

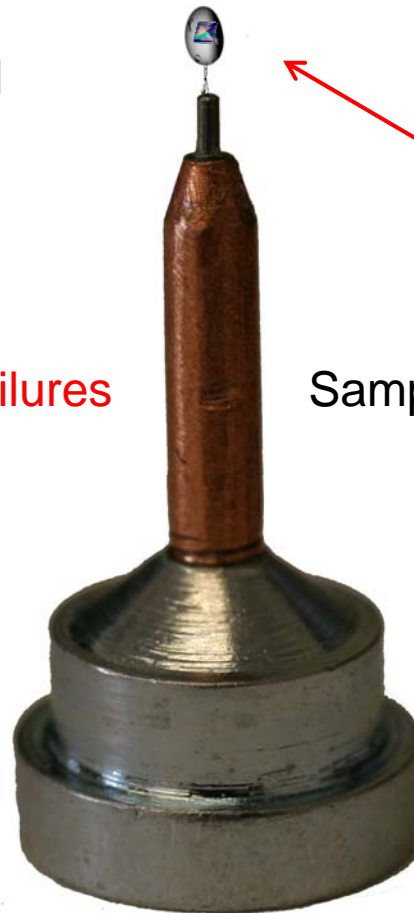
# How to Avoid Problems with SAM

The majority of problems we have observed with automated sample mounting have been related to the use of improper sample pins.

Improper Pins → Hardware Failures

Sample Icing → Loss of Data Quality

See the sample pin preparation directions



See the cassette directions

See the uni-puck directions

Another common problem is ice accumulation on the samples from improper cassette loading.

# How to Ship Samples to SSRL

Two types of containers may be used for automated sample mounting at SSRL:

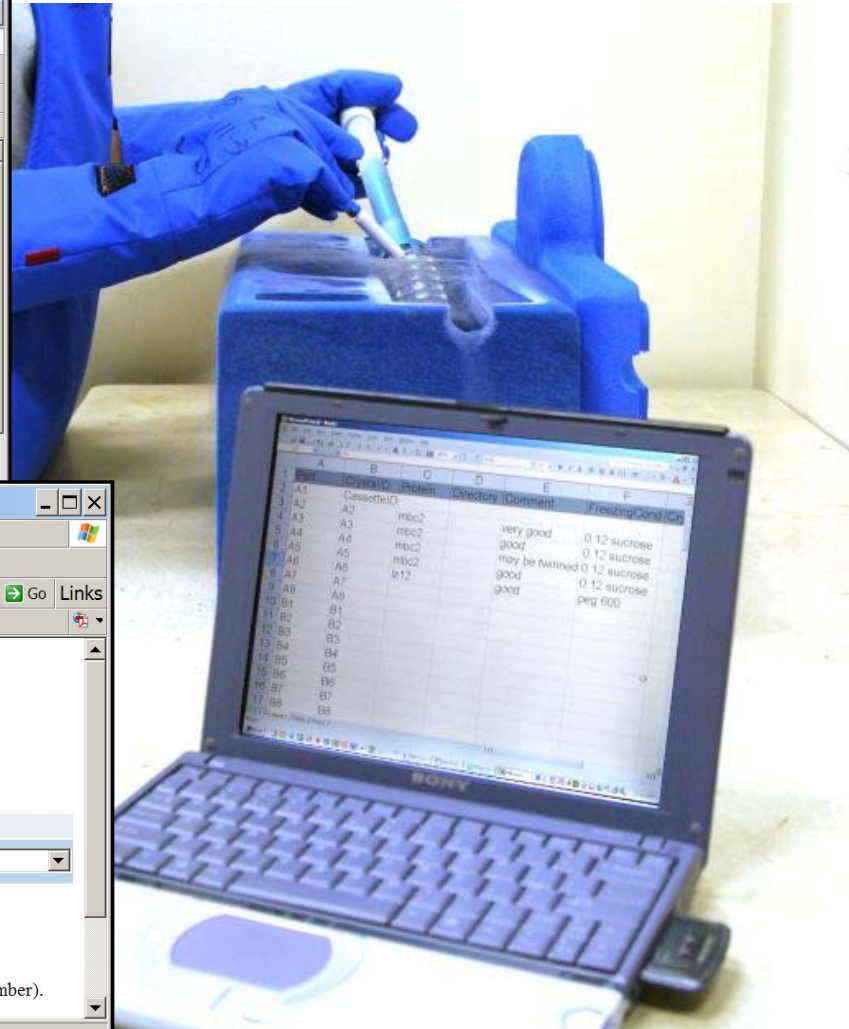
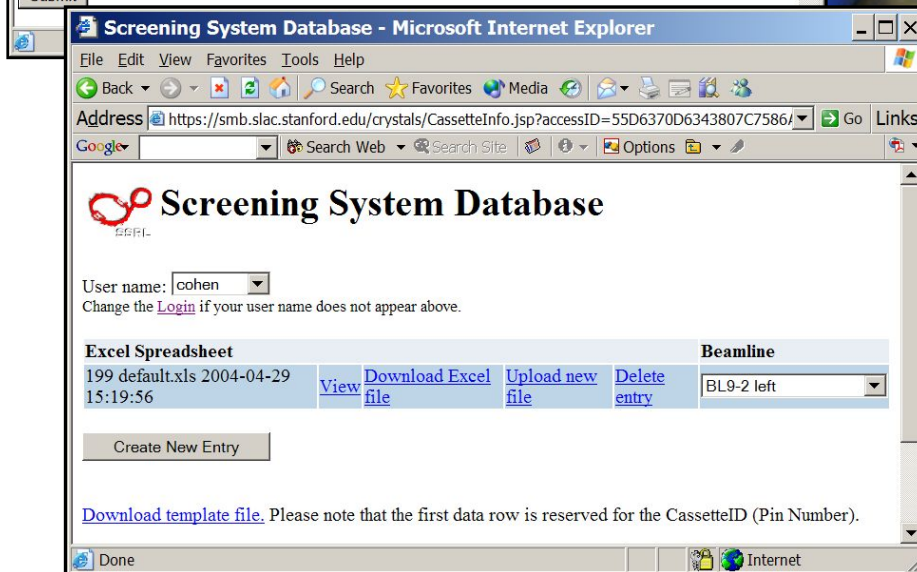
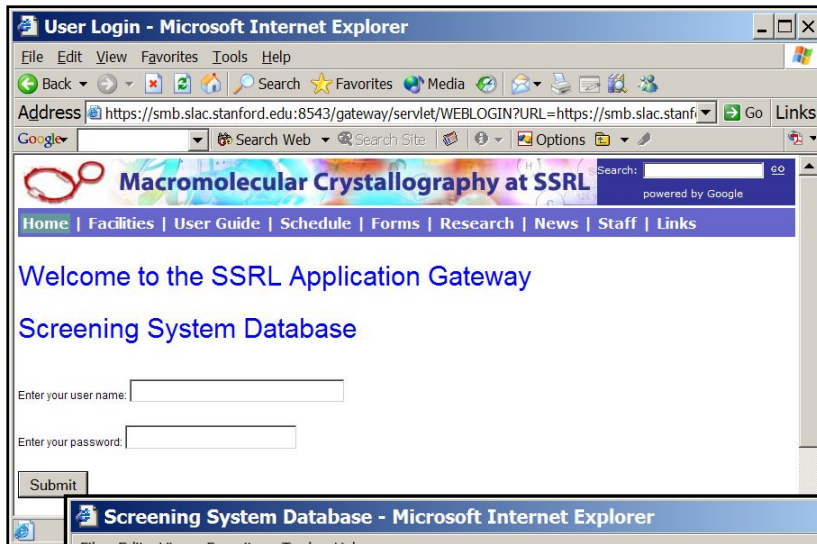
The Cassette or the Uni-Puck



Do not confuse Uni-Pucks with the original ALS puck.

Only Uni-Pucks work with both the SAM and BAM robots.

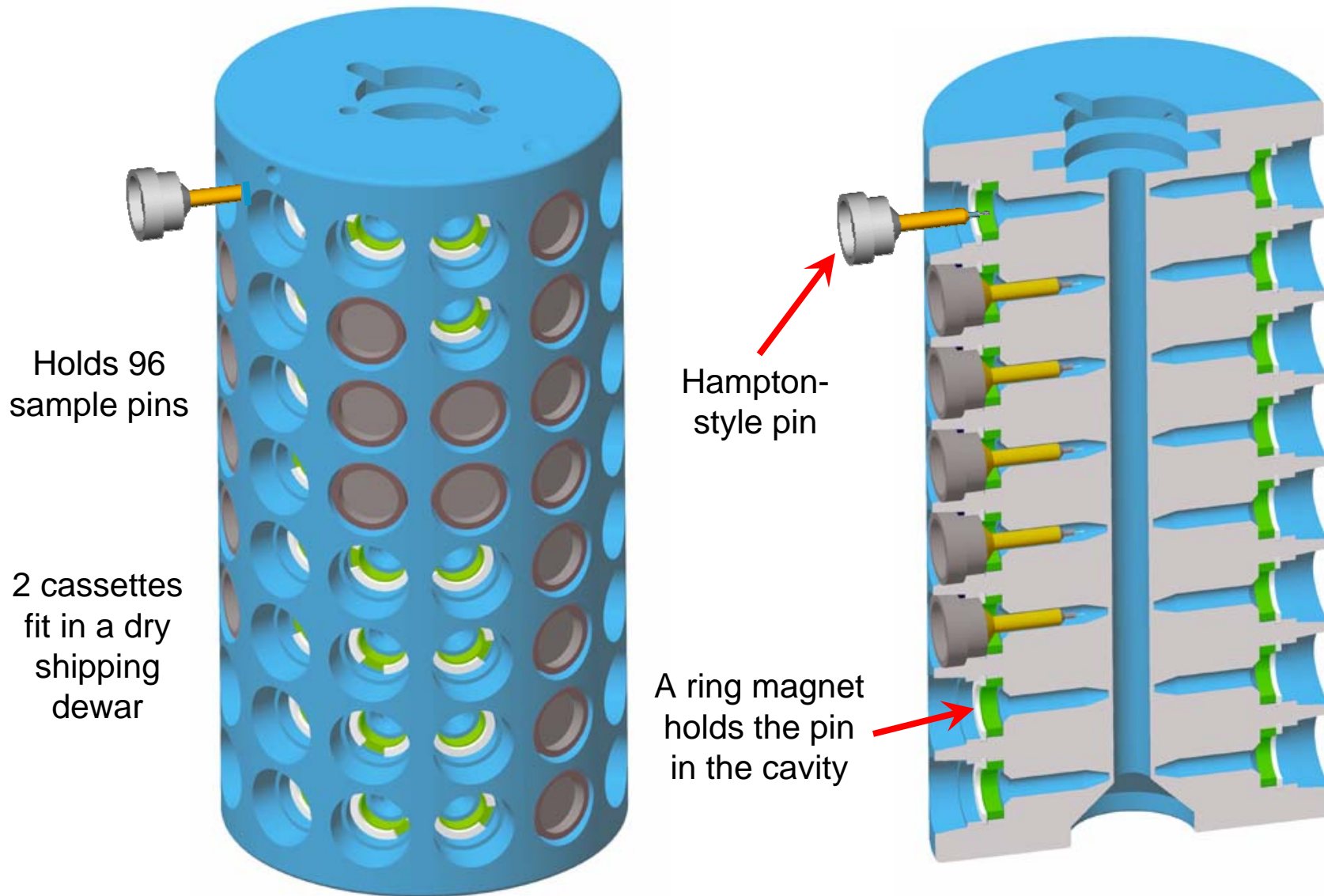
# Keep track of sample location while loading uni-pucks or cassettes



# Cassette Loading and Shipping



# The Cassette



The samples are well protected from frosty liquid nitrogen once inside the cassette

# Follow Proper Handling Procedures for Liquid Nitrogen Use

## Required PPE for Handling Liquid Nitrogen (at SSRL)

	Safety Glasses	Cryogenic Gloves	Goggles or Face Shield	Long Pants without cuffs or Apron	Closed-toe shoes	Insulated tool handles
Filling dewar with close-loop transfer line	X	X				
Filling dewar with open flow delivery line		X	X	X	X	
Dewar to dewar transfer	X	X		X	X	
Removing/storing items in dewars	X	X		X	X	
Transporting open dewars holding less than 0.5 L	X	X				
Disposing of liquid nitrogen by pouring on ground	X	X		X	X	
Disposing of liquid nitrogen by bubbling warm nitrogen gas	X	X				
Manipulating protein crystals in dewars	X					X
Transporting dewars or tanks with lids or closed valves						
Disposing of liquid nitrogen by evaporation						

# Watch Out for Ice



During cassette loading samples may pickup ice when traveling through frosty liquid nitrogen

# Cassette Loading

Put on the Lid when not in use.

To prevent frost on the guide tool place on the internal shelf with the metal portion submerged



Liquid Nitrogen should be Clear (no frost)



# Cassette Loading

Fill to the internal ledge (4 L)

Push the cassette all the way forward so the guide tool will not tip over and the cassette will be easier to rotate



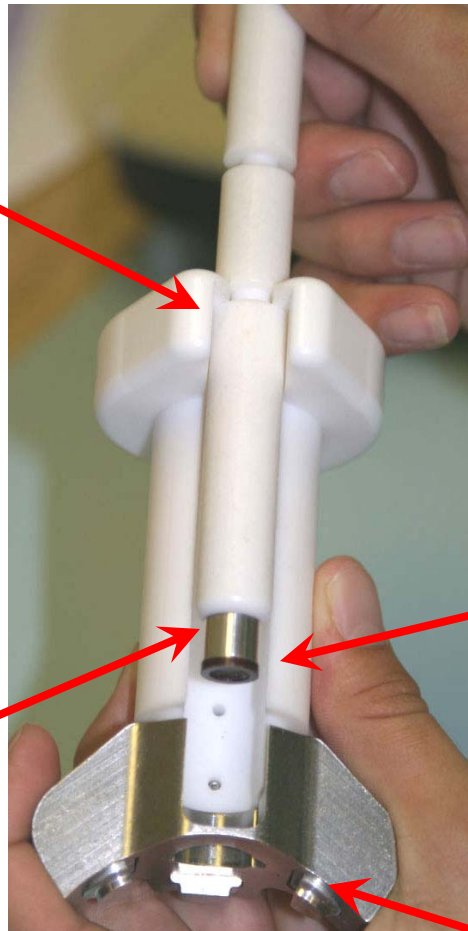
To avoid frosty liquid nitrogen – try loading cassettes under a fume hood or dry air stream

# Guide Tool and Magnetic Wand

Place lower slot  
in guide handle

For transferring  
pre-frozen samples,  
slide the wand through  
side of the guide tool  
keeping the sample  
submerged in liquid  
nitrogen

Keep the wand dry  
Wipe off moisture  
or frost with a towel  
or if possible  
alternate between  
two sets of tools



To flash-freeze  
samples while loading  
the cassette, insert  
samples through the  
top of the guide tool

Use the red side  
of the magnet  
tool for loading  
samples

The guide tool feet fit  
inside adjacent cassette  
ports for stability

# Shipping and Transporting Cassettes

Cassette transfer handle



The beam line dewar holds 3 cassettes or up to 288 samples.



Ship 2 cassettes inside a Taylor Wharton or MVE dry shipper  
Store 20 cassettes inside a Taylor Wharton HC35 storage device

# Shipping Cassettes



1. Place the Teflon support ring inside the shipping dewar before inserting the canister and fill the dewar with liquid nitrogen in the usual manner.

2. Transfer the cassette into the canister in the dewar, minimizing the time the cassette is in the air. Remove the transfer handle from the cassette by pushing down the handle and turning counter-clockwise to release it.

3. Two cassettes may be shipped inside one canister. When shipping just one cassette, place the Styrofoam spacer on top of the cassette to keep cassette in place during shipment.



4. The cassettes are compatible with most dry shipping dewars. We recommend using the combination of a MVE model SC4/2V cryogenic shipping dewar with a Taylor Wharton TAY CX10-8C00 dewar container.



# How do I get more cassettes and cryo-tools?

[www.crystalpositioningsystems.com](http://www.crystalpositioningsystems.com)



SSRL Cassette Loading Dewar and Lid (Part number: CP-111-002)

Single Cassette Loading Dewar with Lid  
\$ 625.00

[View Cart](#)

[Add to Cart](#)

**Volume Discounts:**

Three Cassette Loading Dewars with Lids  
\$1800.00 (or \$600/each)

[Add to Cart](#)

Ten Cassette Loading Dewars with Lids  
\$5750.00 (or \$575/each)

[Add to Cart](#)



For product usage information visit the SSRL protein crystallography group website:  
<http://smb.slac.stanford.edu/hardware>

Shipping is free in the continental United States.  
For overseas or express shipping further charges will apply.

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