IMPLEMENTATION GUIDE

US Guidance on Printing Text Associated with Red Cell Antigens

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We thank Sandra Nance (ARC) and Teresa Harris (ARC) from the MAK Users Group for providing the categorized list of antigens.

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1 Introduction

1.1 Purpose

The purpose of this document is to provide guidance for the printing of text and the coding of Red Blood Cell antigen test results on the affixed blood label.

1.2 Scope

This document provides a recommended hierarchy for the order in which Red Cell antigen test results appear on the label. Recommendations are also made for the specific font styles to use in order to differentiate between upper case and lower case letters when the difference between the two is based only on size.

This guidance document applies to US facilities but this does not preclude its use in other countries.

1.3 Intended Audience

The intended audience of this document is blood transfusion facility staff (management, information technology, quality, validation, and laboratory), and software developers, and label/software vendors.

1.4 Normative Reference

ISBT 128 Standard Technical Specification (ST-001)
ISBT 128 Standard Labeling of Blood Components (ST-005)
ISBT 128 Standard for XML Electronic Messaging - Standardized XML Elements for Medical Products of Human Origin (ST-020)
ISBT 128 Standard for the Medical Products of Human Origin (MPHO) Unique Identifier (ST-026)
ISBT 128 Standard ISBT 128 Dictionary of Standard Data Elements (ST-027)

1.5 Other Reference

FDA Guidance for Industry : Labeling of Red Blood Cell Units with Historical Antigen Typing Results: Guidance for Industry (December 2018)
Use of Red Cell Antigens with Test History Data Structure [030] (IG-027)
Use of Data Matrix Symbols with ISBT 128 (IG-014)

1.6 Background

The Americas Technical Advisory Group (ATAG) recognized three issues that needed to be resolved:

1. The order in which RBC antigens appeared on a label was not standardized requiring hospital end users to search for test results in different formats.

2. If only one antigen was printed, it was difficult to differentiate antigens where the only difference was relative size. Specifically, it was difficult to differentiate C and c, S and s, and K and k.
3. In some situations, red cell antigen test results were being printed in a font too small to read easily.

A subcommittee was formed to address these issues. It was soon discovered that a MAK users group had already addressed the first of these issues by creating a hierarchy defining the order of the antigen results on the label. Their solution, based on a 5-category hierarchy, was adopted by ATAG and is described in Chapter 2 of this document.

The second issue, differentiating between antigens that are similar in appearance, was resolved with the assistance of vendors with expertise in label printing. Their recommendation is found in section 3.4.

For the third issue, the group recommended a font size be 7 or greater.

The group addressed a few other issues (e.g., which results to print and the use of separators), but did not recommend standardization in these areas. The final recommendation of the group was to use electronically readable results.

1.7 Changes in this Version

The following table indicates the major changes between Version 1.0.0 and Version 1.1.0. Actual changes or additions to requirements of the ISBT 128 Standard are in bold print; changes to formatting or organization, or additional guidance, are in regular print. When changes were a result of a formal proposal, the number of the proposal is listed in the Rationale column.

US Guidance on Printing Text Associated with Red Cell Antigens Version Control: Version 1.0.0 vs. Version 1.1.0.

	Version 1.0.0 **Chapter, Section, Table, or Figure**	**Version 1.1.0** **Chapter, Section, Table, or Figure**	**Change**	**Rationale**
1.	1.4	1.4	Included references to ICCBBA publications related to the electronic transfer of information (i.e., ST-020, ST-026, ST-027.	For completeness
2.	1.5	1.5	Included a reference to the FDA Guidance for Industry: Labeling of Red Blood Cell Units with Historical Antigen Typing Results.	For completeness

2 Order of Antigens

The order in which Red Cell antigen test results are printed may follow the recommendations of this document. The hierarchy of test results is based on high-incidence negatives, then common antigens, followed by common low incidence antigens, then miscellaneous antigens, and lastly the rest of low incidence antigens.

When multiple antigens within the same priority are printed, they should be printed in the order in which they are listed within the tables below.

The International Society of Blood Transfusion has assigned a code to each of the antigens it recognizes. The codes are maintained by their Working Party on Red Cell Immunogenetics and Blood Group Terminology. The reference tables are available at:

http://www.isbtweb.org/working-parties/red-cell-immunogenetics-and-blood-group-terminology/blood-group-terminology/

2.1 High Incidence Negatives

High incidence antigens with negative results should receive a first priority position on the label and are listed in Table 1 below.

Table 1 List of High Incidence Antigens

ISBT Code	Antigen Name	Also Known As
002005	U	MNS5
002028	MNS28	En^a
002029	MNS29	En^a KT
002030	MNS30	'N', GPB^N
002039	MNS39	ENEP
002040	MNS40	ENEH
002042	MNS42	ENAV, Avis
002044	MNS44	ENDA
002045	MNS45	ENEV
003003	Pk	P1PK1, P^k
004017	RH17	Hr_0
004018	RH18	Hr, Hr^s, Shabalala
004019	RH19	hr^S, Shabalala
004029	RH29	Total Rh
004031	RH31	Bastiaan, hr^B
004034	RH34	Hr^B, Bas, Baas, Bastiaan
004039	RH39	C-like
004044	RH44	Nou
004046	RH46	Sec

ISBT Code	Antigen Name	Also Known As
004047	RH47	Dav
004051	RH51	MAR
004057	RH57	CEST
004058	RH58	CELO
004059	RH59	CEAG
004061	RH61	CEVF
005002	Lub	Lu^b, LU2
005003	LU3	Lu^{ab}, Lu^aLu^b
005004	LU4	Barnes
005005	LU5	Beal, Fox
005006	LU6	Jan, Jankowski
005007	LU7	Gary
005008	LU8	Taylor, MT
005011	LU11	Reynolds
005012	LU12	Muchowski, Much
005013	LU13	Hughes
005016	LU16	
005017	LU17	Delcol
005020	LU20	
005021	LU21	
005023	LU23	LUIT
006002	k	k, Cellano, KEL2
006004	Kpb	Kp^b, Rautenberg, KEL4
006005	Ku	Ku, KEL5,Peltz, K_0
006007	Jsb	Js^b, Matthews
006011	K11	Cote
006012	K12	Boc, Bockman, Spears
006013	K13	SGRO
006014	K14	San, Santini, Dp
006016	K16	Weak k, k-like
006018	K18	V.M., Marshall
006019	K19	Sub, Sublett
006020	K20	Km
006022	K22	N.I., Ikar
006026	K26	TOU
006027	K27	RAZ
006029	K29	KALT
006030	K30	KTIM
006032	K32	KUCI
006033	K33	KANT
006034	K34	KASH
006036	K36	KETI
006037	K37	KHUL

ISBT Code	Antigen Name	Also Known As
006038	K38	KYOR
008003	FY3	Fy^{ab}, $Fy^{a}Fy^{b}$
008005	FY5	
008006	FY6	
009003	JK3	Jk^{ab}, $Jk^{a}Jk^{b}$
010002	Dib	Di^{b}, Luebano
010004	Wrb	Wr^{b}, Fritz, DI4
011001	Yta	Yt^{a}, YT1
012002	XG2	CD99, MIC2, E2
013001	SC1	Sc1, Sm
013003	SC3	
013005	SC5	STAR
013006	SC6	SCER
013007	SC7	SCAN
014003	Gya	Gy^{a}, Gregory, DO3
014004	Hy	Hy, Holley, DO4
014005	Joa	Jo^{a}, Joseph, DO5
014006	DO6	DOYA
014008	DO8	DOLG
015001	Coa	Co^{a}, CO1
015003	CO3	Co^{ab}
016005	LWa	Lw^{a}, LW5, LW
016006	LWab	Lw^{ab}, LW6, Bigelow
017001	Ch	Ch^{a}, Chido, CH/RG1
017002	CH2	Ch2, CH/RG2
017003	CH3	Ch3, CH/RG3
017004	CH4	Ch4, CH/RG4
017005	CH5	Ch5, CH/RG5
017006	CH6	Ch6, CH/RG6
017011	Rg	Rg1, Rodgers, Rg^{a}, CH/RG11
017012	CH12	Rg2, CH/RG12
018001	H	H1
019001	Kx	Kx, XK1
020002	GE2	
020003	GE3	
020004	GE4	
021001	Cra	Cr^{a}, Go^{b}, CROM1
021002	Tca	Tc^{a}, CROM2
021005	Dra	CROM5, Dr^{a}
021006	Esa	CROM6, Es^{a}
021007	IFC	CROM7,IFC
021009	WESb	CROM9, WES^{b}

ISBT Code	Antigen Name	Also Known As
021010	UMC	CROM10, UMC
021011	GUTI	CROM11 GUTI
021012	SERF	CROM12
021013	ZENA	CROM13
021014	CROV	CROM14
021015	CRAM	CROM15
021017	CRUE	CROM17
021018	CRAG	CROM18
022001	Kna	Kn^{a}, KN1, COST4
022003	McCa	McC^{a}, KN3, COST6
022004	Sla	Sl^{a}, COST7, McC^{c}, KN4
022005	Yka	Yk^{a}, KN5, COST3
022008	KN8	S13
022009	KN9	KCAM
023002	Inb	In^{b}, IN2
023003	IN3	INFI
023004	IN4	INJA
024001	Oka	Ok^{a}, OK1
025001	MER2	RAPH, Raf
026001	JMH	John Milton Hagen
027001	I	I1
028001	GLOB1	P
028002	GLOB2	PX2
029001	GIL1	GIL
030001	Duclos	RHAG1
032001	Jra	Jr^{a}, Junior
033001	Lan	Lan, Langereis
034001	Vel	Vel, Ve^{a}
205001	Csa	Cs^{a}, COST1
207002	i	I, I2
208001	Era	Er^{a}, ER1
209003	LKE	Luke
901003	Ata	At^{a}, August
901008	EMM	
901009	AnWj	Wj, Anton
901012	Sda	Sd^{a}, Sid
901014	PEL	Pelletier
901015	ABTI	ABTI
901016	MAM	

2.2 Common Antigens

Common antigens should receive a second priority position on the label and are listed in Table 2 below.

Table 2 List of Common Antigens

ISBT Code	Antigen Name	Also Known As
001004	A1	
002001	M	MNS1
002002	N	MNS2
002003	S	MNS3
002004	s	MNS4
003001	P1	
004002	C	RH2
004003	E	RH3
004004	c	RH4
004005	e	RH5
006001	K	Kell, KEL1, Kelleher
007001	Lea	Le^a, LE1
007002	Leb	Le^b, LE2
008001	Fya	Fy^a, FY1
008002	Fyb	Fy^b, FY2
009001	Jka	Jk^a, JK1
009002	Jkb	Jk^b, JK2

2.3 Common Low Incidence Antigens

Common low incidence antigens should receive a third priority position on the label and are listed in Table 3 below.

Table 3 List of Common Low Incidence Antigens

ISBT Code	Antigen Name	Also Known As
002006	He	He, Henshaw, MNS6
002007	Mia	Mi^a, Miltenberger, MNS7
002009	Vw	Verweyst, Mi.I, MNS9
004008	Cw	C^w, RH8
004010	V	ce^s, hr^v, RH10
004020	VS	e^s, RH20
004030	Goa	Go^a, Gonzales, D^{Cor}, RH30
005001	Lua	Lu^a, LU1
006003	Kpa	Kp^a, Penney, KEL3
006006	Jsa	Js^a, Sutter
010003	Wra	Wr^a, Wright, DI3
011002	Ytb	Yt^b, YT2
013002	SC2	Sc2, Bu^a
015002	Cob	Co^b, CO2

2.4 Miscellaneous Antigens

Miscellaneous antigens should receive a fourth priority position on the label and are listed in Table 4 below.

Table 4 List of Miscellaneous Antigens

ISBT Code	Antigen Name	Also Known As
002008	Mc	M^c, MNS8
002013	Me	M^e, MNS13
004006	f	f, ce, hr, RH6
004007	RH7	Ce, rh_i
004012	G	rh^G, RH12
004021	RH21	C^G
004026	RH26	c-LIKE, Deal
004027	RH27	Ce
004041	RH41	Ce-like
005018	Aua	LU18; Au^a; Auberger;

ISBT Code	Antigen Name	Also Known As
005019	Aub	LU19; Au^b
007003	Leab	Le^x, Le^{abx}, LE3
007004	LebH	Le^{Bh}, LE4
007005	Aleb	A_1Le^b, LE5
007006	Bleb	Ble^b, LE6
012001	Xga	Xg^a, XG1
014001	Doa	Do^a, DO1
014002	Dob	Do^b, DO2
017007	CH7	WH, CH/RG7
022007	McCd	McCd, KN7, Sl2
205002	Csb	Cs^b, COST2

2.5 Low Incidence Antigens

The rest of the low incidence antigens should receive a fifth priority position on the label and are listed in Table 5 below.

Table 5 List of Low Incidence Antigens

ISBT Code	Antigen Name	Also Known As
002010	Mur	Mur, Murrell, Mu, MNS10
002011	Mg	Mg, Gilfeather, MNS11
002012	Vr	Vr, Verdegaal, MNS12
002014	Mta	Mta, Martin, MNS14
002015	MNS15	Sta, Stones
002016	MNS16	Ria, Ridley
002017	MNS17	Cla, Caldwell
002018	MNS18	Nya, Nyberg
002019	MNS19	Hut, Mi.II
002020	MNS20	Hil, Hill
002021	MNS21	Mv, Armstrong
002022	MNS22	Far, Kam, Kamhuber
002023	MNS23	Sd, Dreyer
002024	MNS24	Mit, Mitchell
002025	DANTU	Dantu; MNS25
002026	MNS26	Hop
002027	MNS27	Nob
002031	MNS31	Ora, Orriss
002032	MNS32	Dane
002033	MNS33	TSEN
002034	MNS34	MINY
002035	MNS35	MUT

ISBT Code	Antigen Name	Also Known As
002036	MNS36	SAT
002037	MNS37	ERIK
002038	MNS38	Osa
002041	MNS41	HAG
002043	MNS43	MARS
002046	MNS46	MNTD
002047	SARA	MNS47
002048	MNS48	KIPP
003004	NOR	P1PK4
004009	Cx	Cx, rhx, RH9
004011	Ew	Ew, Rhw2, RH11
004022	RH22	CE, Jarvis
004023	RH23	Dw, Weil
004028	RH28	hrH
004032	RH32	RN
004033	RH33	Har, R0HAR, Dhar
004035	RH35	
004036	RH36	Berrens, Bea
004037	RH37	Evans
004040	RH40	Tar, Targett
004042	RH42	CeS, CceS, rhS, Thornton
004043	RH43	Crawford
004045	RH45	Riv
004048	RH48	JAL, S. Allen, J. Allen
004049	RH49	STEM
004050	RH50	FPTT, Mol
004052	RH52	BARC
004053	RH53	JAHK
004054	RH54	DAK
004055	RH55	LOCR
004056	RH56	CENR
004060	RH60	PARG
005009	LU9	Mull
005014	LU14	Hofanesian
006010	K10	Ula, Karhula
006017	K17	Wka, Weeks
006021	K21	Kpc, Levay
006023	K23	Centauro
006024	K24	CL, Callais, Cls
006025	K25	VLAN
006028	K28	VONG
006031	K31	KYO

ISBT Code	Antigen Name	Also Known As
010001	Dia	Dia, Diego
010005	Wda	Wda, Waldner, DI5
010006	Rba	Rba, Redelberger DI6
010007	WARR	WARR, Warrior, DI7
010008	ELO	ELO, DI8
010009	Wu	Wu, Wulfsburg, DI9
010010	Bpa	Bpa, Bishop, DI10
010011	Moa	Moa, Moen, DI11
010012	Hga	Hga, Hughes, Tarplee, Tarp, DI12
010013	Vga	Vga, VanVugt, DI13
010014	Swa	Swa, Swann, DI14
010015	BOW	BOW, Bowyer, DI15
010016	NFLD	NFLD , DI16
010017	Jna	Jna, Nunhart, JN, DI17
010018	KREP	KREP, IK, DI18
010019	Tra	Tra, Traversu, Lanthois, DI19
010020	Fra	Fra, Froese, DI20
010021	SW1	SW1, DI21
013004	SC4	Rd, Rda, Radin
016007	LWb	LW7, Nea
020005	Wb	Webb, GE5
020006	GE6	Lsa
020007	GE7	Ana, Ahonen
020008	GE8	Dha, Duch
020009	GE9	GEIS
021003	Tcb	Tcb, CROM3
021004	Tcc	CROM4, Tcc
021008	WESa	CROM8, WESa
022002	Knb	Knb, COST5, KN2
022006	McCb	McCb, KN6
023001	Ina	Ina, IN1
030002	Ola	RHAG 2, Ola
030004	RHAG4	
208002	Erb	Erb, ER2
700002	By	Batty
700003	Chra	Chra
700005	Bi	Biles
700006	Bxa	Bxa, Box
700017	Toa	Toa
700018	Pta	Pta
700019	Rea	Rea

ISBT Code	Antigen Name	Also Known As
700021	Jea	Jea
700028	Lia	Lia
700039	MILNE	
700040	RASM	
700044	JFV	
700045	Kg	Kg
700047	JONES	
700049	HJK	
700050	HOFM	
700054	REIT	

2.6 High Incidence Positives

Facilities may choose to print high incidence antigens with positive results. If these positive results will be printed, they should be printed in the same order in the list as the antithetical antigen.

3 Antigen Text

The ISBT 128 Standard specifications have left the specific appearance of text on the label to be nationally defined. Therefore the recommendations made in this document for the appearance of Red Cell antigen test results are not requirements of the Standard itself.

It is recommended that the names appearing in the Antigen Name column of the above tables be used for identifying the antigen on the label.

3.1 Font Size

A minimum font size of 7 should be used. Larger font sizes may be used if space permits.

3.1.1 Use of Superscripts

The use of superscripts will be left to the discretion of each facility. A font size large enough to read the superscripted characters shall be used.

3.2 Test Results to Print

The selection of which test results to print on the label will be left to the discretion of each facility. For example, the laboratory may choose to print only the negative results that were requested, all negative results, or the full phenotype (negative and positive antigens). Facilities will need to take into consideration the amount of space available in the lower right quadrant of the label.

Each facility is responsible for adhering to regulatory requirements that may restrict the printing of test results under certain circumstances. For example, regulations may restrict the printing of historical test results, require that tests be performed on the current donation, or disallow the printing of test results if the tests were performed using unlicensed antisera.

3.3 Use of Separators

The use of commas, spaces, semicolons, etc. as separators between antigens will be left to the discretion of each facility. Facilities may choose not to use any separators depending on the amount of space available on the label.

3.4 Use of Reverse Printing

It can be difficult to distinguish an upper case letter from a lower case letter especially if only one character is printed. Specifically, C and c, S and s, and K and k are difficult to differentiate where the only difference is their relative size. It is therefore recommended that a special printing technique be used to differentiate these antigens.

When test results for c, s, and k (lower case) are printed, they should be printed using reverse printing (i.e., white on black) similar to the manner in which RhD Negative status is printed in the upper right quadrant of the label).

4 Label Text Examples

This section provides various examples of Red Cell antigen test results based on recommendations made from the previous sections.

Figure 1 Example Order of Antigens

Jsb- C- E- Kpa- Doa- Lia-

Yta- Fya- Mia- Dob- Mur-

Figure 2 Separator Options or No Separators

Js(b-); S-; C-, E-; K-; Fy(a-); Jk(a-)

Js(b-), S-, C-, E-, K-, Fy(a-), Jk(a-)

Js(b-) S- C- E- K- Fy(a-) Jk(a-)

Jsb- S- C- E- K- Fya- Jka-

Figure 3 Reverse Printing Examples with Multiple Antigens

k- C+ E- c- e+ K+

k- M- S- E- c- Le(a-) Fy(b-) Jk(a-) Cw-

Figure 4 Reverse Printing with a Single Antigen

k- k+

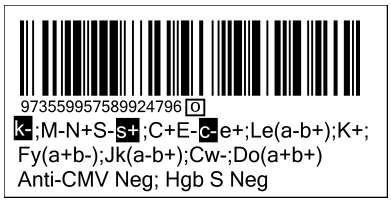
c- c+

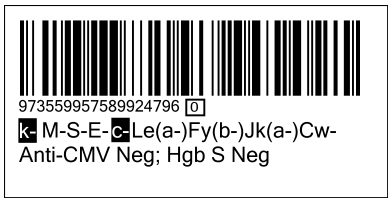
s- s+

Figure 5 Use of Superscripts

k-, M-, S-, E-, c-, C^{w}-

Figure 6 Bar Code Text Examples





5 Electronically-Readable Red Cell Antigen Test Results

There is no requirement that Red Cell antigen test results be bar coded, but it is highly recommended that such test results are machine readable. The data structures that allow for encoding Red Cell antigen test results include Data Structures 002, 012, 013, or 030.

5.1 Blood Groups [ABO and RhD] [Data Structure 002]

Data Structure 002 has a very limited capability of encoding phenotypes in its "r" value. It is limited to encoding results for C, c, E, e, and Kell phenotypes, or just a Miltenberger phenotype.

In the US, this data structure is not used for the purposes of encoding these antigen test results.

5.2 Special Testing: Red Blood Cell Antigens – General [Data Structure 012]

Only some antigens can be encoded using Data Structure 012 and are listed in the ISBT 128 reference table RT009 found in the *ISBT 128 Standard Technical Specification* (ST-001). They are also listed in Table 6. For details on encoding Data Structure 012, refer to ST-001.

If it is encoded into a linear bar code, the placement of the linear bar code shall appear in the lower right quadrant below the expiration date/time.

5.3 Special Testing: Red Blood Cell Antigens – Finnish [Data Structure 013]

Data Structure 013 should not be used in the US. For details regarding Data Structure 013, refer to the *ISBT 128 Standard Technical Specification* (ST-001).

5.4 Red Cell Antigens with Test History [Data Structure 030]

For details regarding Data Structure 030, refer to:

- *ISBT 128 Standard Technical Specification* (ST-001)
- *Use of Red Cell Antigens with Test History Data Structure [030]* (IG-027)

The ISBT Codes listed in the antigen tables above are used as coding values for Data Structure 030.

The Data Matrix symbology shall be used when bar coding Data Structure 030. The standardized placement of the 2D bar code will be established in the near future and it will be specified in the *ISBT 128 Standard Technical Specification* (ST-001).

Table 6 Comparison Table

Characteristic	Data Structure 002	Data Structure 012	Data Structure 030
Recommended for use in the US?	No	Yes	Yes
Bar codes that may be used	Linear (Code 128) or 2D (Data Matrix)	Linear (Code 128) or 2D (Data Matrix)	2D (Data Matrix) only
Antigens that can be encoded	K, C, c, E, and e OR Miltenberger	C, c, E, e, K, k, C^w, Mi^a, M, N, S, s, U, P1, Lu^a, Kp^a, Le^a, Le^b, Fy^a, Fy^b, Jk^a, Jk^b, Do^a, Do^b, In^a, Co^b, Di^a, V/VS, Js^a plus one additional high or low incidence antigen selected from a list of 88 antigens	All antigens for which there is an ISBT numerical code
Differentiates test method? (serological vs. predicted phenotype based on genotyping)	No	No	Yes (use is optional)
Encodes the number of tests performed for a donor? (e.g., tested once on this donation, tested once on prior donation, tested twice on different donations, etc.)	No	No	Yes (use is optional)

6 Appendix A

The table below lists the antigens in alphabetical order based on the Antigen Name column. The antigen priorities in this table adhere to the following color scheme.

1. High incidence antigens: highlighted in green indicating first priority
2. Common antigens: highlighted in red indicating second priority
3. Common low incidence antigens: highlighted in blue indicating third priority
4. Miscellaneous antigens: highlighted in yellow indicating fourth priority
5. Rest of low incidence antigens: highlighted in orange indicating fifth priority

ISBT Code	Antigen Name	Also Known As
001004	A1	
901015	ABTI	ABTI
007005	Aleb	A_1Le^b, LE5
901009	AnWj	Wj, Anton
901003	Ata	At^a, August
005018	Aua	LU18; Au^a; Auberger;
005019	Aub	LU19; Au^b
700005	Bi	Biles
007006	Bleb	Ble^b, LE6
010015	BOW	BOW, Bowyer, DI15
010010	Bpa	Bpa, Bishop, DI10
700006	Bxa	Bxa, Box
700002	By	Batty
004002	C	RH2
004004	c	RH4
017001	Ch	Ch^a, Chido, CH/RG1
017002	CH2	Ch2, CH/RG2
017003	CH3	Ch3, CH/RG3
017004	CH4	Ch4, CH/RG4
017005	CH5	Ch5, CH/RG5
017006	CH6	Ch6, CH/RG6
017007	CH7	WH, CH/RG7
017012	CH12	Rg2, CH/RG12
700003	Chra	Chra
015003	CO3	Co^{ab}
015001	Coa	Co^a, CO1
015002	Cob	Co^b, CO2
021001	Cra	Cr^a, Go^b, CROM1
021018	CRAG	CROM18
021015	CRAM	CROM15
021014	CROV	CROM14

ISBT Code	Antigen Name	Also Known As
021017	CRUE	CROM17
205001	Csa	Cs^a, COST1
205002	Csb	Cs^b, COST2
004008	Cw	C^w, RH8
004009	Cx	Cx, rhx, RH9
002025	DANTU	Dantu; MNS25
010001	Dia	Dia, Diego
010002	Dib	Di^b, Luebano
014006	DO6	DOYA
014008	DO8	DOLG
014001	Doa	Do^a, DO1
014002	Dob	Do^b, DO2
021005	Dra	CROM5, Dr^a
030001	Duclos	RHAG1
004003	E	RH3
004005	e	RH5
010008	ELO	ELO, DI8
901008	EMM	
208001	Era	Er^a, ER1
208002	Erb	Erb, ER2
021006	Esa	CROM6, Es^a
004011	Ew	Ew, Rhw2, RH11
004006	f	f, ce, hr, RH6
010020	Fra	Fra, Froese, DI20
008003	FY3	Fy^{ab}, Fy^aFy^b
008005	FY5	
008006	FY6	
008001	Fya	Fy^a, FY1
008002	Fyb	Fy^b, FY2
004012	G	rh^G, RH12
020002	GE2	
020003	GE3	
020004	GE4	
020006	GE6	Lsa
020007	GE7	Ana, Ahonen
020008	GE8	Dha, Duch
020009	GE9	GEIS
029001	GIL1	GIL
028001	GLOB1	P
028002	GLOB2	PX2
004030	Goa	Go^a, Gonzales, D^{Cor}, RH30
021011	GUTI	CROM11 GUTI

ISBT Code	Antigen Name	Also Known As
014003	Gya	Gy^a, Gregory, DO3
018001	H	H1
002006	He	He, Henshaw, MNS6
010012	Hga	Hga, Hughes, Tarplee, Tarp, DI12
700049	HJK	
700050	HOFM	
014004	Hy	Hy, Holley, DO4
027001	I	I1
207002	i	i, I2
021007	IFC	CROM7,IFC
023003	IN3	INFI
023004	IN4	INJA
023001	Ina	Ina, IN1
023002	Inb	In^b, IN2
700021	Jea	Jea
700044	JFV	
009003	JK3	Jk^{ab}, Jk^aJk^b
009001	Jka	Jk^a, JK1
009002	Jkb	Jk^b, JK2
026001	JMH	John Milton Hagen
010017	Jna	Jna, Nunhart, JN, DI17
014005	Joa	Jo^a, Joseph, DO5
700047	JONES	
032001	Jra	Jr^a, Junior
006006	Jsa	Js^a, Sutter
006007	Jsb	Js^b, Matthews
006002	k	k, Cellano, KEL2
006001	K	Kell, KEL1, Kelleher
006010	K10	Ula, Karhula
006011	K11	Cote
006012	K12	Boc, Bockman, Spears
006013	K13	SGRO
006014	K14	San, Santini, Dp
006016	K16	Weak k, k-like
006017	K17	Wka, Weeks
006018	K18	V.M., Marshall
006019	K19	Sub, Sublett
006020	K20	Km
006021	K21	Kpc, Levay
006022	K22	N.I., Ikar
006023	K23	Centauro
006024	K24	CL, Callais, Cls

ISBT Code	Antigen Name	Also Known As
006025	K25	VLAN
006026	K26	TOU
006027	K27	RAZ
006028	K28	VONG
006029	K29	KALT
006030	K30	KTIM
006031	K31	KYO
006032	K32	KUCI
006033	K33	KANT
006034	K34	KASH
006036	K36	KETI
006037	K37	KHUL
006038	K38	KYOR
700045	Kg	Kg
022008	KN8	S13
022009	KN9	KCAM
022001	Kna	Kn^a, KN1, COST4
022002	Knb	Knb, COST5, KN2
006003	Kpa	Kp^a, Penney, KEL3
006004	Kpb	Kp^b, Rautenberg, KEL4
010018	KREP	KREP, IK, DI18
006005	Ku	Ku, KEL5,Peltz, K_0
019001	Kx	Kx, XK1
033001	Lan	Lan, Langereis
007001	Lea	Le^a, LE1
007003	Leab	Le^x, Le^{abx}, LE3
007002	Leb	Le^b, LE2
007004	LebH	Le^{bH}, LE4
700028	Lia	Lia
209003	LKE	Luke
005003	LU3	Lu^{ab}, Lu^aLu^b
005004	LU4	Barnes
005005	LU5	Beal, Fox
005006	LU6	Jan, Jankowski
005007	LU7	Gary
005008	LU8	Taylor, MT
005009	LU9	Mull
005011	LU11	Reynolds
005012	LU12	Muchowski, Much
005013	LU13	Hughes
005014	LU14	Hofanesian
005016	LU16	
005017	LU17	Delcol

ISBT Code	Antigen Name	Also Known As
005020	LU20	
005021	LU21	
005023	LU23	LUIT
005001	Lua	Lu^{a}, LU1
005002	Lub	Lu^{b}, LU2
016005	Lwa	Lw^{a}, LW5, LW
016006	Lwab	Lw^{ab}, LW6, Bigelow
016007	LWb	LW7, Nea
002001	M	MNS1
901016	MAM	
002008	Mc	M^{c}, MNS8
022003	McCa	McC^{a}, KN3, COST6
022006	McCb	McCb, KN6
022007	McCd	McCd, KN7, Sl2
002013	Me	M^{e}, MNS13
025001	MER2	RAPH, Raf
002011	Mg	Mg, Gilfeather, MNS11
002007	Mia	Mi^{a}, Miltenberger, MNS7
700039	MILNE	
002015	MNS15	Sta, Stones
002016	MNS16	Ria, Ridley
002017	MNS17	Cla, Caldwell
002018	MNS18	Nya, Nyberg
002019	MNS19	Hut, Mi.II
002020	MNS20	Hil, Hill
002021	MNS21	Mv, Armstrong
002022	MNS22	Far, Kam, Kamhuber
002023	MNS23	Sd, Dreyer
002024	MNS24	Mit, Mitchell
002026	MNS26	Hop
002027	MNS27	Nob
002028	MNS28	En^{a}
002029	MNS29	En^{a} KT
002030	MNS30	‘N’, GPB^{N}
002031	MNS31	Ora, Orriss
002032	MNS32	Dane
002033	MNS33	TSEN
002034	MNS34	MINY
002035	MNS35	MUT
002036	MNS36	SAT
002037	MNS37	ERIK
002038	MNS38	Osa

ISBT Code	Antigen Name	Also Known As
002039	MNS39	ENEP
002040	MNS40	ENEH
002041	MNS41	HAG
002042	MNS42	ENAV, Avis
002043	MNS43	MARS
002044	MNS44	ENDA
002045	MNS45	ENEV
002046	MNS46	MNTD
002048	MNS48	KIPP
010011	Moa	Moa, Moen, DI11
002014	Mta	Mta, Martin, MNS14
002010	Mur	Mur, Murrell, Mu, MNS10
002002	N	MNS2
010016	NFLD	NFLD , DI16
003004	NOR	P1PK4
024001	Oka	Ok^a, OK1
030002	Ola	RHAG 2, Ola
003001	P1	
901014	PEL	Pelletier
003003	Pk	P1PK1, P^k
700018	Pta	Pta
700040	RASM	
010006	Rba	Rba, Redelberger DI6
700019	Rea	Rea
700054	REIT	
017011	Rg	Rg1, Rodgers, Rg^a, CH/RG11
004007	RH7	Ce, rh_i
004017	RH17	Hr_0
004018	RH18	Hr, Hr^s, Shabalala
004019	RH19	hr^S, Shabalala
004021	RH21	C^G
004022	RH22	CE, Jarvis
004023	RH23	Dw, Weil
004026	RH26	c-LIKE, Deal
004027	RH27	cE
004028	RH28	hrH
004029	RH29	Total Rh
004031	RH31	Bastiaan, hr^B
004032	RH32	RN
004033	RH33	Har, R0HAR, Dhar

ISBT Code	Antigen Name	Also Known As
004034	RH34	Hr^B, Bas, Baas, Bastiaan
004035	RH35	
004036	RH36	Berrens, Bea
004037	RH37	Evans
004039	RH39	C-like
004040	RH40	Tar, Targett
004041	RH41	Ce-like
004042	RH42	CeS, CceS, rhS, Thornton
004043	RH43	Crawford
004044	RH44	Nou
004045	RH45	Riv
004046	RH46	Sec
004047	RH47	Dav
004048	RH48	JAL, S. Allen, J. Allen
004049	RH49	STEM
004050	RH50	FPTT, Mol
004051	RH51	MAR
004052	RH52	BARC
004053	RH53	JAHK
004054	RH54	DAK
004055	RH55	LOCR
004056	RH56	CENR
004057	RH57	CEST
004058	RH58	CELO
004059	RH59	CEAG
004060	RH60	PARG
004061	RH61	CEVF
030004	RHAG4	
002003	S	MNS3
002004	s	MNS4
002047	SARA	MNS47
013001	SC1	Sc1, Sm
013002	SC2	Sc2, Bu^a
013003	SC3	
013004	SC4	Rd, Rda, Radin
013005	SC5	STAR
013006	SC6	SCER
013007	SC7	SCAN
901012	Sda	Sd^a, Sid
021012	SERF	CROM12

ISBT Code	Antigen Name	Also Known As
022004	Sla	Sl^{a}, COST7, McC^{c}, KN4
010021	SW1	SW1, DI21
010014	Swa	Swa, Swann, DI14
021002	Tca	Tc^{a}, CROM2
021003	Tcb	Tcb, CROM3
021004	Tcc	CROM4, Tcc
700017	Toa	Toa
010019	Tra	Tra, Traversu, Lanthois, DI19
002005	U	MNS5
021010	UMC	CROM10, UMC
004010	V	ce^{s}, hr^{v}, RH10
034001	Vel	Vel, Ve^{a}
010013	Vga	Vga, VanVugt, DI13
002012	Vr	Vr, Verdegaal, MNS12
004020	VS	e^{s}, RH20
002009	Vw	Verweyst, Mi.I, MNS9
010007	WARR	WARR, Warrior, DI7
020005	Wb	Webb, GE5
010005	Wda	Wda, Waldner, DI5
021008	WESa	CROM8, WESa
021009	WESb	CROM9, WES^{b}
010003	Wra	Wr^{a}, Wright, DI3
010004	Wrb	Wr^{b}, Fritz, DI4
010009	Wu	Wu, Wulfsburg, DI9
012002	XG2	CD99, MIC2, E2
012001	Xga	Xg^{a}, XG1
022005	Yka	Yk^{a}, KN5, COST3
011001	Yta	Yt^{a}, YT1
011002	Ytb	Yt^{b}, YT2
021013	ZENA	CROM13

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ST-001 ISBT 128 Standard Technical Specification
ST-005 ISBT 128 Standard Labeling of Blood Components
ST-020 ISBT 128 Standard for XML
ST-026 ISBT 128 Standard for the Medical Products of Human Origin (MPHO) Unique Identifier
ST-027 ISBT 128 Dictionary of Standard Data Elements
IG-014 Use of Data Matrix Symbols with ISBT 128
IG-027 Use of Red Cell Antigens with Test History Data Structure [030]

