

Blood Typing

Product catalog

TYPING



Blood typing

Grifols instrumentation and reagents for pretransfusion compatibility testing ensure that patients receive timely and safer transfusions. Our blood typing product portfolio employs a broad range of immunohematology technologies, including column agglutination technology, tube testing, lateral-flow techniques, and blood group genotyping to provide the right technique at the right moment.

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Product registration and availability vary by country.
Ask your local Grifols representative for more information.

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GEL CARD TECHNOLOGY

DG Gel cards

Reagent red blood cells 0.8%

Quality controls for DG Gel cards

Antisera for DG Gel cards

Complementary reagents and solutions

DG Gel System instruments

DG Gel cards

The unique 8-column format gel cards

DG Gel cards are the original 8-well gel card based on column agglutination technology for blood group typing and investigation of unexpected antibodies. The same cards can be used with any of our instruments.

One card format,
multiple profiles,
same great
performance

Complete ABO/Rh blood grouping

- Complete forward and reverse blood group determination
- Exclusive profiles with control well

Blood group confirmation

- Rh control well included
- Donor and patient profiles

Rh phenotype and Kell determination

- Optimal combination with DG Gel ABO/Rh cards
- Exclusive profiles with C^w and Kell antigens

Unexpected antibody investigation

- More tests per card
- The desired extended phenotype profile combining DG Gel cards with liquid antisera

Special tests

- Complete ABO/RhD typing and DAT for HDN tests on newborns
- Exclusive profiles for reference laboratories



Unique double-decker rack saving storage space



One system
Many solutions

COMPLETE ABO/RH BLOOD GROUPING

REF	PRODUCT	PROFILE / CLONES									
210355	DG Gel ABO/Rh 2 x 25 cards	Profile	A	B	AB	D ^{VI-}	CDE	Ctl	N/A ₁	N/B	
		Clones	16243 G2, 16247 E6	9621 A8	16245 F11 D8, 16247 E6, 7821 D9	P3x61	P3x61, P3x25513 G8, P3x234				
210338	DG Gel ABO/Rh (2D) 2 x 25 cards	Profile	A	B	AB	D ^{VI-}	D ^{VI+}	Ctl	N/A ₁	N/B	
		Clones	16243 G2, 16247 E6	9621 A8	16245 F11 D8, 16247 E6, 7821 D9	P3x61	P3x290, P3x35, P3x61, P3x21223 B10				
210126	DG Gel ABO/Rh (2D) (RT) 2 x 25 cards	Profile	A	B	AB	D ^{VI-}	D ^{VI+}	Ctl	N/A ₁	N/B	
		Clones	16243 G2, 16247 E6	9621 A8	16245 F11 D8, 16247 E6, 7821 D9	MS-201	P3x61, ESD-1M				
210198	DG Gel ABO/Rh (2DVI-) 2 x 25 cards	Profile	A	B	AB	(1)D ^{VI-}	(2)D ^{VI-}	Ctl	N/A ₁	N/B	
		Clones	16243 G2, 16247 E6	9621 A8	16245 F11 D8, 16247 E6, 7821 D9	P3x61	MS-201				
210348	DG Gel ABO/Rh (2D)+Kell 2 x 25 cards	Profile	A	B		(1)D ^{VI-}	(2)D ^{VI-}	Kell	Ctl	N/A ₁	N/B
		Clones	16243 G2, 16247 E6	9621 A8	P3x61	MS-201	MS-56				
210378	DG Gel ABO/Rh (CR) 2 x 25 cards	Profile	A	B		(1)D ^{VI-}	(2)D ^{VI-}	Ctl	N	N	N
		Clones	16243 G2, 16247 E6	9621 A8	P3x61	MS-201					
210352	DG Gel ABO/Rh+Kell (RT) 2 x 25 cards	Profile	A	B	AB	D ^{VI-}	Kell	Ctl	N/A ₁	N/B	
		Clones	16243 G2, 16247 E6	9621 A8	ES-15, LA-2, LB-2	P3x61	MS-56				
210340	DG Gel ABO-CDE 2 x 25 cards	Profile	A	B		D ^{VI-}	C	E	Ctl	N/A ₁	N/B
		Clones	16243 G2, 16247 E6	9621 A8	P3x61	P3x25513 G8	906				

BLOOD GROUP CONFIRMATION

REF	PRODUCT	PROFILE / CLONES									
210339	DG Gel Confirm 2 x 25 cards	Profile	A	B	D ^{VI+}	Ctl	A	B	D ^{VI+}	Ctl	
		Clones	16243 G2, 16247 E6	9621 A8	P3x290, P3x35, P3x61, P3x21223 B10						
210351	DG Gel Confirm P 2 x 25 cards	Profile	A	B	D ^{VI-}	Ctl	A	B	D ^{VI-}	Ctl	
		Clones	Birma-1	LB-2	MS-201						
210346	DG Gel AB (x4) 2 x 25 cards	Profile	A	B	A	B	A	B	A	B	
		Clones	16243 G2, 16247 E6	9621 A8							

RH PHENOTYPE AND KELL

REF	PRODUCT	PROFILE / CLONES								
210341	DG Gel Anti-D 1 x 25 cards	Profile	D ^{VI+}	Ctl	D ^{VI+}	Ctl	D ^{VI+}	Ctl	D ^{VI+}	Ctl
		Clones	P3x290, P3x35, P3x61, P3x21223 B10							
210349	DG Gel Rh Pheno 2 x 25 cards	Profile	C	E	c	e	C	E	c	e
		Clones	MS-24	MS-260	MS-33	MS-21, MS-16, MS-63				
210382	DG Gel Double Pheno 2 x 25 cards	Profile	(1)C	(1)E	(1)c	(1)e	(2)C	(2)E	(2)c	(2)e
		Clones	MS-24	MS-260	951	MS-21, MS-63, MS-16	P3x25513G8 906	MS-33	MS 63, MS-16	
210350	DG Gel Rh Pheno + Kell 2 x 25 cards	Profile	D ^{VI+}	C	E	c	e	C ^w	Kell	Ctl
		Clones	RUM-1, ESD-1M	MS-24	906	MS-33	MS-21, MS-63, MS-16	MS-110	MS-56	

IRREGULAR ANTIBODIES INVESTIGATION

REF	PRODUCT	PROFILE / CLONES							
210342	DG Gel Coombs 2 x 25 cards	Profile	AHG	AHG	AHG	AHG	AHG	AHG	AHG
		Clones	Polyclonal Anti-IgG, Monoclonal Anti-C3d (12011 D10)						
210343	DG Gel Neutral 2 x 25 cards	Profile	N	N	N	N	N	N	N
		Clones	Buffered solution						
210375	DG Gel Neutral/Coombs 2 x 25 cards	Profile	N	N	N	N	AHG	AHG	AHG
		Clones	Buffered solution				Polyclonal Anti-IgG, Monoclonal Anti-C3d (12011 D10)		
210344	DG Gel Anti-IgG 2 x 25 cards	Profile	IgG	IgG	IgG	IgG	IgG	IgG	IgG
		Clones	Polyclonal Anti-IgG						

SPECIAL TESTS

REF	PRODUCT	PROFILE / CLONES									
210353	DG Gel Newborn 2 x 25 cards	Profile	A	B	AB	D ^{VI-}	D ^{VI+}	Ctl	IgG	AHG	
		Clones	16243 G2, 16247 E6	9621 A8	ES-15, LA-2, LB-2	P3x61	RUM-1, ESD-1M		Polyclonal Anti-IgG	Anti-IgG, Anti-C3d (12011 D10)	
210345	DG Gel DC Scan 1 x 25 cards	Profile	AHG	IgG	C3d	Ctl	AHG	IgG	C3d	Ctl	
		Clones	Polyclonal Anti-IgG, Monoclonal Anti-C3d	Polyclonal Anti-IgG	12011 D10						
210374	DG Gel CT 2 x 25 cards	Profile	(12011 D10)	B	D ^{VI+}	Ctl	N	N	AHG	AHG	
		Clones	16243 G2, 16247 E6	9621 A8	P3x290, P3x35, P3x61, P3x21223 B10				Polyclonal Anti-IgG, Monoclonal Anti-C3d (12011 D10)		
210377	DG Gel T/S Poly 2 x 25 cards	Profile	A	B	D ^{VI-}	Ctl	AHG	AHG	AHG	AHG	
		Clones	16243 G2, 16247 E6	9621 A8	P3x61		Polyclonal Anti-IgG, Monoclonal Anti-C3d (12011 D10)				

Reagent red blood cells 0.8%

The DG Gel system offers a complete range of reagent red blood cells for use with column agglutination technology that can easily adapt to the daily work requirements of IH laboratories and fulfill high-quality standards.

Determination of the reverse group

Reagent red blood cells from known A₁, A₂, B, and O group donors for reverse grouping.

- The combination of A₁ and A₂ provides an effective way of detecting unexpected anti-A₁
- The preservative used does not inhibit complement activation, allowing for detection of hemolysins

Reagent red blood cells for reverse grouping

REF	PRODUCT	PRESENTATION
210215	Serigrup Diana 4	4 x 10 mL (A ₁ , A ₂ , B, O)
213588	Reverse-Cyte A ₁ , A ₂ , B, O (0.8%)	4 x 10 mL (A ₁ , A ₂ , B, O)
213659	Serigrup Diana A ₁ /B	2 x 10 mL (A ₁ , B)
213598	Reverse-Cyte A ₁ , B 0.8%	2 x 10 mL (A ₁ , B)
213591	Reverse-Cyte A ₁ 0.8%	1 x 10 mL (A ₁)
213658	Serigrup Diana A ₂	1 x 10 mL (A ₂)
213592	Reverse-Cyte A ₂ 0.8%	1 x 10 mL (A ₂)
213593	Reverse-Cyte B 0.8%	1 x 10 mL (B)
213594	Reverse-Cyte O 0.8%	1 x 10 mL (O)

Find the product
that best fits
your needs with
a comprehensive
range of reagent
red blood
cells 0.8%



Reverse-Cyte Reagents

Screening of unexpected antibodies

Panels of 1, 2, 3, or 4 cells, with a specifically selected antigen configuration, for screening most of the clinically relevant, unexpected antibodies.

- A complementary range of papainized (P) red blood cells is available (2, 3, and 4 cells)
- Routine presence of antigen C^w, K, Kp^a, Le^a, Le^b, and P1
- Homozygous expression for the following antigens: D, C, c, E, e, M, N, S, s, Fy^a, Fy^b, Jk^a, Jk^b, Lu^b, Kp^b, and k
- Screen-Cyte Di^a 0.8%: 3-cell panel for screening unexpected antibodies, including anti-Di^a
- Sero-Cyte Pool 0.8%: Mixture of 2 cells in 1 vial (pool) for screening unexpected antibodies in donors
- Data-Cyte Extend 0.8%: 4-cell panel O RhD negative for screening unexpected antibodies. It can be used for known anti-D-positive patients

Each vial of red blood cells is from a single O group donor, except for the Sero-Cyte Pool 0.8%

Reagent red blood cells for screening of unexpected antibodies

REF	PRODUCT	PRESENTATION
213634	Sero-Cyte Pool 0.8%	3 x 10 mL (I, I, I)
210204	Serascan Diana 2	2 x 10 mL (I, II)
213589	Sero-Cyte 0.8%	2 x 10 mL (I, II)
210206	Serascan Diana 3	3 x 10 mL (I, II, III)
213590	Screen-Cyte 0.8%	3 x 10 mL (I, II, III)
213653	Screen-Cyte Di ^a 0.8%	3 x 10 mL (I, II, III ^{Di^a})
210208	Serascan Diana 4	4 x 10 mL (I, II, III, IV)
210203	Serascan Diana Di ^a	1 x 10 mL (Di ^a)
213802	Diego(a)-Cyte 0.8%	1 x 10 mL (Di ^a)
213386	Mi(a)-Cyte 0.8%	1 x 10 mL (Mi ^a)
213685*	Data-Cyte Extend 0.8%	4 x 4 mL (I, II, III, IV)

Papainized reagent red blood cells for screening of unexpected antibodies

REF	PRODUCT	PRESENTATION
210205	Serascan Diana 2P	2 x 10 mL (IP, IIP)
210207	Serascan Diana 3P	3 x 10 mL (IP, IIP, IIIP)
210209	Serascan Diana 4P	4 x 10 mL (IP, IIP, IIIP, IVP)
213665	Screen-Cyte P 0.8%	3 x 10 mL (IP, IIP, IIIP)

*Data-Cyte Extend 0.8% is also validated for use in the identification of unexpected antibodies

Identification of unexpected antibodies

11-cell, 12-cell, 15-cell, and 16-cell panels with an antigen configuration specifically selected for identification of clinically relevant unexpected antibodies.

- Several panels can be used in combination
- A complementary range of papainized (P) red blood cells is available
- In the presence of anti-D, anti-C, or anti-E, it enables detection of a second antibody for Jk, Fy, MNS, or K
- **Homozygous expression** for the following antigens: M, N, S, s, C, c, E, e, Lu^b, k, Kp^b, Js^b, Fy^a, Fy^b, Jk^a, and Jk^b
- **Data-Cyte Plus Di^a 0.8%:** a 12-cell panel that always includes a positive cell for the Di^a antigen
- **Identisera Diana + Identisera Diana Extend:** Unique 15-cell panel with 3 R₁R₁ and 5 rr homozygous cells and complementary Jk, Fy, and MNS cells
- **Data-Cyte Plus 0.8% or Data-cyte plus Dia 0.8% + Data-Cyte Extend 0.8%:** Unique 15- or 16-cell panel including 4-cells O RhD negative for identifying unexpected antibodies. Data-Cyte Extend 0.8% complements Data-Cyte[®] Plus 0.8% and Data-Cyte[®] Plus Dia 0.8% Reagent Red Blood Cells

Reagent red blood cells for identification of unexpected antibodies

REF	PRODUCT	PRESENTATION
210210	Identisera Diana	11 x 5 mL (1 to 11)
210212	Identisera Diana Extend	4 x 5 mL (12 to 15)
213587	Data-Cyte Plus 0.8%	11 x 4 mL (1 to 11)
213627	Data-Cyte Plus Di ^a 0.8%	12 x 4 mL (1 to 12 ^{Di^a})
213685*	Data-Cyte Extend 0.8%	4 x 4 mL (13 to 17)

Papainized reagent red blood cells for identification of unexpected antibodies

REF	PRODUCT	PRESENTATION
210211	Identisera Diana P	11 x 5 mL (1P to 11P)
210213	Identisera Diana Extend P	4 x 5 mL (12P to 15P)
213661	Data-Cyte Plus P 0.8%	11 x 4 mL (1P to 11P)



Identisera Diana

**Data-Cyte Extend 0.8% is also validated for use in the detection of unexpected antibodies
Product registration and availability vary by country. Ask your local Grifols representative for more information.*

Quality controls for DG Gel cards

Quality management is necessary for reliable and accurate laboratory performance. To guarantee increased transfusion safety, internal controls must be conducted at regular intervals in accordance with local and national guidelines.

The Grifols immunochemistry internal quality controls, Extended IV Control and Essential II Control, simulate real patient samples and are used for monitoring both manual and automated procedures.

Adapt to laboratory quality assurance protocols with a choice of controls

Specifications

Extended IV Control:

- Tube 1: A₂B R₁R₂ (CcD.Ee), K pos
- Tube 2: A R₁^w R₁ (CC^wD.ee), Fy^a neg, with anti-B and anti-Fy^a
- Tube 3: B R₂R₂ (ccD.EE), with anti-A
- Tube 4: O rr (ccdde), K neg, with anti-A, anti-B, and anti-D (approx. 0.05 IU/mL)

Essential II Control:

- Tube 1: A rr (ccdde), K pos with anti-B and anti-D (approx. 0.05 IU/mL)
- Tube 2: B R₁R₂ (CcD.Ee), K neg, Fy^a neg with anti-A and anti-Fy^a

Quality control reagents

REF	PRODUCT	PRESENTATION
213286	Extended IV Control*	4 x 6 mL
213287	Essential II Control*	2 x 2 x 6 mL



Extended IV Control



Essential II Control

**Extended IV Control and Essential II Control have been validated to also work with Grifols conventional techniques and the MDmulticard system providing additional flexibility. Product registration and availability vary by country. Ask your local Grifols representative for more information.*

Antisera for DG Gel cards

The DG Gel system provides a wide range of high-quality monoclonal and polyclonal antisera for typing common and rare antigens. Antisera for DG Gel cards are validated for manual and automated processing.

Antisera reagents combined with DG Gel Neutral, DG Gel Coombs, or DG Gel anti-IgG cards enables further customization of your testing profile without using different cards.

Antisera validated for manual and automated processing

REF	PRODUCT	ANTIBODY TYPE / ORIGIN	CLONE	PRESENTATION
213633*	Anti-H Mono-Type	Monoclonal murine IgM	10934C11	1 x 5 mL
213437*	Anti-A ₁ Lectin	Lectin from Dolichos biflorus	-	1 x 5 mL
213005	Anti-D IgG Mono-Type	Monoclonal murine/human IgG	ESD1	1 x 5 mL
213296*	Anti-C ^w Mono-Type Dual	Monoclonal murine/human IgM	MS-110	1 x 5 mL
213297*	Anti-K Mono-Type Dual (1)	Monoclonal murine/human IgM	MS-56	1 x 5 mL
213557*	Anti-K Mono-Type (2)	Monoclonal human IgM	AEK-4	1 x 5 mL
213209*	Anti-k (cellano) Mono-Type	Monoclonal human IgG	P3A118OL67	1 x 5 mL
213995*	Anti-Kp ^a Dual	Polyclonal human	-	1 x 5 mL
213996*	Anti-Kp ^b Dual	Polyclonal human	-	1 x 5 mL
213208*	Anti-Fy ^a Mono-Type	Monoclonal human IgG	P3TIM	1 x 5 mL
213206	Anti-Fy ^a for DG Gel	Polyclonal human	-	1 x 5 mL
213207	Anti-Fy ^b for DG Gel	Polyclonal human	-	1 x 5 mL
213293*	Anti-Fy ^b Mono-Type Dual	Monoclonal murine IgM	SpA264LBg1	1 x 5 mL
213290	Anti-Jk ^a for DG Gel	Monoclonal human IgM	MS-15	1 x 5 mL
213291	Anti-Jk ^b for DG Gel	Monoclonal human IgM	MS-8	1 x 5 mL
213221	Anti-Jk ^a	Monoclonal human IgM	MS-15	1 x 5 mL
213223	Anti-Jk ^b	Monoclonal human IgM	MS-8	1 x 5 mL
213214**	Anti-Js ^b	Polyclonal human	-	1 x 5 mL
213294	Anti-Lu ^a for DG Gel	Polyclonal human	-	1 x 5 mL
213295*	Anti-Lu ^b Mono-Type Dual	Monoclonal murine IgG	LU2	1 x 5 mL
213008*	Anti-M Mono-Type Dual	Monoclonal murine IgG	LM110/140	1 x 5 mL
213181	Anti-M	Monoclonal murine	LM110/140	1 x 5 mL
213989*	Anti-N (LN3/MN879) Mono-Type	Monoclonal murine IgG	LN3/MN879	1 x 5 mL
213182	Anti-N	Monoclonal murine	20H12, MN879	1 x 5 mL
213993*	Anti-S Mono-Type	Monoclonal murine/human IgM	MS-94	1 x 5 mL
213183	Anti-S	Polyclonal human	-	1 x 5 mL
213994*	Anti-s Mono-Type	Monoclonal murine/human IgM	P3BER	1 x 5 mL
213185	Anti-s	Polyclonal human	-	1 x 5 mL
213283	Anti-Le ^a for DG Gel	Monoclonal human IgM	P3N20V3	1 x 5 mL
213217	Anti-Le ^a	Monoclonal murine	GA2	1 x 5 mL
213284	Anti-Le ^b for DG Gel	Monoclonal murine IgM	LeB2/L2-74.4.D11G11-9A9	1 x 5 mL
213219	Anti-Le ^b	Monoclonal murine	LEB1	1 x 5 mL
213292*	Anti-P ₁ Mono-Type Dual	Monoclonal human IgM	P3NIL100	1 x 5 mL
213229**	Anti-Di ^a Dual	Polyclonal human	-	1 x 2 mL
213215**	Anti-Co ^a	Polyclonal Human	-	1 x 3 mL
213216**	Anti-Co ^b	Polyclonal human	-	1 x 3 mL

* Antisera reagents also validated for use in conventional techniques.

** Antisera only validated for manual processing.

Product registration and availability vary by country. Ask your local Grifols representative for more information

Complementary reagents and solutions

Complementary solutions are compatible with all DG Gel reagents and instruments, improving laboratory stock management, enabling the use of any combination of instruments, and making it easy to upgrade laboratory instrumentation.

Complementary reagents and solutions

REF	PRODUCT	PRESENTATION	DESCRIPTION
210354	DG Gel Sol	2 x 100 mL	DG Gel Sol is a reagent used for preparing red blood cell suspensions used in DG Gel techniques.
210385	DG CellMedia	1 x 500 mL	DG CellMedia is a liquid red blood cell preservative used to prepare red blood cell 0.8% suspensions for use with DG Gel cards.
210357	DG-Papain	1 x 10 mL	DG-Papain is a liquid papain solution for performing enzyme assays in DG Gel techniques.
213578	Bromelase 30	1 x 10 mL	Bromelase 30 is a liquid bromelain solution for performing enzyme assays using conventional and DG Gel techniques.
213679	DG Fluid A	12 x 125 mL	DG Fluid A is a saline-based solution for internal washing of the fluid systems and probes of in vitro diagnostic devices. It should be diluted and used with DG Fluid B.
213678	DG Fluid B	12 x 125 mL	DG Fluid B is a tensioactive solution used for internal washing of the fluid systems and probes of in vitro diagnostic devices. It should be diluted and used with DG Fluid A.
213797	DG Clean	9 x 30 mL	DG Clean is a solution for cleaning the probes of Grifols analyzers. For laboratory use.

DG Gel system instruments

Grifols has been a pioneer in column agglutination automation by designing and manufacturing a range of scalable instruments from manual to fully automated.

Automated systems

REF	PRODUCT	DESCRIPTION
210600	Erytra Eflexis	Fully automated, mid-sized instrument to process DG Gel cards in pretransfusion compatibility tests
210400	Erytra	Fully automated, high-capacity, high-throughput instrument to process DG Gel cards in pretransfusion compatibility tests

Semi-automated systems

REF	PRODUCT	DESCRIPTION
210700	DG Reader Net	Advanced reader for DG Gel cards

Manual systems

REF	PRODUCT	DESCRIPTION
210366	DG Manual Station	DG Gel card work station (2 modules for cards + 2 racks for reagents)
213722	DG Pipette	Repetitive pipette for set volumes (10, 25, 50 µL)
213720	DG Dispenser Plus	Dispenser for set volumes (from 250 µL to 2500 µL)
213699	DG Dispenser Holder	Plastic transparent subject base for the DG Gel Sol bottle
213734	DG Therm	Digital incubator for the processing of DG Gel cards
210363	DG Spin	Digital centrifuge for the processing of DG Gel cards

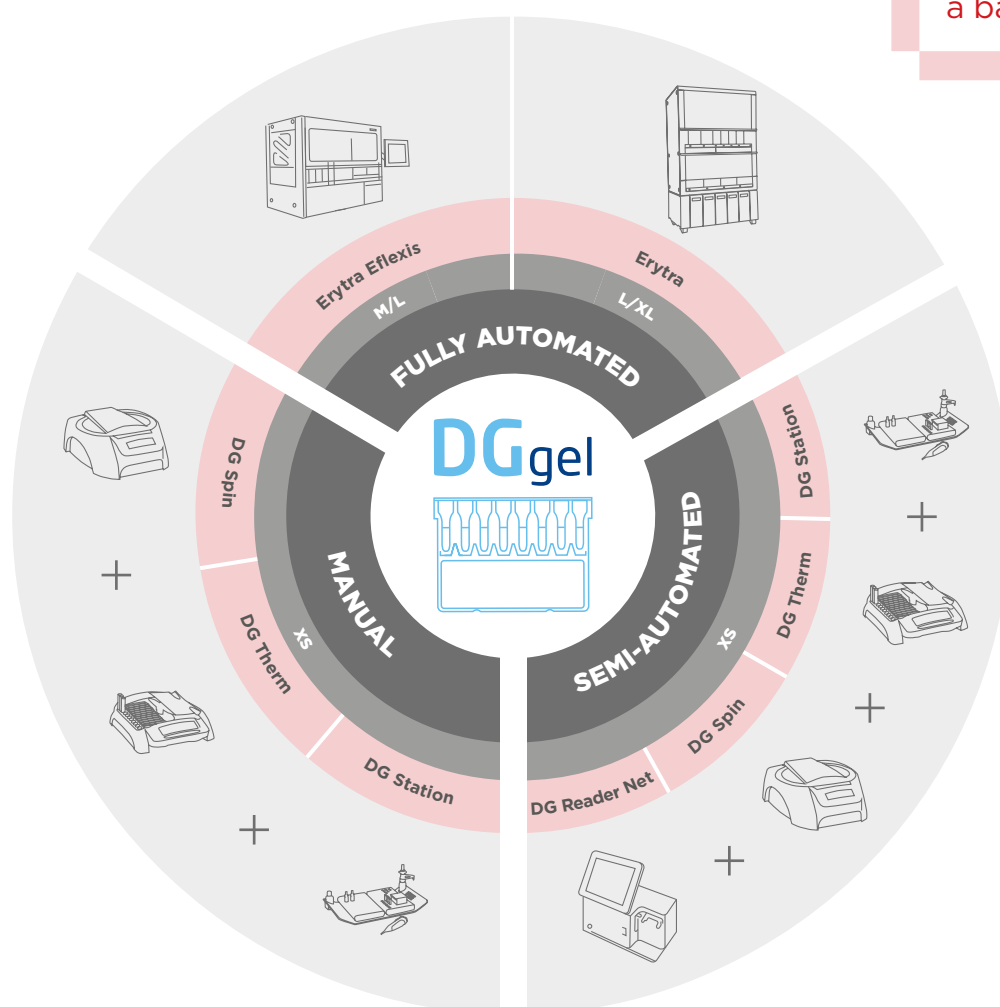
Accessories

REF	PRODUCT	DESCRIPTION
213713	Sample holder	Holder to load samples into Erytra and Erytra Eflexis analyzers
210601	Erytra Eflexis rack for samples	Rack to load samples into the Erytra Eflexis
210603	Erytra Eflexis card waste container	Disposable container for card waste
213778	Diana BCC	Barcode replicating printer
213775	DG Pipette tips	Bag of tips for the DG Pipette (1000 units)
210367	DG Cap holder	Support for the dropper caps of the reagent red blood cells
210611	Grifols Bench (earthquake-proof)	Special stand-alone table designed to hold the Erytra Eflexis to help increase autonomy
213796	DG Clean Erytra rack adaptor	Adaptor for the DG Clean solution (compatible with Erytra and Erytra Eflexis)
730541	Droppers for vials (10 mL)	Droppers for 10 mL 0.8% RRBCs vials (100 units)
732559	Droppers for vials (4 mL)	Droppers for 4 mL 0.8% RRBCs vials (100 units)

Working models

DG Gel system instruments have a smart and simple design and require minimal maintenance.* They were designed for consistent test procedures and sample management across different platforms. Using unique simultaneous perforation and dispensing technologies, they allow 100% use of the card wells, which reduces the risk of cross-contamination.

Combine DG Gel instruments to handle an increased workload or use as a backup system



Manual - XS	The minimum essentials: Pure manual processing of DG Gel cards
Semi-automated - XS/S	The enhanced combination: Manual processing of DG Gel cards with standardized reading and results traceability
Fully automated - M/L	Fully automated processing of DG Gel cards in a flexible and intuitive mid-sized instrument
Fully automated - L/XL	Fully automated processing of DG Gel cards in a high-capacity, high-throughput instrument

**Only monthly maintenance is required.*

Product registration and availability vary by country. Ask your local Grifols representative for more information.

Automated systems

erytra

Erytra is a fully automated, high-throughput, high-capacity instrument for performing pretransfusion compatibility tests using gel technology. The Erytra system combines efficiency and flexibility with intuitive operation that adapts to laboratory needs. The instrument assists in delivering highly reliable, quick results, which contribute to patient safety.

High efficiency
and flexibility

High workloads are handled efficiently

- Self-organizing capacity to optimally perform sample testing
- Autonomy of up to 4 hours
- Erytra can be combined with another Erytra or Erytra Eflexis using the same software
- LIS bidirectional communication

Superior flexibility

- Continuous loading of samples and reagents
- High capacity: 96 samples, 54 liquid reagents, 400 DG Gel cards
- Efficient STAT management
- Configurable parameters adapt to different laboratory requirements

Easy user interaction

- Minimal training* required due to intuitive software and simple design
- Real-time status of reagents and samples
- High-definition color results for easier revision of results
- Quality control check throughout the test procedure
- Minimal maintenance**



* On average, the training requires less than three work days to complete.

** Only monthly maintenance is required.

110 x 70 x 175 cm; 43.3 x 27.6 x 68.9 in (W x D x H)
350 kg; 772 lb





erytra eflexis

Erytra Eflexis is a fully automated, mid-size analyzer that performs pretransfusion compatibility tests using DG Gel technology.

This smart, flexible, and intuitive instrument helps labs achieve workflow efficiency and improve daily work routines.

Adaptability that
fits your lab

Smart, compact design

- Multiple laboratory configurations and multi-site networks: option to connect different Erytra Eflexis and Erytra units as a network
- Compact, benchtop model with transparent casing for a clear view of the internal processes
- LIS bidirectional connectivity

Flexible performance

- True continuous loading and unloading of samples, reagents, and cards
- Emergency samples (STAT) management: just press the STAT button for sample prioritization
- Two in one: unique interchangeable sample and reagents lineal racks automatically identified by the system for additional laboratory workflow adaptability
- Capacity for 200 DG Gel cards, up to 72 samples, and 46 liquid reagents

Intuitive operations

- Minimal training* to interact with the easy-to-use external touchscreen
- Grifols exclusive simultaneous perforations and dispensing technology for 100% use of the cards
- The same intuitive and customizable Erytra software suite
- Remote access for results validation and after-sales support remote connection
- Minimal maintenance**



* On average, the training requires less than three work days to complete.

** Only monthly maintenance is required.

110 x 71 x 91 cm; 43.3 x 27.9 x 35.8 in (W x D x H)
173 kg; 381.4 lb

Manual and semi-automated systems

Manual instruments are the minimum essentials to manually process DG Gel cards.

They can be used as a single platform for card processing for low sample volume laboratories or as a backup system for laboratories using a Grifols fully automated system.

Manual instruments can be combined with the DG Reader providing traceability and data management of results.

DG manual station

Work station

- Aluminum support for DG Gel cards, sample tubes, and reagents
- Capacity for 16 DG Gel cards, 2 bottles of DG Gel Sol diluent, 8 vials of reagents (5 and 10 mL), 32 dilution tubes (13 mm), and 16 sample tubes (16 mm)
- Completely adaptable to suit both left-handed and right-handed operators



55.5 x 34 x 75 cm; 21.8 x 13.4 x 3 in (W x D x H)
0.75 kg; 1.65 lb

DG Pipette

- Manual dispenser for the precise pipetting of liquids in repeat series
- One load can dispense multiple deposits of selected volumes: 10 μ L in 40 wells, 25 μ L in 16 wells, or 50 μ L in 8 wells
- Easy access to the bottom of commonly used test tubes
- Lightweight ergonomic design makes it comfortable to use
- The removable tip system makes it easy to remove the tip quickly and safely after use



DG Dispenser Plus

- Fixed volume dispenser for volumes of 250 μ L to 2500 μ L
- Attachable to different types of bottles
- Convenient for dispensing DG Gel Sol diluent from the bottle precisely and safely when preparing RBC suspensions
- Easy-to-use volume adjustment control

DG Dispenser Holder

- Plastic subject base for DG Gel Sol
- Convenient to facilitate the dispensing process together with the DG Dispenser Plus



DG^{therm}

Digital incubator

- 2 independent incubation zones
- Capacity for 12 DG Gel cards and 12 tubes each
- Digital on-screen display
- Fixed preset temperature of 37°C
- Adjustable, preset incubation time of 15 minutes



31 x 33 x 10 cm; 24 x 26 x 40 in (W x D x H)
4 kg; 9 lb

DG^{spin}

Digital centrifuge

- Simultaneous centrifuge of up to 24 DG Gel cards
- Removable and exchangeable spinning head
- Pre-defined centrifuge parameters
- Digital on-screen display
- Automatic detection of incorrect placement of DG Gel cards on the spinning head



41 x 52.5 x 18 cm; 16 x 21 x 7 in (W x D x H)
9 kg; 20 lb

DG^{readernet}

Advanced instrument for reading and interpreting DG Gel cards

- Embedded PC and touch screen
- High-resolution colored pictures for clear and reliable results management
- Possibility to combine different cards for a single assay
- Based on Erytra and Erytra Eflexis reader
- Wi-Fi connection



43.9 x 28.6 x 40.6 cm; 17.28 x 11.26 x 15.98 in (W x D x H)
8.5 Kg; 18.7 lb

CONVENTIONAL TECHNIQUES

Reagent red blood cells 3% and 5%

Anti-human globulin sera

Antisera

Quality controls for conventional techniques

Enhancing media and auxiliary solutions



Reagent red blood cells 3% and 5%

Grifols offers a wide range of reagent red blood cells for use in conventional tube technique. This extensive portfolio includes reagents for determination of the reverse group, for screening and identification of unexpected antibodies, and for performing IH controls.

Determination of the reverse group

Reverse-Cyte are reagent red blood cell suspensions at 5%, from A₁ ccddee, A₂ CcD.ee, B ccddee, and O CcD.Ee donors, used for determining the reverse group.

- The combination of A₁ and A₂ provides an effective way of detecting unexpected anti-A₁
- The preservative used does not inhibit complement activation, allowing for the detection of hemolysins

Efficiently detect
unexpected
antibodies

REF	PRODUCT	PRESENTATION
213383	Reverse-Cyte A ₁ , A ₂ , B, O 5%	4 x 5 mL (A ₁ , A ₂ , B, O)
213388	Reverse-Cyte A ₁ 5%	1 x 5 mL (A ₁)
213389	Reverse-Cyte A ₂ 5%	1 x 5 mL (A ₂)
213390	Reverse-Cyte B 5%	1 x 5 mL (B)
213391	Reverse-Cyte O 5%	1 x 5 mL (O)

Screening of unexpected antibodies

Sero-Cyte 3% and Screen-Cyte 3% are panels of two and three cells, respectively, of the O blood group at a 3% suspension. Their antigen configuration is specifically selected for screening clinically relevant, unexpected antibodies.

- Sero-Cyte 3%: C^w and K are present in each panel
- Screen-Cyte 3%: presence of at least one positive cell for C^w, K, Kp^a, Lu^a, Le^a, Le^b, and P1
- Screen-Cyte Di^a 3%: 3-cell panel for screening unexpected antibodies including anti-Di^a

REF	PRODUCT	PRESENTATION
213384	Sero-Cyte 3%	2 x 10 mL (I, II)
213385	Screen-Cyte 3%	3 x 10 mL (I, II, III)
213628	Screen-Cyte Di ^a 3%	3 x 10 mL (I, II, III Di ^a)
213803	Diego(a)-Cyte 3%	1 x 10 mL (Di ^a)

Identification of unexpected antibodies

Data-Cyte Plus 3% is an 11-cell panel of the O blood group at a 3% suspension. Its antigen configuration is specifically selected for the individual identification of clinically relevant, unexpected antibodies, as well as for the majority of frequent antibody combinations.

- Data-Cyte Plus Di^a 3%: a 12-cell panel that includes a positive cell for the Di^a antigen
- Homozygous expression for the following antigens: M, N, S, s, C, c, E, e, Lu^b, k, Kp^b, Fy^a, Fy^b, Jk^a, and Jk^b
- At least one cell negative for M, N, S, P1, Le^a, Le^b, K, Fy^a, Fy^b, Jk^a, Jk^b, and Xg^a

REF	PRODUCT	PRESENTATION
213392	Data-Cyte Plus 3%	11 x 4 mL (1 to 11)
213626	Data-Cyte Plus Di ^a 3%	12 x 4 mL (1 to 12 Di ^a)



Anti-human globulin sera

Anti-human globulin is used for in vitro detection of sensitized erythrocytes that do not agglutinate in a saline medium.

Grifols has a wide range of polyspecific and monospecific anti-globulins for detecting sensitization by different types of antibodies and antibodies against different components of the complement.

REF	PRODUCT	ANTIBODY TYPE / ORIGIN	CLONE	PRESENTATION
213423	Anti-human globulin Mono-Type (green)	Blend of polyclonal rabbit anti-IgG and monoclonal murine Anti-C3b/- C3d	GB2, SB4	1 x 10 mL
213568				6 x 10 mL
213559	Anti-IgG	Polyclonal rabbit	-	1 x 2 mL
213560	Monospecific anti-human sera		-	1 x 10 mL
213562	Anti-IgM	Polyclonal rabbit	-	1 x 2 mL
	Monospecific anti-human sera		-	
213563	Anti-IgA	Polyclonal rabbit	-	1 x 2 mL
	Monospecific anti-human sera		-	
213564	Anti-C3	Polyclonal rabbit	-	1 x 2 mL
	Monospecific anti-human sera		-	
213566	Anti-C3d	Polyclonal rabbit	-	1 x 2 mL
	Monospecific anti-human sera		-	
213565	Anti-C4	Polyclonal rabbit	-	1 x 2 mL
	Monospecific anti-human sera		-	



Anti-Human Globulin Sera Monospecific

Antisera

Liquid antisera for typing erythrocytes using conventional techniques such as tubes, microplates, plates, and slides.

The Mono-Type products are Grifols proprietary line of monoclonal antibodies for blood group antigen typing.

ABO grouping and Rh phenotype antisera

REF	PRODUCT	ANTIBODY TYPE / ORIGIN	CLONE	PRESENTATION
213434	Anti-A Mono-Type	Monoclonal murine IgM	BIRMA-1	1 x 10 mL
213506				6 x 10 mL
213436	Anti-B Mono-Type	Monoclonal murine IgM	LB-2	1 x 10 mL
213507				6 x 10 mL
213508	Anti-A,B Mono-Type	Monoclonal murine IgM	ES-4, ES-15	1 x 10 mL
213509				6 x 10 mL
213437*	Anti-A ₁ Lectin	Lectin from Dolichos biflorus	-	1 x 5 mL
213633*	Anti-H Mono-Type	Monoclonal murine IgM	10934C11	1 x 5 mL
213523	IgM Anti-D (MS-201) Mono-Type	Monoclonal human IgM	MS-201	1 x 10 mL
213524				6 x 10 mL
213516	IgM Anti-D (RUM-1) Mono-Type	Monoclonal human IgM	RUM-1	1 x 10 mL
213517				6 x 10 mL
213514	Combi Anti-D Mono-Type	Monoclonal human IgM/IgG blend	LDM3, ESD1	1 x 10 mL
213586				6 x 10 mL
213526	Anti-C Mono-Type (1)	Monoclonal human IgM	MS-24	1 x 10 mL
213528	Anti-c Mono-Type (1)	Monoclonal human IgM	MS-33	1 x 10 mL
213530	Anti-E Mono-Type (1)	Monoclonal human IgM	MS-258, MS-80	1 x 10 mL
213531	Anti-e Mono-Type (1)	Monoclonal human IgM	MS-62, MS-69	1 x 10 mL
213532	Anti-C Mono-Type (2)	Monoclonal human IgM	MS-273	1 x 10 mL
213533	Anti-c Mono-Type (2)	Monoclonal human IgM	MS-35	1 x 10 mL
213534	Anti-E Mono-Type (2)	Monoclonal human IgM	MS-12, MS-260	1 x 10 mL
213535	Anti-e Mono-Type (2)	Monoclonal human IgM	MS-16, MS-21, MS-63	1 x 10 mL
213296*	Anti-C ^w Mono-Type Dual	Monoclonal murine/human IgM	MS-110	1 x 5 mL
213424	Neutr-AB II	Neutralization solution	-	1 x 10 mL

Rare antisera

REF	PRODUCT	ANTIBODY TYPE / ORIGIN	CLONE	PRESENTATION
213297*	Anti-K Mono-Type Dual	Monoclonal murine/human IgM	MS-56	1 x 5 mL
213557*	Anti-K Mono-Type (2)	Monoclonal human IgM	AEK-4	1 x 5 mL
213542	Anti-K polyclonal	Polyclonal human	-	1 x 5 mL
213209*	Anti-k (cellano) Mono-Type	Monoclonal human IgG	P3A118OL67	1 x 5 mL
213544	Anti-k (cellano)	Polyclonal human	-	1 x 3 mL
213995	Anti-Kp ^a Dual	Polyclonal human	-	1 x 5 mL
213996	Anti-Kp ^b Dual	Polyclonal human	-	1 x 5 mL
213208*	Anti-Fy ^a Mono-Type	Monoclonal human IgG	P3TIM	1 x 5 mL
213443	Anti-Fy ^a	Polyclonal human	-	1 x 3 mL
213293*	Anti-Fy ^b Mono-Type Dual	Monoclonal murine IgM	SpA264LBg1	1 x 5 mL
213444	Anti-Fy ^b	Polyclonal human	-	1 x 3 mL
213548	Anti-Jk ^a Mono-Type	Monoclonal murine IgM	MS-15	1 x 3 mL
213549	Anti-Jk ^b Mono-Type	Monoclonal murine IgM	MS-8	1 x 3 mL
213537	Anti-Le ^a (LEA2) Mono-Type	Monoclonal murine IgM	LEA2	1 x 5 mL
213538	Anti-Le ^b (LEB2) Mono-Type	Monoclonal murine IgM	LEB2	1 x 5 mL
213540	Anti-Le ^a Mono-Type	Monoclonal murine IgM	LeA8	1 x 3 mL
213541	Anti-Le ^b Mono-Type	Monoclonal murine IgM	LeB2	1 x 3 mL
213553	Anti-Lu ^a	Polyclonal human	-	1 x 3 mL
213554	Anti-Lu ^b	Polyclonal human	-	1 x 3 mL
213008*	Anti-M Mono-Type Dual	Monoclonal murine IgG	LM110/140	1 x 5 mL
213989*	Anti-N (LN3/MN879) Mono-Type	Monoclonal murine IgG	LN3/MN879	1 x 5 mL
213993*	Anti-S Mono-Type	Monoclonal murine/human IgM	MS-94	1 x 5 mL
213994*	Anti-s Mono-Type	Monoclonal murine/human IgM	P3BER	1 x 5 mL
213546	Anti-S	Polyclonal human	-	1 x 3 mL
213547	Anti-s	Polyclonal human	-	1 x 3 mL
213292	Anti-P ₁ Mono-Type Dual	Monoclonal murine/human IgM	P3NIL100	1 x 5 mL
213229	Anti-Di ^a Dual	Polyclonal human	-	1 x 2 mL
213104	Anti-Wr ^a	Polyclonal human	-	1 x 2 mL
213081	Anti-Xg ^a	Polyclonal human	-	1 x 2 mL

*Also validated for use in DG Gel cards.

Quality controls for conventional techniques

Quality management is necessary for reliable and accurate laboratory performance. To guarantee increased transfusion safety, internal controls must be conducted at regular intervals in accordance with local and regulatory guidelines.

Grifols provides all the essential controls for routine pretransfusion testing in the immunohematology laboratory when working with reagent red blood cells 3% and 5% and conventional antisera.

Increased
transfusion
safety

REF	PRODUCT	PRESENTATION
213394	Coombs Control	1 x 10 mL
213397	Rh-Control Mono-Type	1 x 10 mL
213395	D ^{weak} Control	1 x 3 mL
213396	Control Set	2 x 6 mL
213398	Sero-Control	1 x 5 mL
213399	Sero ^{weak} -Control	1 x 5 mL

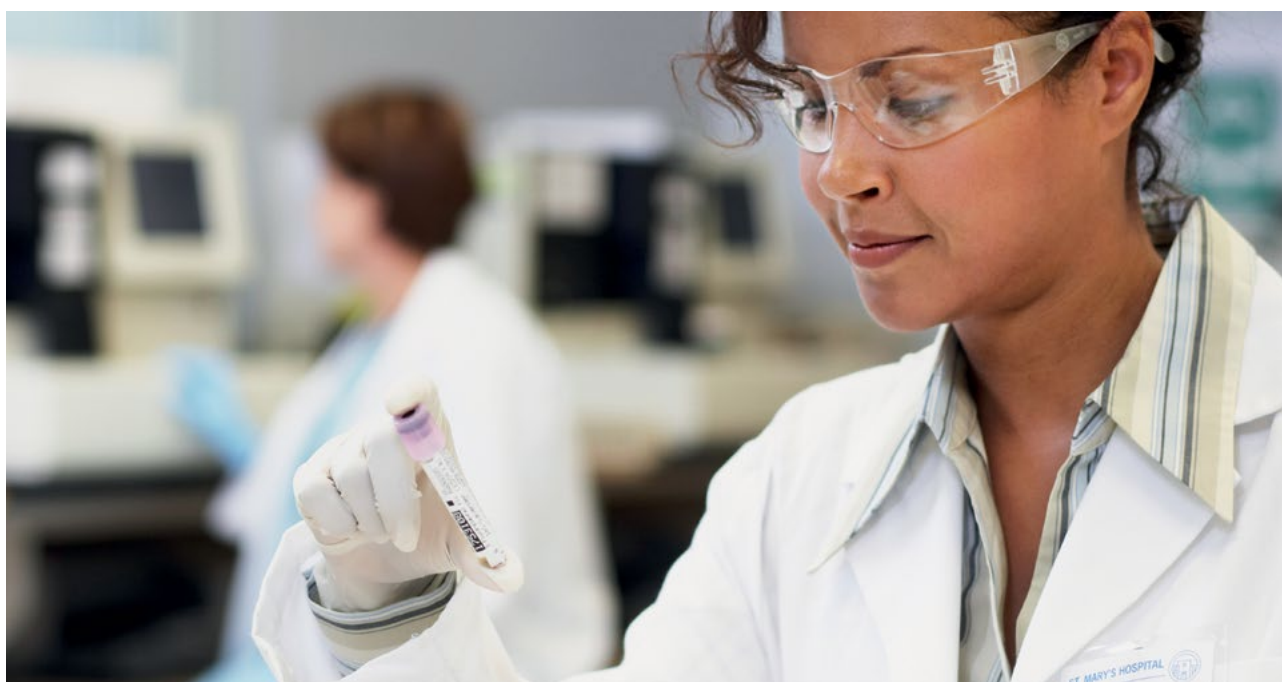
The following simulated whole blood controls are useful for the conventional techniques in tube, the DG Gel system, and the MDmulticard system.

REF	PRODUCT	PRESENTATION
213287	Essential II Control	2 x 2 x 6 mL
213286	Extended IV Control	4 x 6 mL

Enhancing media and auxiliary solutions

Grifols offers an extensive range of enhancing media and auxiliary solutions for performing conventional techniques.

REF	PRODUCT	PRESENTATION	DESCRIPTION
213577	Enliss II	6 x 10 mL	A low ionic strength solution (LISS) that is suitable for pretransfusion tests in conventional techniques.
213578	Bromelase 30	1 x 10 mL	A liquid bromelain solution for performing enzyme assays using conventional and DG Gel techniques.
213422	Specific Albumin 22% (Polymer)	1 x 10 mL	A bovine serum albumin 22% (polymer) solution used to potentiate antigen-antibody reactions in conventional techniques.
213573	Specific Albumin 30% (Monomer)	6 x 10 mL	A bovine serum albumin 30% (monomer) solution used to potentiate antigen-antibody reactions in conventional techniques.
213580	Immusol Compact	1 x 500 mL	A 1:20 concentrated isotonic saline solution used to prepare red blood cell suspensions and as a washing solution in immunohematology conventional techniques.



Product registration and availability vary by country. Ask your local Grifols representative for more information.

**MOLECULAR
TECHNOLOGIES**

BLOODchip ID

Reagents

Software



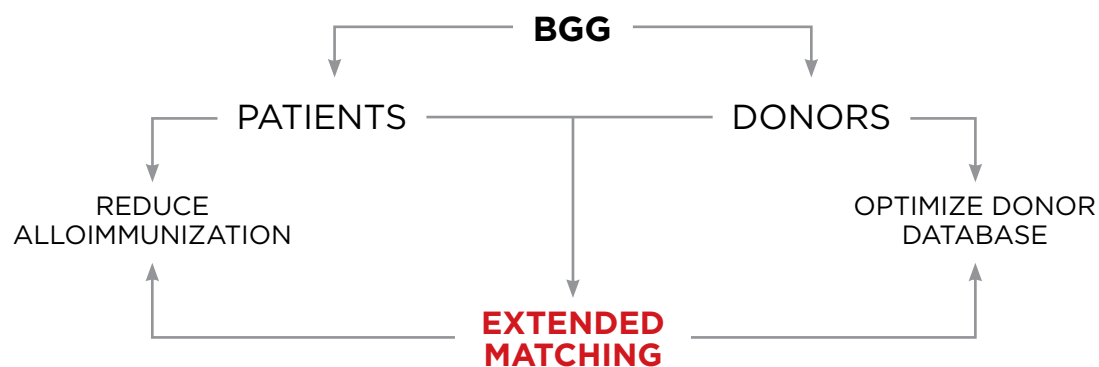
Genotyping: when and why?

Molecular typing has been proven very effective in overcoming some well-known serology limitations such as:¹

- Typing recently and chronically transfused patients
- DAT positive samples
- Weak expressions
- When antisera is not available

Main applications and benefits of BGG

	CLINICAL SITUATION	BENEFITS
PATIENTS	• Chronically transfused patients (SCD, thalassemia, cancer patients) • Autoimmune hemolytic anemia • Pregnancy • Patients under monoclonal treatments such as anti-CD38	• Prospective extended matching has been shown to reduce alloimmunization rates^{2,3} • Reduction of alloimmunization is associated with: - Increased patient survival^{4,5} - Expansion of period between transfusions⁶
DONORS	• When antisera is not available • To build extensively typed donor databases	• Reduction of costs to provide antigen negative units⁷ • Save in reagent and labor cost⁸ • Reduction of time to provide antigen negative units⁷ • Better management of negative units stock (ie, Duffy b and D neg)^{9,10,11}



1. Jungbauer. *ISBT Science Series*. 2011;6:399-403. **2.** Lasalle-Williams et al. *Transfusion*. 2011;51(8):1732-9. **3.** Tahhan et al. *Transfusion*. 1994;34(7):562-9. **4.** Telen et al. *Transfusion*. 2015;55(6 Pt 2):1378-87. **5.** Nickel et al. *Transfusion*. 2016;56(1):107-14. **6.** Da Costa DC et al. *Rev Bras Hematol Hemoter*. 2013;35(1):35-8. **7.** Shafi et al. *Transfusion*. 2014;54(5):1212-9. **8.** Winkler et al. *Immunohematology*. 2012;28(1):24-6. **9.** Sandler et al. *Transfusion*. 2015;55(3):680-9. **10.** Flegel. *Transfus Apher Sci*. 2011;44(1):81-91. **11.** Peiper et al. *J Exp Med*. 1995;181(4):1311-7.

BLOODchip^{ID}

Easy and fast process

FEATURES

EASY

- Only 4 tubes to pipette
- No washing steps
- Ready-to-use reagents

FAST

- 4 hr from DNA to results^{1,2}
- 30 min hands-on time^{1,2}

FLEXIBLE

- 1-96 tests per run
- Multiple batch: ID CORE XT, ID HPA XT, and ID RHD XT can be performed in the same run
- Open technology: standard Luminex equipment can be used for other products

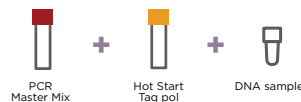
BENEFITS

- Easy for technicians of all levels
- Reduces human errors
- Results are obtained quickly
- Technicians are available to perform other activities
- Results obtained when needed, without running full batches
- Different product results can be obtained simultaneously, which improves efficiency and reduces time and resources
- Efficient equipment investment



BLOODchip ID analytical procedure

1. AMPLIFICATION



15 min



2.5 hr

2. HYBRIDIZATION



10 min



30 min

3. LABELING

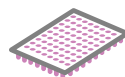


5 min



10 min

4. DATA ACQUISITION + ANALYSIS



20 min



20 min

Hands-on time
30 min

Automated time
3.5 hr

Overall time 4 hr

Accurate and reliable performance

PARAMETER	RESULT	STUDY DESCRIPTION	REFERENCE
ACCURACY (SPECIFICITY AND SENSITIVITY)	100%	- Multi-center study: Milan (Italy), Barcelona (Spain), Bristol and Aberdeen (UK) 519 samples compared with reference methods	Finning et al. Blood Transfus. 2016;14(2):160-7, 2 (This study was supported by Grifols)
	100%	Study performed in Brazil. 242 samples compared with Open Array and with sequencing if discrepant results	Bianchi et al. ISBT Science Series. 2015;10(1):45-51 (Grifols company supplied the inputs for the assays ID CORE XT and ID HPA XT)
	100%	1000 samples tested at 2 sites were compared with CE marked serology assays following Directive 98/79/CE. Antigens were compared with molecular reference methods when serology wasn't available	ID CORE XT package insert (pages 18-19)
	100%	283 samples tested at 1 site were compared with established molecular genotyping reference methods	ID HPA XT package insert (pages 16-17)
	100%	1000 samples were processed with ID RHD XT following Directive 98/79/CE. Results were compared with RHD serology in every case and with bidirectional sequencing in the case of Weak D samples (n=163). Discrepancies were resolved with bidirectional sequencing	ID CORE XT package insert (pages 18-19)
r ^{rs} ACCURACY	99%	Study performed in US. 125 possible r^{rs} samples were tested with HEA beadchip (Immucor) and with ID CORE XT. ID CORE XT could accurately detect r^{rs} type 1 haplotype in one single test	Moulds et al. Transfusion. 2015;55(6 Pt 2):1418-22 (Joann M. Moulds and Katrina L. Billingsley were consultants for Novartis and Grifols)
PRECISION	100%	Use of the analytical procedure in different laboratories, and use of analytical procedure on different days, with different operators and different equipment within the same laboratory	ID CORE XT (pages 18-19) and ID HPA XT (page 17) package inserts

IDCORE^{XT}



ID CORE XT

- Analyzes 29 polymorphisms determining 37 RBC antigens
- 48 tests per kit

Main applications^{1,2}

- Assess the presence/absence of blood groups in chronically transfused patients
- Screen routine donors
- Select compatible donors for alloimmunized patients
- Complement serological panel with further antigen identification
- Type patients treated with drugs such as daratumumab, that interfere with blood typing methods



1. Jungbauer. *ISBT Science Series*. 2011;6:399-403. 2. AABB Association Bulletin #16-02.

ID CORE XT antigen panel

BLOOD GROUPS	ALLELES ASSAYED	PHENOTYPES (ANTIGENS)
RHCE	<i>RHCE*CeCW</i> ; <i>RHCE*ceCW</i> <i>RHCE*CECW</i> ; <i>RHCE*ce</i> ; <i>RHCE*cE</i> ; <i>RHCE*Ce</i> ; <i>RHCE*CE</i> ; <i>RHCE*ceAR</i> <i>RHCE*ce</i> [712G]; <i>RHCE*CeFV</i> <i>RHCE*cEFM</i> ; <i>RHCE*ce</i> [733G] <i>RHCE*ce</i> [733G,1006T] <i>RHCE*CeVG</i> ; <i>RHCE*cE</i> [712G,733G] <i>RHCE*Ce</i> [733G]; <i>RHD*r's-</i> <i>RHCE*ce</i> [733G,1006T] <i>RHCE*CE-D</i> [5, 7]- <i>CE</i>	C (RH2) E (RH3) c (RH4) e (RH5) C^w (RH8) V (RH10) hr^s (RH19) VS (RH20) hr^B (RH31)
KELL	<i>KEL*K_KPB_JSB</i> ; <i>KEL*k_KPB_JSB</i> <i>KEL*k_KPA_JSB</i> ; <i>KEL*k_KPB_JSA</i>	K (KEL1) k (KEL2) Kp^a (KEL3) Kp^b (KEL4) Js^a (KEL6) Js^b (KEL7)
KIDD	<i>JK*B_null(IVS5-1a)</i> <i>JK*A_null(IVS5-1a)</i> ; <i>JK*A</i> ; <i>JK*B</i> <i>JK*B_null(871C)</i>	Jk^a (JK1) Jk^b (JK2)
DUFFY	<i>FY*A_GATA</i> ; <i>FY*B_GATA</i> ; <i>FY*A FY*B</i> <i>FY*A</i> [265T] <i>FY*B</i> [265T]_FY*X	Fy^a (FY1) Fy^b (FY2)
MNS	<i>GYP*A*M</i> ; <i>GYP*A*N</i> ; <i>GYP*B*S</i> ; <i>GYP*B*s</i> <i>GYP*B*S_null(230T)</i> <i>GYP*B*S_null(IVS5+5t)</i> <i>GYP.Mur</i> ; <i>GYP*B*deletion</i>	M (MNS1) N (MNS2) S (MNS3) s (MNS4) U (MNS5) Mi^a (MNS7)
DIEGO	<i>DI*A</i> ; <i>DI*B</i>	Di^a (DI1) Di^b (DI2)
DOMBROCK	<i>DO*A</i> ; <i>DO*B</i> ; <i>DO*B_HY</i> <i>DO*A_JO</i>	Do^a (DO1) Do^b (DO2) Hy (DO4) Jo^a (DO5)
COLTON	<i>CO*A</i> ; <i>CO*B</i>	Co^a (CO1) Co^b (CO2)
CARTWRIGHT	<i>YT*A</i> ; <i>YT*B</i>	Yt^a (YT1) Yt^b (YT2)
LUTHERAN	<i>LU*A</i> ; <i>LU*B</i>	Lu^a (LU1) Lu^b (LU2)



IDHPA^{XT}

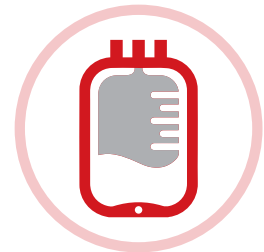


ID HPA XT

- Analyzes 13 polymorphisms determining 12 HPA systems
- 48 tests per kit

Main applications¹

- Platelet antigen typing in donors and patients
- Perform large-scale donor typing for provision of antigen-negative platelets
- Help to select compatible platelet donors for refractory or alloimmunized patients
- Complement clinical history of alloimmune platelet disorders, such as foetal and neonatal alloimmune thrombocytopenia (FNAIT), posttransfusion purpura, and platelet transfusion refractoriness



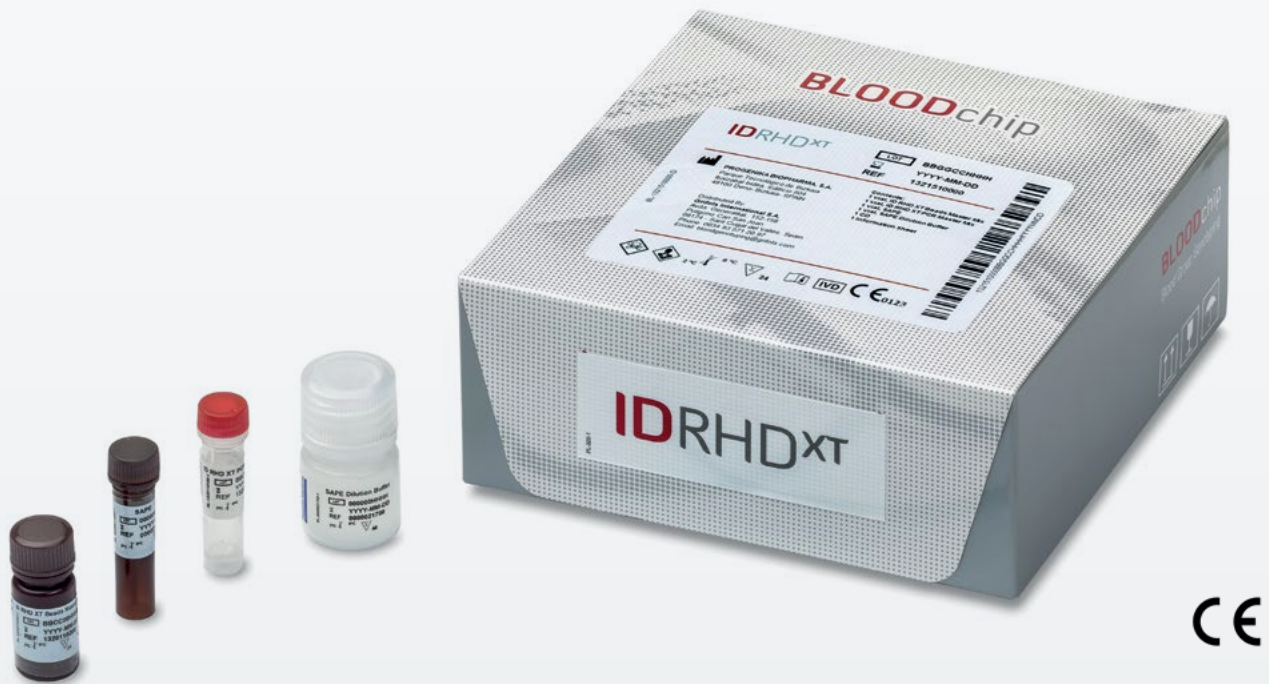
¹. Hurd et al. Vox Sang. 2002;83:1-12.

ID HPA XT antigen panel

HUMAN PLATELET ANTIGENS	ALLELES ASSAYED	PHENOTYPES (ANTIGENS)
HPA-1	HPA1a; HPA1b	HPA-1a; HPA-1b
HPA-2	HPA2a; HPA2b	HPA-2a; HPA-2b
HPA-3	HPA3a; HPA3b	HPA-3a; HPA-3b
HPA-4	HPA4a; HPA4b	HPA-4a; HPA-4b
HPA-5	HPA5a; HPA5b	HPA-5a; HPA-5b
HPA-6	HPA6a; HPA6b	HPA-6bw
HPA-7	HPA7a; HPA7b	HPA-7bw
HPA-8	HPA8a; HPA8b	HPA-8bw
HPA-9	HPA9a; HPA9b	HPA-9bw
HPA-10	HPA10a; HPA10b	HPA-10bw
HPA-11	HPA11a; HPA11b	HPA-11bw
HPA-15	HPA15a; HPA15b	HPA-15a; HPA-15b



IDRHD^{XT}



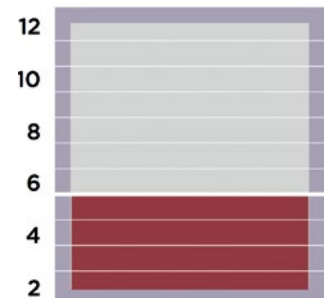
ID RHD XT

- Analyzes 7 polymorphisms determining 6 RHD variants and HPA-1
- 24 tests per kit

Main applications^{1,2}

- Weak D patient subtyping to rationalize the use of D neg blood units
- Weak D pregnant women subtyping to avoid unnecessary RhIG injections
- Confirmation of D neg donors

Blood stocks: O-



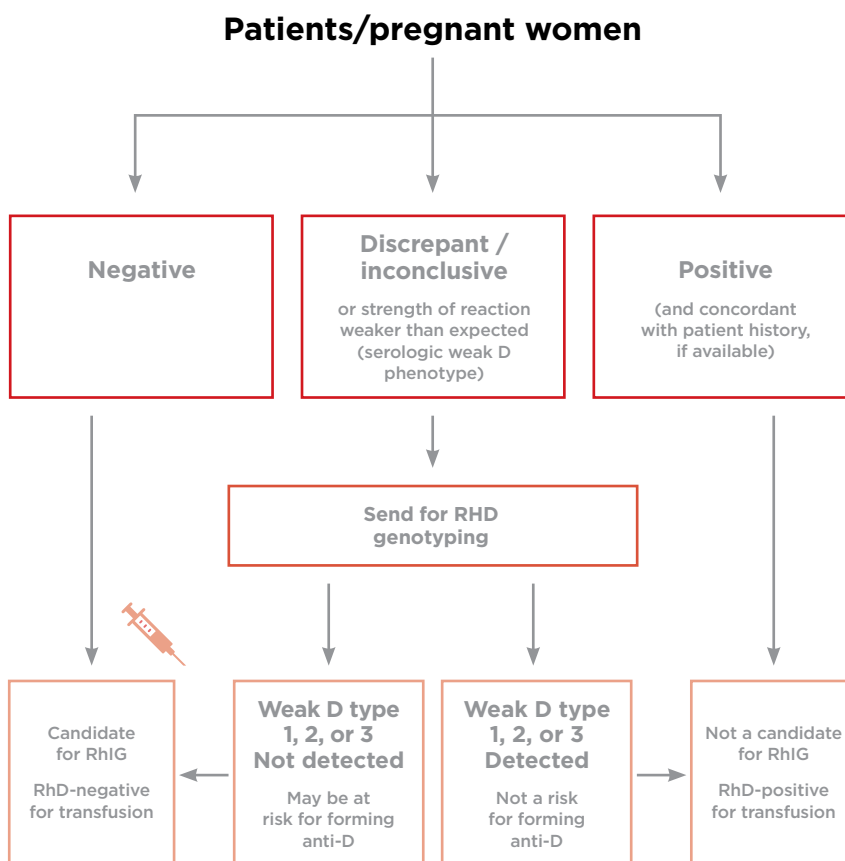
D neg units are scarce

1. Sandler et al. *Transfusion*. 2015;55(3):680-9. 2. Lopez et al. *Vox Sang*. 2016;111(S1):234.

ID RHD XT variant panel

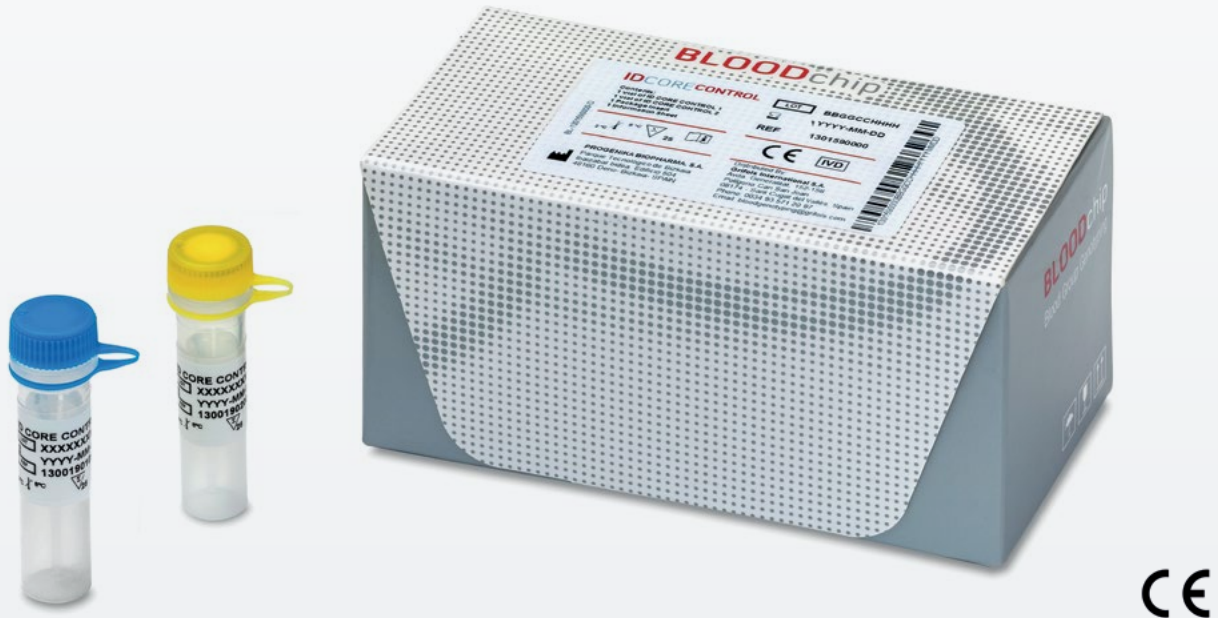
BLOOD GROUP SYSTEM	PREDICTED PHENOTYPE	ALLELES ASSAYED	ISBT NAME
RH	Weak D Type 1	<i>RHD*weak D type 1</i>	<i>RHD*01W.1</i>
RH	Weak D Type 2	<i>RHD*weak D type 2</i>	<i>RHD*01W.2</i>
RH	Weak D Type 3	<i>RHD*weak D type 3</i>	<i>RHD*01W.3</i>
RH	D-	<i>RHD*Pseudogene</i>	<i>RHD*04N.01</i>
RH	D-	<i>RHD*DIlla-CE (3-7)-D</i>	<i>RHD*03N.01</i>
RH	D-	<i>RHD deletion</i>	<i>RHD*01N.01</i>
HPA-1	HPA-1a; HPA-1b	<i>HPA1a; HPA1b</i>	Not applicable

Recommended algorithm for resolving serologic weak D phenotype test results by RHD genotyping to determine candidacy for RhIG and RhD type for transfusions¹.



1. Sandler et al. *Transfusion*. 2015;55(3):680-9.

IDCORE^{CONTROL}



ID CORE CONTROL is a positive control for ID CORE XT

- 2 clones, including testing for all allele A and B of all polymorphisms tested in ID CORE XT
- 25 tests per kit

Main benefits

- Standardization of the system quality control processes
- Practical: already commercially available, the laboratory does not have to produce their own controls
- Allows control of all tested alleles







BLOODchip ID software efficiently handles the genotyping procedure and data

Workflow traceability

- Plate configuration, kit, and enzyme lot registration
- Worksheet print-outs with calculated volumes to pipette

Database and multiple-search function

- Comprehensive database for samples, clinical information, and test results
- Multiple-search function, including phenotypes and genotypes

Clear results

- User-friendly and detailed reports
- Results by sample or batch of samples
- Multiple report formats (.xls, .pdf)
- Results are generated automatically, no user intervention for interpretation

Connectivity

- Connection with LIS
- Connection with Luminex

Performance and quality control

- Provides management of positive and negative controls
- Provides performance statistics
- Provides raw data graphs for troubleshooting

Audits

- Registers all actions performed by users

Configurable
Comprehensive
Flexible

BLOODchip^{ID}

Reagents and software

REF	PRODUCT	DESCRIPTION	SIZE
221239	ID CORE XT*	Genetic identification panel for 37 RBC antigens by DNA analysis	48 tests
221238	ID HPA XT*	Genetic identification panel for 12 HPA systems by DNA analysis	48 tests
730001	ID RHD XT*	Genetic identification panel for 6 RHD variants and HPA-1	24 tests
730285	ID CORE CONTROL*	Positive control for ID CORE XT	25 tests
221240	BIDS XT*	BLOODchip ID software XT	1 unit

Equipment

REF	PRODUCT	DESCRIPTION	SIZE
220973	Luminex 200™ system with xPONENT software	Luminex 200 system with xPONENT software and PC/flat panel monitor	1 unit

* ID CORE XT, ID HPA XT, ID RHD XT, and ID CORE CONTROL comply with the Directive 98/79/EC of the European Parliament and of the Council on in vitro diagnostic medical devices. CE mark certification.

ID CORE XT and ID CORE CONTROL are sold in US as IVD (FDA).

BIDS XT is not an in vitro medical device neither in EU nor US.

ID HPA XT and ID RHD XT are sold in the US for research use only. Not for use in diagnostic procedures.

Product registration and availability vary by country. Ask your local Grifols representative for more information.

TESTING SERVICES

Grifols Immunohematology Reference Laboratory



Grifols Immunohematology Reference Laboratory

Advanced testing capabilities to provide better patient care

Reference laboratory services

Our CLIA laboratory provides testing and support to resolve challenging cases, saving you the time and resources often consumed by complex workups. This laboratory provides an extensive menu of serological and molecular tests — many of which are rare offerings from an immunohematology reference laboratory.

Molecular and clinical consultation is available by phone and email

Typical turnaround time between 1 and 6 business days

Molecular assays

Accessories

REF	PRODUCT	DESCRIPTION
9007606	DNA isolation	Isolation of DNA from white blood cells in the whole blood, cells in saliva, or from other suitable tissue
9007421	DNA amplification	Whole-genome amplification when the quantity of DNA in a sample is insufficient for genotyping
9007637	STAT processing	Moving a sample to the front of the testing queue

Molecular test panels

REF	PRODUCT	DESCRIPTION
9007791*	BGG Navigator	Targeted genotyping for the prediction of 37 RBC antigens

* BGG Navigator is an LDT

Typical TAT is less than 3 business days from receipt of sample. STAT is 2 work days from receipt of sample.

CLIA license #45D2099571, CAP# 9406144.

For Laboratory Developed Tests (LDT), the performance characteristics were validated by the Grifols Immunohematology Center and Clinical Laboratory in San Marcos, TX, as authorized under Clinical Laboratory Improvement Amendments (CLIA) to perform high-complexity testing.

Easy ordering process, Grifols provides sample collection kits, please check with your Grifols representative.

Molecular test

DNA sequencing and zygosity assays developed and validated in the CLIA laboratory at the Grifols Immunohematology Center.

REF	TEST NAME	ANTIGENS TARGETED	DESCRIPTION
9008739	Single Amplicon Sequencing	Variable	Analysis of specific gene segments for the prediction of individual antigens
9007417	ABO Sequencing	A, B, O	Analysis of the coding and flanking regions of the <i>ABO</i> gene to predict the ABO phenotype
9008758	FUT1 Sequencing	A, B, H	Analysis of the coding and flanking regions of the gene encoding the FUT1 enzyme to predict H antigen expression
9008759	FUT2 Sequencing	A, B, H	Analysis of the coding and flanking regions of the gene encoding the FUT2 enzyme to predict A, B, H antigen secretion
9007420	RHCE Sequencing	RhCE	Analysis of the coding and flanking regions of the <i>RHCE</i> gene to predict the RhCE phenotype
9007414	RHD Sequencing	RhD	Analysis of the coding and flanking regions of the <i>RHD</i> gene to predict the RhD phenotype
9008615	Weak D 1, 2, 3 Sequencing	RhD	Partial analysis of the <i>RHD</i> gene to determine the presence or absence of weak D type 1, 2, 3, predict expression of their weak D antigen, and offer a recommendation for blood transfusion and Rh Ig administration
9007418	RHD Zygosity Testing	RhD	Quantitative analysis of the <i>RHD</i> gene in a paternal sample in order to determine the risk of hemolytic disease of the fetus or newborn (HDFN)
9008743	KELL Sequencing	Kell	Analysis of the coding and flanking regions of the <i>KEL</i> gene to predict expression of the Kell antigens
9008750	XK Sequencing	Kell	Analysis of the coding and flanking regions of the gene encoding the XK protein, the absence of which leads to the McLeod phenotype
9008745	KIDD Sequencing	Kidd	Analysis of the coding and flanking regions of the <i>JK</i> gene to predict expression of the Kidd antigens
9008746	LU Sequencing	Lutheran	Analysis of the coding and flanking regions of the <i>LU</i> gene to predict expression of the Lutheran antigens

REF	TEST NAME	ANTIGENS TARGETED	DESCRIPTION
9008744	KLF1 Sequencing	Lutheran	Analysis of the coding and flanking regions of the <i>KLF-1</i> gene, certain variants of which lead to the In(Lu) phenotype
9008747	GYP A Sequencing	M, N	Analysis of the coding and flanking regions of the <i>GYP A</i> gene to predict expression of the M and N antigens
9008748	GYP B Sequencing	S, s, U, Mi ^a	Analysis of the coding and flanking regions of the <i>GYP B</i> gene to predict expression of the S, s, U, and Mi ^a antigens
9008749	FY Sequencing	Duffy	Analysis of the coding and flanking regions of the <i>FY</i> gene to predict FY of the Duffy antigens; includes analysis of the <i>GATA</i> polymorphism
9008751	JR Sequencing	Jr ^a	Analysis of the coding and flanking regions of the <i>JR</i> gene to predict expression of the Jr ^a antigen
9008752	RHAG Sequencing	RhAG, RhD, RhCE	Analysis of the coding and flanking regions of the <i>RHAG</i> gene to determine the regulator type of Rh ^{null}
9008753	DI Sequencing	Diego	Analysis of the coding and flanking regions of the gene <i>DI</i> to predict expression of the Diego antigens
9008754	DO Sequencing	Dombrock	Analysis of the coding and flanking regions of the gene <i>DO</i> to predict expression or absence of the Dombrock antigens
9008755	CO Sequencing	Colton	Analysis of the coding and flanking regions of the gene <i>CO</i> to predict expression of the Colton antigens
9008756	YT Sequencing	Cartwright	Analysis of the coding and flanking regions of the gene <i>YT</i> to predict expression of the Cartwright antigens

Typical TAT is 4-6 business days from receipt of sample. STAT is 4 business days from receipt of sample.

Sample types: whole blood, DNA, saliva, and other suitable tissue.

Serology assays

Serology assays developed and validated in the CLIA laboratory at the Grifols Immunohematology Center.

REF	TEST NAME	DESCRIPTION
9008684	ABO Typing	Test to determine the presence or absence of A and/or B antigen on red blood cells and anti-A and/or anti-B in plasma
9008685	Rh(D) Typing	Test to determine the presence or absence of D antigen on red blood cells
9008686	Weak D Typing	Test to determine the presence or absence of a weakly expressed D antigen on red blood cells
9008687	Antibody Screen	Test to determine the presence or absence of unexpected antibodies to non-ABO blood group antigens
9008710	DAT	Test to determine if red blood cells have been sensitized in vivo with IgG antibodies and/or complement
9008688	DAT Negative Hemolytic Anemia Evaluation	Evaluation may test for IgA and/or IgM in vivo sensitization of RBCs, or utilize testing techniques to increase test sensitivity – case dependent
9008689	Routine Antibody Identification Panel	Routine panel testing to identify unexpected antibody specificity
9008690	Rare Antibody Identification Panel	Panel test with cells having rare blood group phenotype (ie, RBC antigens) negative to high-frequency antigens or positive to low-frequency antigens
9008691	Antibody Titer	Semi-quantitative test to determine antibody levels in an individual's plasma
9008692	Elution	Technique to remove antibodies from red blood cells – freeze-thaw, heat, or acid elution
9008693	Cold Agglutinin Screen	Test to determine the presence or absence of cold agglutinins, usually cold autoantibodies
9008694	Thermal Amplitude	Test to determine the highest temperature at which a cold agglutinin is reactive – used to determine clinical significance of cold agglutinins
9008695	Antigen Typing (per antigen)	Test to determine the presence or absence of non-ABO blood group antigens on red blood cells using antigen-specific antisera

REF	TEST NAME	DESCRIPTION
9008696	Antigen Typing (lectin, per antigen)	Same as antigen typing, except test utilizes plant-derived lectins instead of antisera to determine the presence or absence of blood group antigens
9008697	Antigen Typing (rare, per antigen)	Same as antigen typing, except rare antisera with specificity to high- or low-frequency antigens is utilized
9008698	Adsorption, Allo	Technique to adsorb antibodies from an individual's plasma using allogeneic red cells
9008699	Adsorption, Auto (warm or cold)	Technique to adsorb antibodies from an individual's plasma using autologous red cells
9008700	Adsorption, Rabbit Cells, Human Platelet Concentrate	Technique to adsorb antibodies from an individual's plasma using rabbit erythrocyte stroma or human platelet concentrate
9008701	Cell Separation (per technique)	Techniques used to separate autologous cells from allogeneic in an individual's blood sample
9008702	Neutralization (per target)	Technique using soluble antigens to neutralize antibody reactivity
9008703	RBC Enzyme Treatment (per enzyme)	Enzyme treatment of red blood cells to affect the detection of blood group antigens on cell membrane
9008704	Pretreatment of RBCs for Testing (per treatment)	Chemical treatment of red blood cells to affect the detection of blood group antigens on the cell membrane
9008918	Daratumumab Neutralization Pretreatment	A step to neutralize the interfering anti-CD38 antibody with recombinant CD38 antigen
9008705	Pretreatment of Serum/Plasma for Testing (per treatment)	Chemical treatment of plasma to affect the reactivity of antibodies
9008706	Donath-Landsteiner Test	Test to determine if there is a biphasic hemolysin in an individual's plasma – test for paroxysmal cold hemoglobinuria
9008708	IgG Subclass Assay	Test to determine the specific IgG subclass(es) of detected antibodies. IgG3 and IgG1 are strongest complement activators, so more likely to cause a hemolytic transfusion reaction
9008709	Monocyte Monolayer Assay (MMA)	Test to assess the clinical significance of an antibody and the potential for decreased survival of transfused red cells. The MMA also assesses the risk of HDFN during feto-maternal incompatibility

TAT can vary depending on type and number of tests.

Sample types: whole blood (clotted or anticoagulated). Some tests have special requirements.

Serology assays are only available for the US.

GRIFOLS

Grifols Asia Pacific Pte Ltd
460 Alexandra Road
#09-01 mTower
Singapore 119963
Tel: +65 6708 7166
Fax: +65 6735 2607

Grifols International, S.A.
Parc Empresarial Can Sant Joan
Av. De la Generalitat, 152-158
08174 Sant Cugat del Vallès
Barcelona, Spain
Tel: +34 935 710 500