Key to Symbols

CONTAINS: AZIDE	Contains sodium azide. Contact with acids liberates very toxic gas.
FOR USE WITH	Identifies products to be used together
IVD	*In Vitro* Diagnostic Medical Device
LOT	Batch code/Lot number
PRODUCT OF ITALY	Product of Italy
R1	Reagent 1
R2	Reagent 2
REF	Catalog number/List number
SN	Serial number
WARNING: SENSITIZER	Warning: May cause an allergic reaction.
	Consult instructions for use
	Manufacturer
	Sufficient for
	Temperature limitation
	Use by/Expiration date

PANCREATIC AMYLASE
REF 6K22-30

Customer Service: Contact your local representative or find country-specific contact information on www.abbottdiagnostics.com.

SENTINEL CH. SpA
Via Robert Koch, 2
Milan 20152 Italy

June 2017

Abbott

PANCREATIC AMYLASE

Package insert instructions must be carefully followed. Reliability of assay results cannot be guaranteed if there are any deviations from the instructions in this package insert.

Read Highlighted Changes: Revised June 2017.

INTENDED USE

The MULTIGENT Pancreatic Amylase assay is intended for the enzymatic colorimetric determination of pancreatic amylase according to the IFCC method of determination in serum or plasma on the ARCHITECT *c* Systems.

SUMMARY AND EXPLANATION OF TEST

Alpha-amylases are hydrolytic enzymes, which break down starch into maltose. In the human body, alpha-amylases originate from various organs that give the corresponding name to the enzyme. The pancreatic alpha-amylase is produced almost exclusively by the pancreas and released into the intestinal tract; the salivary alpha-amylase, mainly synthesized in the salivary glands, is secreted into saliva and is also present in tears, sweat, and amniotic fluid. Pancreatic alpha-amylase assays are suitable for monitoring acute pancreatitis and acute attacks in chronic pancreatitis.

PRINCIPLES OF PROCEDURE

The enzymatic colorimetric assay for pancreatic alpha-amylase determination is carried out in two successive steps. In the first incubation step, the activity of the human salivary alpha-amylase is inhibited using two different monoclonal antibodies with no effect on the pancreatic alpha-amylase. In the second reaction step, the pancreatic alpha-amylase catalyzes the hydrolysis of the EPS substrate (Ethylidene Protected Substrate) *p*-nitrophenyl-maltoheptaoside 4,6-ethylidene-blocked (ethylidene-G7PNP) forming 2 ethylidene-G5 + 2 G2PNP + 2 ethylidene-G4 + 2 G3PNP + ethylidene-G3 + G4PNP. The α-glycosidase hydrolyzes all fragments of G2PNP, G3PNP, and G4PNP into *p*-nitro phenol (PNP) and glucose (G). The increase of absorbance, due to PNP formation is proportional to the activity of pancreatic alpha-amylase in the examined sample.

Methodology: IFCC method

REAGENTS

Reagent Kit

REF 6K22-30 MULTIGENT Pancreatic Amylase is supplied as a liquid, ready-to-use, two-reagent kit which contains:

R1 2 x 36 mL
R2 2 x 11 mL

Estimated tests per kit: 296

Calculation is based on the minimum reagent fill volume per kit.

Reactive Ingredients		Concentration
R1	HEPES buffer (pH 7.15)	53 mmol/L
	$MgCl_2$	13 mmol/L
	α-glucosidase	≥ 4 kU/L
	Anti-salivary alpha-amylase monoclonal antibodies (mouse)	≥ 30 mg/L
R2	HEPES buffer (pH 7.15)	53 mmol/L
	4,6-ethylidene-G7PNP	4 mmol/L

Nonreactive Ingredients: R1 contains buffer, detergent, stabilizer, and preservatives including sodium azide (< 0.1%). R2 contains buffer and sodium azide (< 0.1%) as a preservative.

REAGENT HANDLING AND STORAGE

Reagent Handling

- R1 Ready for use.
- R2 Ready for use.
- Remove air bubbles, if present in the reagent cartridge, with a new applicator stick. Alternatively, allow the reagent to sit at the appropriate storage temperature to allow the bubbles to dissipate. To minimize volume depletion, do not use a transfer pipette to remove the bubbles.
  CAUTION: Reagent bubbles may interfere with proper detection of reagent level in the cartridge, causing insufficient reagent aspiration that could impact results.
- Do not pipette by mouth and avoid any contact with skin. Both saliva and sweat contain alpha-amylase.

Reagent Storage

- Unopened reagents are stable until the expiration date when stored at 2 to 8°C.
- Reagent stability is 30 days if the reagent is uncapped and onboard.

Indications of Deterioration

Reagents must be clear; do not use if turbid. A slight yellow color of R2 does not affect the reagent performance. Instability or deterioration should be suspected if there are visible signs of leakage, turbidity, microbial growth, if calibration does not meet the appropriate package insert and/or **ARCHITECT System Operations Manual** criteria, or if controls do not meet the appropriate criteria.

WARNINGS AND PRECAUTIONS

Precautions for Users

- IVD
- For *In Vitro* Diagnostic Use.
- Do not use components beyond the expiration date.
- Do not mix materials from different kit lot numbers.
- **CAUTION:** This product requires the handling of human specimens. It is recommended that all human-sourced materials be considered potentially infectious and handled in accordance with the OSHA Standard on Bloodborne Pathogens.[1] Biosafety Level 2[2] or other appropriate biosafety practices[3,4] should be used for materials that contain or are suspected of containing infectious agents.
- The following warnings and precautions apply to R1:

WARNING: Contains methylisothiazolones and sodium azide.

H317 May cause an allergic skin reaction.
EUH032 Contact with acids liberates very toxic gas.

Prevention

P261 Avoid breathing mist /vapors / spray.
P280 Wear protective gloves / protective clothing / eye protection.
P272 Contaminated work clothing should not be allowed out of the workplace.

Response

P302+P352 IF ON SKIN: Wash with plenty of water.
P333+P313 If skin irritation or rash occurs: Get medical advice / attention.
P362+P364 Take off contaminated clothing and wash before reuse.

Disposal

P501 Dispose of contents / container in accordance with local regulations.

- The following warnings and precautions apply to R2:

Contains sodium azide.

EUH032 Contact with acids liberates very toxic gas.

P501 Dispose of contents / container in accordance with local regulations.

- For a detailed discussion of safety precautions during system operation, refer to the **ARCHITECT System Operations Manual,** *Section 8.*
- Safety Data Sheets are available at www.abbottdiagnostics.com or contact your local representative.

SPECIMEN COLLECTION AND HANDLING

Suitable Specimens

- **Serum:** Use serum collected by standard venipuncture techniques into plastic tubes with or without gel barriers. Ensure complete clot formation has taken place prior to centrifugation. Centrifuge according to tube manufacturer's instructions to ensure proper separation of serum from blood cells. Glass tubes were not tested.

  Some specimens, especially those from patients receiving anticoagulant or thrombolytic therapy, may take longer to complete their clotting processes. Fibrin clots may subsequently form in these sera and the clots could cause erroneous test results.
- **Plasma:** Use plasma collected by standard venipuncture techniques into plastic tubes. The acceptable anticoagulants are sodium and lithium heparin and EDTA. Ensure centrifugation is adequate to remove platelets. Centrifuge according to tube manufacturer's instructions to ensure proper separation of plasma from blood cells. Glass tubes and gel separator tubes were not tested.

For total sample volume requirements, refer to the ASSAY PARAMETERS section of this package insert and *Section 5* of the **ARCHITECT System Operations Manual**.

Specimen Storage

Serum and Plasma

Temperature	Maximum Storage	Bibliographic Reference
20 to 25°C	7 days	5
2 to 8°C	7 days	5, 6
-20°C	1 year	5

Guder et al.[5] suggest storage of frozen specimens at -20°C for no longer than the time interval cited above. However, limitations of laboratory equipment make it necessary in practice for clinical laboratories to establish a range around -20°C for specimen storage. This temperature range may be established from either the freezer manufacturer's specifications or your laboratory standard operating procedure(s) for specimen storage.

NOTE: Stored specimens must be inspected for particulates. If present, mix and centrifuge the specimen to remove particulates prior to testing.

PROCEDURE

Materials Provided

REF 6K22-30 MULTIGENT Pancreatic Amylase Kit

Materials Required but not Provided

- REF 6K30-10 MULTIGENT Clin Chem Cal
- REF 6K30-20 MULTIGENT Clin Chem Control 1
- REF 6K30-21 MULTIGENT Clin Chem Control 2
- Saline (0.85% to 0.90% NaCl) for specimens that require dilution

Assay Procedure

For a detailed description of how to run an assay on the ARCHITECT *c* Systems, refer to *Section 5* of the **ARCHITECT System Operations Manual**.

Specimen Dilution Procedure

The ARCHITECT *c* Systems have an automatic dilution feature; refer to *Section 2* of the **ARCHITECT System Operations Manual** for additional information.

Serum and Plasma: Specimens with pancreatic amylase values exceeding 2,200 U/L (36.67 µkat/L) are flagged and may be diluted by following either the Automated Dilution Protocol or the Manual Dilution Procedure.

Automated Dilution Protocol

If using the Automated Dilution Protocol, the system performs a 1:10 dilution of the specimen and automatically corrects the concentration by multiplying the result by the appropriate dilution factor.

Manual Dilution Procedure

- Use saline (0.85% to 0.90% NaCl) to dilute the sample.
- The operator must enter the dilution factor in the patient or control order screen. The system uses this dilution factor to automatically correct the concentration by multiplying the result by the entered factor.
- If the operator does not enter the dilution factor, the result must be multiplied by the appropriate dilution factor before reporting the result.

NOTE: If the diluted sample result is flagged indicating it is less than the linear low limit, do not report the result. Rerun using an appropriate dilution.

For detailed information on ordering dilutions, refer to *Section 5* of the **ARCHITECT System Operations Manual**.

CALIBRATION

Calibration is stable for 30 days (720 hours) and is required with each change in reagent lot number. Verify calibration curve with at least two levels of controls according to the established quality control requirements for your laboratory. If control results fall outside acceptable ranges, recalibration may be necessary.

For a detailed description of how to calibrate an assay, refer to *Section 6* of the **ARCHITECT System Operations Manual**.

For information on calibrator standardization, refer to the REF 6K30-10 MULTIGENT Clin Chem Cal package insert.

QUALITY CONTROL

As appropriate, refer to your laboratory standard operating procedure(s) and/or quality assurance plan for additional quality control requirements and potential corrective actions:

- Two levels of controls (normal and abnormal) are to be run every 24 hours.
- If more frequent control monitoring is required, follow the established quality control procedures for your laboratory.
- If quality control results do not meet the acceptance criteria defined by your laboratory, patient values may be suspect. Follow the established quality control procedures for your laboratory. Recalibration may be necessary.
- Review quality control results and acceptance criteria following a change of reagent or calibrator lot.

RESULTS

Refer to *Appendix C* of the **ARCHITECT System Operations Manual** for information on results calculations.

To convert results from U/L to µkat/L, multiply U/L by 0.01667.[7]

Representative performance data are given in the EXPECTED VALUES and SPECIFIC PERFORMANCE CHARACTERISTICS sections of this package insert. Results obtained in individual laboratories may vary.

LIMITATIONS OF THE PROCEDURE

Refer to the SPECIMEN COLLECTION AND HANDLING and SPECIFIC PERFORMANCE CHARACTERISTICS sections of this package insert.

EXPECTED VALUES

Reference Range

Serum and Plasma

Gender/Age	Range (U/L)	Range (µkat/L)
Either	8 to 51	0.13 to 0.85

A study was conducted using 259 volunteers from a healthy blood donor population in Milan, Italy. Data were analyzed as described by Clinical and Laboratory Standards Institute (CLSI) protocol NCCLS C28-A2.[8] From this study, the central 95% of specimens fell within the range above.

It is recommended that each laboratory determine its own reference range based upon its particular locale and population characteristics. For diagnostic purposes, the patient's medical history and all other clinical findings should be considered when evaluating pancreatic amylase results.

SPECIFIC PERFORMANCE CHARACTERISTICS

Reportable Range

The reportable range (analytical measurement range) for MULTIGENT Pancreatic Amylase is 1 to 2,200 U/L (0.02 to 36.67 µkat/L).

Limit of Detection (LOD)

The LOD for MULTIGENT Pancreatic Amylase is 1 U/L (0.02 µkat/L). LOD was calculated on 20 replicates of normal saline and reported as the mean zero value + 3 SD.

Interfering Substances

Interference studies were conducted using an acceptance criteria of ± 10% or 5.1 U/L deviation from the target value. MULTIGENT Pancreatic Amylase is not affected by the presence of the following interferents up to the concentrations indicated below.

Interfering Substance	Interferent Concentration
Bilirubin, conjugated	50 mg/dL (855 µmol/L)
Bilirubin, unconjugated	50 mg/dL (855 µmol/L)
Hemoglobin	500 mg/dL (5 g/L)
Intralipid	1500 mg/dL (15 g/L)

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Precision

The precision of the MULTIGENT Pancreatic Amylase assay is ≤ 6% Total CV. Studies were performed using CLSI protocol NCCLS EP5-A.[9] Representative results are summarized below.

Control		Level 1	Level 2
N		30	30
Mean (U/L)		33.56	89.43
Within Run	SD	0.32	0.32
	%CV	0.90	0.40
Between Run	SD	0.40	0.40
	%CV	1.20	0.40
Total	SD	0.51	0.50
	%CV	1.50	0.60

Method Comparison

Correlation studies were performed using CLSI protocol NCCLS EP9-A.[10] Results from the MULTIGENT Pancreatic Amylase assay on the AEROSET System were compared with the results from a commercially available method.

Results from the MULTIGENT Pancreatic Amylase assay on an ARCHITECT *c* System were compared with the results from the AEROSET System. Representative results using linear regression analysis are summarized below.

	AEROSET vs. Comparative Method	ARCHITECT vs. AEROSET
N	65	40
Y - Intercept	1.18	0.22
Correlation Coefficient	0.9988	0.9994
Slope	0.9864	0.9975
Range (U/L)	4.9 to 636.4	4.0 to 101.0

BIBLIOGRAPHY

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TRADEMARKS

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ARCHITECT *c* Systems Assay Parameters

Pancreatic Amylase Serum/Plasma—Conventional and SI Units

Configure assay parameters — General

● General O Calibration O SmartWash O Results O Interpretation

Assay: **AmyP** Type: **Photometric** Version: †
Number: **2953**
Run controls for onboard reagents by: **Lot**

● Reaction definition O Reagent / Sample O Validity checks

Reaction mode: **Rate up**

	Primary		Secondary		Read times
Wavelength:	**404**	/	**700**	Main:	**25 – 32**
Last required read:	**32**			Flex:	___ – ___
Absorbance range:	**-0.1000 to 2.200**			Color correction:	___ – ___
Sample blank type:	**None**				

O Reaction definition ● Reagent / Sample O Validity checks

			R1	R2
Reagent:	**AAM0S**	Reagent volume:	**200**	**50**
Diluent:	**Saline**	Water volume:	___	
Diluent dispense mode:	**Type 0**	Dispense mode:	**Type 0**	**Type 0**

Dilution name	Sample	Diluted sample	Diluent	Water		Dilution factor	Default dilution
STANDARD	**8.0**	___	___	___	=	**1:1.00**	●

O Reaction definition O Reagent / Sample ● Validity checks

Reaction check: **None**

Rate linearity %: **10**

Configure assay parameters — Calibration

O General ● Calibration O SmartWash O Results O Interpretation

Assay: **AmyP** Calibration method: **Linear**

● Calibrators O Volumes O Intervals O Validity checks

Calibrator set: **CCC-S**
Replicates: **3** [Range 1 – 3]

		Calibrator level:	Concentration:
Blank:	**Water**	**0**‡	
Cal 1:	**CCC-S1**	††	

O Calibrators ● Volumes O Intervals O Validity checks

Calibrator: **CCC-S**

	Calibrator level	Sample	Diluted sample	Diluent	Water
Blank:	**Water**	**8.0**	___	___	___
Cal 1:	**CCC-S1**	**8.0**	___	___	___

O Calibrators O Volumes ● Intervals O Validity checks

Calibration intervals:
Full interval: **720** (hours)
Calibration type:
Adjust type: **None**

O Calibrators O Volumes O Intervals ● Validity checks

Blank absorbance range:	**-0.0100**	–	**0.0100**
Span:	**Blank**	–	**Blank**
Span absorbance range:	_____	–	_____
Expected cal factor:	**0.00**		
Expected cal factor tolerance %:	**0**		

Configure assay parameters — SmartWash

O General O Calibration ● SmartWash O Results O Interpretation

Assay: **AmyP**

COMPONENT	REAGENT / ASSAY	WASH	Volume	Replicates

Pancreatic Amylase Serum/Plasma—Conventional Units

Configure assay parameters — Results

O General O Calibration O SmartWash ● Results O Interpretation

Assay: **AmyP** Assay number: **2953**
Dilution default range: Result units: **U/L**
Low-Linearity: **1**
High-Linearity: **2200**
Gender and age specific ranges:

GENDER	AGE (UNITS)	NORMAL	EXTREME
Either	**0 – 130 (Y)**	**8 - 51**	

Configure result units

Assay: **AmyP**
Version: †
Result units: **U/L**
Decimal places: **0** [Range 0 – 4]
Correlation factor: **1.0000**
Intercept: **0.0000**

Pancreatic Amylase Serum/Plasma—SI Units

Configure assay parameters — Results

O General O Calibration O SmartWash ● Results O Interpretation

Assay: **AmyP** Assay number: **2953**
Dilution default range: Result units: **µkat/L**
Low-Linearity: **0.02**
High-Linearity: **36.67**
Gender and age specific ranges:

GENDER	AGE (UNITS)	NORMAL	EXTREME
Either	**0 – 130 (Y)**	0.13 – **0.85**	

Configure result units

Assay: **AmyP**
Version: †
Result units: **µkat/L**
Decimal places: **2** [Range 0 – 4]
Correlation factor: **1.0000**
Intercept: **0.0000**

† Due to differences in instrument systems and unit configurations, version numbers may vary.
‡ Displays the number of decimal places defined in the decimal places parameter field.
†† Refer to the concentration specified on calibrator labeling or value sheet. These values are defined on the Configure calibrator set screen.

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