Technical Manual

Thermo Scientific
MSIA Protein A, G and A/G Tips

Thermo SCIENTIFIC

Thermo Scientific Protein A, G and A/G MSIA-Tips

Products Information:

MSIA™ D.A.R.T.'S® Pipette Tips		
Compatible with the Versette™ Automated Liquid Platform, Finnpipette® Novus i Multichannel Electronic Pipettes (for immuno-precipitation), also with select Eppendorf®, Biohit® and Hamilton® Multichannel Pipettes.		
Cat. No.	*Description*	*Packaging*
991PRT11	300 µl MSIA D.A.R.T.'S, Protein A	Pack of 96 tips
991PRT12	300 µl MSIA D.A.R.T.'S, Protein A	Pack of 24 tips
991PRT13	300 µl MSIA D.A.R.T.'S, Protein G	Pack of 96 tips
991PRT14	300 µl MSIA D.A.R.T.'S, Protein G	Pack of 24 tips
991PRT15	300 µl MSIA D.A.R.T.'S, Protein A/G	Pack of 96 tips
991PRT16	300 µl MSIA D.A.R.T.'S, Protein A/G	Pack of 24 tips

MSIA Pipette Tips		
Compatible to Beckman® Multimek™, Type II Liquid Handling System.		
Cat. No.	*Description*	*Packaging*
991PRT01	200 µl MSIA Tips, Protein A	Pack of 96 tips
991PRT02	200 µl MSIA Tips, Protein G	Pack of 96 tips
991PRT03	200 µl MSIA Tips, Protein A/G	Pack of 96 tips

Storage

Upon receipt, store at 4^{o} C. Product shipped with an ice pack.

Disclaimer

These products are supplied for life science research use only. They are not intended for medicinal, diagnostic or therapeutic use.

Table of Content

Introduction

The Mass Spectrometric Immunoassay (MSIA) Tips provide a fast, convenient and highly reproducible method for both manual and automated enrichment of target analytes for subsequent mass spectrometric detection. Thermo Scientific Protein A MSIA-Tips provide the researcher with the flexibility to tailor the devices for specific target analyte applications by using their own antibodies. Such immunoaffinity enrichment is typically used for isolating analytes from, but not limited to; serum, plasma, urine, or cell culture supernatants. For immuno-affinity capture and enrichment of desired target analytes, the protein A, G, and A/G MSIA-Tips, previously loaded with antibody, are used to interrogate a prepared biological sample by employing a cyclical pipetting motion.This allows for simultaneous purification and enrichment of the targeted analyte. After sample incubation, the tips are rinsed (in the same fashion) and the bound antigens are then dissociated from the tips using an elution buffer. The elution buffer selection and the methodologies for mass spectrometric detection are both application and target specific. Manual purification (8-12 samples) can be performed using the Thermo Scientific Finnpipette Novus i electronic multichannel pipette and adjustable pipette stand. The method is also readily automated with liquid handling robots such as theThermo Scientific Versette Liquid Handling Platform, which is especially useful for large-scale screening of multiple samples.

Protein A MSIA-Tips contain a covalently immobilized recombinant Protein A (~44,600 Da; apparent molecular weight by SDS-PAGE ~45KDa) that is expressed in *E.coli* and functions essentially the same as native Protein A. Protein A contains four Fc-binding domains that potentially interact with immunoglobulins. The interaction of Protein A with immunoglobulins is pH-dependent with the optimal condition being pH 8.2, although binding is good at neutral or physiological pH (pH 7.0-7.6). Furthermore, this interaction is not equivalent for all species nor is it within species, i.e. the interaction is stronger with some immunoglobulin subclasses than others.

Protein G MSIA-Tips contain a covalently immobilized recombinant Protein G (~21,600 Da; apparent molecular weight by SDS-PAGE ~32KDa) that enables the probing and detection of mouse and human antibodies, especially IgG isotypes. In addition, the albumin and cell surface binding domains of Protein G have been eliminated in the recombinant Protein G to reduce nonspecific binding and, therefore, can be used to separate immunoglobulins from crude samples. Recombinant Protein G contains two Fc-binding domains that can interact with immunoglobulins. The optimal pH for Protein G to bind immunoglobulins is pH 5. However, effective binding can be achieved at pH 7.0-7.2.

Protein A/G MSIA-Tips contain a covalently immobilized recombinant Protein A/G (~50,500 Da; apparent molecular weight by SDS-PAGE ~40-45K) that combines the IgG binding domains of both Protein A and Protein G. Protein A/G contains 4 Fc-binding domains from Protein A and two from Protein G making it a more general and convenient tool for investigating and purifying immunoglobulins. Also, Protein A/G binding to immunoglobulins is not as pH-dependent as Protein A.

Important Product Information

- Store the Protein A, G, and A/G MSIA-Tips at 4°C, do not freeze.
- This product is intended for single use only.
- Thermo Scientific Protein A, G and A/G MSIA-Tips are not intended for the transference or measurement of liquids. This product is intended for micro-scale analyte purification prior to mass spectrometric detection.
- Protein A binds strongly to human subclasses IgG_1, IgG_2, and IgG_4, but does not bind to IgG_3. In many instances Protein A does not bind to monoclonal antibodies, especially those produced in rat or from mouse that are of the IgG_1 subclass.
- Protein G has greater affinity than Protein A for most mammalian IgGs, and may be used for the purification of mammalian IgGs that do not bind well to Protein A. Protein G binds with significantly greater capacity than Protein A to several IgG subclasses such as human IgG3, mouse IgG1 and rat IgG2a. However, Protein G does not bind to human IgM, IgD and IgA.
- Protein A/G has a broader binding range than either Protein A or Protein G individually. Protein A/G binds to all human IgG subclasses, binds somewhat to IgA, IgE, IgM and, to a lesser extent, IgD. Unlike Protein G, Protein A/G does not bind serum albumin because the gene sequence coding for the albumin-binding site has been eliminated. Protein A/G is effective for use with mouse monoclonal antibodies and binds to all mouse IgG subclasses, but not IgA, IgM or serum albumin.
- For more information, see Tech Tip #34: Binding Characteristics for Immunoglobulins and Protein L, A, G and A/G at www.thermoscientific.com/pierce.

Procedure for Protein A Antibody Loading

Note: The following information provided in this procedure describes the use of the Thermo Scientific Protein A MSIA-Tips in single manual pipette application format. The steps described are readily translatable to multi-channel and robotic platform applications; however, they are not described in this section. This procedure is for **general guidance only** and may require further optimization by the researcher.

A. Additional Materials Required

- Thermo Scientific Finnpipette Novus i Electronic Multichannel Pipette and adjustable pipette stand or Thermo Scientific Versette Liquid Handling Platform or the appropriate Beckman liquid handling platform
- 96-well microplate, U bottom, polypropylene (Thermo Scientific Product No. 267334) or 0.6 mL Fisherbrand* Snap-Cap* Flat-Top Graduated Microcentrifuge Tubes (Fisher Scientific Product No. 02-681-257).
- Purified Water
- Dilution/Wash Buffer: Phosphate-buffered saline (PBS, Thermo Scientific Product No. 28372), or Tris-buffered saline (TBS, Thermo Scientific Product No. 28379). All buffers prepared also include 0.1% (final concentration) Tween-20 Detergent (Thermo Scientific Product No. TA-125-TW).

B. Antibody Loading

Notes:

- Diluent/Wash Buffer can be prepared in bulk and stored at 4°C until use. Buffer must be warmed to room temperature prior to use.
- The prepared antibody solution used in the loading phase should be thoroughly m ixed in the Buffer by repeat inversion or using a rotating platform. Aggressive agitation of antibody solution will denature the antibody.

1. Prepare the antibody solution for use in loading. The antibody should be prepared in the Dilution Buffer at a final concentration in the range of 0.01 – 0.1 mg/mL. Add 100 µL of this antibody solution into each well of the micro-titer plate or micro-centrifuge tube. A single well or tube of antibody solution is necessary for each Protein A MSIA-Tip to be loaded.
2. For each Thermo Scientific Protein A MSIA-Tip to be loaded, a well or micro-centrifuge tube of Wash Buffer (200 µL) is also required.
3. The general workflow for antibody loading is presented in **Table 1**. The pipetting cycle iterations are performed by repetitively aspirating and dispensing (standard pipette mixing action; a cycle = 1 aspiration and 1 dispense) using the listed cycle volumes provided. *The numbers of iterations provided are a general guideline and may require further optimization by the researcher.*

Table 1. Antibody Load Workflow

Step	Description	Cycle Volume (μL)	No. Cycle Iterations	Approx. Allotted time per step
1	Wash Buffer	150	10	1 minute
2	Antibody Solution	75	> 250	> 15 minutes
3	Wash Buffer	150	10	1 minute

The workflow is performed by loading the Protein A MSIA-Tip onto a pipette and immersing the open end of the tip into the volume of liquid for each of the steps provided. Perform each cycle using the normal pipetting action as specified in the pipette user manual. *If the Novus i electronic pipette is used, we recommend starting with speed level 5. The speed of the Novus i pipette cycling can be further optimized by the researcher.*
Note: To maintain proper sample and wash flow through the Protein A MSIA-Tip, ensure that the open end remains completely immersed in the volume of liquid during each step of the workflow. Failure to do so will result in aspiration of air and inconsistency in liquid movement within the tip. Also, do not press the Tip into the bottom of the liquid holding vessel as this will restrict flow.

4. Once the Protein A MSIA-Tip is loaded with antibody, it may be immediately used for analyte purification or stored dry at 4° C for later use. Furthermore, the captured antibody may also be cross-linked to the protein A, following general protocols for cross-linking antibodies to protein A.

C. Sample Analyte Loading

1. The analytical sample of choice is prepared by dispensing a measured aliquot of analyte containing biological matrix into a fixed volume of Dilution Buffer. The diluted sample is then thoroughly mixed via repeat inversion, vortexing or rotary platform. A measured aliquot of the analytical sample is then dispensed into either an individual well of a micro-titer plate or a micro-centrifuge tube.
Notes:
   - *Sample volume and concentration can be modified according to the researcher's preference*. The sample dilution and volume are dictated by the biological matrix selected, as well as the concentration of the analyte being targeted. If the analytical sample amount required exceeds the volume of the micro-titer plate or micro-centrifuge tubes described in this protocol, then appropriately sized receptacles may be substituted.
   - *Cycle volume and number of cycle iterations may be modified according to the researcher preference. If the Novus i electronic pipette is used, we recommend starting with speed level 5. The speed of the Novus i pipette cycling can be further optimized by the researcher*. Studies should be performed by researcher to ensure optimal extraction/purification of the targeted analyte by the MSIA-Tips.
   - If the samples are frozen or refrigerated, they must be thawed and/or warmed to at least room temperature before preparation. A 37^{o} C water bath may be employed to expedite this process and ensure consistent sample temperature. The raw sample should also be centrifuged prior to aliquot distribution in order to ensure the removal of any particulates or debris that may be present.
   - If serial dilutions are required to prepare the analytical sample, use the Dilution Buffer for each step and thoroughly mix prior to the next dilution in the same manner as described above.

2. For each Protein A MSIA-Tip used, a well or micro-centrifuge tube of Wash Buffer (200 μL) and two corresponding wells/tubes of water (200 μL per) are also required.

3. The mechanical application of the Protein A MSIA-Tip in sample analyte loading is exactly the same as previously described for the antibody loading. The general workflow of the sample loading is presented in **Table 2**.

Table 2. Sample Analyte Load Workflow

Step	Description	Cycle Volume (µL)	No. Cycle Iterations	Approx. Allotted time per step
1	Wash Buffer	150	10	1 minute
2	Analytical Sample	100-150	≥ 100	≥ 5 minutes
3	Wash Buffer	150	10	1 minute
4	Water	150	10	1 minute
5	Water	150	10	1 minute

Note: The general workflow provided is to serve as a starting point. The rinse steps, number of cycle iterations, etc. can all be tailored to the researcher's application.

4. Once the Protein A MSIA-Tip is loaded with target analyte, it is ready for subsequent elution and any post elution treatment if necessary. Subsequent steps are specific for the application and the analytical detection system selected by researcher.

Procedure for Protein G Antibody Loading

Note: The following information provided in this procedure describes the use of the Protein G MSIA-Tips in single manual pipette application format. The steps described are readily translatable to multi-channel and robotic platform applications, however, they are not described in this section. This procedure is for **general guidance only** and may require further optimization by the researcher.

A. Additional Materials Required

- Thermo Scientific Finnpipette Novus i Electronic Multichannel Pipette and adjustable pipette stand or Thermo Scientific Versette Liquid Handling Platform or the appropriate Beckman liquid handling platform
- 96-well microplate, U bottom, polypropylene (Thermo Scientific Product No. 267334) or 0.6 mL Fisherbrand* Snap-Cap* Flat-Top Graduated Microcentrifuge Tubes (Fisher Scientific Product No. 02-681-257).
- Purified Water
- Dilution Buffer: 10mM MES pH 5 (MES, Fisher Scientific, Product No. BP300-100) containing 0.1% (final concentration) Tween-20 Detergent (Thermo Scientific Product No. TA-125-TW).
- Wash Buffer: Phosphate-buffered saline (PBS, Thermo Scientific Product No. 28372), or Tris-buffered saline (TBS, Thermo Scientific Product No. 28379). All wash buffers prepared also include 0.1% (final concentration) Tween-20 Detergent.

B. Antibody Loading

Notes:

- Diluent/Wash Buffer can be prepared in bulk and stored at 4^{o} C until use. Buffer must be warmed to room temperature prior to use.
- The prepared antibody solution used in the loading phase should be thoroughly mixed in the Buffer by repeat inversion or using a rotating platform. Aggressive agitation of antibody solution will result in the denaturing of the antibody.

1. Prepare the antibody solution for use in loading. The antibody will be prepared in the Dilution Buffer at a final concentration range of 0.01 – 0.1 mg/mL. Add 100 µL of this antibody solution into each well of the micro-titer plate or micro-centrifuge tube. A single well or tube of antibody solution is necessary for each Protein G MSIA-Tip to be loaded.
2. For each Protein G MSIA-Tip to be loaded, a well or micro-centrifuge tube of each Dilution Buffer and Wash Buffer (200 µL) are also required.
   The general workflow for antibody loading is presented in **Table 1**. These are general conditions and should be optimized by the researchers. The pipetting cycle iterations are performed by repetitively aspirating and dispensing (standard pipette mixing action; a cycle = 1 aspiration and 1 dispense) using the listed cycle volumes provided. *The numbers of iterations provided are a general guideline and may require further optimization by the researcher.*

Table 1. Antibody Load Workflow

Steps	Description	Cycle Volume (µL)	No. Cycle Iterations	Approx. Allotted time per step
1	Wash Buffer	150	10	1 minute
2	Antibody Solution	75	250	> 15 minutes
3	Wash Buffer	150	10	1 minute

The workflow is performed by loading the Protein G MSIA-Tip onto a pipette and immersing the open end of the tip into the volume of liquid for each of the Steps provided. Perform each cycle using the normal pipetting action as specified in the pipette user manual. *If the Novus i electronic pipette is used, we recommend starting with speed level 5. The speed of the Novus i pipette cycling can be further optimized by the researcher.*

Note: To maintain proper sample and wash flow through the Protein G MSIA-Tip, ensure that the open end remains completely immersed in the volume of liquid during each step of the workflow. Failure to do so will result in aspiration of air and inconsistency in liquid movement within the tip. Also, do not press the Tip into the bottom of the liquid holding vessel as this will restrict flow.

3. Once the Protein G MSIA-Tip is loaded with antibody, it may be immediately used for analyte purification or stored dry at 4° C for later use. Furthermore, the captured antibody may also be cross-linked to the protein G, following general protocols for cross-linking antibodies to protein G.

C. Sample Analyte Loading

1. The analytical sample of choice is prepared by dispensing a measured aliquot of analyte containing biological matrix into a fixed volume of Wash Buffer. The diluted sample is then thoroughly mixed via repeat inversion, vortexing or rotary platform. A measured aliquot of the analytical sample is then dispensed into either an individual well of a micro-titer plate or a micro-centrifuge tube.

Notes:

- *Sample volume and concentration may be modified according to the researcher preference*. The sample dilution and volume are dictated by the biological matrix selected, as well as the concentration of the analyte being targeted. If the analytical sample amount required exceeds the volume of the micro-titer plate or micro-centrifuge tubes described in this protocol, then appropriately sized receptacles may be substituted.
- *Cycle volume and number of cycle iterations may be modified according to the researcher preference. If the Novus i electronic pipette is used, we recommend starting with speed level 5. The speed of the Novus i pipette cycling can be further optimized by the researcher*. Studies should be performed by researcher to ensure optimal extraction/purification of the targeted analyte by the MSIA-Tips.
- If the samples are frozen or refrigerated, they must be thawed and/or warmed to at least room temperature before preparation. A 37^{o} C water bath may be employed to expedite this process and ensure consistent sample temperature. The raw sample should also be centrifuged prior to aliquot distribution in order to ensure the removal of any particulates or debris that may be present.
- If serial dilutions are required to prepare the analytical sample, use the Wash Buffer for each step and thoroughly mix prior to the next dilution in the same manner as described above.

2. For each Protein G MSIA-Tip used, a well or micro-centrifuge tube of Wash Buffer (200 µL) and two corresponding wells/tubes of water (200 µL per) are also required.
3. The mechanical application of the Protein G MSIA-Tip in sample analyte loading is exactly the same as previously described for the antibody loading. The general workflow of the sample loading is presented in **Table 2**.

Table 2. Sample Analyte Load Workflow

Steps	Description	Cycle Volume (µL)	No. Cycle Iterations	Approx. Allotted time per step
1	Wash Buffer	150	10	1 minute
2	Analytical Sample	100-150	≥ 100	≥ 5 minutes
3	Wash Buffer	150	10	1 minute
4	Water	150	10	1 minute
5	Water	150	10	1 minute

Note: The general workflow provided is to serve as a starting point. The rinse steps, number of cycle iterations, etc. can all be tailored to the researcher application.

4. Once the Protein G MSIA-Tip is loaded with target analyte, it is ready for subsequent elution and any post elution treatment if necessary. Subsequent steps are specific for the application and the analytical detection system selected by researcher.

Procedure for Protein A/G Antibody Loading

Note: The following information provided in this procedure describes the use of the Protein A/G MSIA-Tips in single manual pipette application format. The steps described are readily translatable to multi-channel and robotic platform applications, however, they are not described in this section. This procedure is for **general guidance only** and may require further optimization by the researcher.

A. Additional Materials Required

- Thermo Scientific Finnpipette Novus i Electronic Multichannel Pipette and adjustable pipette stand or Thermo Scientific Versette Liquid Handling Platform or the appropriate Beckman liquid handling platform
- 96-well microplate, U bottom, polypropylene (Thermo Scientific Product No. 267334) or 0.6 mL Fisherbrand* Snap-Cap* Flat-Top Graduated Microcentrifuge Tubes (Fisher Scientific Product No. 02-681-257).
- Purified Water
- Dilution Buffer: 10mM MES pH 5 (MES, Fisher Scientific, Product No. BP300-100) containing 0.1% (final concentration) Tween-20 Detergent (Thermo Scientific Product No. TA-125-TW).
- Wash Buffer: Phosphate-buffered saline (PBS, Thermo Scientific Product No. 28372), or Tris-buffered saline (TBS, Thermo Scientific Product No. 28379). All wash buffers prepared also include 0.1% (final concentration) Tween-20 Detergent.

B. Antibody Loading

Notes:

- Diluent/Wash Buffer can be prepared in bulk and stored at 4^{o} C until use. Buffer must be warmed to room temperature prior to use.
- The prepared antibody solution used in the loading phase should be thoroughly mixed in the Buffer by repeat inversion or using a rotating platform. Aggressive agitation of antibody solution will result in the denaturing of the antibody.

1. Prepare the antibody solution for use in loading. The antibody should be prepared in the Dilution Buffer at a final concentration range of 0.01 – 0.1 mg/mL. Add 100 µL of this antibody solution into each well of the micro-titer plate or micro-centrifuge tube. A single well or tube of antibody solution is necessary for each Protein A/G MSIA-Tips to be loaded.
2. For each Protein A/G MSIATips to be loaded, a well or micro-centrifuge tube of Wash Buffer (200 µL) is also required.
3. The general workflow for antibody loading is presented in **Table 1**. These are general conditions and should be optimized by the researchers. The pipetting cycle iterations are performed by repetitively aspirating and dispensing (standard pipette mixing action; a cycle = 1 aspiration and 1 dispense) using the listed cycle volumes provided. *The numbers of iterations provided are a general guideline and may require further optimization by the researcher.*

Table 1. Antibody Load Workflow

Steps	Description	Cycle Volume (µL)	No. Cycle Iterations	Approx. Allotted time per step
1	Wash Buffer	150	10	1 minute
2	Antibody Solution	75	250	> 15 minutes
3	Wash Buffer	150	10	1 minute

The workflow is performed by loading the Protein A/G MSIA-Tips onto a pipette and immersing the open end of the tip into the volume of liquid for each of the Steps provided. Perform each cycle using the normal pipetting action as specified in the pipette user manual. *If the Novus i electronic pipette is used, we recommend starting with speed level 5. The speed of the Novus i pipette cycling can be further optimized by the researcher.*

Note: To maintain proper sample and wash flow through the Protein A/G MSIA-Tips, ensure that the open end remains completely immersed in the volume of liquid during each step of the workflow. Failure to do so will result in aspiration of air and inconsistency in liquid movement within the tip. Also, do not press the Tip into the bottom of the liquid holding vessel as this will restrict flow.

4. Once the Protein A/G MSIA-Tip is loaded with antibody, it may be immediately used for analyte purification or stored dry at 4° C for later use. Furthermore, the captured antibody may also be cross-linked to the protein A/G, following general protocols for cross-linking antibodies to protein A/G.

C. Sample Analyte Loading

1. The analytical sample of choice is prepared by dispensing a measured aliquot of analyte containing biological matrix into a fixed volume of Dilution Buffer. The diluted sample is then thoroughly mixed via repeat inversion, vortexing or rotary platform. A measured aliquot of the analytical sample is then dispensed into either an individual well of a micro-titer plate or a micro-centrifuge tube.

   Notes:

   - *Sample volume and concentration may be modified according to the researcher preference*. The sample dilution and volume are dictated by the biological matrix selected, as well as the concentration of the analyte being targeted. If the analytical sample amount required exceeds the volume of the micro-titer plate or micro-centrifuge tubes described in this protocol, then appropriately sized receptacles may be substituted.
   - *Cycle volume and number of cycle iterations may be modified according to the researcher preference. If the Novus i electronic pipette is used, we recommend starting with speed level 5. The speed of the Novus i pipette cycling can be further optimized by the researcher.* Studies should be performed by researcher to ensure optimal extraction/purification of the targeted analyte by the MSIA-Tips.
   - If the samples are frozen or refrigerated, they must be thawed and/or warmed to at least room temperature before preparation. A 37° C water bath may be employed to expedite this process and ensure consistent sample temperature. The raw sample should also be centrifuged prior to aliquot distribution in order to ensure the removal of any particulates or debris that may be present.
   - If serial dilutions are required to prepare the analytical sample, use the Dilution Buffer for each step and thoroughly mix prior to the next dilution in the same manner as described above.

2. For each Protein A/G MSIA-Tips used, two wells or micro-centrifuge tubes of Wash Buffer (200 μL) and two corresponding wells/tubes of water (200 μL per) are also required.
3. The mechanical application of the Protein A/G MSIA-Tips in sample analyte loading is exactly the same as previously described for the antibody loading. The general workflow of the sample loading is presented in **Table 2**.

Table 2. Sample Analyte Load Workflow

Steps	Description	Cycle Volume (μL)	No. Cycle Iterations	Approx. Allotted time per step
1	Wash Buffer	150	10	1 minute
2	Analytical Sample	100-150	≥ 100	≥ 5 minutes
3	Wash Buffer	150	10	1 minute
4	Water	150	10	1 minute
5	Water	150	10	1 minute

Note: The general workflow provided is to serve as a starting point. The rinse steps, number of cycle iterations, etc. can all be tailored to the researcher application.

4. Once the Protein A/G MSIA-Tips are loaded with target analyte, it is ready for subsequent elution and any post elution treatment if necessary. Subsequent steps are specific for the application and the analytical detection system selected by researcher.

Additional Information

Visit the www.thermoscientific.com/msia for additional information and application notes relating to this product.

Visit www.thermoscientific.com/pierce for information specifically related to the Protein A, G, and A/G:

- Tech Tip #34: Binding Characteristics of Immunoglobulins and Protein L, A, G and A/G

Product stable for one year from date of sale, when handled and stored according to Manufacturer instructions, see details under **Warranty**.

The most current versions of all MSIA product instructions are available at www.thermoscientific.com/msia. For a copy, please go to www.thermoscientific.com or your local distributor.

MSIA related Thermo Scientific Products

MSIA D.A.R.T.'S Pipette Tips		
Compatible with the Versette Automated Liquid Platform, Finnpipette Novus i Multichannel Electronic Pipettes (for immuno-precipitation), also with select Eppendorf®, Biohit® and Hamilton® Multichannel Pipettes.		
Cat. No.	*Description*	*Packaging*
991PRT11	300 µl MSIA D.A.R.T.'S, Protein A	Pack of 96 tips
991PRT12	300 µl MSIA D.A.R.T.'S, Protein A	Pack of 24 tips
991PRT13	300 µl MSIA D.A.R.T.'S, Protein G	Pack of 96 tips
991PRT14	300 µl MSIA D.A.R.T.'S, Protein G	Pack of 24 tips
991PRT15	300 µl MSIA D.A.R.T.'S, Protein A/G	Pack of 96 tips
991PRT16	300 µl MSIA D.A.R.T.'S, Protein A/G	Pack of 24 tips
991CUS02	300 µl MSIA D.A.R.T.'S, Custom	Pack of 96 tips
991R	300 µl MSIA D.A.R.T.'S, Reloadable Rack	1 reloadable rack, tips are not

Automated Liquid Handling Platform and Pipetting Head	
Cat. No.	*Description*
650-01-BS	Versette Base Unit Stage, Head Housing and Pipetting Head Required for Use
650-02-NTC	96- and 384-Channel Housing Assembly. For Use with 96- and 384-Channel Pipetting Heads
650-03-SPS	6-Position Stage, Guarding Included
650-06-96300	96-Channel Air Displacement Pipetting Head. Volume 5-300 µl
650-04-PUMP	Pump Module Optional Accessory, Used for Tip Washing/Reagent Replenishing
650-05-96TTW	96-Channel Tip Wash Station, Tall, Optional Accessory
650-08-96300SD	Serial Dilute Magazine 96/300 µl (8/12)

Multichannel Pipettes and Pipette Stand		
Cat. No.	*Description*	*Quantity*
46302000	Finnpipette Novus i Electronic 8-Channel Pipette, 20-300 µl (for immuno-precipitation)	1 pipette
46302100	Finnpipette Novus i Electronic 12-Channel Pipette, 20-300 µl (for immuno-precipitation)	1 pipette
991S	Finnpipette Novus i Adjustable Pipette Stand (for immuno-precipitation)	1 pipette stand
991SP8	Finnpipette Novus i Electronic 8-Channel Pipette, 20-300 µl and Pipette Stand (for immuno-precipitation)	1 pipette and stand
991SP12	Finnpipette Novus i Electronic 12-Channel Pipette, 20-300 µl and Pipette Stand (for immuno-precipitation)	1 pipette and stand

Liquid Chromatography
Description
UltiMate 3000 RSLCnano Systems
Mass Spectrometry and Software

Mass Spectrometer and Software
Description
TSQ Vantage Triple Stage Quadrupole Mass Spectrometer
Pinpoint Software
Q Exactive Hybrid Quadrupole-Orbitrap Mass Spectrometer

Warranty: Sellers warrants that the Products will operate or perform substantially in conformance with Seller's published specifications and be free from defects in material and workmanship, when subjected to normal, proper and intended usage by properly trained personnel, for the period of time set forth in the product documentation, published specifications or page insert. If a period of time is not specified in Seller's product documentation, published specifications or package inserts, the warranty period shall be one (1) year from the date of shipment to Buyer for equipment and ninety (90) days for all other products (the "Warranty Period"). Seller agrees the Warranty Period, to repair or replace at Seller's option, defective Products so as to cause the same to operate in substantial conformance with said published specifications, provided that Buyer shall (a) promptly notify Seller in writing upon the discovery of any defect, which notice shall include the product model and serial number (if applicable) and details of the warranty claim, and (b) after Seller's review. Seller will provide Buyer with service data and/or a Return Material Authorization ("RMA"), which may include biohazard decontamination procedures and other product-specific handling instructions, then, if applicable, Buyer may return the effective Products to Seller with all costs prepaid by Buyer. Replacement parts may be new or refurbished at the election of Seller. All replaced parts shall become the property of Seller. Shipment to Buyer repaired or replacement Products shall be made in accordance with the Delivery provisions of the Seller's Term and Conditions of Sale. Consumables are expressly excluded this warranty.

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North America: +1 800 995 2787 • infosandiego@thermofisher.com
Outside North America: +1 858 453 7551 • info.sandiego@thermofisher.com

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