

# Hamilton Syringe and Needle Assembly Guide

Thank you for choosing a Hamilton Company needle product. We combine the highest quality materials with skilled craftsmanship, ensuring the highest possible performance of every precision fluid device we manufacture. With proper care and handling, the Hamilton needles will provide years of use.

**Hamilton syringes and needles are intended for scientific research and laboratory use only and are not intended for human *in vivo* use.**

## Featured in This Guide

Metal Hub Needle Assembly .....	1
Kel-F Hub Needle Assembly .....	2
Removable Needle Assembly .....	3
Troubleshooting .....	4
Syringe and Needle Cleaning Instructions .....	4
Warranty Statement and Return Policy .....	5

## Hamilton Metal Hub (N) Needle Assembly

The Metal Hub needles are compatible with Hamilton PTFE Luer Lock (TLL) syringes and are available in 10 to 33 gauge. These needles conform to the ANSI standard for Luer connections and are compatible with male Luer connections manufactured to this standard.

Hamilton's needle hub is engineered to minimize the amount of dead volume trapped in the hub. The average amount of liquid trapped is approximately 10  $\mu\text{L}$  which is much less than the 70+  $\mu\text{L}$  that are trapped by other hub designs. Even with minimal dead volume, users should be aware that priming a 25  $\mu\text{L}$  syringe with this type of needle can be difficult.

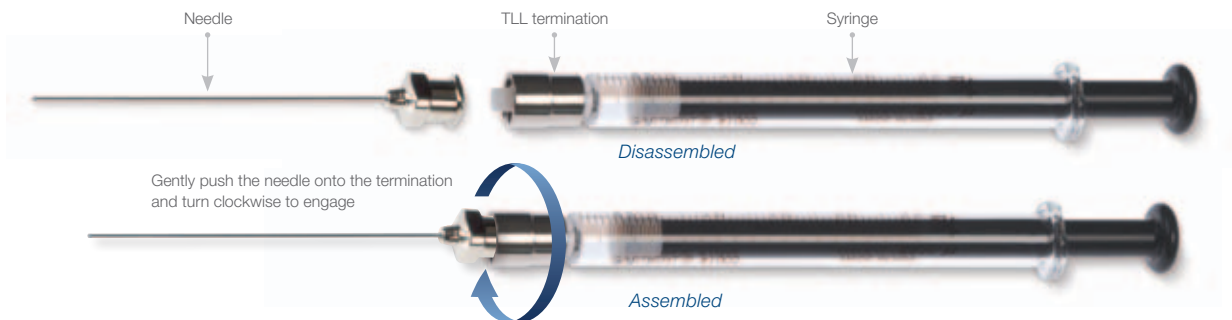
To ensure that small gauge needles do not clog during shipping, a cleaning wire is shipped in all 27 to 33 gauge needles. These cleaning wires must be gently removed prior to assembly.

### Assembling a Metal Hub Needle onto a TLL Syringe

1. If using a small gauge needle (27–33), remove the cleaning wire.
2. Attach the Metal Hub needle onto a TLL syringe by gently pressing the needle onto the syringe's Luer Lock termination and rotate clockwise to engage the locking threads.

**Important:** Metal Hub needles are not compatible with Hamilton Luer Tip syringes. The metal to glass interface does not create a reliable seal and results in leaks at the needle syringe connection.

Figure 1. Assembly of Metal Hub Needle onto TLL Syringe



# Hamilton Kel-F (KF) Hub Needle Assembly

The Kel-F Hub needles are compatible with Hamilton products including PTFE Luer Lock (TLL) and Luer Tip (LT) syringes and are available in 10 to 31 gauge. These needles conform to the ANSI standard for Luer connection and are compatible with male Luer connections manufactured to this standard.

Hamilton's needle hub is engineered to minimize the amount of dead volume trapped in the hub. The average amount of liquid trapped is approximately 10  $\mu\text{L}$  which is much less than the 70+  $\mu\text{L}$  that are trapped by other hub designs. Even with minimal dead volume, users should be aware that priming 10 and 25  $\mu\text{L}$  syringes with this type of needle can be difficult.

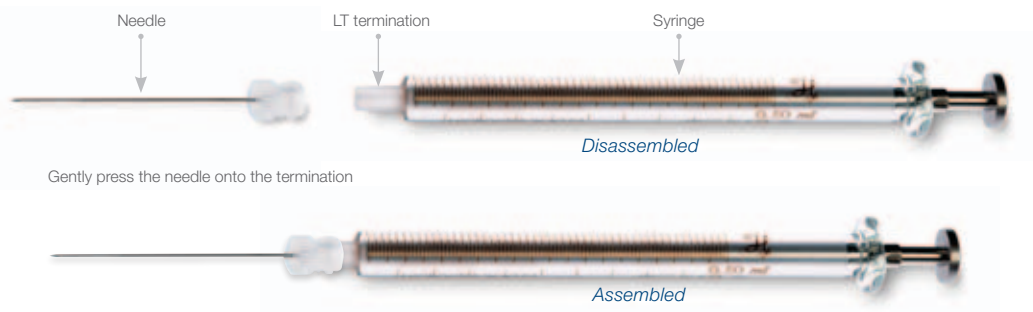
To ensure that small gauge needles do not clog during shipping a cleaning wire is shipped in all 27 to 33 gauge needles. These cleaning wires must be gently removed prior to assembly.

## Assembling a Kel-F Hub Needle onto a TLL or LT Syringe

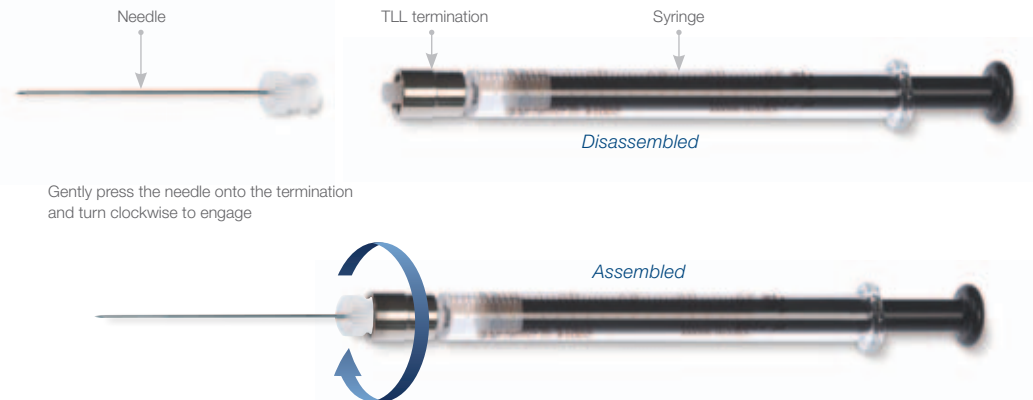
1. If using a small gauge needle (27–33), remove the cleaning wire.
2. Attach the needle to the syringe. To attach a Kel-F needle onto an LT syringe, gently press the needle onto the Luer. To attach a Kel-F needle onto a TLL syringe, gently press the needle onto the syringe's Luer Lock termination and rotate clockwise to engage the locking threads.

Figure 2. Assembly of Kel-F Needles onto LT and TLL Syringes

### LT Syringe



### TLL Syringe



# Hamilton Removable Needle (RN) Assembly

There are two types of removable needles, small hub and large hub. The small hub removable needles are compatible with syringe volumes ranging from 2.5  $\mu\text{L}$  to 100  $\mu\text{L}$ , and are available in 18 to 34 gauge. The large hub removable needles are compatible with syringe volumes from 250  $\mu\text{L}$  to 10 mL, and are available in 20 to 26s gauge.

The removable needle is secured to the syringe by tightening the RN nut. A small plastic ferrule is squeezed between the needle hub and the glass syringe barrel to create a leak free seal. For most removable needles the needle hub is made from stainless steel and the plastic seal is made from PTFE. For small gauge needles from 27 to 34 gauge, a one piece plastic (CTFE) ferrule is used. To ensure that small gauge needles do not clog during shipping a cleaning wire is shipped in all 27 to 33 gauge needles. These cleaning wires must be gently removed prior to assembly.

**Note:** Thirty-four gauge needles should only be used with Hamilton Gastight<sup>®</sup> syringes. An air tight plunger is desirable to create enough vacuum to draw liquid through the fine gauge needle.

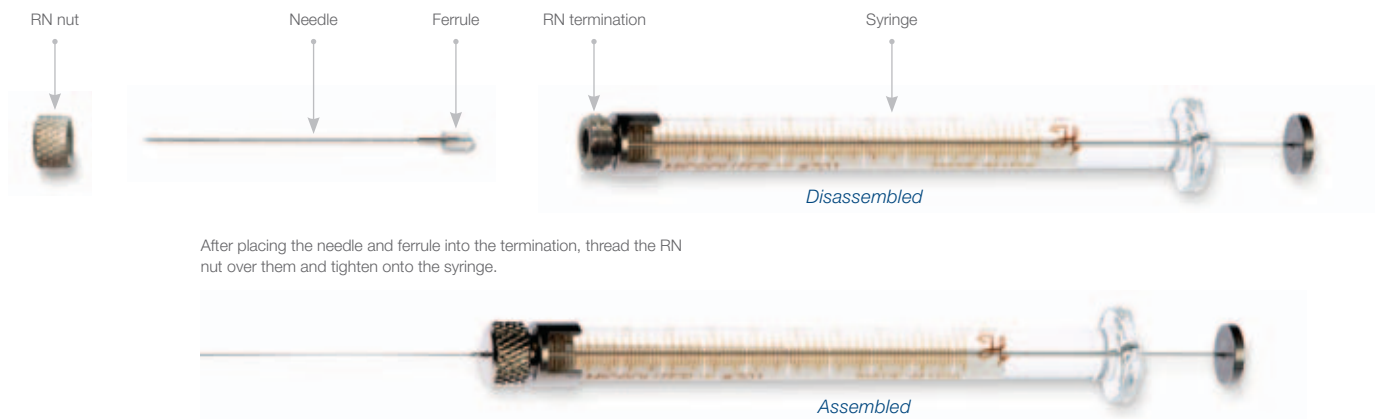
Figure 3. Needles and Ferrules



## Assembling an RN Syringe and Needle

1. If using a small gauge needle (27-33), remove the cleaning wire. This is done by gently straightening the wire and pulling by hand or with pliers.
2. Remove the RN nut from the syringe.
3. If your syringe has an existing needle, gently remove by pulling out the needle. Ensure that the plastic ferrule does not remain in the syringe.
4. Place the new needle and ferrule into the RN syringe termination.
5. Gently thread the RN nut over the needle and tighten onto the syringe.

Figure 4. Final Assembly of Removable Needle onto RN Syringe



## Troubleshooting Tips

Problem	Possible Causes	Corrective Action
The ferrule is stuck in the hub of my Removable Needle (RN) syringe	Continuous use often causes the ferrule to nest into syringe hub	Reinsert the needle into the hub, cock the needle to the side, and slowly remove the ferrule
My Removable Needle (RN) syringe is leaking from the needle connection	RN nut is not tightened enough	Makes sure the RN nut is finger-tight
	The cleaning wire was not removed from the needle	Remove the cleaning wire
	Small hub needle is being used on a large hub syringe	Make sure the appropriate syringe volume is used with the needle gauge
My Metal Hub (N) needle is leaking on my syringe	Metal Hub needles are not compatible with glass LT syringes	Switch to a TLL terminated syringe
	Needle not pressed onto the hub firmly	Make sure the needle is secured onto the syringe
	Cleaning wire is inside the needle	Remove the cleaning wire
	There is debris in the needle	Use a cleaning wire to remove the debris
Needle is not aspirating	The dead volume in the needle is greater than the volume of the syringe	Change to an RN hub needle or a needle with a smaller inner diameter
	The gauge of the needle is so small it is restricting the flow	Choose a larger gauge needle

## Hamilton Syringe and Needle Cleaning Instructions

After performing an application, it is important to clean your syringes and needles. Proper care and maintenance optimizes product lifespan and value.

It is recommended to use a solvent that is known to solubilize the sample that was used in the syringe. Hamilton offers a detergent based Cleaning Solution Concentrate (p/n 18311) to clean syringes and needles.

The Needle Cleaning Kit (p/n 76620A) is also recommended to clean needles. This kit includes tungsten wires with various diameters and Hamilton Cleaning Solution Concentrate.

The cleaning wires help to remove debris left inside the needle.

### Syringe Cleaning Instructions

1. Rinse the syringe by filling and dispensing approximately 10 times with a solvent that is known to solubilize the sample used in the syringe.
2. Rinse the syringe with deionized water by filling and dispensing 10 times.
3. Perform a final rinse with acetone or alcohol by filling and dispensing 10 times. This helps to dry the syringe internally and prepares it for storage and the next use.



## Needle Cleaning Instructions

1. Select the cleaning wire whose size corresponds to your needle.
2. Gently thread the cleaning wire through the needle using a pair of pliers. If an obstruction stops the movement of the cleaning wire, select a smaller size wire. Avoid bending the wire.
3. Repeat until the obstruction is gone or the needle is thoroughly cleaned.

**Warning:** Use caution when handling needles and avoid bending, contamination or personal injury.

## Hamilton Syringe Cleaner

The Syringe Cleaner is designed to clean 7000 Series Modified Microliter™ syringes. The cleaner heats the needle to (370 °C) and allows for the addition of a vacuum source (0.1 mm mercury) to vaporize residual sample in the syringe. A rheostat can be added to the Syringe Cleaner to reduce the cleaning temperature so it can be used to clean Cemented, Removable Needle, Metal Hub and Kel-F Hub needles.

Description	Part Number
Needle Cleaning Kit*	76620A
Hamilton Cleaning Solution Concentrate	18311
Syringe Cleaner 120V	76610
Syringe Cleaner 220V	76615

\*Includes 70 mL bottle Cleaning Solution Concentrate, 6 different 10 packs of cleaning wires

## Warranty Statement

Hamilton Company unconditionally guarantees its products to be free of defects in materials and workmanship. Any product that fails due to such a defect will be repaired or replaced at our discretion without cost, provided the device is returned on a Return Materials Authorization (RMA). It is the responsibility of the purchaser to determine the suitability of application and material compatibility of the product based on the published specifications of the product. To initiate a warranty claim, contact Hamilton Company using the information at the conclusion of this document.

## Return Policy

Hamilton Company's return and repair policy is written to protect its employees from potentially hazardous materials (e.g., serum, radioactive materials, carcinogenic chemicals) or any substance that may cause them partial or permanent disability during the inspection or repair process. In returning a product, the customer acknowledges that the product is free from any hazardous materials. Furthermore, the customer assumes responsibility should the returned product prove to be hazardous. To initiate a return, contact Hamilton Company using the information at the conclusion of this document.

© 2012 Hamilton Company. All rights reserved.  
All trademarks are owned and/or registered by Hamilton Company in the U.S. and/or other countries.  
Lit. No. L20079

# HAMILTON

Web: [www.hamiltoncompany.com](http://www.hamiltoncompany.com)

USA: 800-648-5950

Europe: +41-81-660-60-60

### Hamilton Americas & Pacific Rim

4970 Energy Way  
Reno, Nevada 89502 USA  
Tel: +1-775-858-3000  
Fax: +1-775-856-7259  
[sales@hamiltoncompany.com](mailto:sales@hamiltoncompany.com)

### Hamilton Europe, Asia, & Africa

Via Crusch 8  
CH-7402 Bonaduz, GR, Switzerland  
Tel: +41-81-660-60-60  
Fax: +41-81-660-60-70  
[contact@hamilton.ch](mailto:contact@hamilton.ch)

To find a representative in your area, please visit [hamiltoncompany.com/contacts](http://hamiltoncompany.com/contacts).