibration curve. Method dependent master curve in the enclosed annex can be used for the calculation.
- **International Normalized Ratio (INR):** ratio raised to the power of International Sensitivity Index (ISI).  

$$INR = (PT / MNPT)^{ISI}$$
 The ISI value in the enclosed annex can be used for the calculation.  
 The ISI value assignment follows the guidelines of World Health Organisation (WHO).

<sup>i</sup>Modification: § "Specimen" changed.

<sup>b</sup>Modification: chapter added.

<sup>j</sup>Modification: § "Storage and Stability" changed.

# Yumizen G PT 5

## Precautions of Calculation

- The MNPT value depends on the population (race, gender) and measuring circumstances (sampling tube, etc.).  
Our value, which is identical with the 100% point of the calibration curve, is for information only.  
According to the CLSI H47-A2 document every laboratory should determine its own MNPT value. (2)
- By calculating with inappropriate data or using the supplied data improperly, erroneous results can be obtained.
- The system is validated only for OAT patients by VKA. (2)
- Accurate and general conversion of percentage into INR (or back) is not possible.

## Waste Management <sup>b</sup>

- Please refer to local legal requirements.
- This product contains less than 0.2% of sodium azide as a preservative. Sodium azide may react with lead and copper to form explosive metal azides.

## General Precautions <sup>k</sup>

- This product is for professional *in vitro* diagnostic use only.  
For laboratory use.
- For prescription use only.
- This reagent is classified as non-hazardous in compliance with regulation (EC) N°.1272/2008.
- **Yumizen G PT 5**  
**Warning:** This product is obtained from substances of animal origin. Consequently, it should be treated as potentially infectious and handled with the appropriate cautions in accordance with good laboratory practices (6).
- Do not pipette by mouth.
- Do not replenish the products.
- Do not swallow. Avoid contact with skin and mucous membranes.
- Observe the standard laboratory precautions for use.
- The product vials should be discarded after use. Disposal of all waste material should be in accordance with local guidelines.
- Please refer to the SDS associated with the product.
- Do not use the product if there is visible evidence of biological, chemical or physical deterioration.

- Do not use the product if the recommended storage conditions, including temperature, are not followed.
- User must be trained by a HORIBA representative before attempting to operate the device.
- It is the user's responsibility to verify that this document is applicable to the product used.
- For technical assistance, you can call +33 (0)4 67 14 15 16.
- Any serious incident that has occurred in relation to the device shall be reported to the manufacturer and the competent authority of the country in which the user and/or the patient is established.
- Using of third-party hemostasis analyzers may cause a risk of system un-harmonization.
- It is the user's responsibility to evaluate the risk of using a third-party hemostasis analyzers.

## Performance

The performance data listed below are representative of performance on HORIBA systems.

### Lot to Lot Variability <sup>b</sup>

The lot to lot variability was tested with sample group analysis between consecutive lots. The unit difference of different sample groups on Yumizen G Line analyzers give the following result.

Sample group	Normal INR	Pathological INR
Difference	1.7%	2.2%

### Sample Volume <sup>b</sup>

Instrument	Volume
Yumizen G1500/G1550	50 µL
Yumizen G1500h/G1550h	50 µL
Yumizen G800	50 µL
Yumizen G800h/G850h	50 µL
Yumizen G405	50 µL
Yumizen G400/G400 DDi	50 µL
Yumizen G200	50 µL

<sup>b</sup>Modification: chapter added.

<sup>k</sup>Modification: § "General Precautions" changed.

# Yumizen G PT 5

## Precision

### Repeatability (on automated analyzers) <sup>l</sup>

Repeatability according to the recommendations found in the CLSI (NCCLS), EP15-A3 (7), EP05-A3 (8), H47-A2 (9) (data obtained on internal study).

- 2 controls (10 runs)
- 2 specimens (20 runs)

	Mean value Second	CV %
Control specimen 1	12.4	0.864
Control specimen 2	23.0	1.775
Specimen 1	13.0	1.075
Specimen 2	17.4	0.901

Maximum acceptance criteria (CV %): < 2%.

### Reproducibility (on automated analyzers) <sup>m</sup>

Reproducibility according to the recommendations found in the CLSI (NCCLS), EP05-A3 (8), H47-A2 (9) (data obtained on internal study).

- 2 controls (10 runs)

	Mean value Second	CV %
Control specimen 1	12.0	1.731
Control specimen 2	21.3	3.047

Maximum acceptance criteria (CV %): < 5%.

## Measuring Range <sup>b</sup>

The measuring range is 10 - 120s on the Yumizen G Line instruments.

## Correlation <sup>b</sup>

Specimens are correlated with a commercial reagent taken as reference on HORIBA analyzers (Yumizen G Line).

Number of samples: 80

- Passing-Bablok regression: 1.000 (slope)
- Bland et Altman plot procedure: -0.012 (INR difference)

## Interferences (10) <sup>b</sup>

- Haemoglobin: No significant influence is observed up to 6.80 g/L.
- Triglycerides: No significant influence is observed up to an Intralipid® concentration (representative of lipemia) of 9.0 mmol/L.
- Bilirubin: No significant influence is observed up to 270 µmol/L.
- Heparin: No significant influence is observed up to 0.75 IU/mL.

## Clinical Performance <sup>b</sup>

Clinical sensitivity and specificity, positive predictive value and negative predictive value are not commonly reported for this test.

This is largely attributed to the fact that this test is a screening test.

To arrive at a diagnosis and a course of treatment, results from others routine coagulation tests should be used in conjunction with other diagnostic information and the attending health-care professional's evaluation of the patient's condition.

## Precautions of Characteristics

The measurement data was generated during a performance evaluation and is not recommended as an acceptance criterion.

## Reference

- De Caterina R , Husted S Wallentin L, Andreotti F, Arnesen H, Bachmann F, Baigent C, Huber K, Jespersen J, Kristensen SD, Lip GYH, Morais J, Rasmussen LH, Siegbahn A, Verheugt FWA, Weitz JI. Vitamin K antagonists in heart disease: Current status and perspectives (Section III). *Thromb Haemost* (2013) **110**: 1087-1107.
- One-Stage Prothrombin Time (PT) Test and Activated Partial Thromboplastin Time (APTT) Test. Approved Guideline, 2<sup>nd</sup> ed., CLSI (NCCLS) document H47-A2 (2008) 28:20.
- Van Den Besselaar et al. Paving the way for establishing a reference measurement system for standardization of plasma prothrombin time: Harmonizing the manual tilt tube method. *J Thromb Haemost*. (2020 Aug); **18** (8): 1986-1994.

<sup>l</sup>Modification: modification of repeatability.

<sup>m</sup>Modification: modification of reproducibility.

<sup>b</sup>Modification: chapter added.

## Yumizen G PT 5

4. Collection, Transport, and Processing of Blood Specimens for Testing Plasma-Based Coagulation Assays and Molecular Hemostasis Assays. Approved Guideline, 5<sup>th</sup> ed., CLSI (NCCLS) document H21-A5 (2008).
5. Hirsh J, Dalen J, Anderson DR, Poller L, Bussey H, Ansell J, Deykin D. Oral anticoagulants: Mechanism of action, clinical effectiveness, and optimal therapeutic range. *Chest* (2001) **119**:8S-21S.
6. Council Directive (2000/54/EC). Official Journal of the European Communities. No. L262 from October 17, 2000: 21-45.
7. User Verification of Precision and Estimation of Bias. Approved Guideline, 3<sup>rd</sup> ed., CLSI (NCCLS) document EP15-A3 (2014).
8. Evaluation of Precision of Quantitative Measurement Procedures. Approved Guideline, 3<sup>rd</sup> ed., CLSI (NCCLS) document EP05-A3 (2014).
9. One-Stage Prothrombin Time (PT) Test and Activated Partial Thromboplastin Time (APTT) Test. Approved Guideline, 2<sup>nd</sup> ed., CLSI (NCCLS) document H47-A2 (2008).
10. Interference Testing in Clinical Chemistry. Approved Guideline, 2<sup>nd</sup> ed., CLSI (NCCLS) document EP07-A2 (2005).