



USER HANDBOOK

Version C (August 2012)

DIFFINITY RapidTip[®]2

For PCR Purification with
Polymerase Removal

User Notice:

For optimal purification results, sharply tap the RapidTip2 package 2–3 times on a flat surface so that the particles drop to the bottom of the tips.

Diffinity
Genomics[®]

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Kit Contents

Diffinity RapidTip2s can be used with universal or Rainin LTS style pipettes. All kits come with a user handbook.

| Cat Number | Product Description | Contents |
|--------------------------|--|------------------------|
| RR050-008 RR050-008L* | Diffinity RapidTip2 for PCR Purification with Polymerase Removal | 1 Pack of 8 RapidTip2s |
| RR050-048 RR050-048L* | Diffinity RapidTip2 for PCR Purification with Polymerase Removal | 1 Box of 48 RapidTip2s |
| RR050-096 RR050-096L* | Diffinity RapidTip2 for PCR Purification with Polymerase Removal | 1 Box of 96 RapidTip2s |

* L — denotes Rainin LTS format pipette tips.

Storage

Diffinity RapidTip2s should be stored in low humidity at room temperature (15–25 degrees Celsius). Under these conditions, Diffinity RapidTip2s can be stored and used for up to 12 months without reduction in performance or quality. An expiration date is on the label of the 48 and 96 tip boxes.

Product Use Limitations

Diffinity RapidTip2s are intended for research use only. Diffinity RapidTip2 is designed for purification of 50 μ l PCR solutions prior to dideoxy (BigDye) reaction for Sanger Sequencing, restriction digestion, or T-A cloning. RapidTip2 is compatible with most universal and Rainin LTS pipettors. RapidTip2 is not compatible with detergents, mineral oil, or ready-to-load style PCR master mixes that contain a density-increasing compound.

Product Warranty and Satisfaction Guarantee

Diffinity Genomics will guarantee the performance of Diffinity RapidTip2s for the uses and performance as described in our product literature. If the product fails to perform to your satisfaction for any reason other than misuse, we will replace the product free of charge or refund the purchase price — whichever you choose. Diffinity Genomics maintains the right to update or modify the product to enhance its performance. A copy of our terms and conditions can be found on our web site.

If you have questions about the product or its performance, please contact Diffinity Genomics customer service at 1-877-362-1812.

Quality Control

Each lot of Diffinity RapidTip2s is tested against predetermined specifications to ensure consistent quality.

Technical Assistance

Call 1-877-362-1812 between 8am and 4pm Eastern Time Monday through Friday or visit www.diffinitygenomics.com for help with common questions.

Safety Information (Disposal)

Diffinity RapidTip2s may be disposed in regular lab trash. For more information, please consult the material safety data sheet (MSDS) available on request by calling Customer Service at 1-877-362-1812.

Product Specifications

| | |
|--|---|
| Capacity: PCR Sample Size | 50 ±5 microliters |
| dsDNA Recovery | up to 90% (100bp to 10Kb) |
| Impurity Removal (dNTP, primers, primer-dimers) | up to 90% (less than 40–50 bp) |
| DNA Polymerase removal (Taq, Hot-Start, High-Fidelity) | up to 1:1000 dilution with no measurable amplification activity |

Diffinity RapidTip2 tips are designed to remove dNTPs, primers, primer-dimers, and DNA polymerase at typical PCR concentrations.

Introduction

Diffinity Genomics has developed an innovative new technology that removes undesirable impurities from PCR reactions leaving you with nothing but purified DNA!

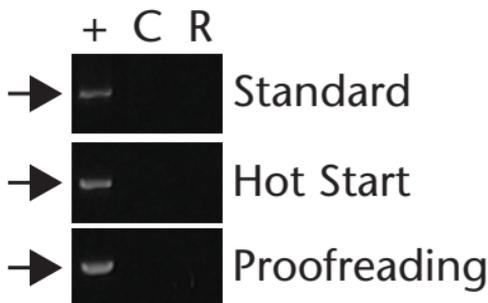
This revolutionary technology effectively removes dNTPs, primers, primer-dimers, and DNA polymerase while providing up to 90% recovery of pure DNA fragments ranging in length from 100bp to 10Kb. It dramatically reduces the amount of time to purify and prepare PCR reactions for use in downstream applications, such as Sanger sequencing, restriction digestion, and/or T-A cloning.

The RapidTip family of tips for PCR purification require just one-tip, one-step, and one-minute for PCR purification!

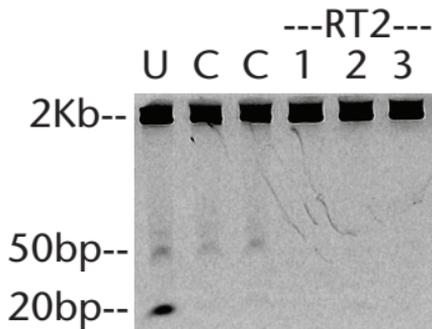
Diffinity™ Technology Principle

The Diffinity RapidTip2 contains everything you need for PCR purification. The tip is filled with our proprietary adsorption technology, which has a differential affinity for PCR reaction components. The impurities are removed from the solution as it enters the pipette tip. Dispensing the solution yields purified, high quality DNA ready to use for downstream applications. You won't need additional equipment, reagents, buffers, or enzymes — only a pipettor!

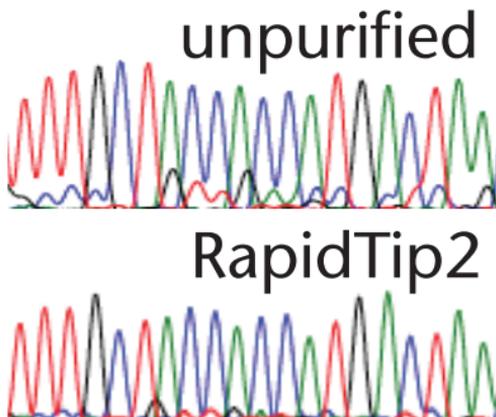
Diffinity RapidTip2 purifies PCR solutions and removes DNA polymerase comparably to popular spin column methods. The positive control (+) contains polymerase and all PCR reagents but did not undergo purification and therefore has a 600bp band. The control purification (C) and RapidTip2 purification (R) do not have bands showing that polymerase was removed during purification.



Diffinity RapidTip2 effectively removes dNTPs (not visible on gel), primers (20bp), and primer-dimers (50bp). The PCR product was divided and purified with either competitor's products (C) or RapidTip2 (RT2: 1, 2, 3). RapidTip2 has high yield: the PCR amplicon (2Kb) shows no loss of band intensity after purification.



Diffinity RapidTip2 purification improves sequence quality. Sequence chromatograms show improved peak quality and lower background in Diffinity RapidTip2 purified samples as compared to unpurified samples.



Equipment to be Supplied by User

- PCR Sample (50 μl \pm 5 μl)
- Tubes to store purified DNA
- Pipettor — P100/P200 manual or programmable
- Standard pipette tips for liquid transfer (if necessary)

Guidelines — Pipetting with the RapidTip2

Careful pipetting is important to achieve effective purification with the RapidTip2. The following pipetting guidelines will help ensure optimal results:

1. Pre-wet the particles

On the first aspirate step, aspirate approximately the first half of the sample and pause 5 seconds to ensure complete wetting of the particles before mixing. Then aspirate the rest of the sample and dispense.

2. Mix effectively

For effective mixing, it is important that the particles remain in contact with the sample during each aspirate and dispense cycle.

Aspirate slowly for the first several cycles until the particles are completely dispersed into the PCR sample.

Avoid long delays between successive aspirate and dispense cycles that allow the particles to settle out of solution for more than 1–2 seconds.

3. Maintain tip-to-sample contact

During aspiration, maintain continuous contact between the end of the pipette tip and your sample to avoid aspirating air bubbles in the sample.

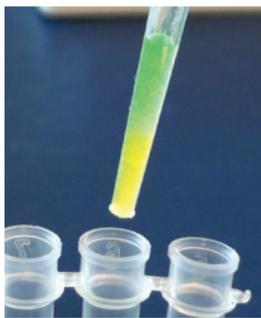
4. Maintain tip-to-well clearance

Maintain clearance between the end of the pipette tip and the bottom of the sample tube or well to avoid plugging the tip during mixing.

5. Recovering from particle detachment

If particles become detached from the sample, gently “flick” the pipettor downward to bring them back into contact with the sample and proceed with mixing.

Pipetting Examples



A. Correct mixing:
Sample and particles
mixing well.



B. Incorrect mixing:
Particles separated by
air bubble.

Please note that typical PCR samples are colorless — for visualization, yellow dye was used.

To correct **B** and to improve performance, gently “flick” the pipettor downward to bring all particles and the sample back together, then proceed with mixing.

RapidTip2 PCR Purification Protocols

Prepare Samples:

Diffinity RapidTip2 is optimized for 50 μl reaction volumes but can effectively purify samples from 45–55 μl .

- For PCR volumes $>55 \mu\text{l}$, please aliquot 50 μl into a new tube for purification.
- For PCR volumes $<45 \mu\text{l}$, please dilute to 50 μl . This works best with highly concentrated DNA samples ($>50 \text{ ng}/\mu\text{l}$) as your sample concentration will be reduced.

Prepare Tips:

Diffinity RapidTip2 for PCR Purification contains proprietary particles that purify a PCR reaction; these particles can adhere to the pipette tip walls during shipping. For optimal results, sharply tap the box 2–3 times on a flat surface so that particles are at the bottom of the tips (near the nozzle).

Please note that it is normal to see fine dust-like particles on the side of the tip. After tapping the box, you should expect to see about 3mm of white particles above the retainer at the small end of the pipette tip.

Purify Samples:

1. Program pipettor to aspirate 60 μl .
2. Place Diffinity RapidTip2 on pipettor — single or multichannel.

Please note that you can use a multi-channel pipettor to mix more than 1 sample at a time for even higher productivity.

3. Place pipette tip into 50 μ l PCR solution.
4. Pre-wet the particles on first aspirate (see page 10).

Aspirate about half the sample and then pause for 5 seconds to ensure complete wetting of the particles before mixing. Aspirate the rest of the sample and then dispense.

5. Set timer and mix for 60 seconds (approximately 15 aspirate/dispense cycles).

Please note that pipetting will be slower than normal — wait for liquid to completely fill the tip to begin the next mix. It is not necessary to drive liquid completely out of the tip on every dispense. The particles should mix completely with the solution and make it appear cloudy while inside the tip. Tip should be close to but not touching the bottom of the well throughout mixing.

6. Dispense all solution into a clean tube when mixing is complete. Use your pipettor's blowout mode for maximum liquid recovery.

Your purified PCR Amplicon is now ready for your downstream application.

Quantifying DNA Recovery

If you wish to confirm purification, run unpurified and purified sample in adjacent lanes on a gel to confirm the amplicon band. To estimate percent recovery, analyses of the samples pre and post-purification are necessary. For this process, we recommend either a PicoGreen[®]2 type assay or visualization on agarose gel.

Troubleshooting Guide

| Problem | Things to try: |
|--------------------------------|--|
| Low DNA recovery | <p>Run some of the untreated and RapidTip2 purified PCR on a gel to check your amplicon band intensity.</p> <p><i>Note: Purify at least 45 μl of your PCR reaction to optimize DNA recovery.</i></p> |
| Slow or difficult aspiration | <p>Check that pipettor volume is 60 μl. Check that tips are firmly attached to the pipettor. Make sure that pipette tip isn't jammed against the bottom of the well.</p> <p><i>Note: Diffinity RapidTip2 is incompatible with detergents, mineral oil, and ready-to-load PCR mixes that contain density increasing compounds.</i></p> |
| Fluid remains in the RapidTip2 | <p>It's normal for a small amount of liquid (~10 μl) to remain inside the Diffinity RapidTip2.</p> <p><i>Note: Overdispense or blowout all fluid on the last dispense cycle.</i></p> |
| Failure to remove impurities | <p>Verify that particles are at the bottom of the tip prior to sample treatment; the pipettor is operating at the proper (slow) speed settings; and that particles are effectively mixing with the sample during pipetting.</p> <p><i>Note: Remove trapped air bubbles by gently "flicking" the pipettor downward for additional aspirate/dispense cycles.</i></p> |

Visit www.diffinitygenomics.com/FAQs.asp for additional information.

Ordering Information

You can place an order by:

1. Contacting one of our distributors worldwide. For a complete list, visit our website.
2. Call Diffinity Genomics Customer Service and place the order by phone: **+1-877-362-1812**
3. Visit our website and place an order online via the online Diffinity store: **www.diffinitygenomics.com/order.asp**

For more information, please visit our website:

www.diffinitygenomics.com

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Diffinity Genomics, Inc.
150 Lucius Gordon Drive, West Henrietta, NY 14586

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