

ENZYMES

Penicillinase

ORIGIN *Bacillus cereus 569/H9*

CAT# PENI-70-1545, PENI-70-1541
EC# 3.5.2.6

► SPECIFICATIONS

Penicillinase is a freeze-dried product containing buffer salts and is active against penicillins only.

TABLE 1: THE SPECIFICATIONS OF PENICILLINASE

CATALOGUE NO.	FORMULATION	UNITS
1541	Freeze dried bulk powder	>15 Units/mg
1545	Sterile vials	>3000 Units/vial

► UNIT DEFINITION

One Sekisui (International) unit of Penicillinase (β -Lactamase I) activity is defined as the amount of enzyme that will catalyse the hydrolysis of 1.0 micromole of benzylpenicillin per minute at 25°C and pH 7.0. One Sekisui (International) Penicillinase unit is equivalent to 600 Levy Units, 75 Pollock Units or 91200 Kersey Kinetic Units.

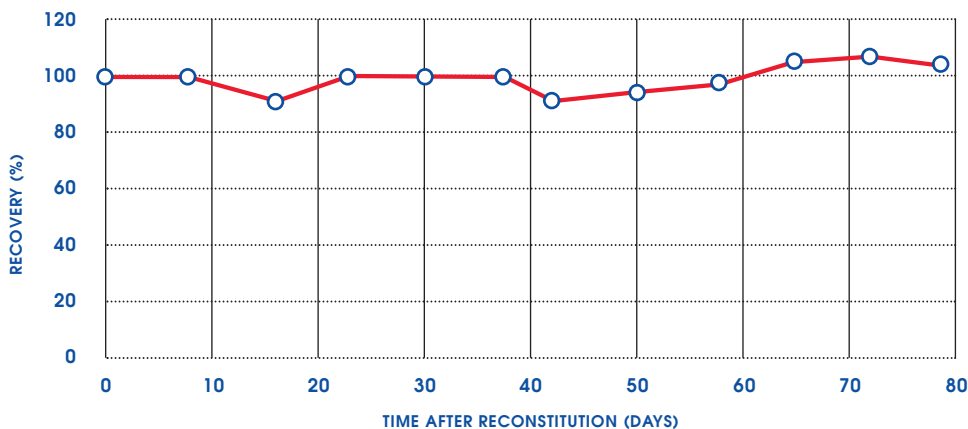
► STERILITY

The Penicillinase vials are sterilised by gamma-irradiation. No detectable growth in Tryptone Soyabroth at 20°C to 25°C or Thioglycollate at 30°C to 35°C for 14 days. The bulk powder is not sterile but has been filtered through a 0.45 micron filter prior to freeze drying.

► RECONSTITUTED STERILITY

Penicillinase vials are stable for 4 weeks at 2-8°C after reconstitution in water.

FIGURE 1: PENICILLINASE LIQUID STABILITY



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EFFECTIVENESS

Sekisui Enzymes Penicillinase has been demonstrated to inactivate the following penicillins; Amdinocillin, Amoxicillin, Ampicillin, Azlocillin, Benzylpenicillin, Carbenicillin, Cloxacillin, Flucloxacillin, Methicillin, Mezlocillin, Nafcillin, Oxacillin, Piperacillin, Ticarcillin.

APPLICATIONS

1. Testing sterility of blood cultures

Blood cultures are routinely prepared in order to test for bacterial infection. False negative results might be obtained where the blood sample contains antibiotics. Incorporation of β -Lactamase/ Penicillinase in the culture medium will overcome this problem when cephalosporins/penicillins are present.

2. Testing for contamination of drugs by antibiotics

US Code of Federal regulations states that "If a reasonable possibility exists that a non-penicillin drug product has been exposed to cross-contamination with penicillin, the non-penicillin drug product shall be tested for the presence of penicillin" (21 CFR 211.176, Penicillin Contamination, FDA, BY-Lines No. 8 November 1977).

3. Environmental monitoring of antibiotic manufacturing areas

Contact plates, settle plates and air monitoring systems for testing of aseptic conditions in antibiotic manufacturing facilities need to be manufactured with agar medium for neutralisation of antibiotic. This is achieved by the addition of Penicillinase or β -Lactamase to the medium. In this way any antibiotic residues are hydrolysed and microbial contamination can be detected.

4. Sterility testing of bulk antibiotics

US Pharmacopeia (USP) Chapter 71 and EP Section 2.6 describe sterility testing of bulk antibiotics, which should be shown to be free from microbial contamination. The testing requires the removal of significant amounts of active antibiotic from solution by combined filtration and the use of Penicillinase or β -Lactamase. The resulting solution is tested for the (lack of) growth of microbes. USP specifies that the amount of Penicillinase or β -Lactamase used in this removal process should be verified using a microbial challenge solution in a control sample.

OTHER AVAILABLE PRODUCTS

CAT. NO.	FORMULATION	UNITS	SPECIFICATIONS
BELA-70-1431	Freeze dried bulk powder	>2 β II Units/mg	Active against both penicillins and a narrower range of cephalosporins
BELA-70-1401	Sterile product in vials	500 β I Units/vial; >50 β II Units/vial	
BELA-70-1491	Freeze dried bulk powder	>2 β II Units/mg	Active against penicillins only
BELA-70-1461	Sterile product in vials	>50 β II Units/vial	

Note: Sekisui Enzymes Penicillinase is for *in vitro* use only.

(1) Waterworth PM; An enzyme preparation inactivating all penicillins and cephalosporins, Jour Clin Path 26: 596, 1973

(2) Newsome SWB, Walsingham BM. The use of β -lactamases in the clinical laboratory. Med. Microbiol. 1972 Jul;6:59-66

(3) Winley C et al; Neutralisation of Beta Lactam Antibiotics in an environmental monitoring medium, PDA Jour Pharm Sci & Tech, 52 (6); 344-345, Nov-Dec 1998

(4) Serge Ohresser, Stéphanie Sacherer, Millipore Molsheim; Development of a culture media for microbiological air monitoring in antibiotic production area (<http://mail.google.com/mail/html/load.html?antibiotic+production+area;+2001.htm>)

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