

# AMT™

## Automated Machine Technologies, Inc.

Automated Machine Technologies, located in Research Triangle Park, North Carolina, is a manufacturer of innovative liquid packaging machines for the pharmaceutical industry.

AMT™ offers total production lines, custom multifunctional and standard stand-alone machines for medium and high-speed productions:

- Sterile Servo Peristaltic Liquid Filling
- Full and Partial Stoppering
- Crimp Sealing
- Screw Capping
- Print & Apply Bottle Labeling
- Micro Plate Filling, 96, 384 and 1536-Well, with Disposable Technology

After 15 years, AMT™ continues to offer solutions to the most challenging production requirements with cutting edge technologies:

**Disposable Technology** - only tubing and nozzles contact the product and are disposable or disassembled in a few minutes for sterilization, and reassembled with reduced risk for contamination.

**EqualFlow™** - innovative digital compensation of AMT™ servo peristaltic pumps (US Patent Number 6,393,338) allows 0.1% dispense precision at higher flow rates, unmatched by conventional peristaltic pumps. Long-term tubing wear is also digitally compensated.

**ServoTorque™** - patented servo capping along with flexible positive gripping system brings unparalleled torque precision and consistency in screw capping (US Patent Number 6,804,929).

**ServoChange™** - new approach to servo liquid filling and vial closing allows for a small footprint, programmable changeover with a touch of the screen, and easy validation.

**SPC Automatic Feedback** - Two check-weighers, for tare and gross weights, are optionally incorporated into the closed loop system for dynamic control of the AMT Servo Peristaltic Dispenser™ for ultimate precision over an extended time.

**AMT™ Print & Apply** Labeling Machine utilizes 5 servo drives for sustained performance and touch of the screen changeover.

The "Loose Loop" system, typical in conventional P&A machines, is eliminated and hardware is greatly simplified for low maintenance and high reliability.

AMT™ machines are ruggedly designed for years of trouble-free operation with minimal maintenance.



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# AMT™ Servo Peristaltic Liquid Filling Machine

Servo precision sterile peristaltic liquid dispensing

Servo programmable nozzles

Instant servo changeover to one of 100 programs

Fill precision: 0.5% typical

Fill volumes from 0.1mL to 1L

10 to 350 bottles per minute production speeds

Instant computer calibration

Suck back system

Reversible flow

Stainless-steel construction

Crafted for lasting performance

Low maintenance



AMT™ Liquid Filling Machines are Stainless-Steel crafted for Clean Room productions.

The AMT™ Servo Peristaltic Dispensers utilize EqualFlow™ - innovative digital compensation (US Patent Number 6,393,338) allowing unmatched fill precision at higher flow rates. Long-term tubing wear is also digitally compensated.

Better than 0.5% fill precision is achievable. Volume calibration is immediate from the touch screen and can be performed without stopping production. AMT™ servo pumps have programmable speed and acceleration for optimum performance. Reversible flow and jogging are provided for system purging and priming. The pumps are suitable for CIP (Cleaning In Place). Tubing and bottom up nozzles are the only fluid contact parts. They can be disposable or disassembled in a few minutes for sterilization and reassembled with reduced risk for contamination. The machine can be equipped with a conveyor or it can operate from the customer's conveyor.

From 1 up to 40 nozzles are servo-programmable for top and bottom positions, acceleration, and speed to assure minimal product foaming and splashing. Precision nozzle to nozzle adjustment system is provided. Drip-less operation is obtained via the suck back system.

One feed screw for bottle indexing can work with a wide range of bottle sizes. Feed Screws are equipped with quick disconnects for changeover to a new range of bottle sizes. Sensors for bottle tracking are incorporated. Feed screws have servo-programmable acceleration for optimum performance. Alternative simplified bottle escapement system with bottle counters is also available.

Inline Filler is programmable via multi-axis servo system for different products. Parameters and functions are recorded in the computer under preprogrammed production profiles. A desired product profile number is called with a touch of the screen for new production or editing. Nozzles top and bottom positions, fill volumes, calibration, speeds, accelerations and timing are programmed for optimal production.

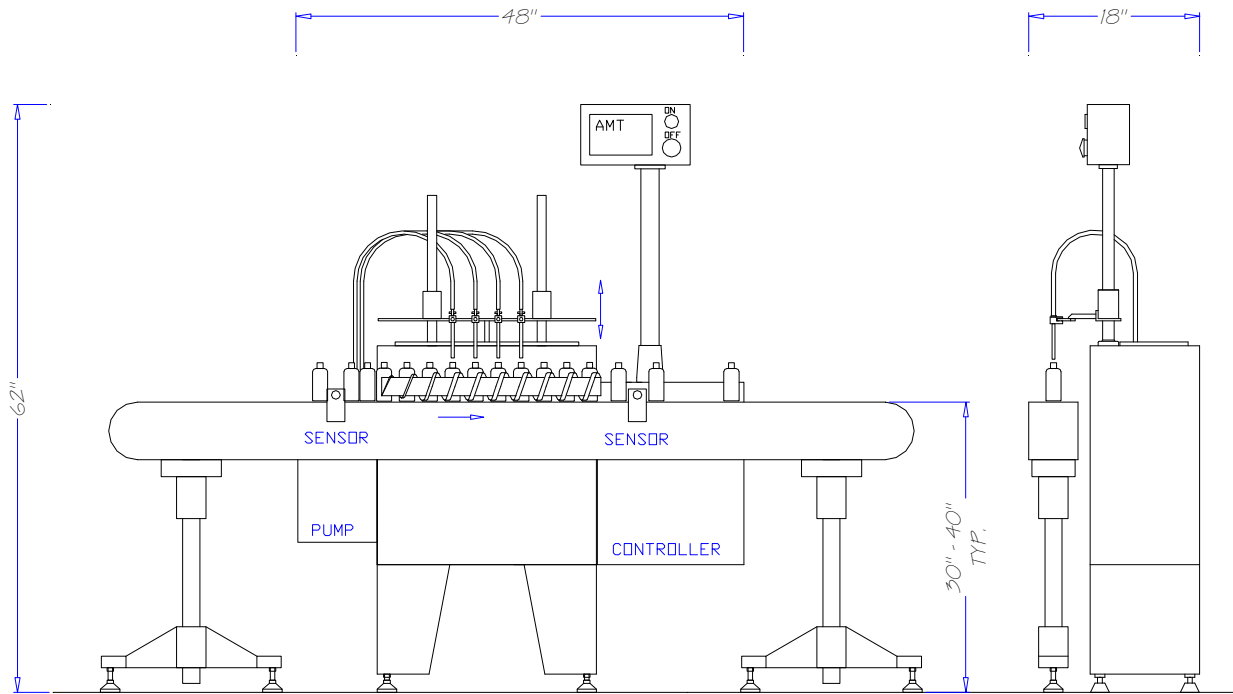
Optional equipment and customized machines are available to meet special filling requirements such as special container indexing, gas flushing, etc. To see a video of various AMT™ models in production, please visit our website: [www.AMTLiquidFilling.com](http://www.AMTLiquidFilling.com)



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# AMT™ Servo Peristaltic Liquid Filling Machine Dimensions



Width=1220 mm, Depth=460 mm, Height=1575 mm, Weight: 700 Newtons

Power: 110V/60Hz/10A

As part of our policy of continuous product development we reserve the right to alter specifications without notice.

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# AMT™ Servo Monoblock

Liquid Filling and Vial Sealing in Clean Room Productions

Digitally compensated servo peristaltic liquid dispensing

Sterile stoppering, capping and crimp sealing options

Fill precision: 0.5% typical

Fill volumes from 0.1 mL to 1L

Up to 80 bottles per minute production speeds

Instant fill volume calibration

Bottom-up nozzles

Suck back system

Reversible flow

100 Programs for instant servo changeover

Minimal foot print

Crafted for lasting performance

Low maintenance



AMT™ Filling and stoppering monoblocks are crafted for Clean Room production.

The AMT™ Servo Peristaltic Dispenser utilizes EqualFlow™ - innovative digital compensation (US Patent Number 6,393,338) allowing unmatched fill precision at higher flow rates. Long-term tubing wear is also digitally compensated.

Tubing and nozzles are the only fluid contact parts and are disassembled in a few minutes for sterilization and reassembled with reduced risk for contamination. Hopper bowl and tooling are made of 316L stainless steel and are also easily removable for sterilization. Components such as motors and belts are below the fill area providing assurance against particulate contamination. The machine can be equipped with a conveyor or it can operate from the customer's conveyor.

ServoTorque™ - patented servo capping along with flexible positive gripping system brings unparalleled torque precision and consistency in chuck screw capping. (US Patent Number 6,804,929).

Changeover to different bottle diameter and bottle height is achieved by exchanging indexing "star-wheel" with a quick disconnect, and selecting a new program from touch screen. Servo-mechanisms will automatically readjust machine.

The screw capping chuck will accept many sizes and shapes of caps, servo precision screw torque is programmable from touch screen. Capping chuck is easily replaceable with crimp sealing of aluminum closure device.

Machine is modular, and any function can be disabled or enabled from touch screen.

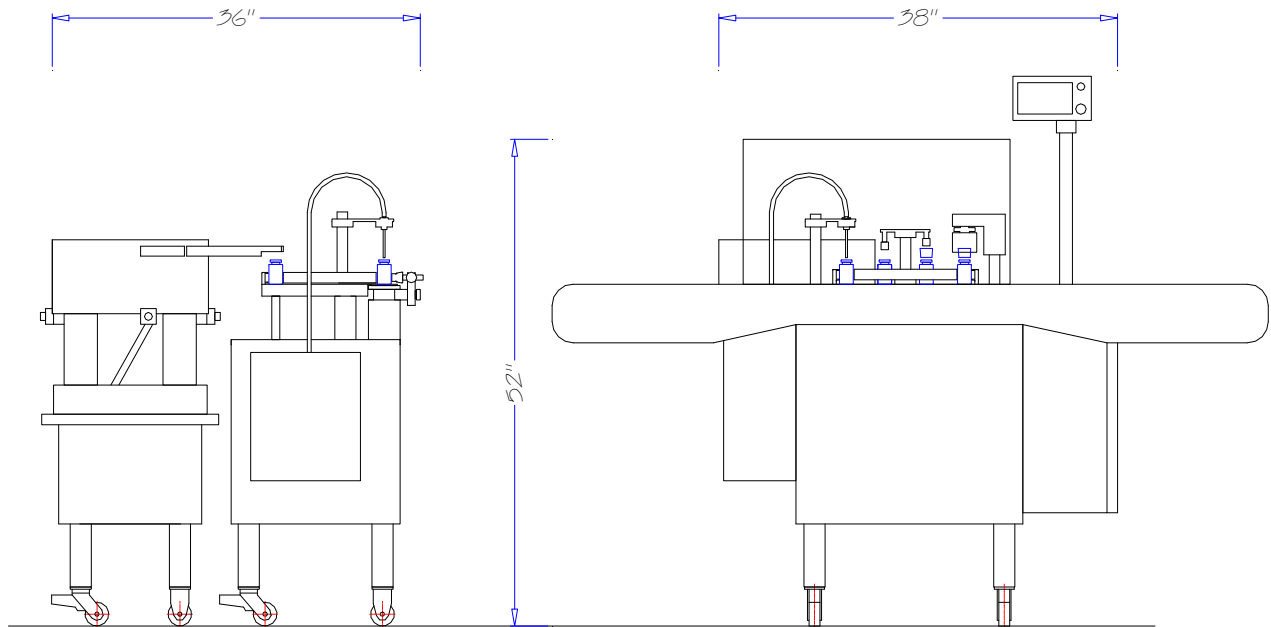
Optional equipment and customized machines are available to meet special filling requirements such as tray loading and unloading, special container indexing, gas flushing, etc. To see a video of various AMT™ models in production, please visit our website: [www.AMTLiquidFilling.com](http://www.AMTLiquidFilling.com)



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## AMT™ Servo Monoblock Dimensions



Width=965 mm, Depth=914 mm, Height=1320 mm, Weight: 1000 Newtons

Power: 110V/60Hz/10A

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# AMT™ Servo Rotary Stoppering Machine

For Clean Room Productions

Servo synchronized  
stoppers and bottles

Servo programmable  
changeover

Full or partial insertion with  
many sizes of stoppers

Over 200 vials per minute  
with single unit

Over 400 vials per minute  
with two units side by side

Crafted for lasting performance

Low maintenance with servo  
programmable adjustment



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AMT™ stoppering machines are crafted for Clean Room productions.

The high speed, servo-synchronized stoppering machines complement our ultra-precision servo-peristaltic liquid filling machines for sterile operations.

The compact size allows for a side-by-side configuration, doubling the speed and matching the speed of the liquid filling machines for over 200 vials per minute per side.

The system will perform full and partial insertion and can be easily changed over to different stopper and bottle sizes.

A state-of-the-art, multi-axis servo system synchronizes stoppers with bottles eliminating the need for difficult mechanical adjustments over years of operations.

Vibratory feeder bowl orients and supplies stoppers, and is also servo driven for programmable changeover to a different bottle height.

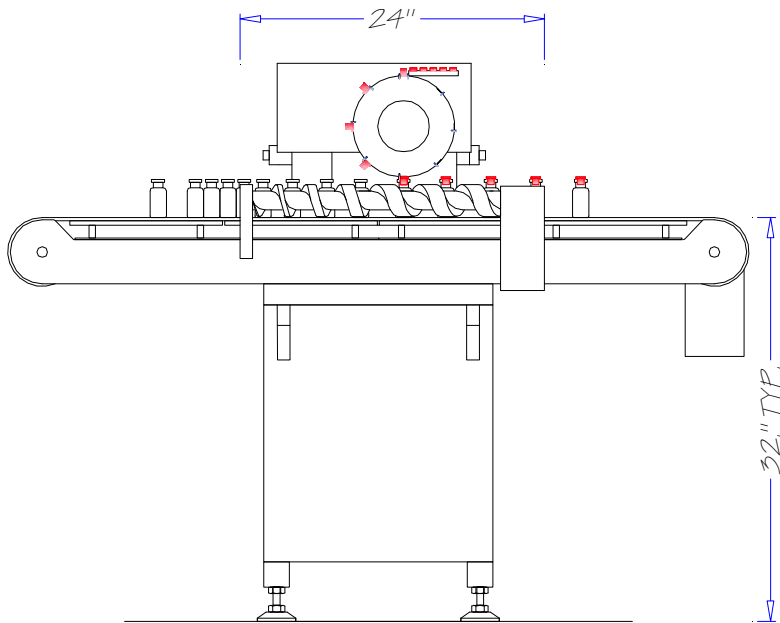
Servo driven feed screw is equipped with a quick disconnect and is easily exchangeable for new bottle diameter.

Advanced servo technology assures seamless operation, including stopping and resuming production at any time.

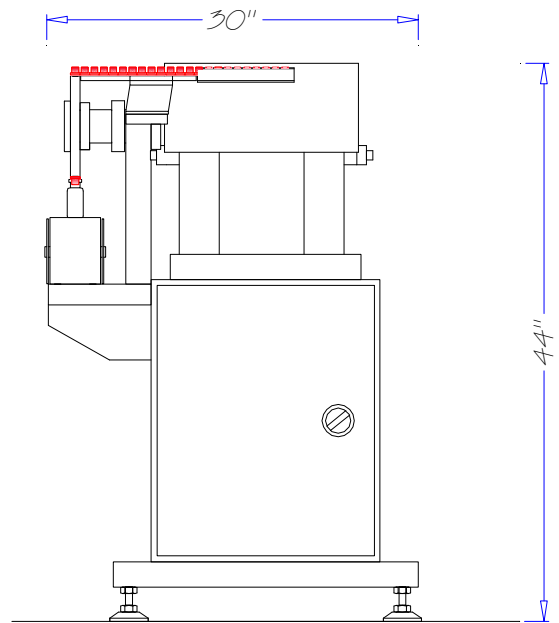
Our new, high speed, clean operating crimp sealing machine (non-sheering, patent pending) along with servo torqueing screw capping completes the total liquid filling and vial closing packaging systems.

To see a video of various AMT™ models in production, please visit our website at: [www.AMTLiquidFilling.com](http://www.AMTLiquidFilling.com)

# AMT™ Servo Rotary Stoppering Machine Dimensions



Front view



Side view

Width=610 mm, Depth=760 mm, Height=1120 mm, Weight: 800 Newtons

Power: 110V/60Hz/6A

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# AMT™ Vial Crimp Sealing Machines

Pharmaceutical grade  
stainless steel construction

Up to 300 vials per minute  
production speeds

Stainless steel vibratory feeder

Tooling with quick disconnects  
for swift changeover

Minimal foot print

Crafted for lasting performance

Low maintenance



AMT™ Fully Automatic Crimp Sealing



Non destructive and objective  
crimp seal tester



Crimp sealing option in multi-  
functional AMT™ Servo Monoblock

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AMT™ Semi-Automatic Crimp Sealing

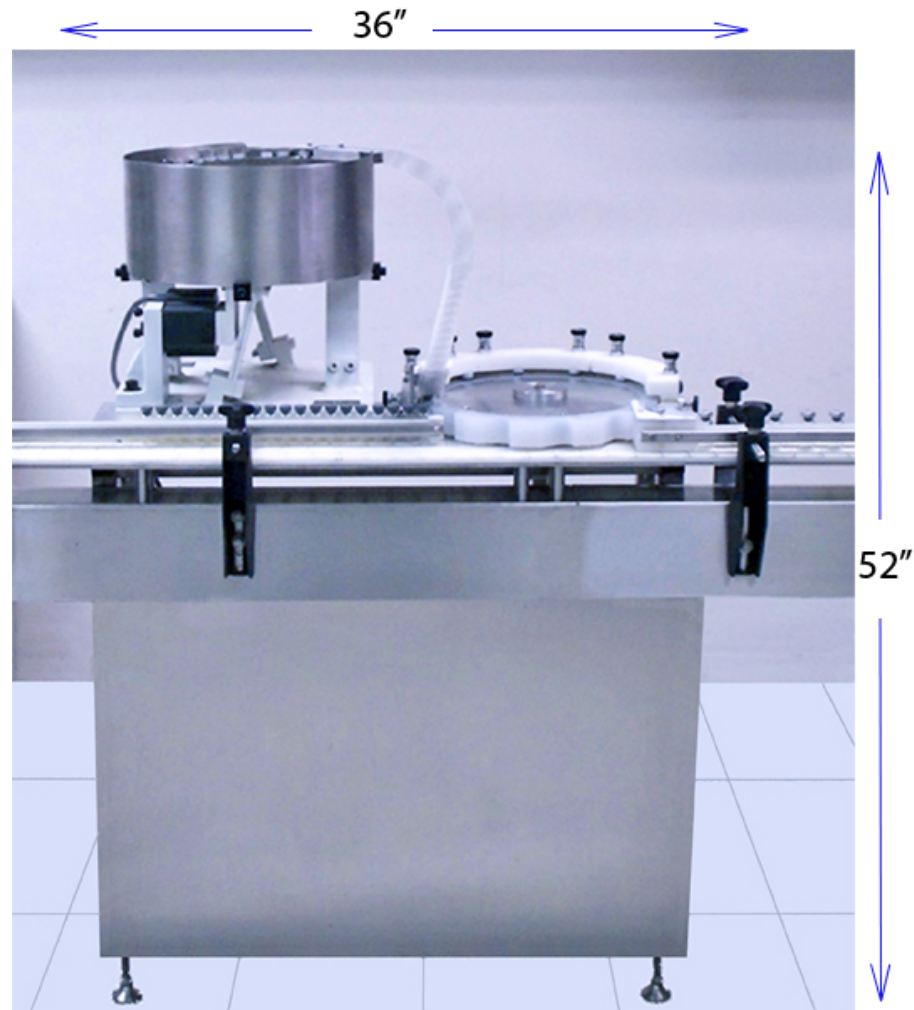
- Standalone Tabletop Model
- Stainless steel, Teflon coated hard anodized aluminum and Delrin™ construction
- Non-shearing crimp sealing, clean operating; no crimping rollers are used
- Operator manually places crimp seal over the stoppered vial and pushes vial into the input side of the Crimp Sealing Machine
- Vial is automatically transferred through Crimp Sealing Machine via motor driven urethane belt and is simultaneously crimped by non-shearing blade; urethane belt minimizes particulate matter generation
- Crimped vials exit output side of Crimp Sealing Machine and accumulate on table

AMT™ has also developed a none destructive and objective method for testing the firmness of the crimped seal.

To see a video of various AMT™ models in production, please visit our website: [www.AMTLiquidFilling.com](http://www.AMTLiquidFilling.com)



## AMT™ Vial Crimp Sealing Machine Dimensions



Width=36", Depth=24", Height=52", Weight: 250 lbs

Power: 110V/6A or 250V/3A, 50-60Hz

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# AMT™ Print & Apply Labeling Machine

The sustained performance and touch of the screen changeover of the AMT™ P&A Labeling Machine is achieved via 5 servo drives.

The label dispensing, wrapper belt, and conveyor belt are all servo linked and programmable for over one hundred products.

The label flag projection and vertical position are also servo-programmable. The "Loose Loop" is eliminated and hardware is greatly simplified for low maintenance and high reliability.

Diagnostic messages such as "Low-Label", "Out-of-Label" or "Low-Ribbon" are clearly communicated via touch screen.

Automatic changeover eliminates cumbersome manual tuning, making the AMT™ P&A Labeling Machine the most consistent and user-friendly in the industry.



All these bottles were labeled by one AMT™ Print & Apply Model 313



AMT™ Print & Apply Model 313 Labeling Machine

## Features:

- Servo** programmable changeover
- Heavy duty** Stainless Steel construction
- Powered** Rewinder
- Touch Screen** with User-Friendly Menus and Programmable Presets
- Zebra, Sato, Avery** or Datamax print engines
- Diagnostic: Out-of-label, Low-Label, Low-Ribbon**
- Supply roll** size: 12" Diameter
- Core size:** up to 3" Diameter
- Dimensions:** 62"Hx24"Dx36"L (+16"L-Wrapper)
- Power** requirements: 120 VAC, 5A
- Speeds** up to 480 inches per minute

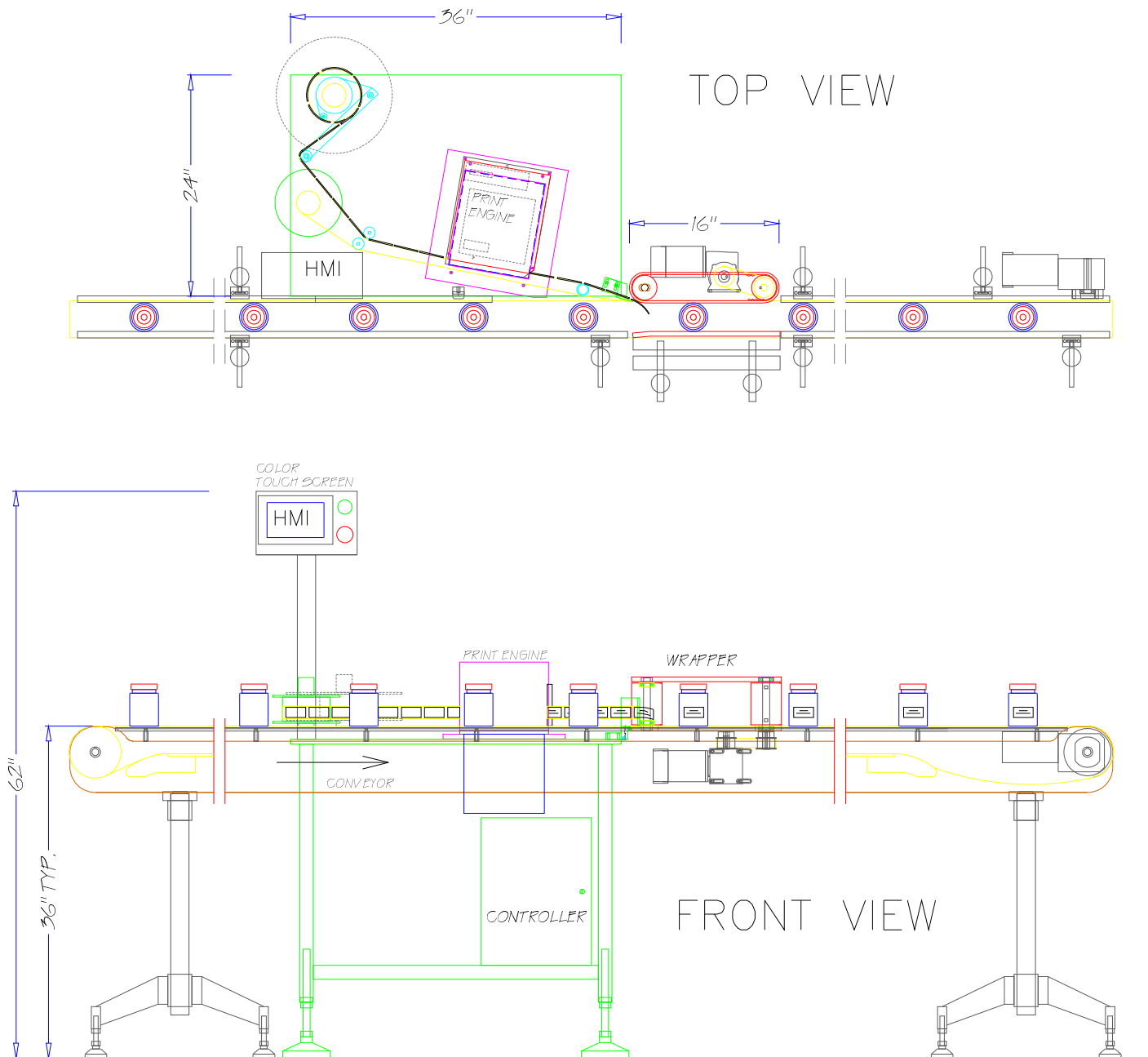
AMT™ P&A Machine in Pharmaceutical Clean Room



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# AMT™ Print & Apply Labeling Machine – Dimensions



Width=36" + 16"-Wrapper, Depth=24", Height=62", Weight: 150 lbs  
Power: 110V/60Hz/5A

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# AMT™ MicroLiter Dispenser



The AMT™ Microliter Servo Peristaltic Dispenser utilizes EqualFlow™ - innovative digital compensation (US Patent Number 6,393,338) allowing unmatched fill precision at higher flow rates. Long-term tubing wear is also digitally compensated.

One unit is capable of filling all standard microplates and microtubes in semi and fully automated productions. Depending upon fill volume, plates can be filled "on-fly" (while plate is continuously moving under the nozzles) in less than 10 seconds. AMT™ MicroLiter Dispenser is ideal for high throughput tasks such as the dispensing of bacterial growth media and cell culture media. With a small footprint, the unit can be sited in a laminar flow hood and can be used with microtubes and microplates of differing depths, including deep-well blocks.

Non-Contact filling from 1 µL to 500 µL is performed with unmatched precision due to the digital compensation and precisely controlled coherent jet. Only one continuous tubing per channel contacts the product. There are no fittings or seals, thus the system is ideal for sterile operations. Easily detachable tubing cartridges are autoclavable or disposable. AMT™ MicroLiter can dispense up to 16 different liquids simultaneously.

With a smooth stainless steel enclosure, AMT™ MicroLiter Dispenser is the most robust in its class. The unit is compact in size, easy to use and maintain, with features that prevent cross contamination and save on reagents. For higher throughput needs dispenser can be easily integrated to robotic setups.

Reversible flow and diving nozzles are provided for aspiration.

Microplate:	96-well	384-well	1536-well
Tubing ID:	0.79 mm	0.51 mm	0.20 mm
Number of Channels:	8 or 12	12 or 16	12 or 16
Fill Volume Range:	40µL-500µL	5µL-100µL	1µL-20µL
Fill Volume Resolution:	0.1µL	0.1µL	0.1µL
Typical Fill Tolerance:	1.75%	2.5%	4%
Fill Time per Plate:	2sec @ 64µL	3sec @ 16µL	6sec @ 1µL
Changeover Time:	Less than 1 minute	Less Than 1 minute	Less than 1 minute

## DISPOSABLE & AUTOCLAVABLE PRODUCT CONTACT PARTS

Tubing and nozzles are the only product contact parts. Sets of 4, 8, 12, or 16 linked tubing come as complete cartridges with attached nozzles, eliminating the need to have them serviced and calibrated. Fixed alignment assures highest nozzle-to-nozzle precision. The complete tubing set snaps into the dispensing apparatus. Changeover to new production takes only a few seconds. Cartridges come pre-sterilized and individually packaged; they are disposable or can be autoclaved multiple times.

## VERIFICATION

Ultrasonic Calibrated Verification System provides Real-Time Quality Control during production.

## AUTOMATED PRODUCTION

The AMT™ MicroLiter Dispenser can work in semi-automatic mode with manual plate handling, or can be configured for fully automatic production with an optional robot, plate stacker and unstacker via a PLC compatible control port. PC interface is provided and can be used for central control and report generating. Please visit our website: [www.AMTLiquidFilling.com](http://www.AMTLiquidFilling.com)



One unit works with 96,  
and 384 wells

1536 wells optional

From 1µL to 500 µL

Sterile Non-contact filling

Digitally compensated  
servo peristaltic pump

Cell culture friendly

Disposable & autoclavable  
tubing cartridges

Microplates filled typically  
in less than 10 seconds

### OPTIONS:

Aspiration with reversible  
flow and diving nozzles

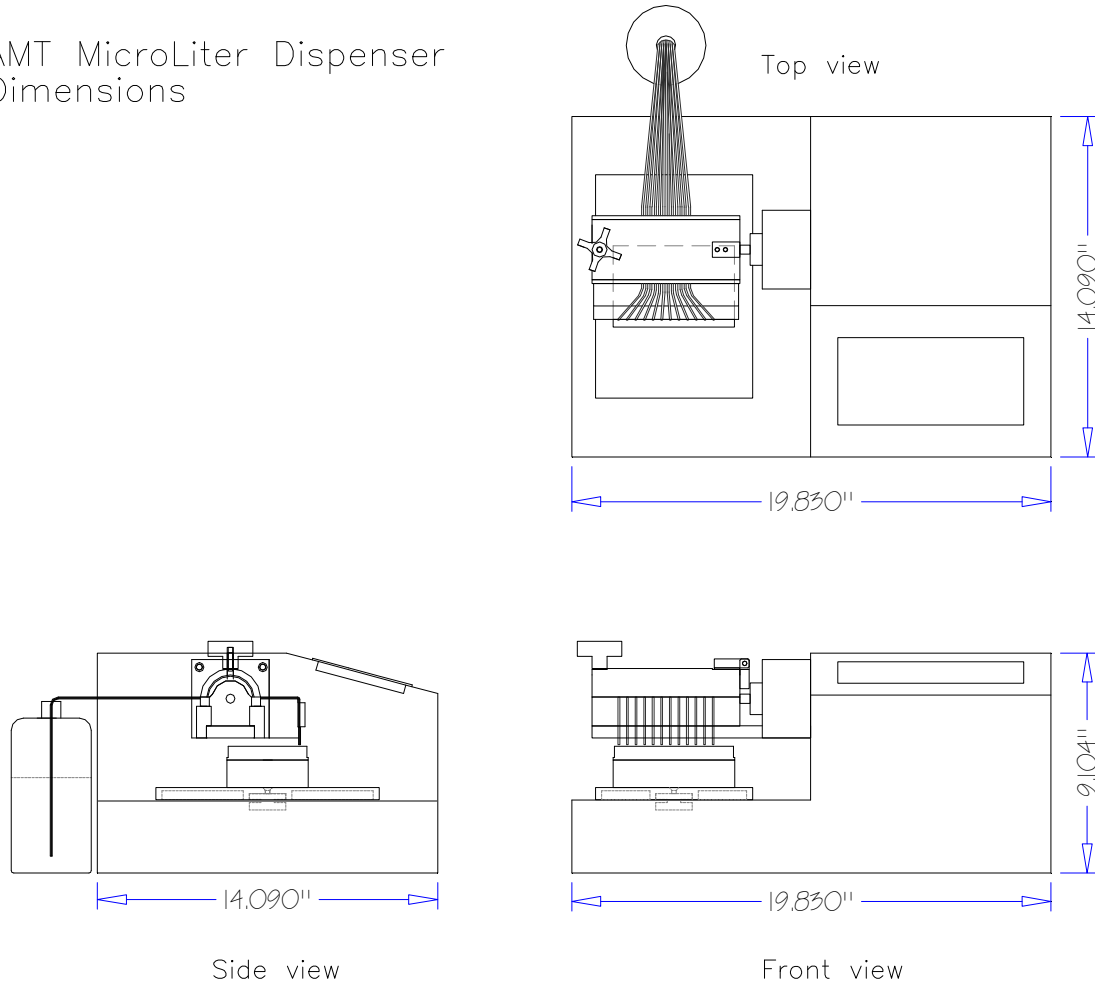
Calibrated Verification  
System



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## AMT MicroLiter Dispenser Dimensions



Width=500 mm, Depth=360 mm, Height=230 mm, Weight: 100 Newtons

Power: 110V/60Hz/3A

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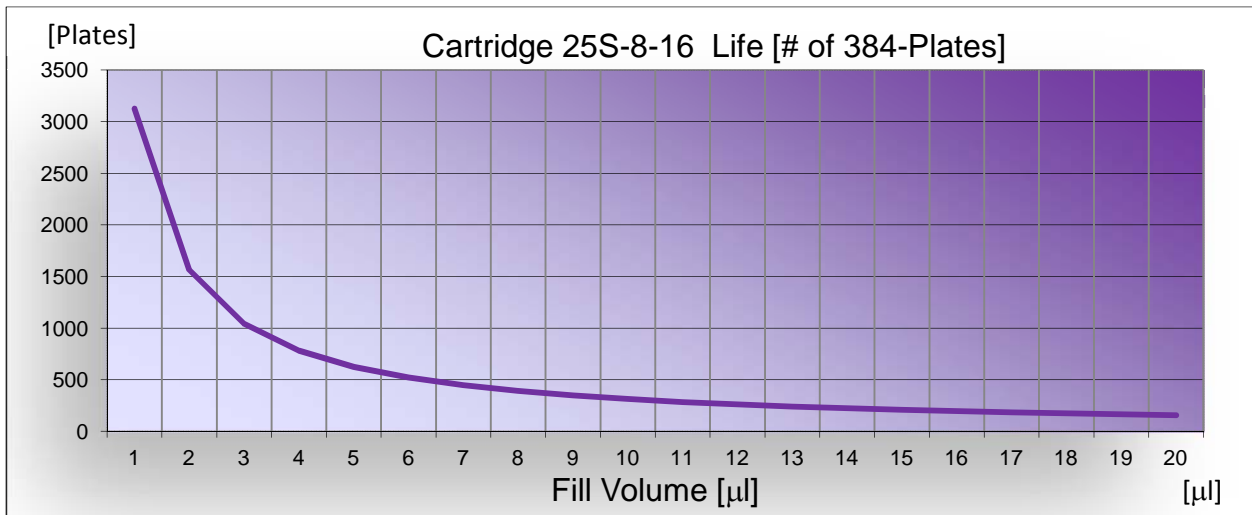
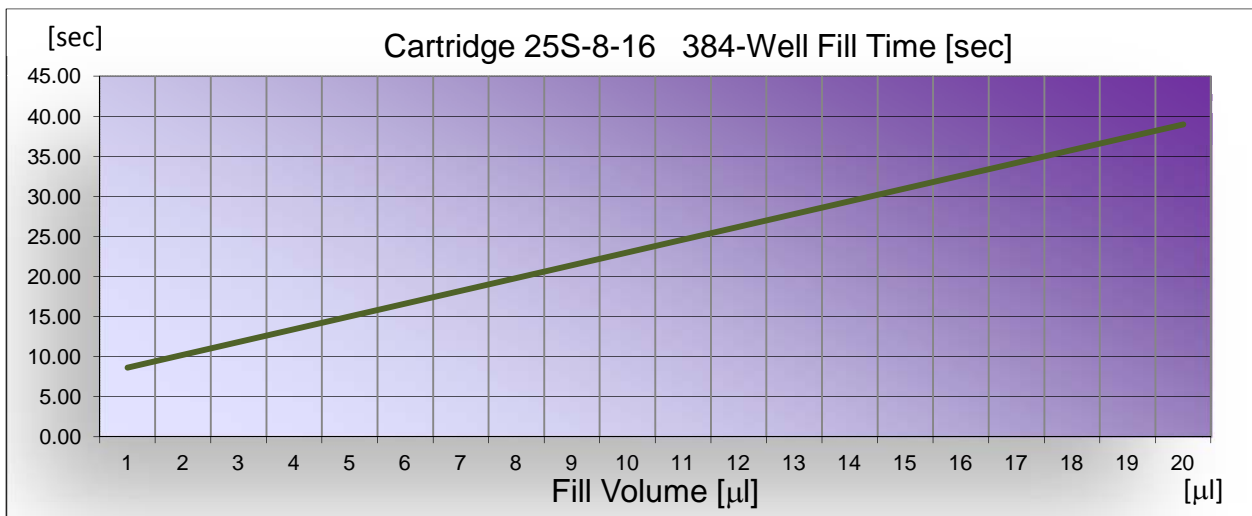
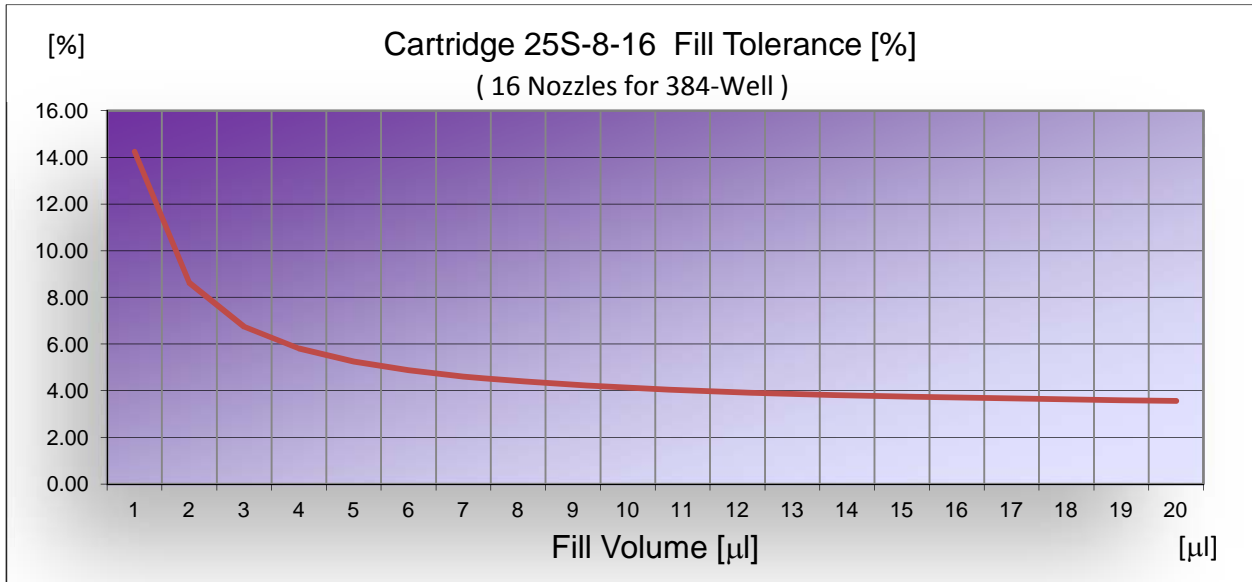
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# 16-Nozzle Cartridge for 384-Well

## 25S-8-16

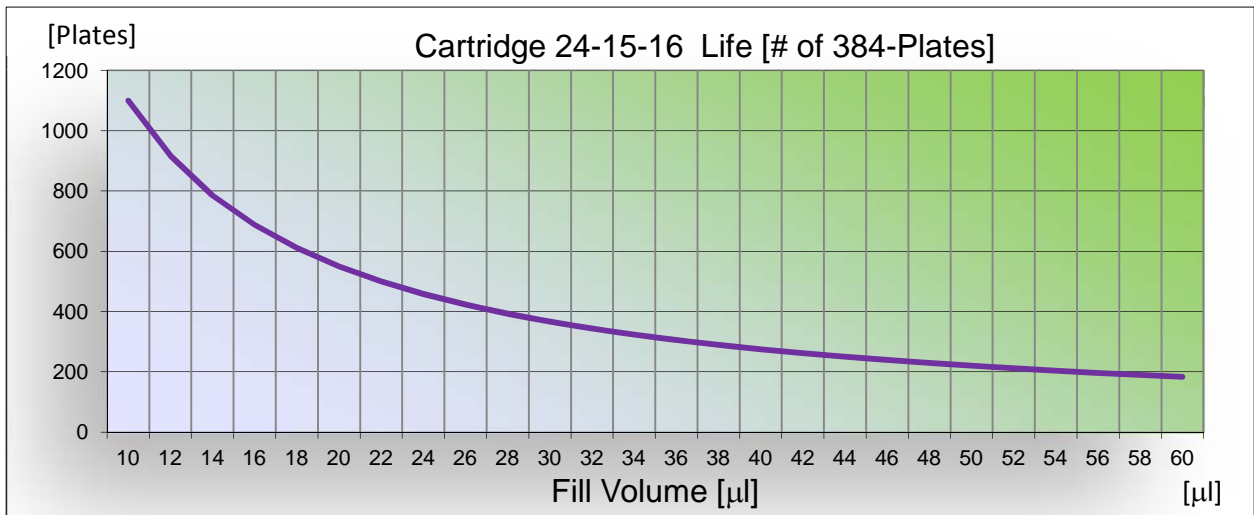
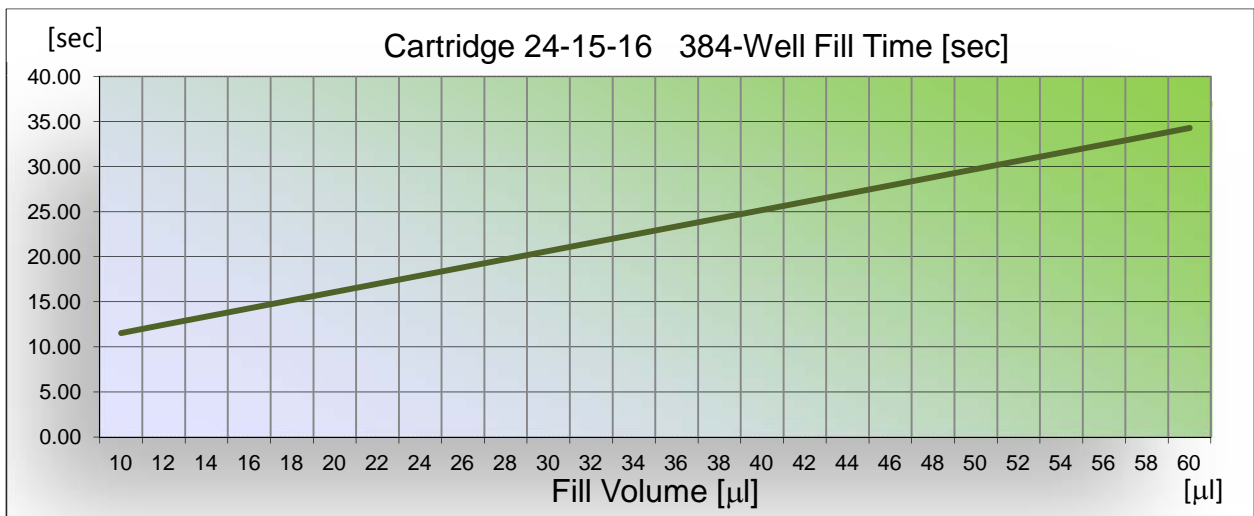
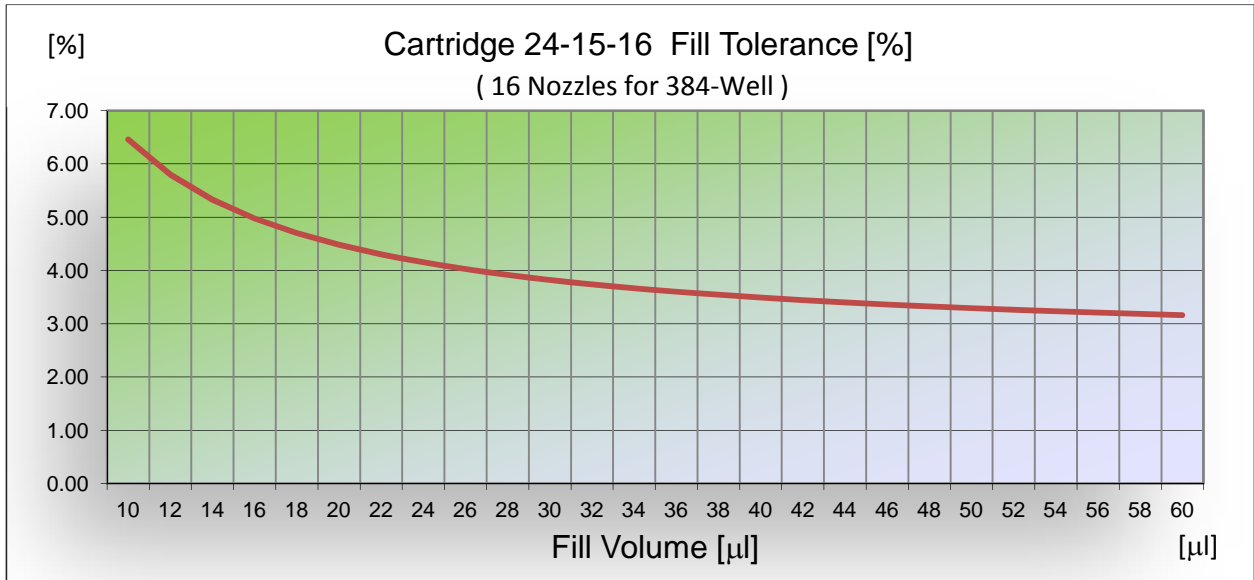
(Recommended for fills from 5 $\mu$ L to 15 $\mu$ L)



# 16-Nozzle Cartridge for 384-Well

## 24-15-16

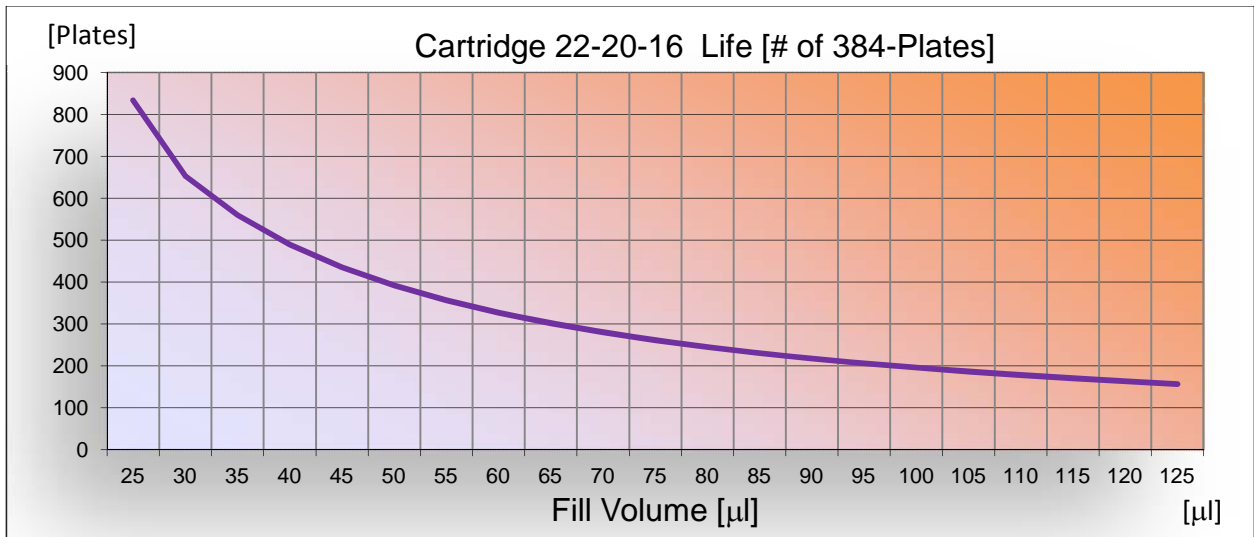
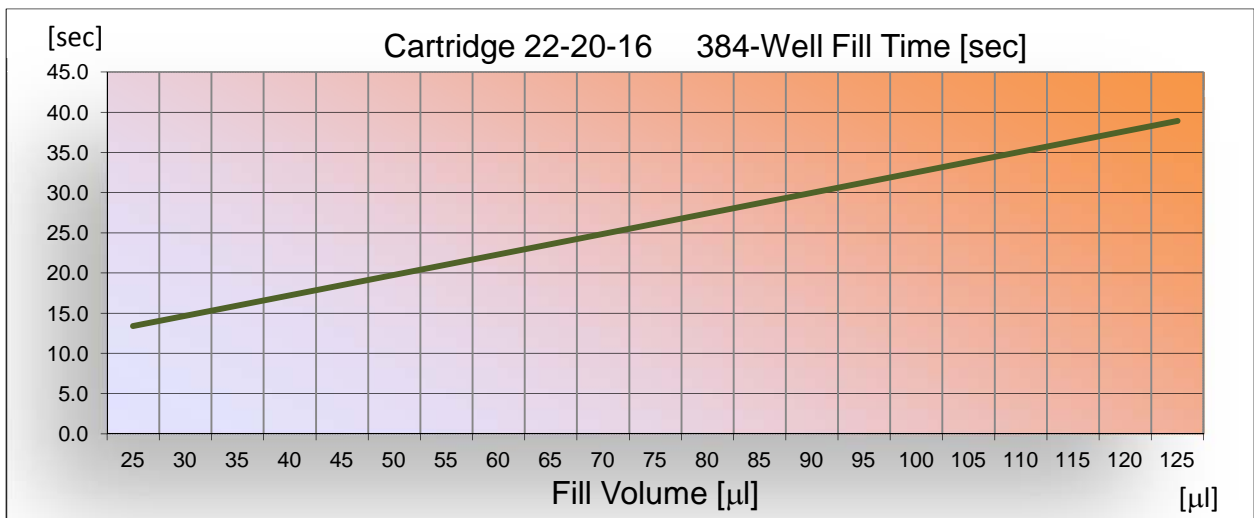
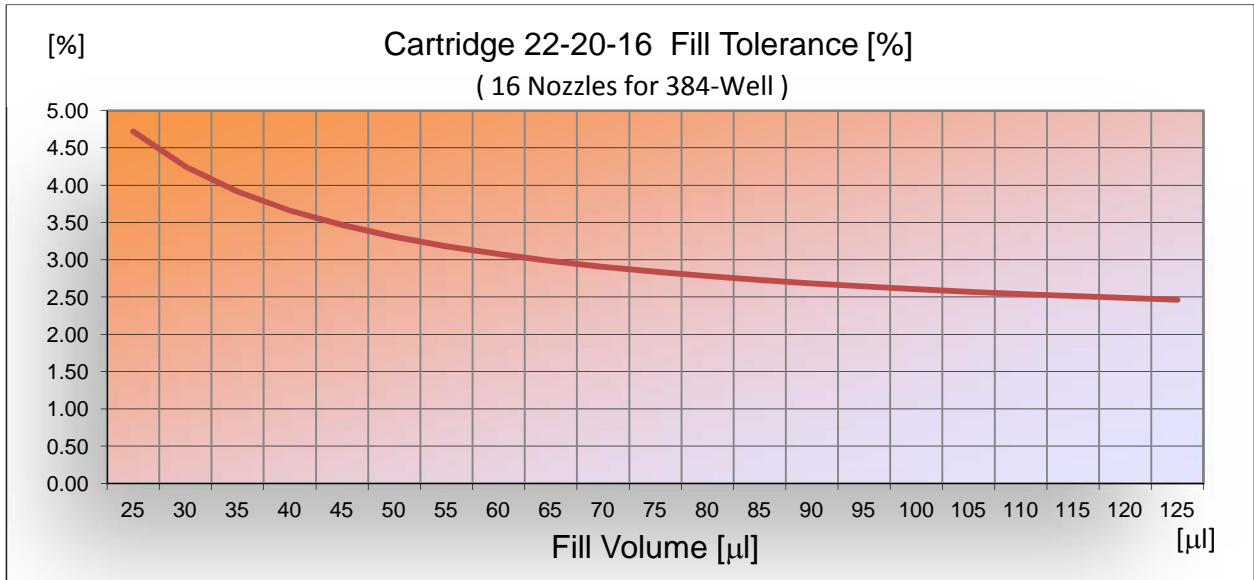
(Recommended for fills from 15 $\mu$ L to 60 $\mu$ L)



# 16-Nozzle Cartridge for 384-Well

**22-20-16**

(Recommended for fills from 40 $\mu$ L to 125 $\mu$ L)

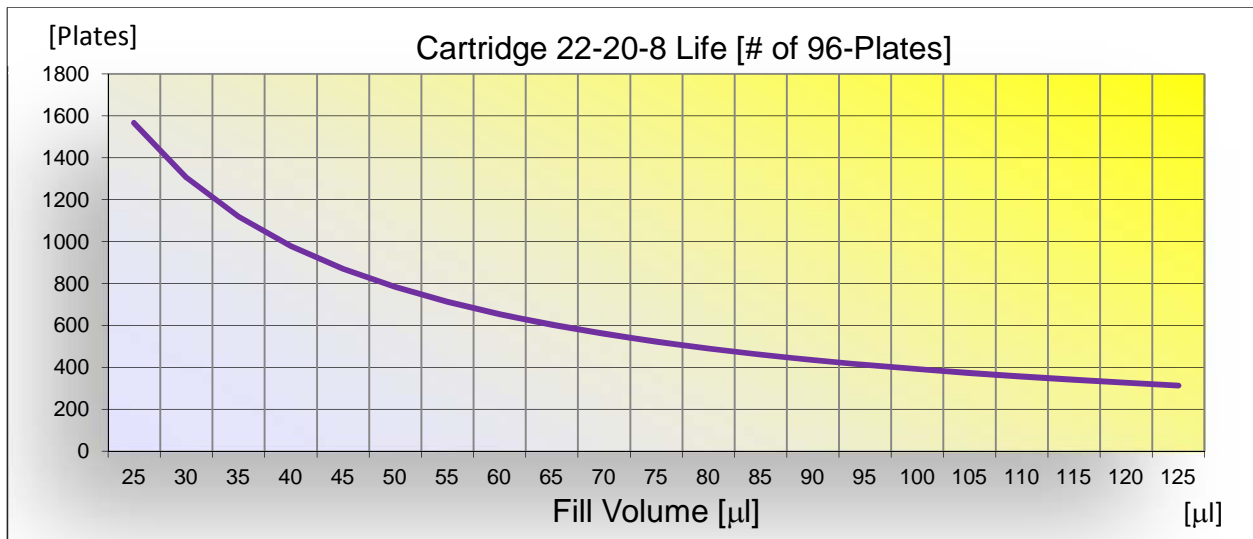
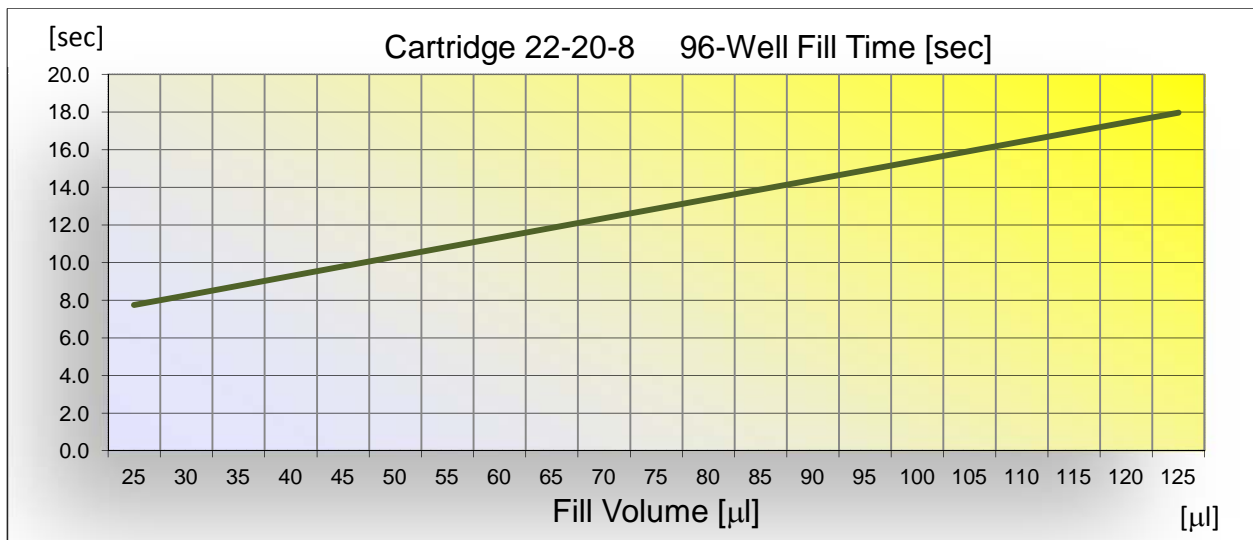
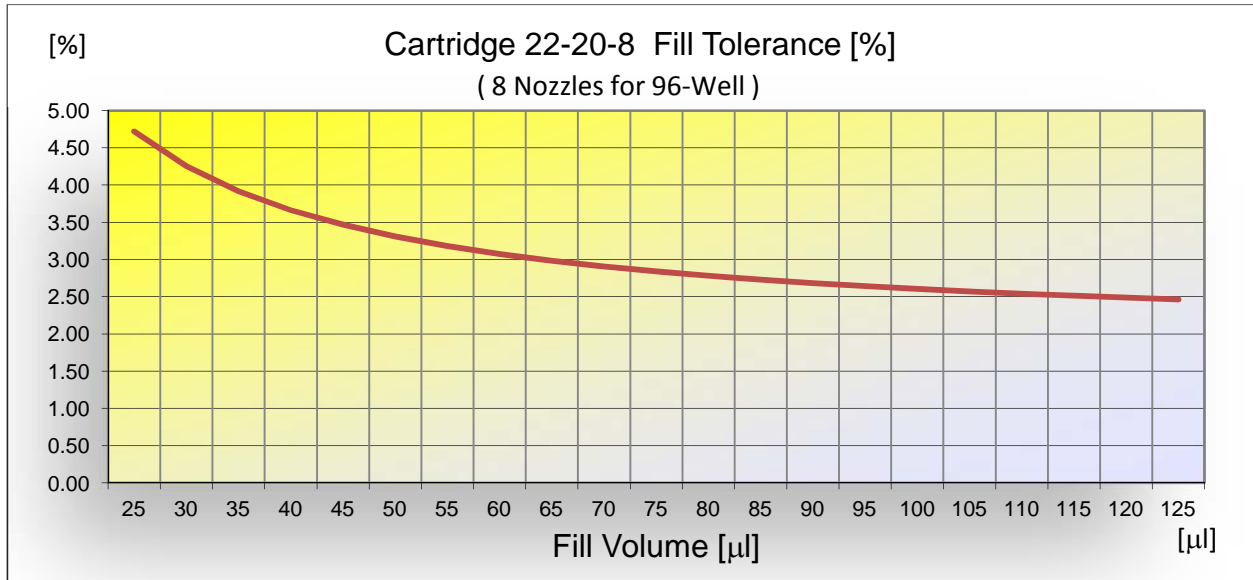




# 8-Nozzle Cartridge for 96-Well

22-20-8

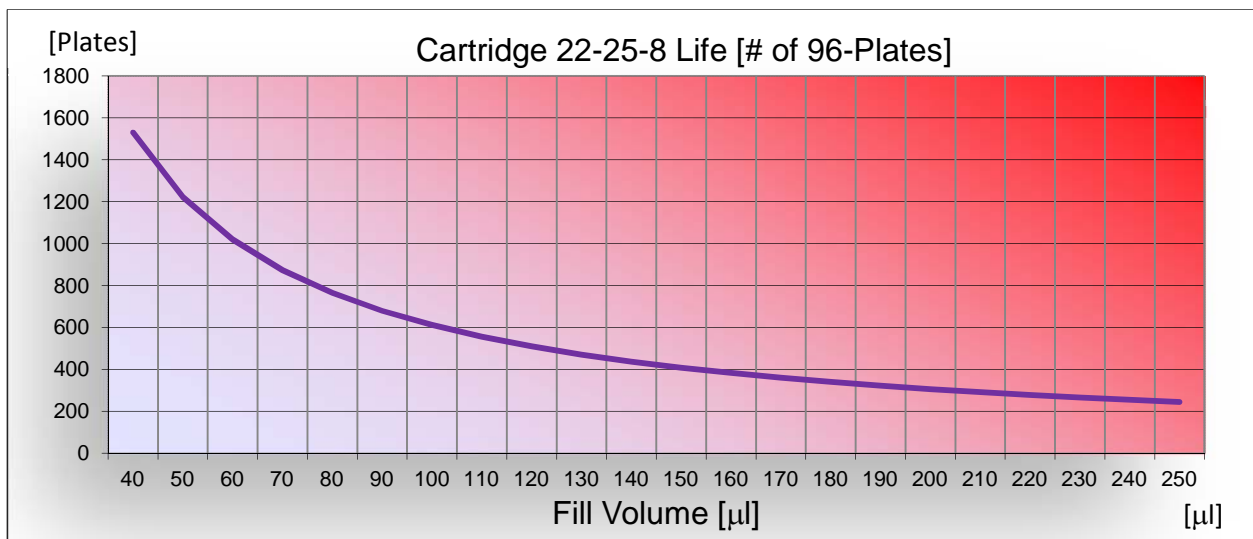
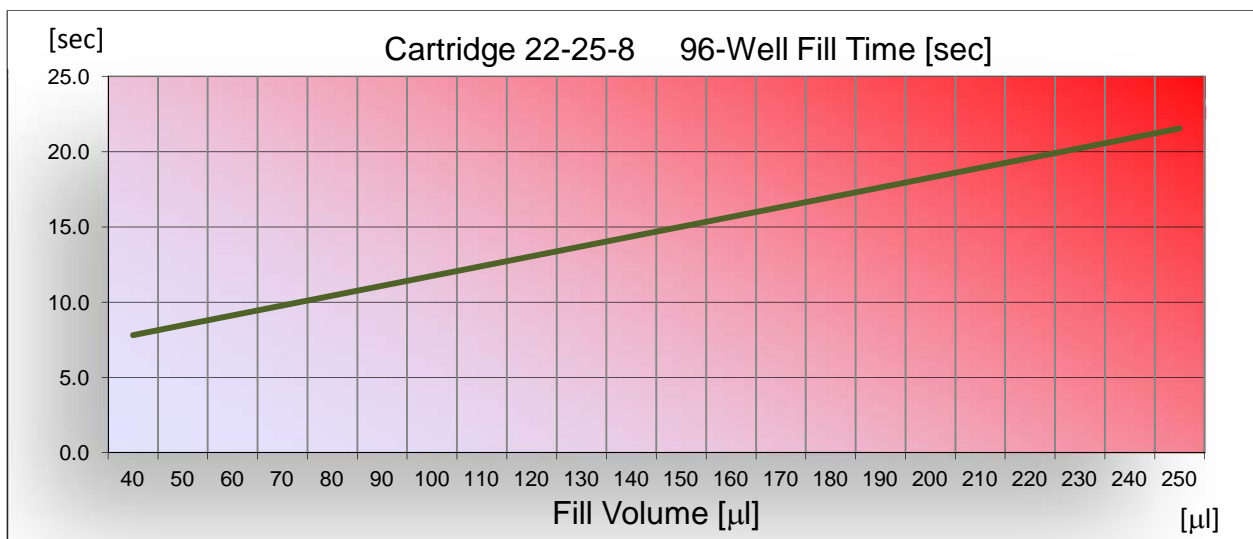
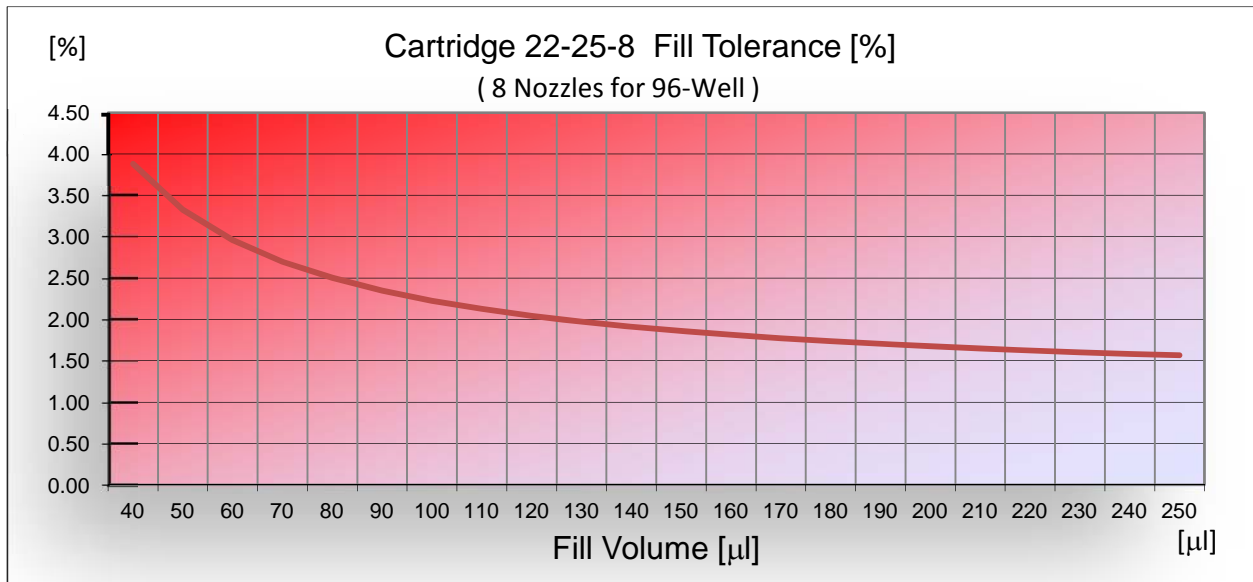
(Recommended for fills from 40 $\mu$ L to 125 $\mu$ L)



# 8-Nozzle Cartridge for 96-Well

**22-25-8**

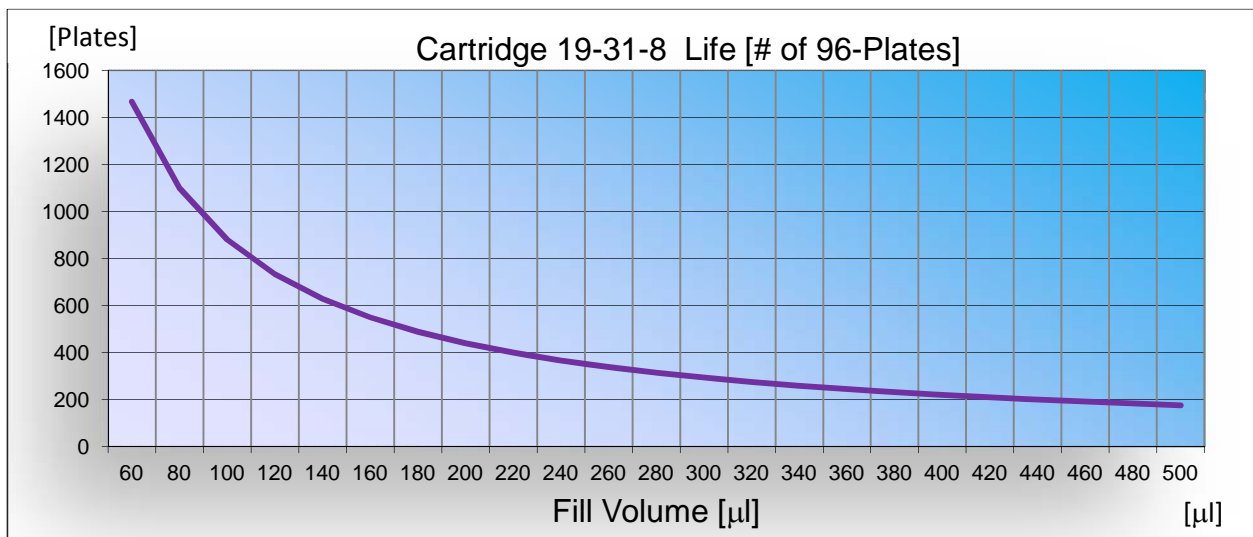
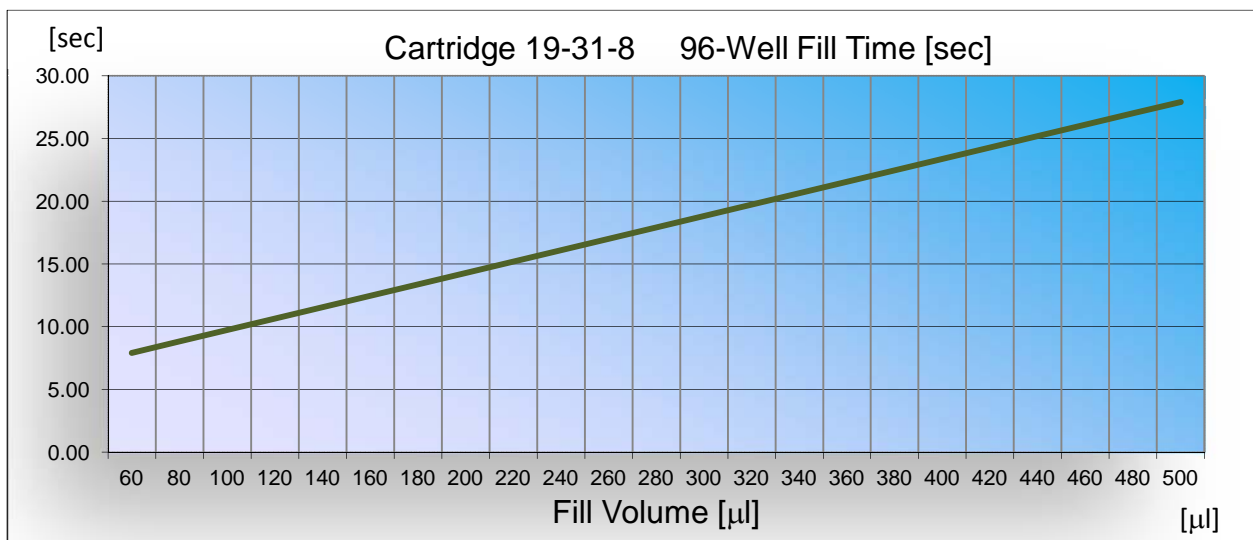
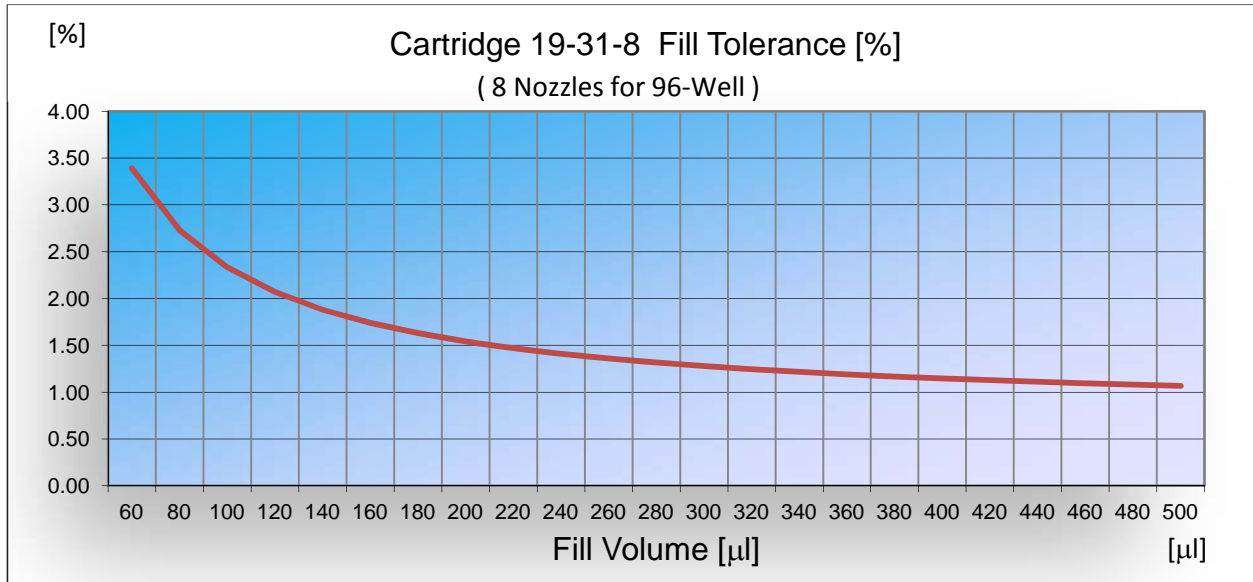
(Recommended for fills from 60 $\mu$ L to 200 $\mu$ L)



# 8-Nozzle Cartridge for 96-Well

## 19-31-8

(Recommended for fills from 100 $\mu$ L to 500 $\mu$ L)



# PLATINUM-CURED SILICONE TUBING

*In AMT™ Stock for Immediate Delivery*

Extensive AMT™ research has led to selecting Pharma-50 as the highest quality pharmaceutical grade tubing for ultra-pure peristaltic applications requiring micro precision dispensing.

The AMT Servo Peristaltic Dispenser™ is a digitally compensated pump utilizing an innovative EqualFlow™ method [US Patent Number 6,393,338], achieving down to 0.1% dispense precision at higher flow rates - unmatched by conventional peristaltic pumps.

Pharma-50 Tubing has become a base for the AMT™ digital compensation method and is highly recommended in all AMT™ Peristaltic Dispensing machines for the highest performance in sterile and precise liquid filling productions.

Tubing can be disposable or sterilized multiple times via autoclave or gamma irradiation.

## *Pharma-50 Tubing Compatible with AMT™ Servo Pumps*

### Features

- Excellent flexibility
- Low extractables
- Contains no peroxide by-products, chlorophenyls or PCBs
- No organic plasticizers, phthalates or latex additives
- Easily sterilized
- Stable over a wide temperature range
- No imparted taste or odor
- Made from BioMedical Grade elastomer that exceeds United States Pharmacopoeia Class VI Plastics Test requirements
- Meets European Pharmacopoeia monogram 3.1.9. "Silicone elastomer for closures and tubing"
- Manufactured to the principles of FDA 21 CFR 210/211 cGMPs for pharmaceutical products
- Produced in an FDA-registered (CFN 1816403) and inspected healthcare facility
- Reduces risk of contaminating ultra-pure liquids
- Consistent performance
- Complete traceability

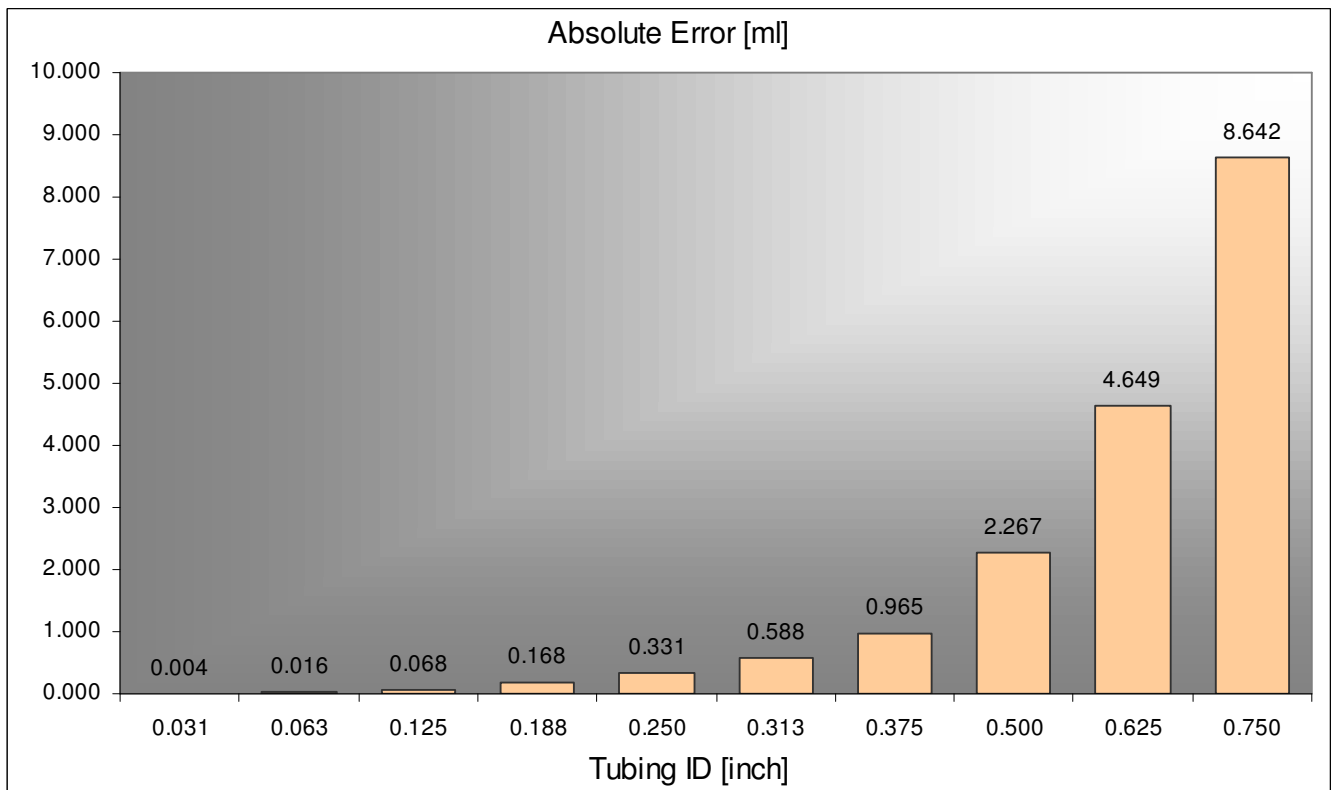
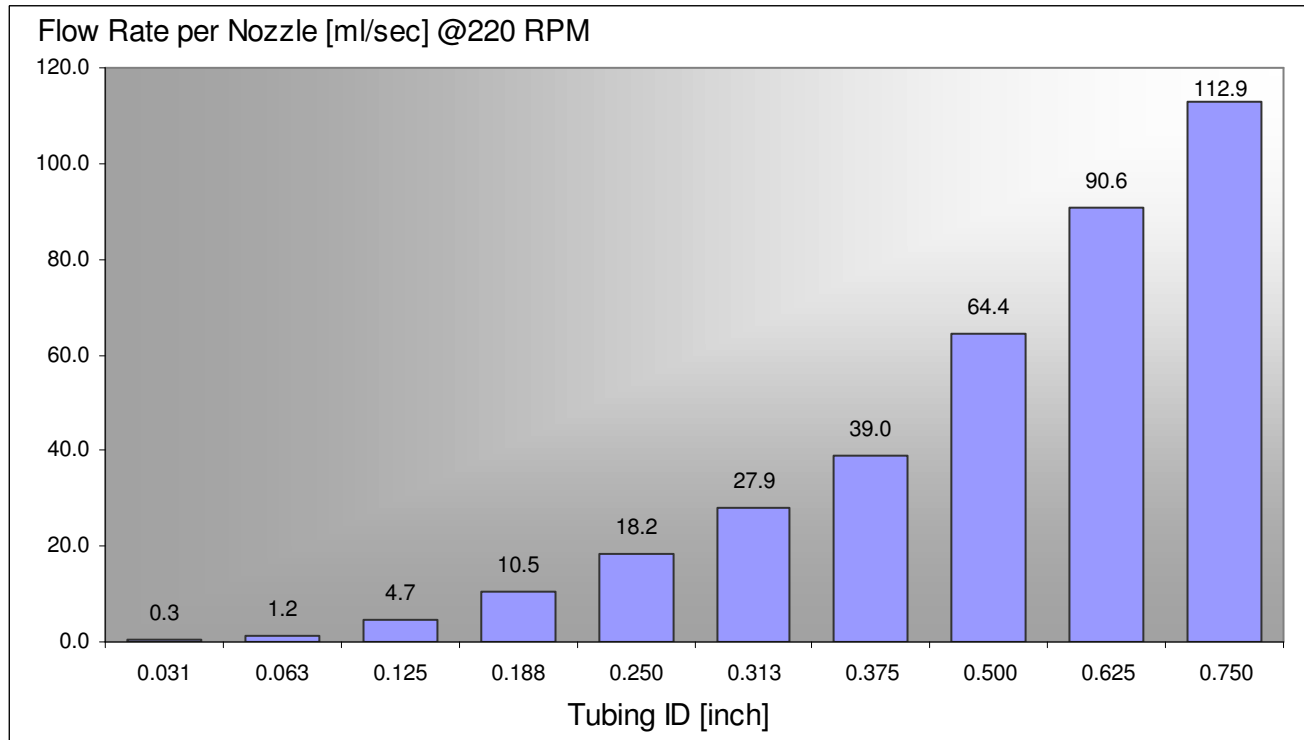
Size ID x OD [in]	AMT Part No.	Price [per foot]
0.063 x 0.313	PCST-063-125	\$1.68
0.125 x 0.375	PCST-125-125	\$2.18
0.188 x 0.438	PCST-188-125	\$2.58
0.250 x 0.500	PCST-250-125	\$2.66
0.313 x 0.563	PCST-313-125	\$2.26
0.375 x 0.625	PCST-375-125	\$3.60

Jan 2008 prices listed in US Dollars.  
Sold in 50 ft increments.

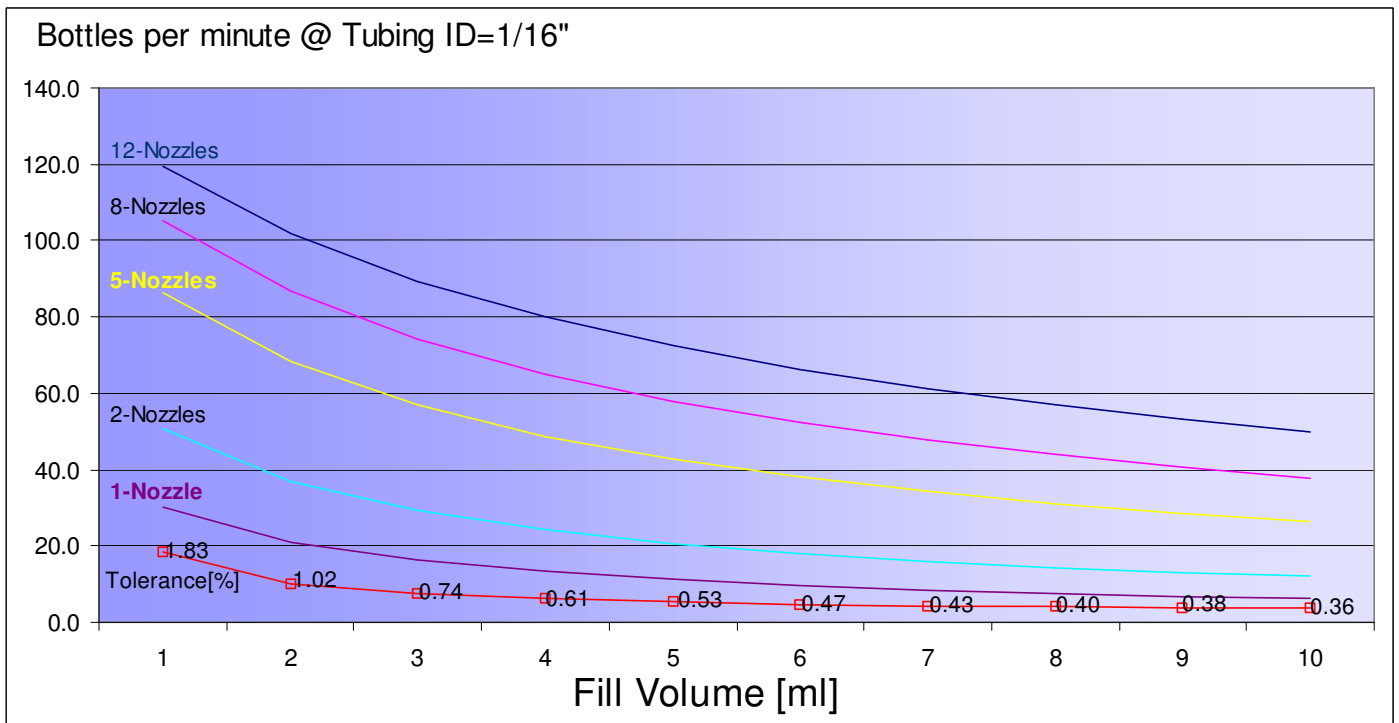
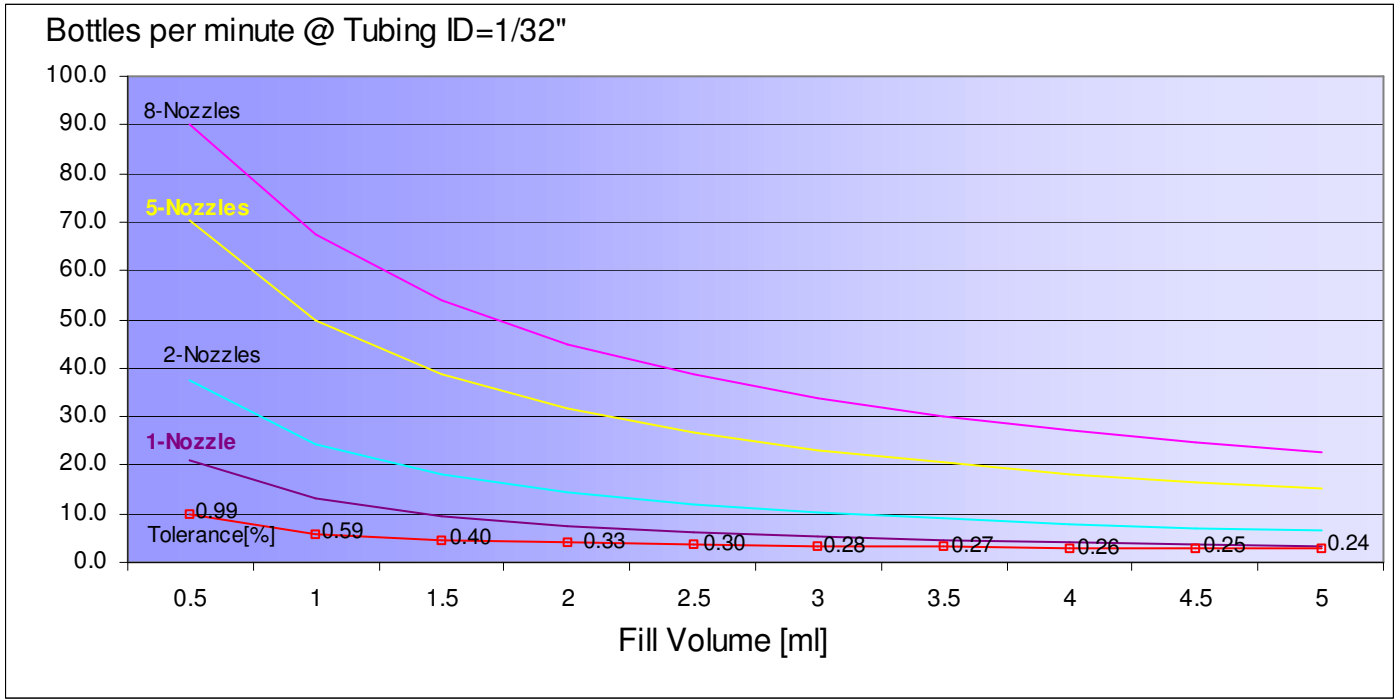
Automated Machine Technologies, Inc.  
10404 Chapel Hill Road, Unit 100  
PO BOX 1186  
Morrisville, NC 27560 USA

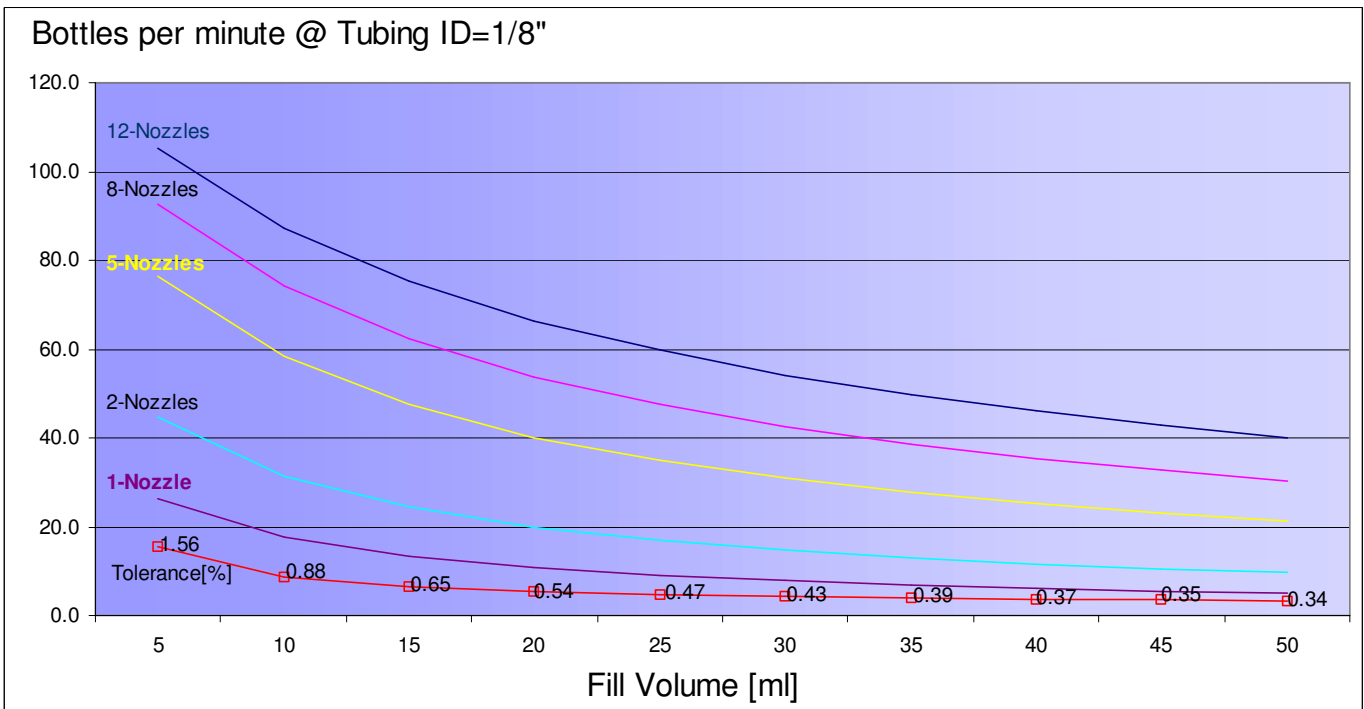
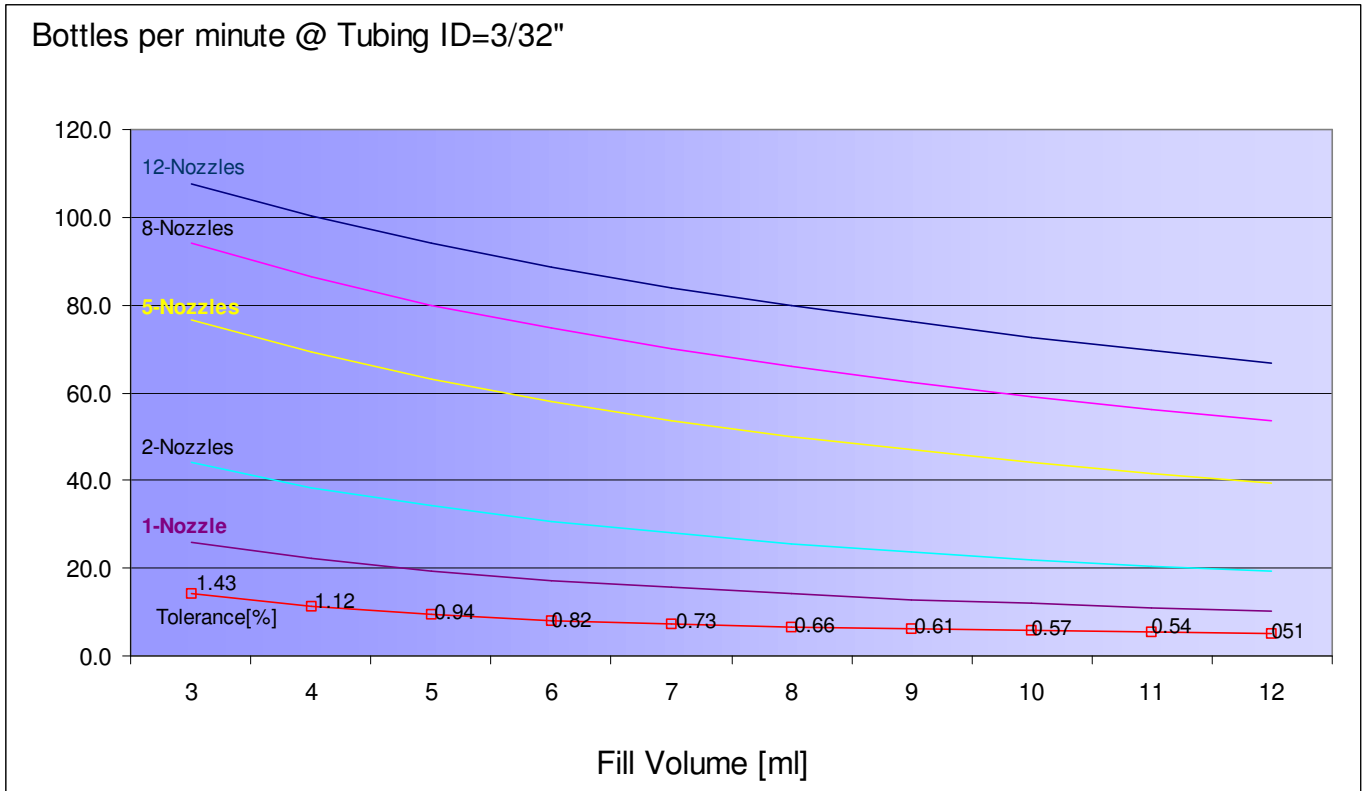
(919) 361 0121  
(919) 481 2120 - FAX  
Office@AMTLiquidFilling.com  
www.AMTLiquidFilling.com

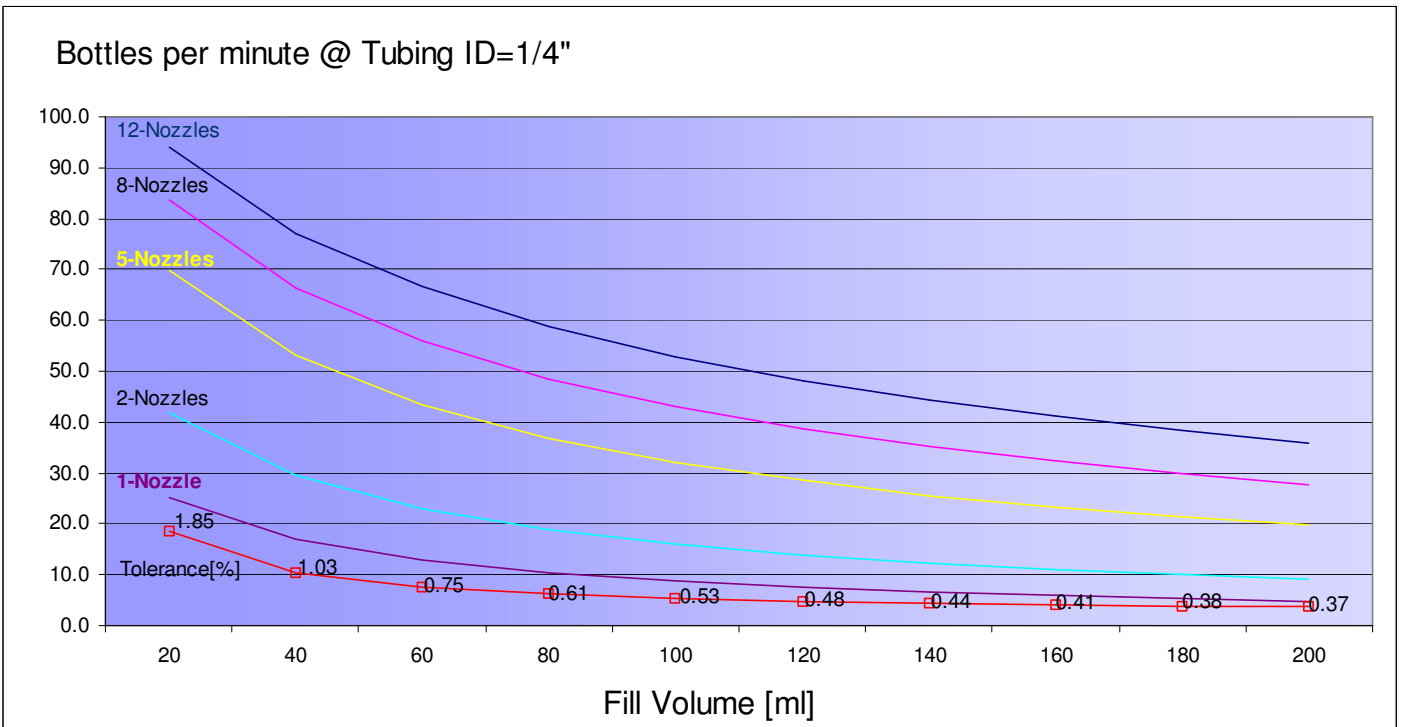
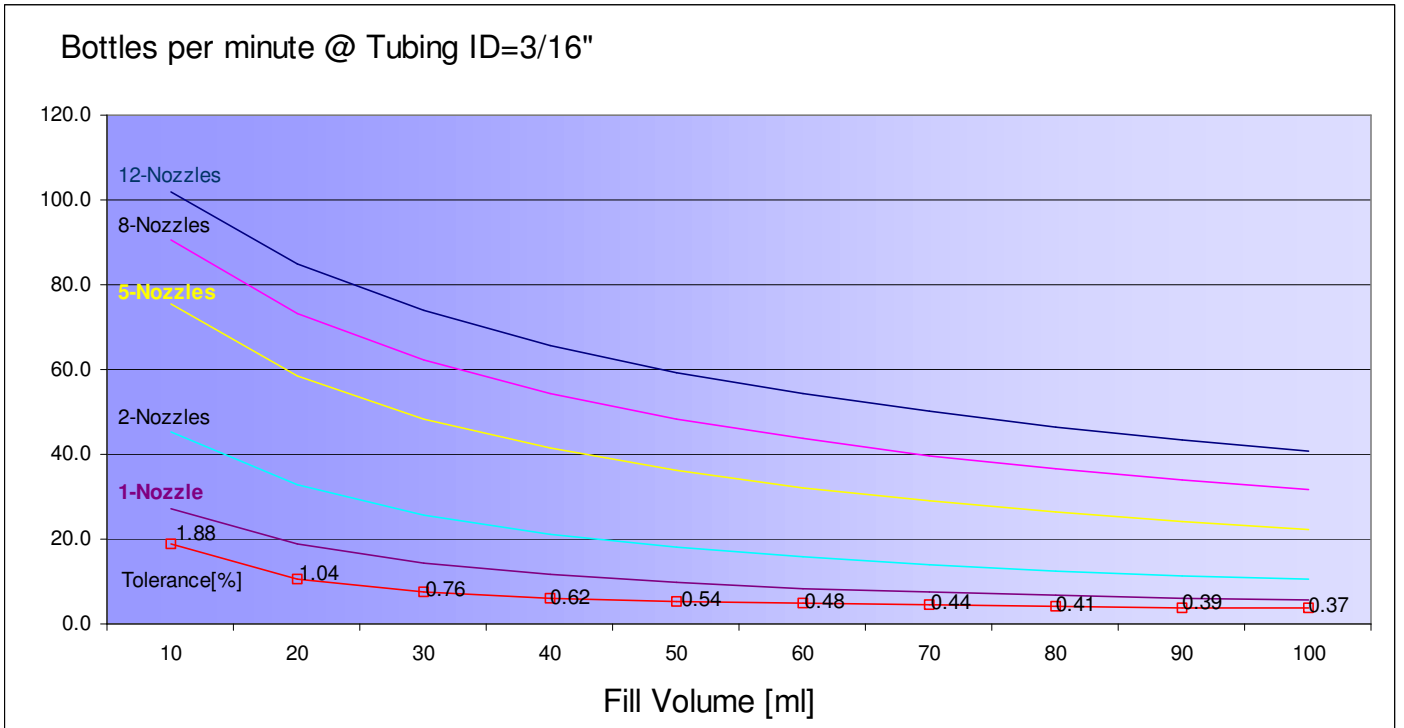
*AMT™ is an Authorized Distributor of Dow Corning® Platinum-Cured Silicone Tubing*



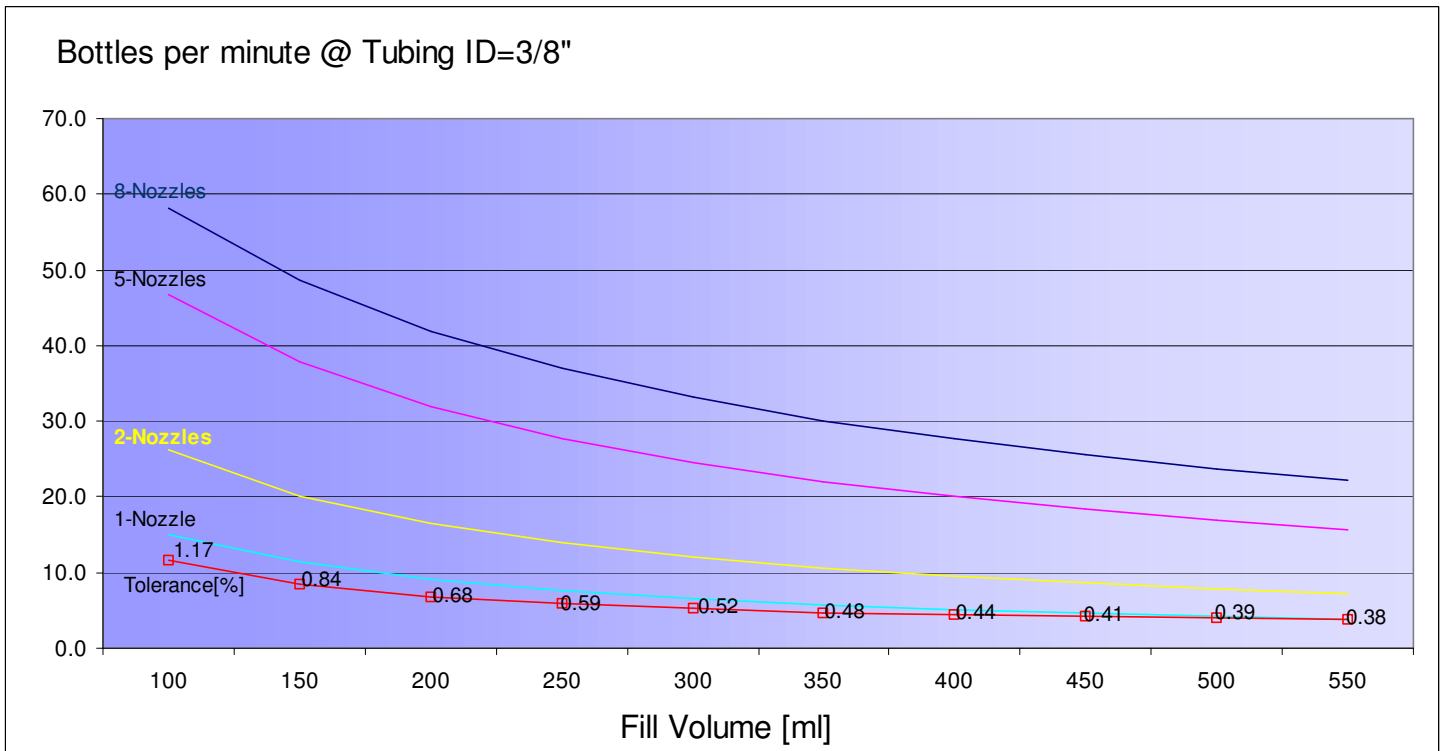
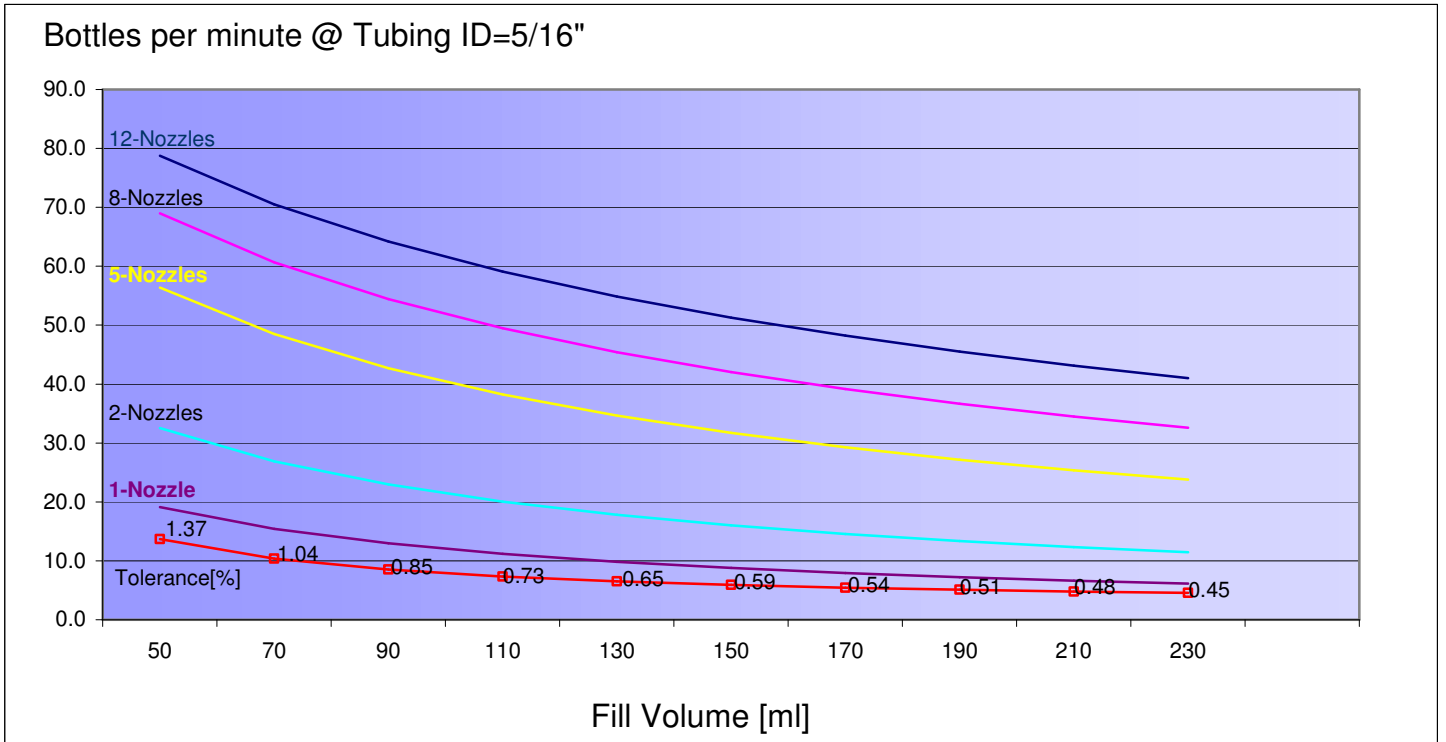
**NOTE:** Production speeds as much as twice higher from shown are achievable. (See NOTE- 1 at the bottom)

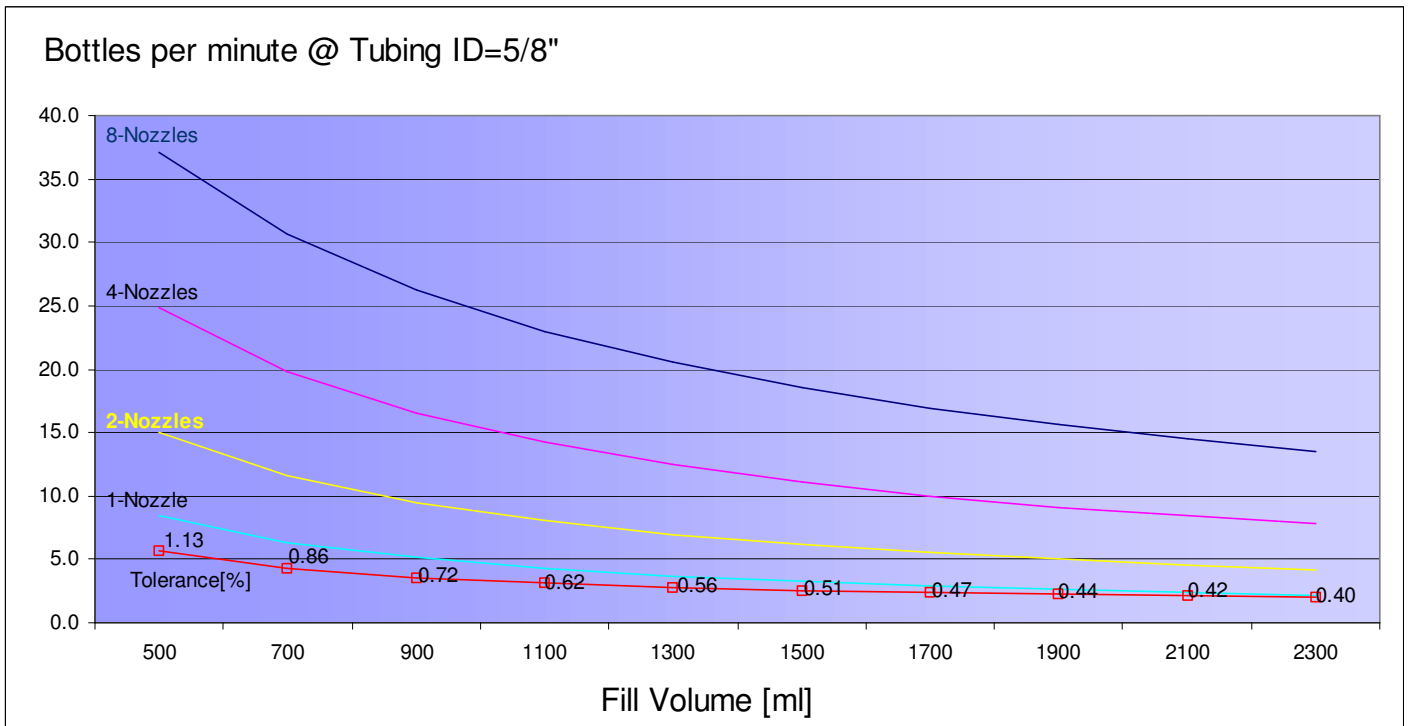
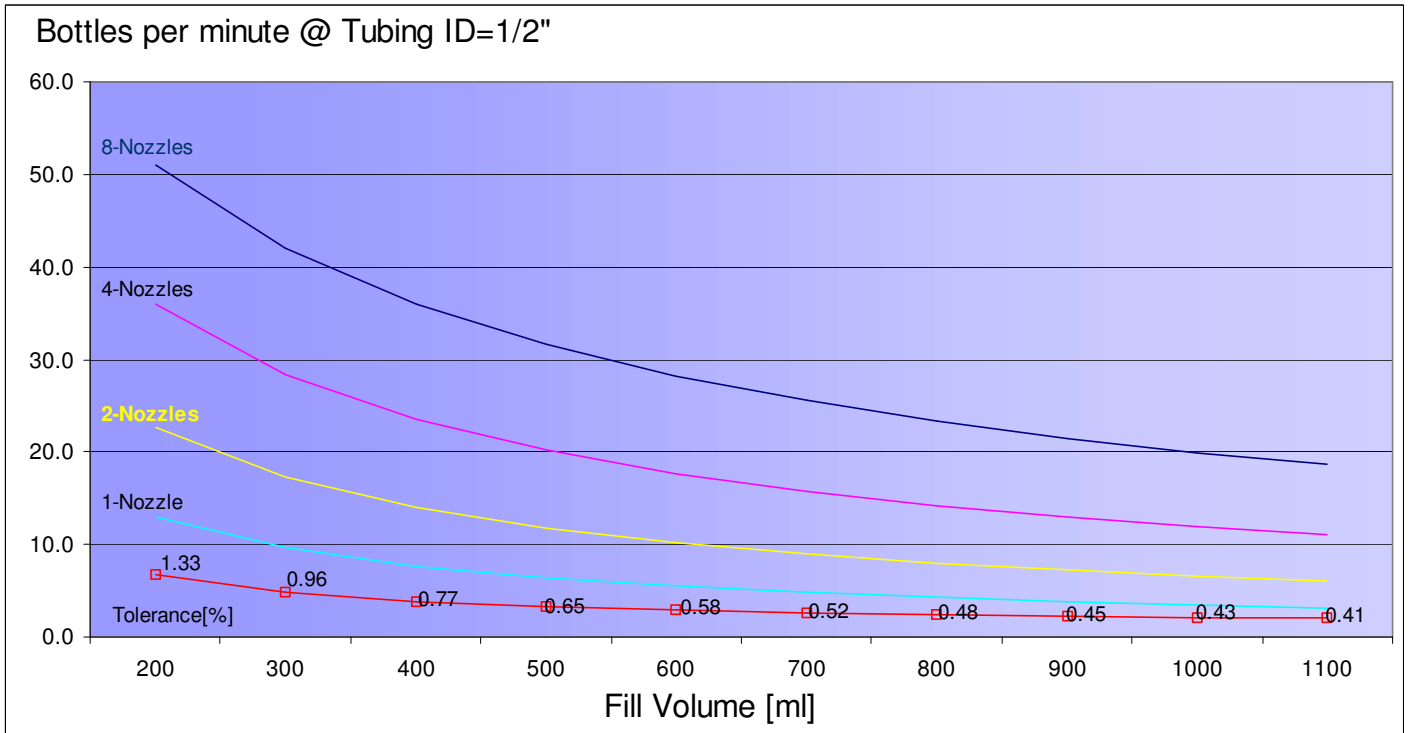


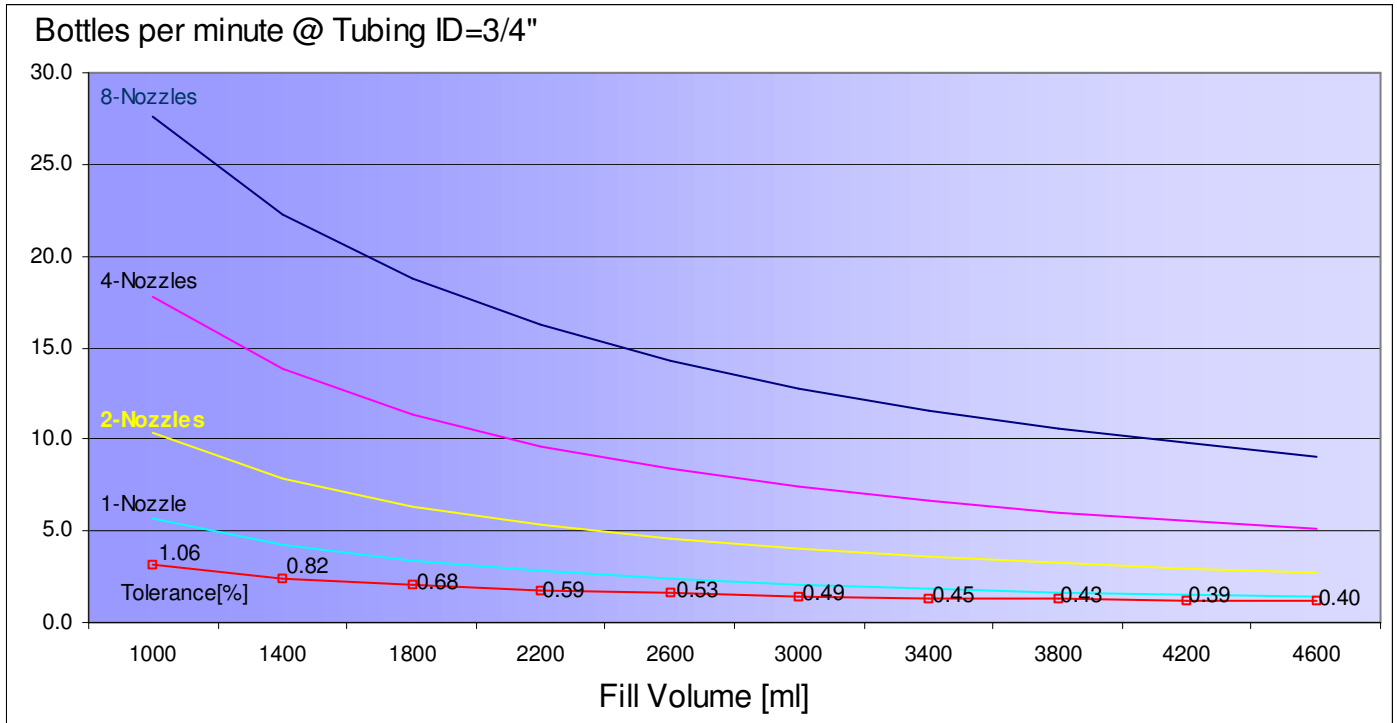












NOTES:

- As much as twice higher production speeds than shown are achievable with our newest servo drives. The above theoretical data are for silicon tubing with 1/8" wall, 220 RPM peristaltic pump servo drive, and water-like product. These data are provided for reference only. The pump speed can be increased up to 500 RPM with our new larger and more efficient servo drivers. At higher flow rates, product splashing and foaming can be dramatically reduced via precise servo programmable bottom-up nozzles.
- Multiple filling modules with increased number of nozzles are available for higher production speeds. 20-nozzle machines are running production over 300 containers per minute, some of them in pharmaceutical clean rooms. Systems with up to 40 nozzles were also custom developed.
- The fill volume tolerance may vary with application. Absolute fill error depends upon peristaltic tubing material, product viscosity, and pressure/vacuum fluctuation of the product supply system. Average relative fill error is approximately 0.2%, and may vary upon peristaltic tubing wear and tubing material instability.
- Production speed is proportional to the flow rate and to the bottle index time. The bottle index time varies upon conveyor speed, bottle diameter, and bottle shape. Flow rate can be optimally adjusted via programming the servo peristaltic pump RPM. Maximum flow rate depends upon product viscosity, foaming, and splashing.