

# Blood Grouping Reagent

## Anti-M (MNS1)

Seraclone<sup>®</sup> Murine Monoclonal  
(BS57)

## Anti-N (MNS2)

Seraclone<sup>®</sup> Murine Monoclonal  
(BS41)

FOR IN-VITRO DIAGNOSTIC USE

For Tube Testing

MEETS FDA POTENCY REQUIREMENTS

U.S. License Number: 1798

### Package size

REF	808410100	VOL	2 mL	Seraclone <sup>®</sup> Anti-M (MNS1)
REF	808415100	VOL	2 mL	Seraclone <sup>®</sup> Anti-N (MNS2)

### Intended Use

For the determination of the M (MNS1) and N (MNS2) antigens of red blood cells using the tube test.

### Summary

Antibodies to the M and N antigens are usually of the IgM class and appear as saline reactive or cold agglutinins. However, in rare cases an IgG anti-M or -N may cause hemolytic disease of the fetus and newborn (HDFN) and hemolytic transfusion reactions (HTR)<sup>1</sup>. The complex system of the MNS system consists of over 40 antigens carried on two glycoprotein molecules. M, N, S,  $\bar{s}$ , and U antigens are the most important antigens of the MNS system with regard to transfusion medicine. The frequencies of the common phenotypes are shown in the table.

Phenotype	Whites	Blacks
M+N-	28	26
M+N+	50	44
M-M+	22	30
S+s-U+	11	3
S+s+U+	44	28
S-s+U+	45	69
S-s-U-	0	Less than 1
S-s-U+w	0	Rare*

\* May not be detected by some reagent and are listed as U-

Biotest Anti-M, Anti-N, Anti-S, and Anti- $\bar{s}$  Blood Group Reagents are used to test for the presence or absence of the M, N, S, and  $\bar{s}$  antigens. They are used principally in the resolution of antibody problems or in family studies.

### Principle of the Test

The test principle is hemagglutination. The antibodies in Anti-M (MNS1), and-N (MNS2) bind to the corresponding antigens on red blood cells and cause an antigen-antibody reaction visible as red blood cell agglutination.

### Reagent

As the reactive components Seraclone<sup>®</sup> Anti-M and Seraclone<sup>®</sup> Anti-N contain murine monoclonal antibodies of the immunoglobulin class IgM. They are derived from hybridoma cell lines which are created by fusing mouse antibody producing B lymphocytes with mouse myeloma cells and demonstrate consistent specificity and reproducibility characteristic for monoclonal antibodies.

**Anti-M:** Antibodies are diluted in a isotonic saline solution containing bovine albumine and macromolecular potentiators. **Anti-N:** Antibodies are diluted in Tris buffer pH 8.75 containing bovine albumin and macromolecular potentiators.

Seraclone<sup>®</sup> Anti-M (MNS1) clone BS57 (IgM)  
Seraclone<sup>®</sup> Anti-N (MNS2) clone BS41 (IgM)

Preservative: 0.1% sodium azide.

### Precautions

- For In-vitro diagnostic use.
- Store at 2 to 8°C.
- Do not use beyond the expiration date.
- Do not use if turbid.
- Use the reagent as it is supplied, do **NOT** acidify.
- Use only Isotonic saline for suspension, **NOT** phosphate buffered saline
- Handle and dispose of reagents as potentially infectious
- Caution: Do not pipette by mouth. The absence of murine viruses has not been determined.
- Caution: This product contains Natural Rubber Latex Which May Cause Allergic Reactions.
- Warning: Contains sodium azide (NaN<sub>3</sub>), which may react with lead or copper plumbing to form explosive azides. If discarded in the sink, flush with large amounts of water to prevent the build-up of explosive metal azides.
- The bovine albumin used for the production of this reagent is purchased from BSE-free US sources, Boval Company L.P. in Cleburne, Tx, USA and Millipore in Kankakee, IL, USA.
- **Do Not** incubate at 2 to 8°C

### Specimen Collection

Fresh samples of clotted, EDTA or citrate anticoagulated whole blood collected following general blood sampling guidelines are acceptable. The specimen should be tested as soon as possible after collection. If testing is delayed, EDTA and clotted specimens should be stored at 2 to 8°C, citrated specimens (donor segments) at 1 to 6°C. Blood specimens exhibiting gross hemolysis or contamination should not be used.

Clotted samples or those collected in EDTA may be tested within ten days from collection. Donor blood stored in citrate anticoagulant may be tested until the expiration date of the donor unit.

### Materials

#### Materials provided

- Seraclone<sup>®</sup> Anti-M (MNS1) and/or Seraclone<sup>®</sup> Anti-N (MNS2)

#### Materials required but not provided

- Pipettes (drop volume 40 to 50 µl)
- Isotonic saline solution, do **NOT** use phosphate buffered saline
- Glass tubes 10 x 75mm or 12 x 75mm
- Serological centrifuge
- Interval Timer
- Markers
- Optical aid (optional). The use of an optical aid for agglutination reading must be validated by the user.

### Test Procedure

#### Tube test

1. Prepare a 3 to 5% suspension of red blood cells to be tested in isotonic saline.
2. Place one drop reagent into an appropriately labeled tube.
3. Add one drop of red blood cell suspension into the tube and mix.
4. Incubate at room temperature (20 to 24°C) for 30 minutes **DO NOT CENTRIFUGE.**
5. Gently dislodge red blood cell button and observe for agglutination.
6. Record results

### Stability of the Reaction

Following incubation, all tube tests should be read immediately and results interpreted without delay. Time delays may cause a dissociation of the antigen-antibody complexes resulting to false negative or more often weak positive reactions.

### Quality Control

The reactivity of all blood typing reagents should be confirmed by testing with known positive and negative red blood cells on each day of use.

To confirm the reactivity or specificity of Biotest Monoclonal Anti-M, Anti-N Blood Grouping Reagents, each should be tested with antigen-positive (preferably from heterozygous individuals) and antigen-negative red blood cells, respectively. Each reagent is satisfactory for use if it reacts only with antigen-positive red blood cells.

It is recommended that a positive and a negative control be performed in parallel with testing.

### Interpretation of results

Agglutination of the red blood cells is a positive result and indicates the presence of the corresponding antigen. No agglutination is a negative result and indicates the absence of the corresponding antigen.

Antigen Frequency (%)		
	Caucasians	Blacks
M	78%	74%
N	72%	75%

An agglutination viewer may facilitate the reading of tube tests (as recommended by the AABB Technical Manual, 15th edition).

### Limitations

- **DO NOT CENTRIFUGE.** False positive interpretation may occur when the test is centrifuged.
- Samples with a positive direct antiglobulin test, cold agglutinins, or rouleaux formation may show false positive results in testing with monoclonal antibodies. Results on these samples must be interpreted with caution. False positive results or reaction suspected to be due to cold agglutinins should be resolved according to in-house procedures. It is recommended that an appropriate control be tested in parallel.
- Samples prepared with Phosphate Buffered Saline (PBS) will give invalid results
- Some conditions that may cause false positive results are:
  - Contamination of sample or reagents
  - Autoantibodies
  - Improper storage or preparation of red blood cells
  - Antibodies to antibiotics or other reagents
  - Cold Antibodies

### Specific Performance Characteristics

Testing is performed in accordance with FDA recommended methods. The final release testing is performed according to the product specific SOPs. Each lot of Biotest blood group reagent is tested in the Quality control by package insert method against a panel of antigen positive red blood cells (heterozygous antigen expression and if possible weakened antigen expression) to insure suitable reactivity. The products meet FDA potency requirements. The specificity testing for the presence of contaminating antibodies is performed according to the product specific SOPs.

For the product performance it is necessary to adhere to the recommended method in the instructions for use.

The performance of the Biotest Anti-M and Anti-N was confirmed against a FDA approved reference reagent in a Multi Center Field Trial.

For Technical Support or further product information, contact Biotest Diagnostics Corporation at 800-522-0090.











### Note

Each facility should verify the optimum spin time for the specific centrifuge in use.

Manual techniques are to be performed according to the manufacturer's instructions. Each deviation from these instructions is the sole responsibility of the user.

Used tests must be discarded as hazardous material. Manage waste according to local, state and national regulations.

### Glossary of Symbols

Symbol	Definition	Symbol	Definition
	Batch Code		In vitro diagnostic medical device
	Caution, consult accompanying documents		Consult instructions for use.
	Manufacturer		Use by YYYY-MM-DD
	Contains sufficient quantity for <n> tests.		Catalog number
	Temperature limitation		Volume

### Bibliography

1. Mark E. Brecher, MD et al. Technical Manual 15th Edition, Bethesda, MA: AABB, 2005.
2. Marion E. Reid, Christine Lomas-Francis, The Blood Group Antigen FactsBook, New York, NY: Academic Press, 2004.