

# Reagent Red Blood Cells

## IH-Cell I-II-III / IH-Cell I-II / IH-Cell Pool

### 0.6 ±0.1%

English, B186522, Version 06, 2016.07

**For In Vitro Diagnostic Use**  
**Reagent Red Blood Cells for use with the IH-System**  
**No U.S. Standard of Potency**  
**U.S. LICENSE NUMBER: 1845**

Product-Identification:

<b>IH-Cell I-II-III</b>	<b>79020</b>	<b>IH-Cell I-II</b>	<b>79040</b>	<b>IH-Cell Pool</b>	<b>79050</b>
IH-Cell I	79120	IH-Cell I	79140		
IH-Cell II	79220	IH-Cell II	79240		
IH-Cell III	79320				

IH-Cell I-II-III:	<b>VOL</b> 3 x 10 mL vials.....	<b>REF</b> 814 030 100
IH-Cell I-II:	<b>VOL</b> 2 x 10 mL vials.....	<b>REF</b> 814 050 100
IH-Cell Pool:	<b>VOL</b> 1 x 10 mL vials.....	<b>REF</b> 814 060 100

### INTENDED USE

The IH-Cell I-II and IH-Cell I-II-III are intended for the detection of antibodies to human red blood cell antigens in patients and donors. The IH-Cell Pool is intended for the detection of antibodies to human red blood cell antigens in donors.

### SUMMARY

Unexpected red blood cell alloantibodies are found in 0.3% to 38% of the population<sup>1</sup>, depending on the group studied and the detection method used. These antibodies may have clinical significance as they can cause red blood cell destruction as the result of transfusion reactions, hemolytic disease of the newborn or autoimmune hemolytic anemia. Antibody screening tests are employed to reveal the presence of these antibodies in patient and donor sera.

IH-Cell I-II-III, IH-Cell I-II and IH-Cell Pool are selected red blood cells used to test for the presence or absence of unexpected antibodies when mixed with patient or donor sera or plasma under certain test conditions.

### PRINCIPLES OF THE TEST

Refer to the instructions for use for the specific IH-Card tested with the Reagent Red Blood Cells.

### REAGENTS

#### **IVD** OBSERVABLE INDICATIONS

Do not use if markedly hemolyzed or discolored

NOTE: INSPECT THE CONDITION OF THE REAGENT BEFORE USE (SEE PRECAUTIONS).

All Reagent Red Blood Cells are of human origin suspended in a buffered (bovine albumin) preservative suspension medium at 0.6±0.1%

IH-Cell I-II-III and IH-Cell I-II are Reagent Red Blood Cells derived from three or two single group O blood donors, respectively, in separate vials for the detection of red blood cell antibodies.

IH-Cell I-II-III and IH-Cell I-II and IH-Cell Pool contain the following antigens: D, C, E, c, e, K, k, Fy<sup>a</sup>, Fy<sup>b</sup>, Jk<sup>a</sup>, Jk<sup>b</sup>, M, N, S, s, Le<sup>a</sup>, Le<sup>b</sup>, P1, Xg<sup>a</sup>. All vials of IH-Cell I-II-III, IH-Cell I-II and IH-Cell Pool contain red blood cells which are negative for the following low-incidence blood antigens: Js<sup>a</sup>, Kp<sup>a</sup>, Wr<sup>a</sup>, Di<sup>a</sup>, Vw, V, Lu<sup>a</sup> and C<sup>w</sup> unless otherwise noted on the accompanying antigen profile.

The specifications for the IH-Cell I-II-III are: vial 1 R<sub>1</sub>R<sub>1</sub> or R<sub>1</sub><sup>w</sup>R<sub>1</sub>, vial 2 R<sub>2</sub>R<sub>2</sub> and vial 3 rr, a double dose expression of the following antigens: M, N, S, s, Fy<sup>a</sup>, Fy<sup>b</sup>, Le<sup>a</sup>, Le<sup>b</sup>, Jk<sup>a</sup> and Jk<sup>b</sup> and expression of Lu<sup>b</sup>, Kp<sup>b</sup>, Xg<sup>a</sup> and Co<sup>a</sup>.

The specifications for the IH-Cell I-II are: vial 1 R<sub>1</sub>R<sub>1</sub> or R<sub>1</sub><sup>w</sup>R<sub>1</sub> and vial 2 R<sub>2</sub>R<sub>2</sub>, a double dose expression of at least Jk<sup>a</sup>; expression of Lu<sup>b</sup>, Kp<sup>b</sup>, Xg<sup>a</sup> and Co<sup>a</sup> antigens and negative for Wr<sup>a</sup>.

IH-Cell Pool is a single vial containing Reagent Red Blood Cells derived from two single group O blood donors.

The complete antigen profile will vary with each individual lot. For the exact antigen content of each production lot, please refer to the enclosed antigen profile table of each specific lot.

IH-Cell I-II-III, IH-Cell I-II and IH-Cell Pool can be used directly from the vial without further modification. The contents of each vial should be resuspended by gentle mixing.

Preservative: 32 µg/mL Trimethoprim and 160 µg/mL Sulfamethoxazol.

The bovine albumin used for the production of this reagent is purchased from BSE-free sources.

## STORAGE REQUIREMENTS

- Store at 2 to 8° C.
- Do not use reagent beyond the expiry on the label which is expressed as YYYY-MM-DD (year-month-day)
- Do not freeze or expose reagents to excessive heat.
- Store in an upright position.
- Do not store near any heat, air conditioning sources or ventilation outlets.

## PRECAUTIONS

- All IH-System reagents and test samples must be brought to room temperature (18 to 25° C) prior to use.
- Use reagents as furnished.
- Once the IH-reagent has been used for testing, it may contain infectious material and should therefore be handled and disposed of as biohazardous waste in accordance with local, state, and national regulations
- Caution: The packaging of this product (dropper bulbs) contains natural rubber latex which may cause allergic reactions.
- Caution: ALL BLOOD PRODUCTS SHOULD BE TREATED AS POTENTIALLY INFECTIOUS. SOURCE MATERIAL FROM WHICH THIS PRODUCT WAS DERIVED WAS FOUND NEGATIVE WHEN TESTED WITH FDA LICENSED EIA/ELISA TESTS. NAT TESTING WAS NOT PERFORMED. NO KNOWN TEST METHOD CAN OFFER ASSURANCE THAT PRODUCTS DERIVED FROM HUMAN BLOOD WILL NOT TRANSMIT INFECTIOUS AGENTS.
- As with all Reagent Red Blood Cells, the reactivity of the cells may decrease during the dating period.
- Pooled red blood cells are not recommended for pretransfusion test, done in lieu of a major crossmatch, to detect unexpected antibodies in patient samples.

## SPECIMEN COLLECTION AND PREPARATION

No special preparation of the patient or donor is required prior to specimen collection. Blood samples should be collected following general blood sampling guidelines. Do not use grossly hemolyzed, lipemic or icteric samples.

Please refer to the instructions for use for the IH-Card used for testing and the **IH-1000** User Manual NA for card and instrument specific specimen collection and preparation requirements, respectively.

## TEST PROCEDURE FOR AUTOMATED SYSTEMS

### Materials provided

- IH-Cell I-II-III
- IH-Cell I-II
- IH-Cell Pool

### Materials recommended but not provided

- IH-Card AHG Anti-IgG, or
- IH-Card AHG Anti-IgG, -C3d

- **IH-1000**

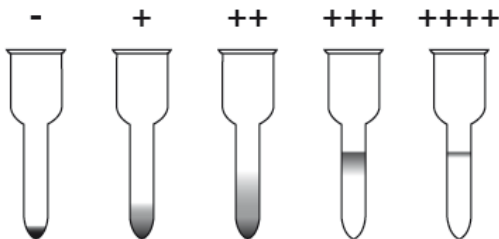
### Method

Please refer to the instructions for use for the specific IH-Card.

## INTERPRETATION OF RESULTS

### For automated systems

Below is a description of the various reaction grades and how the software uses that well reaction to determine the result interpretation.



Well Reaction Grade	Result Interpretation	Reaction Description
-	Negative	A compact, pellet of RBCs* with a smooth surface at the bottom of the well with no visible agglutination.
+/-	Blood Grouping, Antisera, and Phenotyping including Anti-D Blend, = Not interpretable	A pellet of RBCs at the bottom of the well with a very few agglutinated RBCs visible above the pellet or an irregular pellet.

	For Reverse (serum) ABO Testing = Positive Direct Antiglobulin Test, Antibody Detection, Autocontrol = Positive Antibody Identification= no overall result interpretation, only well result shown as +/- For Crossmatching = Incompatible	
1+	For Blood Grouping, Antisera and Phenotyping including Anti-D Blend = Not interpretable For Reverse (serum) ABO Testing = Positive For Antibody Detection and DAT = Positive For Antibody Identification= no overall result interpretation, only well result shown as positive For Crossmatching = Incompatible	A pellet of RBCs at the bottom of the well with agglutinated RBCs visible in the lower half of the gel column.
2+	For Blood Grouping, Antisera and Phenotyping including Anti-D Blend = Positive For Reverse (serum) ABO Testing = Positive For Antibody Detection and DAT = Positive For Antibody Identification= no overall result interpretation, only well result shown as positive For Crossmatching = Incompatible	Agglutinated RBCs distributed throughout the entire length of the gel column, with no line of RBCs on the top of the well.
3+	For Blood Grouping, Antisera and Phenotyping including Anti-D Blend = Positive For Reverse (serum) ABO Testing = Positive For Antibody Detection and DAT = Positive For Antibody Identification= no overall result interpretation, only well result shown as positive For Crossmatching = Incompatible	Most agglutinated RBCs concentrated at the top of the gel or upper half of the gel column.
4+	For Blood Grouping, Antisera and Phenotyping including Anti-D Blend = Positive For Reverse (serum) ABO Testing = Positive For Antibody Detection and DAT = Positive For Antibody Identification= no overall result interpretation, only well result shown as positive For Crossmatching = Incompatible	Agglutinated RBCs concentrated as a line on the top of the gel column with a few agglutinated RBCs just underneath the gel surface.
<b>Mixed Field (DP)</b>	Blood Grouping, Antisera, and Phenotyping including Anti-D Blend, = Not interpretable For Reverse (serum) ABO Testing = Positive Direct Antiglobulin Test, Antibody Detection, Autocontrol = Positive Antibody Identification= no overall result interpretation, only well result shown as DP For Crossmatching = Incompatible	Agglutinated RBCs as a line at the top of the gel or dispersed in upper part of the gel and non-agglutinated RBCs forming a pellet at the bottom of the well. The instrument interpretation software displays "DP" (double population) for a mixed field result.
?	For Blood Grouping including Reverse ABO Testing, Antisera, and Phenotyping including Anti-D Blend, Antibody Detection and Identification, Direct Antiglobulin Testing = Not interpretable For Crossmatching = Incompatible	Ambiguous result.

\* RBCs = Red Blood Cells

For interpretation, please refer to the instructions for use for the appropriate IH-Card. When recording the reactions, ensure that the lot number of the Antigen Profile corresponds with the lot number of the Reagent Red Blood Cells used for testing.

#### QUALITY CONTROL

On each day of use, the IH-Cells should be tested with antibody positive and negative samples. Each IH-Cell is satisfactory for use if positive and negative samples react as expected.

#### LIMITATIONS

Erroneous and abnormal results may be caused by:

- Bacterial or chemical contamination of the serum, plasma, red blood cells or equipment.
- Patient medication or disease yielding a cross-reaction.
- A red blood cell concentration or suspension medium different from that recommended.

- Incomplete re-suspension of the red blood cells.
  - Sample or Reagent Red Blood Cell hemolysis.
  - Contamination between microtubes through pipetting errors.
- Grossly icteric blood samples, blood samples with abnormally high concentrations of protein or blood samples from patients who have received plasma expanders of high molecular weight may give false positive results.
  - Fibrin, clots, particulates or other artifacts may cause some red blood cells to be trapped at the top of the gel that may cause an anomalous result.
  - In very rare cases HLA-antigens within the product may lead to false positive reactions.
  - The reactivity of the product may decrease during the dating period and therefore should not be used after expiration date. The rate of decrease in reactivity is partially dependent on individual donor characteristics that are neither controlled nor predicted by the manufacturer.
  - Negative reactions will be obtained if the sample contains antibodies present in concentrations too low to be detected by the test method employed. ••• No test method is capable of detecting all red blood cell antibodies.
  - Use of the IH-Cell Pool should be limited to donor blood testing or processing.
  - Complement-dependent antibodies may not be detected if a plasma specimen is used.
  - Low frequency antigens may not always be present on IH-Cell I-II-III, IH-Cell I-II, and IH-Cell Pool. Therefore, negative reactions with the screening Reagent Red Blood Cells do not always indicate the absence of unexpected antibodies.
  - Because some antibodies show a dosage effect, the antigen density on the Reagent Red Blood Cells needs to be considered when evaluating the test results (homozygous or heterozygous hereditary disposition). A heterozygous expression of the antigen may result in non-detection of weak antibodies depending on the used test method.

## SPECIFIC PERFORMANCE CHARACTERISTICS

The final release testing is performed according to the product specific Standard Operating Procedures. As part of the lot release process, each lot of Bio-Rad Reagent is tested against antigen positive and negative samples to ensure suitable reactivity and specificity.

### Performance characteristics on the IH-1000 Analyzer

A multi-center clinical trial, which included testing at four different US clinical sites and an internal site, was conducted to evaluate the performance of IH-Card AHG Anti-IgG,-C3d, IH-Card AHG Anti-IgG and appropriate Reagent Red Blood Cells for antibody detection. The clinical trial included testing of patient and donor samples. The positive and negative percent agreements were calculated in comparison to the FDA licensed reference reagents. Additional internal studies have been performed with well-characterized and/or contrived samples to evaluate the performance of IH-Card AHG Anti-IgG,-C3d, IH-Card AHG Anti-IgG and appropriate Reagent Red Blood Cells for antibody detection when tested on the IH-1000.

The clinical trial results of positive percent agreement and negative percent agreement, as well as the one-sided Exact 95% Lower Confidence Limit (LCL), are listed in the data table below. Also included are the percent agreements and LCL for the additional testing with well-characterized and/or contrived samples. Note: See the IH-1000 User Manual NA and IH-COM User Manual NA for more information on verification of results.

Test	Tested on	Results from Clinical Trials				Results from In-House Study with well-characterized and/or contrived samples			
		Negative Agreement		Positive Agreement		Negative Agreement		Positive Agreement	
		N	Point Estimate (one-sided Exact 95% LCL)	N	Point Estimate (one-sided Exact 95% LCL)	N	Point Estimate (one-sided Exact 95% LCL)	N	Point Estimate (one-sided Exact 95% LCL)
IH-Cell Pool	IH-Card AHG Anti-IgG	2,942	99.12% (98.78%)	86	89.53% (82.45%)	Not Tested	NA	64	100% (95.43%)
	IH-Card AHG Anti-IgG, -C3d	563	98.76% (97.68%)	72	93.06% (85.95%)	Not Tested	NA	64	100% (95.43%)
IH-Cell I-II	IH-Card AHG Anti-IgG	1,188	97.22% (96.34%)	12	100% (77.91%)	Not Tested	NA	64	100% (95.43%)
	IH-Card AHG Anti-IgG, -C3d	1,996	99.35% (98.97%)	6	100% (60.70%)	Not Tested	NA	64	100% (95.43%)
IH-Cell I-II-III	IH-Card AHG Anti-IgG	469	97.23% (95.63%)	68	98.53% (93.21%)	Not Tested	NA	64	100% (95.43%)
	IH-Card AHG Anti-IgG, -C3d	1,262	97.86% (97.06%)	75	97.33% (91.84%)	Not Tested	NA	63	100% (95.36%)










NA= not applicable

Reproducibility was evaluated at two external sites and one internal site by testing a reproducibility panel according to the following scheme: one lot of reagent x 3 sites x 1 operator x 5 non-consecutive days x 2 runs x 2 replicates over a period of 20 days using the IH-1000 Analyzer. Reproducibility was demonstrated for the IH-Cells intended for use for antibody detection within runs, between runs and between sites.

A precision study was conducted internally using three reagent lots x 5 non-consecutive days x 2 runs x 2 replicates over a period of 20 days using the IH-1000 Analyzer. Precision was demonstrated with all three lots of IH-Cells intended for use for antibody detection.

For technical support or further product information, contact Bio-Rad Laboratories, Inc at 800-224-6723.

## GLOSSARY OF SYMBOLS

Symbol	Definition	Symbol	Definition
	Batch code		<i>In vitro</i> diagnostic medical device
	Caution, consult accompanying documents		Consult instructions for use
	Manufacturer		use by (YYYY-MM-DD)
	Contains sufficient quantity for <n> test.		Catalog number
	Temperature limitation	VOL	Volume

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