ATS
SCIENTIFIC PRODUCTS WILMAD

NMR Tubes and Accessories

2025

WILMAD

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Liquid Phase NMR

Small Volume & External Reference NMR

Gas-Tight NMR

NMR Accessories

Solid-State NMR

Fundamentals of an NMR Tube

Outer Diameter & Inner Diameter

Outer Diameter (O.D.) - A measure of the distance across the center of the tube from the outermost surfaces.

Inner Diameter (I.D.) - A measure of the distance across the center of the tube from the innermost surfaces.

Concentricity

A measurement of variation in the radial centers, measured at the inner and outer walls.

Concentricity can be thought of as the degree to which the cylinders defined by the inner and outer surfaces of the tube are parallel. If the inner surface deviates and becomes closer to the outer surface that will cause one portion of the tube to have a smaller wall thickness than the other.

Camber

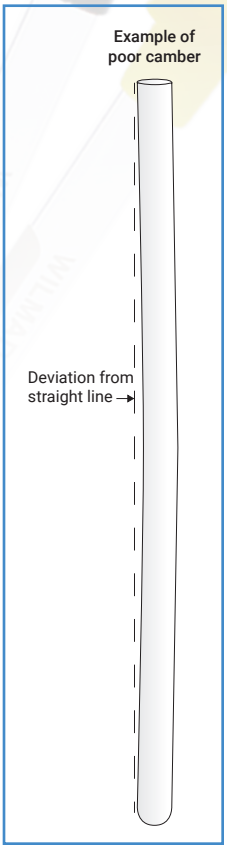
The lack of straightness of an NMR tube.

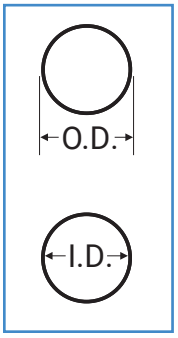
The camber of an NMR tube is measured by holding the tube on both ends and rotating it. During rotation, gauges measure the deflection in the middle of the tube giving a (+/-) deviation reading. All Wilmad Precision & Economy Thin-Walled tubes are guaranteed to have deviations less than 53.34 µm and can be expected to spin reliably.

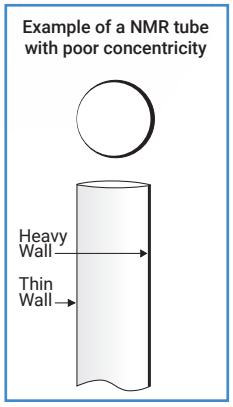
Why it's Important

An NMR tube with poor O.D. & I.D. tolerances, concentricity, or camber can produce undesirable experimental outcomes such as...

- Tube rupture when the I.D. is too small and inserts are used
- Modulation sidebands and decreased spectral quality when the concentricity or camber is large
- Tube slipping or wobbling when the O.D. is too small which can cause major probe damage
- NMR tube breakage due to probe contact when the O.D. or Camber is too large causing instrument downtime & contamination







ATS SCIENTIFIC PRODUCTS WILMAD

Standard Liquid Phase NMR Consumables

Technical Tubes

Always confirm the camber, concentricity, & MHz rating are correct for your experiment to ensure the highest spectral quality.

Precision NMR Tubes

Precision NMR Tubes have minimal paramagnetic impurities that would impact shimming.

- Manufactured using a unique precision shrinking and grinding process to maximize filling factor
- Made from borosilicate glass that meets the requirement of Type 1 Class A glass from ASTM E438
- Inner surface is resistant to strong acid and base at ambient temperature (hydrolytic class 1)
- Can be operated safely at temperatures up to 230˚ C, and within a temperature step of 120˚ C
- Ideal for experiments requiring critical shimming quality (high/ultrahigh field, multi-dimensional, multi-nuclei, DNP experiments and studies involving biological samples)
- 100% inspection with multiple NIST traceable gauges and optical surface defect checks
- Includes disposable cap

Note: Caps are not recommended for use with samples dissolved in chloroform-d or acetone-d_6.

Wilmad 3mm O.D. Thin Walled Precision NMR Tubes							
Catalog No.	**MHz Rating**	**Length**	**O.D.**	**Concentricity**	**Camber**	**I.D.**	**Wall Thickness**
341-PP-7-5	800	7"	2.9935±0.0065mm	3.8 µm	3.8 µm	2.4195±0.0065mm	0.29mm
341-PP-8-5	800	8"	2.9935±0.0065mm	3.8 µm	3.8 µm	2.4195±0.0065mm	0.29mm
335-PP-7-5	600	7"	2.9935±0.0065mm	13 µm	6 µm	2.4195±0.0065mm	0.29mm
335-PP-8-5	600	8"	2.9935±0.0065mm	13 µm	6 µm	2.4195±0.0065mm	0.29mm
335-PP-9-5	600	9"	2.9935±0.0065mm	13 µm	6 µm	2.4195±0.0065mm	0.29mm
328-PP-7-5	500	7"	2.9935±0.0065mm	25 µm	13 µm	2.4195±0.0065mm	0.29mm
328-PP-8-5	500	8"	2.9935±0.0065mm	25 µm	13 µm	2.4195±0.0065mm	0.29mm
328-PP-9-5	500	9"	2.9935±0.0065mm	25 µm	13 µm	2.4195±0.0065mm	0.29mm
327-PP-7-5	400	7"	2.9935±0.0065mm	25 µm	25 µm	2.4195±0.0065mm	0.29mm
327-PP-8-5	400	8"	2.9935±0.0065mm	25 µm	25 µm	2.4195±0.0065mm	0.29mm
327-PP-9-5	400	9"	2.9935±0.0065mm	25 µm	25 µm	2.4195±0.0065mm	0.29mm
307-PP-7-5	300	7"	2.9935±0.0065mm	51 µm	25 µm	2.4195±0.0065mm	0.29mm
307-PP-8-5	300	8"	2.9935±0.0065mm	51 µm	25 µm	2.4195±0.0065mm	0.29mm
307-PP-9-5	300	9"	2.9935±0.0065mm	51 µm	25 µm	2.4195±0.0065mm	0.29mm
305-PS-7-5	200	7"	2.9935±0.0065mm	76 µm	51 µm	2.413±0.13mm	0.29mm
305-PS-8-5	200	8"	2.9935±0.0065mm	76 µm	51 µm	2.413±0.13mm	0.29mm
305-PS-9-5	200	9"	2.9935±0.0065mm	76 µm	51 µm	2.413±0.13mm	0.29mm

Precision NMR tubes are sold in packs of 5

Catalog No.	MHz Rating	Length	O.D.	Concentricity	Camber	I.D.	Wall Thickness
Wilmad 4mm O.D. Thin Walled Precision NMR Tubes							
435-PP-7-5	600	7"	3.9835±0.0065mm	13 µm	6 µm	3.240±0.013mm	0.38mm
427-PP-7-5	400	7"	3.9835±0.0065mm	25 µm	25 µm	3.240±0.013mm	0.38mm
427-PP-8-5	400	8"	3.9835±0.0065mm	25 µm	25 µm	3.240±0.013mm	0.38mm
427-PP-9-5	400	9"	3.9835±0.0065mm	25 µm	25 µm	3.240±0.013mm	0.38mm
406-PP-7-5	300	7"	3.9835±0.0065mm	76 µm	51 µm	3.240±0.013mm	0.38mm
406-PP-8-5	300	8"	3.9835±0.0065mm	76 µm	51 µm	3.240±0.013mm	0.38mm
406-PP-9-5	300	9"	3.9835±0.0065mm	76 µm	51 µm	3.240±0.013mm	0.38mm
405-PS-7-5	100	7"	3.9835±0.0065mm	152 µm	51 µm	3.2mm	0.4mm
405-PS-8-5	100	8"	3.9835±0.0065mm	152 µm	51 µm	3.2mm	0.4mm
405-PS-9-5	100	9"	3.9835±0.0065mm	152 µm	51 µm	3.2mm	0.4mm
Wilmad 5mm O.D. Thin Walled Precision NMR Tubes							
542-PP-7-5	1000	7"	4.9635±0.0065mm	2.5 µm	3.8 µm	4.2065±0.0065mm	0.38mm
542-PP-8-5	1000	8"	4.9635±0.0065mm	2.5 µm	3.8 µm	4.2065±0.0065mm	0.38mm
541-PP-7-5	800	7"	4.9635±0.0065mm	3.8 µm	3.8 µm	4.2065±0.0065mm	0.38mm
541-PP-8-5	800	8"	4.9635±0.0065mm	3.8 µm	3.8 µm	4.2065±0.0065mm	0.38mm
535-PP-7-5	600	7"	4.9635±0.0065mm	13 µm	6 µm	4.2065±0.0065mm	0.38mm
535-PP-8-5	600	8"	4.9635±0.0065mm	13 µm	6 µm	4.2065±0.0065mm	0.38mm
535-PP-9-5	600	9"	4.9635±0.0065mm	13 µm	6 µm	4.2065±0.0065mm	0.38mm
528-PP-7-5	500	7"	4.9635±0.0065mm	25 µm	13 µm	4.2065±0.0065mm	0.38mm
528-PP-8-5	500	8"	4.9635±0.0065mm	25 µm	13 µm	4.2065±0.0065mm	0.38mm
528-PP-9-5	500	9"	4.9635±0.0065mm	25 µm	13 µm	4.2065±0.0065mm	0.38mm
527-PP-7-5	400	7"	4.9635±0.0065mm	25 µm	25 µm	4.2065±0.0065mm	0.38mm
527-PP-8-5	400	8"	4.9635±0.0065mm	25 µm	25 µm	4.2065±0.0065mm	0.38mm
527-PP-9-5	400	9"	4.9635±0.0065mm	25 µm	25 µm	4.2065±0.0065mm	0.38mm
526-PP-7-5	350	7"	4.9635±0.0065mm	51 µm	13 µm	4.2065±0.0065mm	0.38mm
526-PP-8-5	350	8"	4.9635±0.0065mm	51 µm	13 µm	4.2065±0.0065mm	0.38mm
526-PP-9-5	350	9"	4.9635±0.0065mm	51 µm	13 µm	4.2065±0.0065mm	0.38mm
507-PP-7-5	300	7"	4.9635±0.0065mm	51 µm	25 µm	4.2065±0.0065mm	0.38mm
507-PP-8-5	300	8"	4.9635±0.0065mm	51 µm	25 µm	4.2065±0.0065mm	0.38mm
507-PP-9-5	300	9"	4.9635±0.0065mm	51 µm	25 µm	4.2065±0.0065mm	0.38mm
506-PP-7-5	200	7"	4.9635±0.0065mm	51 µm	51 µm	4.2065±0.0065mm	0.38mm
506-PP-8-5	200	8"	4.9635±0.0065mm	51 µm	51 µm	4.2065±0.0065mm	0.38mm
506-PP-9-5	200	9"	4.9635±0.0065mm	51 µm	51 µm	4.2065±0.0065mm	0.38mm
505-PS-7-5	100	7"	4.9635±0.0065mm	76 µm	51 µm	4.21±0.13mm	0.38mm
505-PS-8-5	100	8"	4.9635±0.0065mm	76 µm	51 µm	4.21±0.13mm	0.38mm
505-PS-9-5	100	9"	4.9635±0.0065mm	76 µm	51 µm	4.21±0.13mm	0.38mm

Precision NMR tubes are sold in packs of 5

Catalog No.	MHz Rating	Length	O.D.	Concentricity	Camber	I.D.	Wall Thickness
Wilmad 5mm O.D. Ultra-Thin Walled Precision NMR Tubes							
545-PPT-7-5	600	7"	4.9635±0.0065mm	13 µm	6 µm	4.4965±0.0065mm	0.24mm
545-PPT-8-5	600	8"	4.9635±0.0065mm	13 µm	6 µm	4.4965±0.0065mm	0.24mm
545-PPT-9-5	600	9"	4.9635±0.0065mm	13 µm	6 µm	4.4965±0.0065mm	0.24mm
540-PPT-7-5	400	7"	4.9635±0.0065mm	25 µm	13 µm	4.4965±0.0065mm	0.24mm
540-PPT-8-5	400	8"	4.9635±0.0065mm	25 µm	13 µm	4.4965±0.0065mm	0.24mm
540-PPT-9-5	400	9"	4.9635±0.0065mm	25 µm	13 µm	4.4965±0.0065mm	0.24mm
537-PPT-7-5	300	7"	4.9635±0.0065mm	51 µm	25 µm	4.4965±0.0065mm	0.24mm
537-PPT-8-5	300	8"	4.9635±0.0065mm	51 µm	25 µm	4.4965±0.0065mm	0.24mm
537-PPT-9-5	300	9"	4.9635±0.0065mm	51 µm	25 µm	4.4965±0.0065mm	0.24mm
Wilmad 5mm O.D. Medium Walled Precision NMR Tubes							
524-PP-7-5	400	7"	4.9635±0.0065mm	76 µm	51 µm	3.43±0.13mm	0.77mm
524-PP-8-5	400	8"	4.9635±0.0065mm	76 µm	51 µm	3.43±0.13mm	0.77mm
524-PP-9-5	400	9"	4.9635±0.0065mm	76 µm	51 µm	3.43±0.13mm	0.77mm
504-PP-7-5	300	7"	4.9635±0.0065mm	152 µm	51 µm	3.43±0.13mm	0.77mm
504-PP-8-5	300	8"	4.9635±0.0065mm	152 µm	51 µm	3.43±0.13mm	0.77mm
504-PP-9-5	300	9"	4.9635±0.0065mm	152 µm	51 µm	3.43±0.13mm	0.77mm
503-PS-7-5	100	7"	4.9635±0.0065mm	76 µm	51 µm	3.43±0.13mm	0.77mm
503-PS-8-5	100	8"	4.9635±0.0065mm	76 µm	51 µm	3.43±0.13mm	0.77mm
503-PS-9-5	100	9"	4.9635±0.0065mm	76 µm	51 µm	3.43±0.13mm	0.77mm
Wilmad 5mm O.D. Heavy Walled Precision NMR Tubes							
522-PP-7-5	500	7"	4.9635±0.0065mm	51 µm	51 µm	2.160±0.013mm	1.4mm
522-PP-8-5	500	8"	4.9635±0.0065mm	51 µm	51 µm	2.160±0.013mm	1.4mm
522-PP-9-5	500	9"	4.9635±0.0065mm	51 µm	51 µm	2.160±0.013mm	1.4mm
502-PP-7-5	300	7"	4.9635±0.0065mm	152 µm	51 µm	2.160±0.013mm	1.4mm
502-PP-8-5	300	8"	4.9635±0.0065mm	152 µm	51 µm	2.160±0.013mm	1.4mm
502-PP-9-5	300	9"	4.9635±0.0065mm	152 µm	51 µm	2.160±0.013mm	1.4mm
501-PS-7-5	100	7"	4.9635±0.0065mm	152 µm	51 µm	2.16±0.13mm	1.4mm
501-PS-8-5	100	8"	4.9635±0.0065mm	152 µm	51 µm	2.16±0.13mm	1.4mm
501-PS-9-5	100	9"	4.9635±0.0065mm	152 µm	51 µm	2.16±0.13mm	1.4mm
Wilmad 6.5mm O.D. Thin Walled Precision NMR Tubes							
6.5-PP-7-5	400	7"	6.5135±0.0065mm	51 µm	13 µm	5.7±0.013mm	0.41mm
6.5-PP-8-5	400	8"	6.5135±0.0065mm	51 µm	13 µm	5.7±0.013mm	0.41mm
6.5-PP-9-5	400	9"	6.5135±0.0065mm	51 µm	13 µm	5.7±0.013mm	0.41mm
Wilmad 7.5mm O.D. Thin Walled Precision NMR Tubes							
513B-7PP-7-5	400	7"	7.4835±0.0065mm	38 µm	13 µm	6.480±0.013mm	0.51mm
513B-7PP-8-5	400	8"	7.4835±0.0065mm	38 µm	13 µm	6.480±0.013mm	0.51mm
513B-7PP-9-5	400	9"	7.4835±0.0065mm	38 µm	13 µm	6.480±0.013mm	0.51mm
513B-1PP-7-5	100	7"	7.4835±0.0065mm	254 µm	51 µm	6.480±0.013mm	0.51mm
513B-1PP-8-5	100	8"	7.4835±0.0065mm	254 µm	51 µm	6.480±0.013mm	0.51mm
513B-1PP-9-5	100	9"	7.4835±0.0065mm	254 µm	51 µm	6.480±0.013mm	0.51mm

Precision NMR tubes are sold in packs of 5

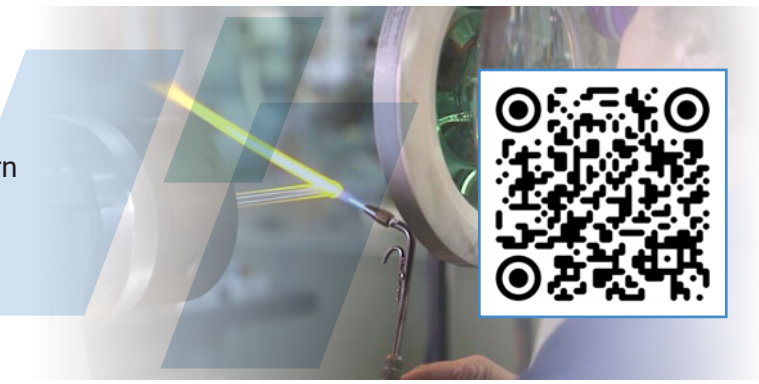
Catalog No.	MHz Rating	Length	O.D.	Concentricity	Camber	I.D.	Wall Thickness
Wilmad 8mm O.D. Thin Walled Precision NMR Tubes							
513A-9PP-7-5	500	7"	7.9935±0.0065mm	13 µm	13 µm	6.990±0.013mm	0.51mm
513A-9PP-8-5	500	8"	7.9935±0.0065mm	13 µm	13 µm	6.990±0.013mm	0.51mm
513A-9PP-9-5	500	9"	7.9935±0.0065mm	13 µm	13 µm	6.990±0.013mm	0.51mm
513A-7PP-7-5	400	7"	7.9935±0.0065mm	38 µm	13 µm	6.990±0.013mm	0.51mm
513A-7PP-8-5	400	8"	7.9935±0.0065mm	38 µm	13 µm	6.990±0.013mm	0.51mm
513A-5PP-7-5	350	7"	7.9935±0.0065mm	51 µm	25 µm	6.990±0.013mm	0.51mm
513A-5PP-8-5	350	8"	7.9935±0.0065mm	51 µm	25 µm	6.990±0.013mm	0.51mm
513A-3PP-7-5	300	7"	7.9935±0.0065mm	76 µm	38 µm	6.990±0.013mm	0.51mm
513A-3PP-8-5	300	8"	7.9935±0.0065mm	76 µm	38 µm	6.990±0.013mm	0.51mm
513A-1PP-7-5	60	7"	7.9935±0.0065mm	254 µm	51 µm	6.990±0.013mm	0.51mm
513A-1PP-8-5	60	8"	7.9935±0.0065mm	254 µm	51 µm	6.990±0.013mm	0.51mm
513A-1PP-9-5	60	9"	7.9935±0.0065mm	254 µm	51 µm	6.990±0.013mm	0.51mm
Wilmad 10mm O.D. Thin Walled Precision NMR Tubes							
513-7PP-7-5	500	7"	9.9935±0.0065mm	38 µm	13 µm	9.070±0.013mm	0.46mm
513-7PP-8-5	500	8"	9.9935±0.0065mm	38 µm	13 µm	9.070±0.013mm	0.46mm
513-7PP-9-5	500	9"	9.9935±0.0065mm	38 µm	13 µm	9.070±0.013mm	0.46mm
513-5PP-7-5	400	7"	9.9935±0.0065mm	51 µm	25 µm	9.070±0.013mm	0.46mm
513-5PP-8-5	400	8"	9.9935±0.0065mm	51 µm	25 µm	9.070±0.013mm	0.46mm
513-5PP-9-5	400	9"	9.9935±0.0065mm	51 µm	25 µm	9.070±0.013mm	0.46mm
513-3PP-7-5	300	7"	9.9935±0.0065mm	76 µm	38 µm	9.070±0.013mm	0.46mm
513-3PP-8-5	300	8"	9.9935±0.0065mm	76 µm	38 µm	9.070±0.013mm	0.46mm
513-3PP-9-5	300	9"	9.9935±0.0065mm	76 µm	38 µm	9.070±0.013mm	0.46mm
513-1PP-7-5	200	7"	9.9935±0.0065mm	254 µm	51 µm	9.070±0.013mm	0.46mm
513-1PP-8-5	200	8"	9.9935±0.0065mm	254 µm	51 µm	9.070±0.013mm	0.46mm
513-1PP-9-5	200	9"	9.9935±0.0065mm	254 µm	51 µm	9.070±0.013mm	0.46mm
513-1PS-7-5	100	7"	9.9935±0.0065mm	254 µm	51 µm	8.90±0.13mm	0.55mm
513-1PS-8-5	100	8"	9.9935±0.0065mm	254 µm	51 µm	8.90±0.13mm	0.55mm
513-1PS-9-5	100	9"	9.9935±0.0065mm	254 µm	51 µm	8.90±0.13mm	0.55mm
Wilmad 10mm O.D. Medium Walled Precision NMR Tubes							
513-7PPM-7-5	200	7"	9.9935±0.0065mm	38 µm	13 µm	8.160±0.013mm	0.92mm
513-7PPM-8-5	200	8"	9.9935±0.0065mm	38 µm	13 µm	8.160±0.013mm	0.92mm
513-7PPM-9-5	200	9"	9.9935±0.0065mm	38 µm	13 µm	8.160±0.013mm	0.92mm
Wilmad 10mm O.D. Heavy Walled Precision NMR Tubes							
513-7PPH-7-5	450	7"	9.9935±0.0065mm	51 µm	13 µm	7.100±0.013mm	1.45mm
513-7PPH-8-5	450	8"	9.9935±0.0065mm	51 µm	13 µm	7.100±0.013mm	1.45mm
513-7PPH-9-5	450	9"	9.9935±0.0065mm	51 µm	13 µm	7.100±0.013mm	1.45mm

Precision NMR tubes are sold in packs of 5

Need a custom NMR Tube?

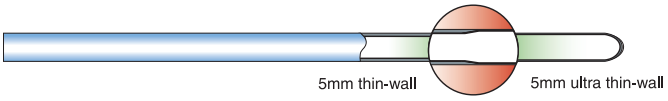
Wilmad's experienced glass engineers are happy to help with your custom NMR tube concepts. Their ability to turn your complex designs into world class finished goods is what they have been doing for 30+ years.

Contact us today to discuss your custom NMR needs.
wilmadcustomglass.com



Wilmad Precision Step-Down Tubes

Precision Step-Down Tubes change wall thickness from Thin-Wall to Ultra Thin-Wall within the Rf coil limit. This change in wall thickness allows for 15% more sample volume and a less fragile tube than standard Ultra Thin-Walled tubes.



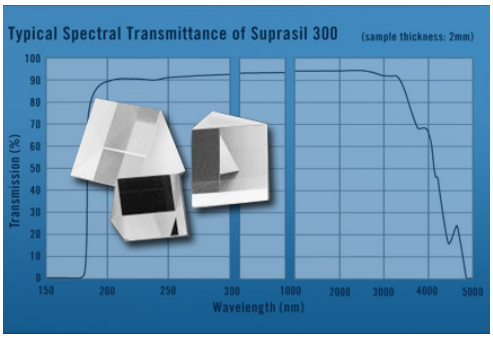
Wilmad 5mm O.D. Step-Down Ultra-Thin Walled Precision NMR Tubes

Catalog No.	MHz Rating	Length	O.D.	Concentricity	Camber	Bottom I.D.	Bottom Wall Thickness
555-PPT-7	600	7"	4.9635±0.0065mm	13 µm	6 µm	4.4965±0.0065mm	0.24mm
555-PPT-8	600	8"	4.9635±0.0065mm	13 µm	6 µm	4.4965±0.0065mm	0.24mm
555-PPT-9	600	9"	4.9635±0.0065mm	13 µm	6 µm	4.4965±0.0065mm	0.24mm

Wilmad Precision NMR Suprasil® (Synthetic Quartz) Tubes

Wilmad Precision NMR Suprasil® (Synthetic Quartz) Tubes are manufactured from high purity synthetic fused silica materials with <0.005ppm Fe_2O_3 and outstanding optical characteristics in the deep UV to the near IR.

- Transmission rate from 190nm to 2600nm is well over 95% (10mm thickness) excluding reflection
- Possesses a similar thermal expansion rate and tensile strength as natural quartz which is 14 times more robust during the cooling/heating process than Type 1 Class A glass
- To maximize SNR, Wilmad Precision NMR Suprasil® Tubes have minimal paramagnetic impurities that would impact shimming
- Ideal for photolysis experiments that employ 266nm light from a Q-Switched laser or 254nm light emitted by a mercury low pressure lamp with a Schott UG 5 filter, as well as variable temperature experiments that have a temperature step over 120˚C
- Safe for experiments at temperatures up to 1300˚C
- 100% inspection with multiple NIST traceable gauges and optical surface defect checks
- Includes disposable cap



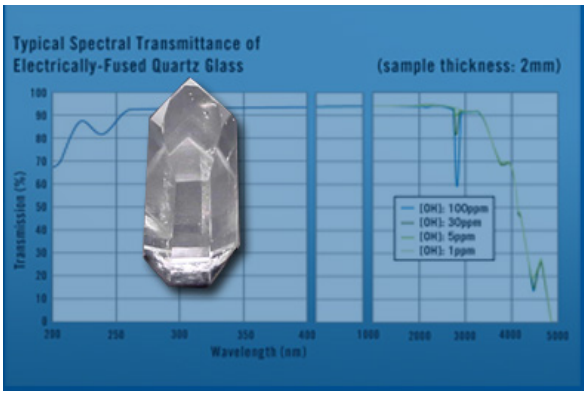
Note: Caps are not recommended for use with samples dissolved in chloroform-d or acetone-d_6.

Wilmad 5mm O.D. Thin Walled Suprasil® NMR Tubes

Catalog No.	MHz Rating	Length	O.D.	Concentricity	Camber	I.D.	Wall Thickness
535-PP-7SUP	600	7"	4.9635±0.0065mm	13 µm	6 µm	4.2065±0.0065mm	0.38mm
535-PP-8SUP	600	8"	4.9635±0.0065mm	13 µm	6 µm	4.2065±0.0065mm	0.38mm
535-PP-9SUP	600	9"	4.9635±0.0065mm	13 µm	6 µm	4.2065±0.0065mm	0.38mm
528-PP-7SUP	500	7"	4.9635±0.0065mm	25 µm	13 µm	4.2065±0.0065mm	0.38mm
528-PP-8SUP	500	8"	4.9635±0.0065mm	25 µm	13 µm	4.2065±0.0065mm	0.38mm
528-PP-9SUP	500	9"	4.9635±0.0065mm	25 µm	13 µm	4.2065±0.0065mm	0.38mm
507-PP-7SUP	300	7"	4.9635±0.0065mm	51 µm	25 µm	4.2065±0.0065mm	0.38mm
507-PP-8SUP	300	8"	4.9635±0.0065mm	51 µm	25 µm	4.2065±0.0065mm	0.38mm
507-PP-9SUP	300	9"	4.9635±0.0065mm	51 µm	25 µm	4.2065±0.0065mm	0.38mm

Wilmad Precision NMR Quartz Tubes

Wilmad Precision NMR Quartz Tubes have an extremely low thermal expansion rate and high tensile strength which is 14 times more robust during the cooling/heating process than Type 1 Class A glass tubes.



- Naturally occurring quartz maintains an over 85% transmission rate (10 mm thickness, with consideration of reflection loss) above 265nm that makes quartz tubes preferable in photochemistry studies
- Half the dielectric constant of Pyrex® glass helps improve the quality factor
- Low Boron density at or below 0.1 ppm guarantees a clean background in Boron-11 NMR studies
- To maximize SNR, Precision NMR Quartz Tubes have minimal paramagnetic impurities that would impact shimming
- Ideal for variable temperature experiments that have a temperature step over 120˚C as well as experiments at temperatures up to 1300˚C
- Inner surface is resistant to strong acid and base at ambient temperature
- 100% inspection with multiple NIST traceable gauges and optical surface defect checks
- Includes disposable cap

Note: Caps are not recommended for use with samples dissolved in chloroform-d or acetone-d_6.

Wilmad 5mm O.D. Thin Walled Quartz NMR Tubes							
Catalog No.	**MHz Rating**	**Length**	**O.D.**	**Concentricity**	**Camber**	**I.D.**	**Wall Thickness**
535-PP-7QTZ	600	7"	4.936±0.0065mm	13 µm	6 µm	4.2065±0.0065mm	0.38mm
535-PP-8QTZ	600	8"	4.936±0.0065mm	13 µm	6 µm	4.2065±0.0065mm	0.38mm
535-PP-9QTZ	600	9"	4.936±0.0065mm	13 µm	6 µm	4.2065±0.0065mm	0.38mm
528-PP-7QTZ	500	7"	4.936±0.0065mm	25 µm	13 µm	4.2065±0.0065mm	0.38mm
528-PP-8QTZ	500	8"	4.936±0.0065mm	25 µm	13 µm	4.2065±0.0065mm	0.38mm
528-PP-9QTZ	500	9"	4.936±0.0065mm	25 µm	13 µm	4.2065±0.0065mm	0.38mm
507-PP-7QTZ	300	7"	4.936±0.0065mm	51 µm	25 µm	4.2065±0.0065mm	0.38mm
507-PP-8QTZ	300	8"	4.936±0.0065mm	51 µm	25 µm	4.2065±0.0065mm	0.38mm
507-PP-9QTZ	300	9"	4.936±0.0065mm	51 µm	25 µm	4.2065±0.0065mm	0.38mm
Wilmad 10mm O.D. Thin Walled Quartz NMR Tubes							
513-7PP-7QTZ	400	7"	9.9935±0.0065mm	38 µm	13 µm	9.070±0.013mm	0.46mm
513-7PP-8QTZ	400	8"	9.9935±0.0065mm	38 µm	13 µm	9.070±0.013mm	0.46mm
513-7PP-9QTZ	400	9"	9.9935±0.0065mm	38 µm	13 µm	9.070±0.013mm	0.46mm

Wilmad Economy NMR Tubes

Designed for routine use in all NMR spectrometers, Wilmad Economy NMR Tubes are guaranteed to fit tightly in any spinner turbine.

- Best O.D. tolerance in the industry and a 30% thicker wall
- Camber and concentricity values listed are the Total Indicator Reading (TIR)
- 100% visual and physical inspection ensures quality, including physical dimensions and surface defects
- Made from borosilicate glass; meets ASTM E438 Type 1 Class B standard, recognized as N51A
- Includes disposable cap
- Recommended only for experiments with small organic molecules (Molecular Weight ~500) at ambient temperatures only
- Cooling/heating of these tubes may lead to breakage. For variable temperature experiments use Wilmad Precision NMR Tubes

Note: Caps are not recommended for use with samples dissolved in chloroform-d or acetone-d_6.

Wilmad 5mm O.D. Thin Walled Economy NMR Tubes

Catalog No.	MHz Rating	Length	O.D.	Concentricity	Camber	I.D.	Wall Thickness
WG-1242-7-5	700	7"	4.947±0.019mm	2.5 µm	3.8 µm	4.1mm	0.43mm
WG-1242-8-5	700	8"	4.947±0.019mm	2.5 µm	3.8 µm	4.1mm	0.43mm
WG-1241-7-5	600	7"	4.947±0.019mm	3.8 µm	3.8 µm	4.1mm	0.43mm
WG-1241-8-5	600	8"	4.947±0.019mm	3.8 µm	3.8 µm	4.1mm	0.43mm
WG-1235-7-5	500	7"	4.947±0.019mm	13 µm	6 µm	4.1mm	0.43mm
WG-1235-8-5	500	8"	4.947±0.019mm	13 µm	6 µm	4.1mm	0.43mm
WG-1228-7-5	400	7"	4.947±0.019mm	13 µm	13 µm	4.1mm	0.43mm
WG-1228-8-5	400	8"	4.947±0.019mm	13 µm	13 µm	4.1mm	0.43mm
WG-1226-7-5	300	7"	4.947±0.019mm	51 µm	13 µm	4.1mm	0.43mm
WG-1226-8-5	300	8"	4.947±0.019mm	51 µm	13 µm	4.1mm	0.43mm
WG-1208-7-5	200	7"	4.947±0.019mm	51 µm	25 µm	4.1mm	0.43mm
WG-1208-8-5	200	8"	4.947±0.019mm	51 µm	25 µm	4.1mm	0.43mm
WG-1206-7-5	100	7"	4.947±0.019mm	51 µm	50 µm	4.1mm	0.43mm
WG-1206-8-5	100	8"	4.947±0.019mm	51 µm	50 µm	4.1mm	0.43mm
WG-5MM-ECONOMY-7-5	100	7"	4.94665±0.01905mm	76 µm	76 µm	4.1mm	0.43mm
WG-5MM-ECONOMY-8-5	100	8"	4.94665±0.01905mm	76 µm	76 µm	4.1mm	0.43mm
WG-5MM-ECONOMY-9-5	100	9"	4.94665±0.01905mm	76 µm	76 µm	4.1mm	0.43mm

Tubes sold in packs of 5

Wilmad Thin Walled High Throughput NMR Tubes

Wilmad Thin Walled High Throughput NMR Tubes have an average camber of 60 microns to guarantee spectral quality for small molecule (MW<250) samples up to 600 MHz.

- Camber and concentricity values listed are the Total Indicator Reading (TIR)
- Designed for routine use in most low to mid field NMR spectrometers
- One of the best O.D. tolerances in the industry
- Made from ASTM E438 Type 1 Class B glass
- 100% inspected for surface defects and physical dimension to ensure the success of your experiments

Note: Experiments involving cooling, heating, biological sample, multi-dimension, multi-nuclei, or DNP use Precision NMR Tubes.

Wilmad Benchtop Spectrometer NMR Tubes

Catalog No.	O.D.	Length	MHz Rating	Wall Thickness	Package Qty.
WG-3000-3-50	3.0±0.03mm	3"	High Throughput	0.27mm	50
WG-3000-4-50	3.0±0.03mm	4"	High Throughput	0.27mm	50
WG-3000-4	3.0±0.03mm	4"	High Throughput	0.27mm	100
WG-3000-7-50	3.0±0.03mm	7"	High Throughput	0.27mm	50
WG-3000-8-50	3.0±0.03mm	8"	High Throughput	0.27mm	50
WG-1000-4	4.94665±0.01905mm	4"	High Throughput	0.43mm	100
WG-1000-7	4.94665±0.01905mm	7"	High Throughput	0.43mm	100
WG-1000-8-50	4.94665±0.01905mm	8"	High Throughput	0.43mm	50
WG-1000-8	4.94665±0.01905mm	8"	High Throughput	0.43mm	100
WG-4000-7	9.944±0.025mm	7"	High Throughput	0.60mm	100

Large Writing Area High-Throughput NMR Tubes

Double the writing area allows for easy sample marking and identification. These High-Throughput tubes have an average camber of 60 microns to ensure spectrum clarity for small molecule (MW<250) samples up to 600 MHz.

- 2x larger marking area eliminates cramped and unreadable sample names
- Packaging allows for easy tube access and storage
- Attractively priced for a high-throughput laboratory environment
- Type 1, Class B Borosilicate glass construction with disposable caps

Note: Not for use with high-field instruments or spinning experiments

Wilmad Large Writing Area NMR Tubes

Catalog No.	Length	O.D.	Wall Thickness	Package Qty.
WG-1003-7	7"	4.94665±0.01905mm	0.43mm	100
WG-1003-7-50	7"	4.94665±0.01905mm	0.43mm	50

Wilmad SampleJet NMR Tubes

Introducing Wilmad High-Throughput NMR tubes, now featuring genuine Bruker® SampleJet® caps. Seamlessly integrate industry-standard Wilmad NMR tubes into your SampleJet® workflow, enabling convenient handling by lab-automation devices pre- or post-NMR measurement. Elevate your workflow efficiency with this innovative solution.

- Available in 4 & 7 inch lengths
- Rated for up to 600 MHz

Note: Caps are without code and should not be used in conjunction with ceramic turbines.

Wilmad Bruker® SampleJet® NMR Tubes						
Catalog No.	**MHz Rating**	**O.D.**	**Length**	**Wall Thickness**	**Camber**	**Package Qty.**
WG-1000-4-SJ	600	4.947±0.019mm	103.5mm	0.43mm	60 µm	100
WG-1000-7-SJ	600	4.947±0.019mm	178mm	0.43mm	60 µm	100
WG-3000-4-SJ	600	3.0mm	103.5mm	0.43mm	60 µm	100
WG-3000-7-SJ	600	3.0mm	178mm	0.43mm	60 µm	100
Wilmad SampleJet MicroProbe & MicroCryoProbe NMR Tubes						
620-2A	500	1.00±0.019mm	103.5mm	0.1mm	30 µm	10
620-2B	500	1.70±0.019mm	103.5mm	0.2mm	30 µm	10
620-2F	500	2.50±0.019mm	103.5mm	0.2mm	30 µm	10

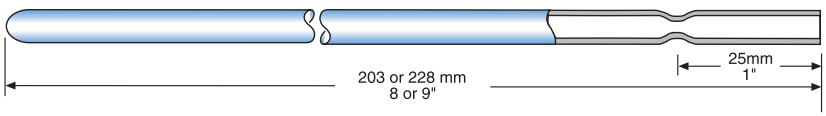
Wilmad Agilent® Automatic Sample Changer NMR Tubes							
Catalog No.	**Description**	**MHz Rating**	**O.D.**	**I.D.**	**Length**	**Wall Thickness**	**Package Qty.**
528-PP-4VAR	–	500	4.9635± 0.0065mm	4.2065± 0.0065mm	4.00"±0.01	0.38mm (Thin Walled)	1
524-PP-4VAR	–	400	4.9635± 0.0065mm	3.43± 0.013mm	4.00"±0.01	0.77mm (Medium Walled)	1
522-PP-4VAR	–	400	4.9635± 0.0065mm	2.160± 0.013mm	4.00"±0.01	1.4mm (Heavy Walled)	1
5MM-CAP-POLY	Polypropolene Cap For Automatic Sampler	–	–	–	–	–	1

Constricted NMR Tubes for Flame Seal

Constricted NMR tubes offer the most convenient way to flame-seal an air-sensitive sample. Simply apply vacuum to the tube using our Tip-Off Manifold, then heat the constricted portion and twist off to seal the sample. Order a constricted NMR tube by adding "CONS" to the product number of any Wilmad sample tube. Example: 507-PP-7CONS.

Unless otherwise specified, constrictions are placed 1 inch from top of tube. Order tubes that are 1 inch longer than your required finished length.

Constricted NMR Tubes for Flame Seal	
Tube I.D.	**Constricted I.D.**
3-5mm	1.0mm
6.5-16mm	2.0mm
18-30mm	2.0mm



Wilmad Benchtop Spectrometer NMR Tubes

Ideal for use with 43, 60, & 80MHz manual sample loading benchtop NMR spectrometers, Wilmad Benchtop NMR Tubes have been tested in the most popular benchtop spectrometers to assure performance and give you confidence in purchasing consumables for your instrument.

- 5mm O.D. tubes available in 7" or 8" lengths
- Packaging allows for easy tube access and storage
- Attractively priced for a high-throughput laboratory environment
- Type 1, Class B Borosilicate glass construction with disposable caps

Note: Not for use with high-field instruments or spinning experiments

Wilmad Benchtop Spectrometer NMR Tubes				
Catalog No.	**Length**	**O.D.**	**Wall Thickness**	**Package Qty.**
WG-BTNMR-7	7"	5mm	0.43mm	150
WG-BTNMR-8	8"	5mm	0.43mm	150

Wilmad Reaction Monitoring System NMR Tubes

Designed to monitor reactions from start to finish, the Wilmad Reaction Monitoring System is a two-chamber borosilicate glass NMR tube that allows for in-tube mixing. The system features an inner chamber with a Teflon® tip that when secured creates a positive seal separating solutions until the user is ready to mix.

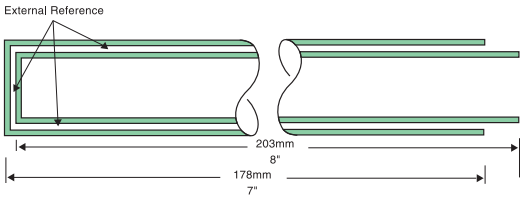
- Allows for acquisition of both pre-mix and post-mix spectra
- In situ mixing of solutions provides a clear 'before and after' reaction picture
- Enables specific reaction endpoint determination
- Eliminates variables and reduces risk of contamination during experiments
- May allow for capture of initial kinetic data points in benchtop spectrometers where the upper portion of the sample tube is accessible
- Permits researchers to run reaction experiments without specialized instruments or equipment
- Includes an extra black phenolic cap with a white rubber liner for the outer tube allowing for easy sample storage

Wilmad 5mm O.D. Reaction Monitoring System NMR Tubes						
Catalog No.	**MHz Rating**	**Outer Tube O.D.**	**Inner Tube O.D.**	**Tube Length**	**Overall Length**	**Thread Size**
WG-RMS-7	600	5mm	3mm	7"	8.75" collapsed / 15.75" extended	15mm O.D.
WG-RMS-8	600	5mm	3mm	8"	9.75" collapsed / 17.75" extended	15mm O.D.

Double Layered NMR Tube for Toxic Samples

Wilmad's Double Layered Tube provides extra protection for your toxic sample or can be used with a reference standard that is insoluble in the sample or may cause a reaction.

- Outer tube and inner tube have a 50 µm gap that allows for 2 samples in the same tube while kept sperate
- Ideal for variable temperature studies as the as both tubes are made of Type 1, Class A borosilicate glass
- Each insert fits snugly into the outer tube like a syringe plunger fits its barrel



Wilmad Double Layered NMR Tubes				
Product No.	**MHz Rating**	**Components**	**O.D.**	**I.D.**
516-CC-3	600	Complete Set	3.00mm	1.07mm
516-CC-5	600	Complete Set	5.00mm	2.97mm
516-CC-10	600	Complete Set	10.00mm	7.87mm
516-O-3	600	Outer Tube	3.00mm	1.93mm
516-O-5	600	Outer Tube	5.00mm	4.07mm
516-O-10	600	Outer Tube	10.00mm	8.99mm
516-I-3	N/A	Inner Insert for 516-CC-3	1.83mm	1.07mm
516-I-5	N/A	Inner Insert for 516-CC-5	3.97mm	2.97mm
516-I-10	N/A	Inner Insert for 516-CC-10	8.89mm	7.87mm

Time Domain NMR Tubes

Time Domain Benchtop NMR spectrometers serve many industries as a cost effective NMR solution.

TD NMR Tubes | Thin Walled | ASTM Type 1, Class B Borosilicate Glass				
Catalog No.	**O.D.**	**Length**	**Bottom**	**Package Qty.**
WG-4001-7	10mm	7"	Flat	100

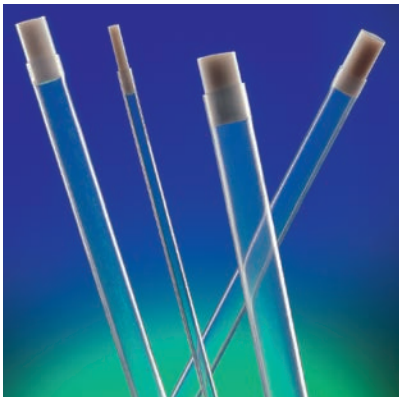
Wilmad PTFE-FEP Time Domain NMR Tubes

Compared to borosilicate glass, PTFE tubing possesses the following advantages:

- Shatterproof
- Better resistance to corrosive chemicals, including HF acid
- 100% contamination-free for 1H background
- Each tube is supplied with a PTFE cap

Wilmad PTFE-FEP Time Domain NMR Tubes			
Catalog No.	**O.D.**	**Length**	**Bottom**
6012-BTNMR	10mm	8"	Round
6018-BTNMR	17mm	8"	Round
6026-BTNMR	25mm	8"	Round

PTFE-FEP NMR Tube Liners for Corrosive Samples & ^{29}Si NMR



Wilmad's PTFE-FEP NMR Tube Liner provides a contamination-free environment. Ideal for use where chemical compounds like hydrofluoric acid, ammonium bifluoride and concentrated hydroxide solutions are present.

PTFE-FEP Tube liners are round-bottom and made from Polytetrafluoroethylene/Fluorinated Ethylene Polypropylene Copolymer. Thin-wall construction minimizes filling-factor losses. Non-rigid liners, straighten upon insertion into the sample tube. Not recommended for elevated temperature studies. A PTFE plug is included with each liner.

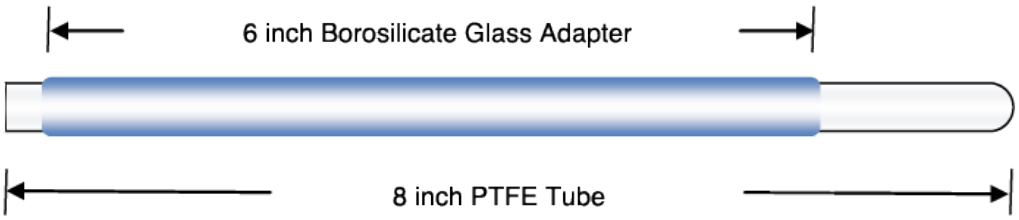
Note: Only for use in Wilmad Precision tubes with corresponding wall thickness

PTFE-FEP NMR Tube Liners for Corrosive Samples & ^{29}Si NMR

Catalog No.	Fits Tube with Wall Thickness	Fits Tube with O.D.	Fits Tube with Length	Length	Volume per 10mm Height
6003	Thin	3mm	7"	8"	30 µL
6005	Thin	5mm	7"	8"	80 µL
6005-8	Thin	5mm	7 & 8"	9"	80 µL
6010	Thin	10mm	7"	8"	440 µL
6012	Thin or Medium	12mm	7"	8"	550 µL
6015	Thin	15mm	7"	8"	1000 µL

PTFE-FEP NMR Tube Kit for ^{29}Si NMR

Wilmad's PTFE NMR Tube Kit features a high field 500MHz precision bore open-ended glass adapter for a 5mm spinner turbine. Please use a depth gauge to fine adjust the position of the liner so no glass part will protrude into the Rf coil limit.



PTFE-FEP NMR Tube Kit for ^{29}Si NMR

Catalog No.	MHz Rating	Description	Length	Camber	Concentricity
PTFE-5mm-KIT	500	PTFE Tube + 5mm O.D. Both End Open Glass Adapter	8"	13 µm	25 µm
PTFE-10mm-KIT	500	PTFE Tube + 10mm O.D. Both End Open Glass Adapter	8"	36 µm	75 µm

ATS SCIENTIFIC PRODUCTS WILMAD

Consumables for Liquid-Phase Small Volume & External Reference NMR

Microcell Technical Tip

To improve shimming quality and signal lock surround the microcell with reference solvent.

Pyrex® NMR Capillary Tubes

Wilmad's Pyrex® capillary tubes are a low cost solution for small volume NMR measurement.

- Available with both ends open or sealed at one end
- Tested at 400 MHz field
- Made of ASTM Type 1 Class A glass

Pyrex NMR Capillary Tubes					
Catalog No.	**Description**	**O.D.**	**I.D.**	**Length**	**Package Qty.**
WG-1364-1	Sealed at one end	1.0mm	0.8mm	75mm	10
WG-1364-1-203M	Sealed at one end	1.0mm	0.8mm	203mm	5
WG-1365-1	Both ends open	1.0mm	0.8mm	300mm	1
WG-1364-1.7	Sealed at one end	1.7mm	1.3mm	100mm	10
WG-1364-1.7-5	Sealed at one end	1.7mm	1.3mm	127mm	10
WG-1364-1.7-203M	Sealed at one end	1.7mm	1.3mm	203mm	5
WG-1365-1.7	Both ends open	1.7mm	1.3mm	300mm	1
WG-1364-1.9	Sealed at one end	1.9mm	1.5mm	110mm	10
WG-1365-1.9	Both ends open	1.9mm	1.5mm	300mm	1
WG-1364-2	Sealed at one end	2.0mm	1.6mm	100mm	10
WG-1364-2-203M	Sealed at one end	2.0mm	1.6mm	203mm	5
WG-1365-2	Both ends open	2.0mm	1.6mm	300mm	1
WG-1364-2.5A	Sealed at one end	2.5mm	2.2mm	100mm	10
WG-1364-2.5A-203M	Sealed at one end	2.5mm	2.2mm	203mm	5
WG-1365-2.5A	Both ends open	2.5mm	2.2mm	300mm	1

Stem Coaxial Small Volume NMR Insert

The most versatile and reliable coaxial system available for NMR experiments is the Wilmad Stem Coaxial Small Volume NMR Inserts.

- General applications include small volume NMR, external referencing, external locking and magnetic susceptibility determination
- Manufactured from ASTM Type 1 class A glass, ideal for variable temperature studies

Note: Outer tube sold separately. Follow guidance in "Use with" column for appropriate outer tube

Stem Coaxial Small Volume NMR Insert						
Catalog No.	**Fits Outer Tube with O.D.**	**Stem Height**	**Stem O.D.**	**Inner Capacity**	**Outer Capacity**	**Use with**
WGS-4BL	4mm	25mm	2mm	30 µL	124 µL	406-PP, 427-PP
WGS-5BL	5mm	50mm	2mm	60 µL	530 µL	506-PP to 535-PP
WGS-5BL-SP	5mm	50mm	3.3mm	220 µL	260 µL	506-PP to 535-PP
WGS-8BL	8mm	50mm	3mm	190 µL	1560 µL	513A-XPP
WGS-10BL	10mm	50mm	4mm	410 µL	2600 µL	513-XPP
Other sizes available upon request						

***Note:** Outer tube sold separately

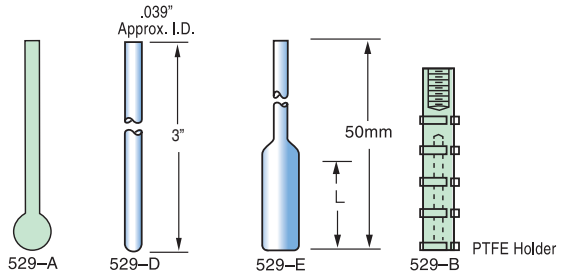
Coaxial Small Volume NMR Insert

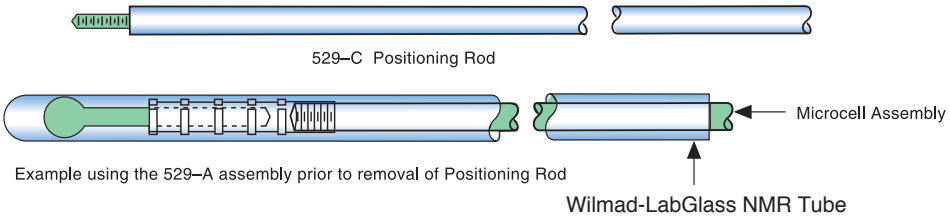
- Each Catalog No. has a unique sample/reference solution ratio
- Ideal for variable temperature experiments since material remains the same between the outer tube, inner tube, and spacer
- Insert and outer tube are fused together at the bottom

Complete Sets					
Catalog No.	**Outer Tube O.D.**	**Outer Tube I.D.**	**Inner Tube O.D.**	**Inner Tube I.D.**	**MHz Rating**
517-Complete	4.97mm	4.20mm	3.30mm	2.34mm	600
518-Complete	4.97mm	4.20mm	2.97mm	1.96mm	600
519-Complete	4.97mm	4.20mm	2.52mm	1.50mm	600

Microcell Small Volume NMR Insert

- Sample volume can be as little as 18 µL
- Three different inserts with various shapes (Spherical Bulb, Capillary Tube, Cylindrical Bulb)
- Outer tube (Wilmad Precision Thin-Walled Tube) must be ordered separately depending on magnetic field strength
- Not recommended for variable temperature experiments.
- Use Wilmad PTFE Needles (C/N: 90630) with syringe to fill and clean sample





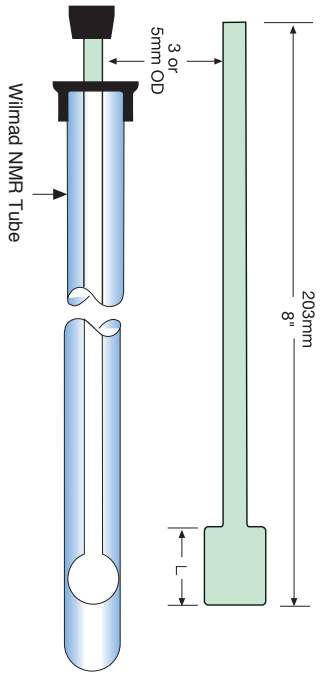
Positioning Components			
Catalog No.	**Fits Tube with O.D.**	**Description**	**Length**
529-B	5.0mm	PTFE Holder	25mm
529-C	5.0mm	Positioning Rod	228mm

Spherical Bulb and Capillary Tube Microcell			
Catalog No.	**Fits Tube with O.D.**	**Description**	**Volume**
529-A	5.0mm	Spherical Bulb	18 µL
529-D	5.0mm	Capillary Tube	6 µL

Cylindrical Bulb Microcell				
Catalog No.	**Fits Tube with O.D.**	**Description**	**Volume**	**Cylinder Length**
529-E	5.0mm	Cylindrical Bulb	110 µL	12mm
529-E-5-L-15	5.0mm	Cylindrical Bulb	140 µL	15mm
529-E-5-L-20	5.0mm	Cylindrical Bulb	190 µL	20mm

Large Volume Microcell Insert

- Use with probe size between 8 to 20mm
- Add sample through NMR pipets
- Outer tube cap is provided to hold insert
- Custom sizes available



Spherical Bulb Insert			
Catalog No.	**Fits Tube with O.D.**	**Stem O.D.**	**Capacity**
529-A-8	8.0mm	3.0mm	110 µL
529-A-10	10.0mm	3.0mm	280 µL
529-A-12	12.0mm	3.0mm	530 µL
529-A-15	15.0mm	5.0mm	1020 µL
529-A-16	16.0mm	5.0mm	1320 µL
529-A-18	18.0mm	5.0mm	1970 µL
529-A-20	20.0mm	5.0mm	2600 µL

Cylindrical Bulb Insert				
Catalog No.	**Fits Tube with O.D.**	**Stem O.D.**	**Capacity**	**Cylinder Length**
529-E-8	8.0mm	3.0mm	270 µL	10mm

Bruker® MicroProbe/MicroCryoProbe NMR Tubes

Our Ultra-High Field MicroProbe Tube (>600 MHz) is 10 times more precise in terms of camber and concentricity than instrument manufacturers' stock tubes. This technological advancement helps increase the shimming quality and SNR.
Note: The O.D. of the upper section is 5.0mm.

Bruker® MicroProbe/MicroCryoProbe NMR Tubes							
Catalog No.	**MHz Rating**	**Probe Type**	**Stem Length**	**Stem O.D.**	**Stem I.D.**	**Stem Volume**	**Overall Length**
620-1A	500	Bruker® 1.0 mm MicroProbe	50mm	1.00mm	0.80mm	25 µL	8"
620-1H	500	Bruker® 1.7 mm MicroProbe	43.5mm	1.70mm	1.30mm	22 µL	4"
620-1B	500	Bruker® 1.7 mm MicroCryoProbe	50mm	1.70mm	1.30mm	66 µL	8"
620-1G	500	Bruker® 3.0/2.5 mm CryoProbe	43.5mm	2.00mm	1.60mm	87 µL	4"
620-1C	500	Bruker® 3.0/2.5 mm CryoProbe	50mm	2.00mm	1.60mm	100 µL	8"
520-1A	800	Bruker® 3.0/2.5 mm MicroProbe	50mm	2.50mm	2.16mm	1.83 µL	8"
620-1F	500	Bruker® 3.0 mm CryoProbe	43.5mm	2.95mm	2.41mm	198 µL	4"
620-1D	500	Bruker® 3.0 mm CryoProbe	50mm	2.95mm	2.41mm	228 µL	4"
620-1E	500	Bruker® 3.0 mm CryoProbe	50mm	2.95mm	2.41mm	228 µL	8"

Agilent®(Varian®) ColdProbe 2.5 mm O.D. NMR Tubes

Agilent®(Varian®) ColdProbe 2.5 mm O.D. NMR Tubes						
Catalog No.	**MHz Rating**	**Probe Type**	**Length**	**O.D.**	**I.D.**	**Package Qty.**
WG-1364-2.5A-203M	400	Agilent® ColdProbe	8"	2.50mm	2.20mm	5

Shigemi® Susceptibility Matched NMR Tubes

Experience the unparalleled quality of Shigemi® susceptibility matched NMR tubes, crafted from a specialized hard glass renowned for its exceptional chemical durability. Each tube is \magnetic susceptibility matched to its designated solvent, ensuring precise identification and optimal performance. This NMR tube features an outer tube and insert designed for heightened sensitivity. Elevate your NMR experiments with unmatched precision and reliability.

Note: If you do not see the matched solvent Shigemi® tube you require, please contact us at wilmad.com

Shigemi® Susceptibility Matched NMR Tubes

Catalog No.	Outer Tube O.D.	Insert O.D.	Insert Length	Outer Tube Length	Bottom Length	Matched Solvent	Compatibility
CMS-005B	5.0mm	4.1mm	190mm	180mm	8mm	Chloroform-d	Bruker®
CMS-005J	5.0mm	4.1mm	190mm	180mm	12mm		JEOL®
CMS-005V	5.0mm	4.1mm	190mm	180mm	15mm		Agilent®(Varian®)
CMS-010B	10.0mm	8.9mm	200mm	190mm	8mm		Bruker®
CMS-010V	10.0mm	8.9mm	200mm	190mm	15mm		Agilent®(Varian®)
MMS-005B	5.0mm	4.1mm	190mm	180mm	8mm	Methanol-d_4	Bruker®
MMS-005J	5.0mm	4.1mm	190mm	180mm	12mm		JEOL®
MMS-005V	5.0mm	4.1mm	190mm	180mm	15mm		Agilent®(Varian®)
MMS-010B	10.0mm	8.9mm	200mm	190mm	8mm		Bruker®
MMS-010V	10.0mm	8.9mm	200mm	190mm	15mm		Agilent®(Varian®)
DMS-005B	5.0mm	4.1mm	190mm	180mm	8mm	DMSO-d_6	Bruker®
DMS-005J	5.0mm	4.1mm	190mm	180mm	12mm		JEOL®
DMS-005V	5.0mm	4.1mm	190mm	180mm	15mm		Agilent®(Varian®)
DMS-010B	10.0mm	8.9mm	200mm	190mm	8mm		Bruker®
DMS-010V	10.0mm	8.9mm	200mm	190mm	15mm		Agilent®(Varian®)
BMS-005B	5.0mm	4.1mm	190mm	180mm	8mm	Deuterium Oxide	Bruker®
BMS-005J	5.0mm	4.1mm	190mm	180mm	12mm		JEOL®
BMS-005V	5.0mm	4.1mm	190mm	180mm	15mm		Agilent®(Varian®)
BMS-010B	10.0mm	8.9mm	200mm	190mm	8mm		Bruker®
BMS-010V	10.0mm	8.9mm	200mm	190mm	15mm		Agilent®(Varian®)

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SCIENTIFIC PRODUCTS WILMAD

Gas-Tight Consumables for Liquid & Gas-Phase NMR

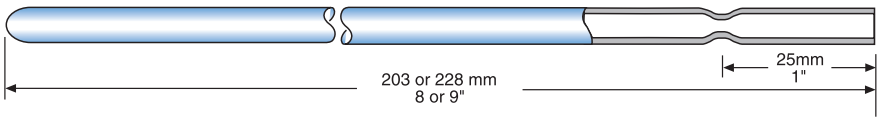
Under Pressure

Caution should always be taken when pressurizing an NMR tube as even a tiny scratch could cause the tube to break.

Constricted Vacuum Tubes

Constricted NMR tubes offer the most convenient way to flame-seal an air-sensitive sample. Simply apply vacuum to the tube using our Tip-Off Manifold, then heat the constricted portion and twist off to seal the sample. Order a constricted NMR tube by adding "CONS" to the product number of any Wilmad sample tube.
Example: 507-PP-7CONS.

Unless otherwise specified, constrictions are placed 1 inch from top of tube. Order tubes that are 1 inch longer than your required finished length.



Constricted Vacuum Tubes	
Tube I.D.	**Constricted I.D.**
3-5mm	1mm
6.5-16mm	2mm
18-30mm	2mm

Tip-off Manifolds

The Tip-Off Manifold connects to an NMR tube by a threaded aluminum bushing which is isolated from the vacuum by a PTFE high-vacuum rotary valve with Viton O-rings. Rotating the valve will open and close the tube to the vacuum line.

- Highly resistant to chemicals
- Easy operation

Tip-Off Manifolds and Replacement Parts		
Catalog No.	**Fits tube with O.D.**	**Description**
552-3	3mm	Complete Tip-Off Manifold
552-4	4mm	Complete Tip-Off Manifold
552-5	5mm	Complete Tip-Off Manifold
552-10	10mm	Complete Tip-Off Manifold
552-P	–	Replacement Piston Valve
552-S	–	Replacement Piston O-Ring
552-G	–	Replacement Glass Valve Section

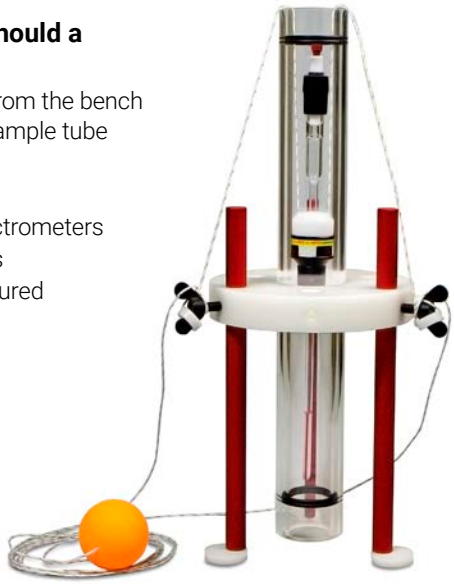
Explosion Protection Chamber for High-Pressure NMR

Acrylic tube system shields users by preventing debris from projecting sideways should a pressurized NMR or EPR tube fracture or explode.

The chamber is used by securely suspending the sample during pressurization and in transport from the bench to the spectrometer. Placement over the magnet's upper barrel allows for simple loading of the sample tube while the stopper ensures the lowering strings cannot fall into the spectrometer.

- Helps prevent injury when performing high-pressure NMR or EPR experiments
- One-size-fits-all design allows for simple set-up with all Bruker®, JEOL®, Agilent®(Varian®) spectrometers
- Chamber also shields the user during transport and loading of the sample, unlike blast shields
- Can withstand up to 1000 bar when configured for Bruker® systems and 500 bar when configured for Agilent®(Varian®) & JEOL® systems
- Leg array can be set to a wide or narrow stance to better fit your spectrometer

Note: Not for use with spinning experiments



Explosion Protection Chamber for High-Pressure NMR			
Catalog No.	**Used With**	**Inner Tube I.D.**	**Outer Tube I.D.**
RS-EXPL-PROTECT	5mm NMR & EPR Tubes	1.01" (25.65mm)	1.34" (34.04mm)

Screw-Cap Tubes

The Screw-Cap Tube is commonly used in sample degasification. The vacuum quality that it can maintain is >10^{-4} torr. For better vacuum, please check our Pressure/Vacuum Tube and Quick Pressure Valve Tube.

Each Screw-Cap Tube comes with one PTFE/Silicone Septum.

Note: PTFE/ Rubber septums are inert to most solvents and many corrosive materials but not recommended for multiplepunctures. PTFE/Silicone septums are inert to most organic solvents and compounds but not recommended for strongly corrosive materials. The septum remains reliable after multiple punctures.

Screw-Cap Sample Tube			
Catalog No.	**MHz Rating**	**O.D.**	**Length**
335-TR-7	600	3mm	7”
335-TR-8	600	3mm	8”
328-TR-7	500	3mm	7”
328-TR-8	500	3mm	8”
328-TR-9	500	3mm	9”
307-TR-7	300	3mm	7”
535-TR-7	600	5mm	7”
535-TR-8	600	5mm	8”
535-TR-9	600	5mm	9”
528-TR-7	500	5mm	7”
528-TR-8	500	5mm	8”
528-TR-9	500	5mm	9”
507-TR-7	300	5mm	7”
507-TR-8	300	5mm	8”
507-TR-9	300	5mm	9”
513-7TRA-7	500	10mm	7”
513-7TRA-8	500	10mm	8”
513-7TRA-9	500	10mm	9”

Low Pressure/Vacuum Tubes

Wilmad's Low Pressure/Vacuum (LPV) tube is ideal for anaerobic and gas-tight NMR experiments, and offers a convenient flame-free sealing solution for air sensitive or volatile liquid samples.

- Robust sealing system allows pressure build-up inside the sample
- Greaseless PTFE piston provides a 100% contamination-free seal
- Redesigned with a 4X larger sealing surface; eliminates leaks and greatly increases lifetime when compared to traditional J. Young tubes
- Axial symmetric design guarantees application in spinning experiments
- Due to the nature of glass, Extreme Caution should be exercised when using at elevated or reduced pressures since a tiny scratch on the glass surface would significantly lower the tensile strength. Adequate safety shielding should always be used when working in these conditions.

Low Pressure/Vacuum Tube

Catalog No.	MHz Rating	Length	O.D.	Wall Thickness	Concentricity	Camber	Glass Type
335-LPV-7	600	7"	3mm	0.29mm	13 µm	6 µm	Borosilicate
335-LPV-8	600	8"	3mm	0.29mm	13 µm	6 µm	Borosilicate
328-LPV-7	500	7"	3mm	0.29mm	25 µm	13 µm	Borosilicate
328-LPV-8	500	8"	3mm	0.29mm	25 µm	13 µm	Borosilicate
328-LPV-9	500	9"	3mm	0.29mm	25 µm	13 µm	Borosilicate
307-LPV-7	300	7"	3mm	0.29mm	51 µm	25 µm	Borosilicate
307-LPV-8	300	8"	3mm	0.29mm	51 µm	25 µm	Borosilicate
435-LPV-7	600	7"	4mm	0.38mm	13 µm	6 µm	Borosilicate
535-LPV-7	600	7"	5mm	0.38mm	13 µm	6 µm	Borosilicate
535-LPV-8	600	8"	5mm	0.38mm	13 µm	6 µm	Borosilicate
535-LPV-9	600	9"	5mm	0.38mm	13 µm	6 µm	Borosilicate
528-LPV-7	500	7"	5mm	0.38mm	25 µm	13 µm	Borosilicate
528-LPV-7QTZ	500	7"	5mm	0.38mm	25 µm	13 µm	Quartz
528-LPV-8	500	8"	5mm	0.38mm	25 µm	13 µm	Borosilicate
528-LPV-9	500	9"	5mm	0.38mm	25 µm	13 µm	Borosilicate
522-LPV-7	400	7"	5mm	1.40mm	51 µm	51 µm	Borosilicate
524-LPV-7	400	7"	5mm	0.77mm	76 µm	51 µm	Borosilicate
507-LPV-7	300	7"	5mm	0.38mm	51µm	25µm	Borosilicate
507-LPV-8	300	8"	5mm	0.38mm	51µm	25µm	Borosilicate
507-LPV-9	300	9"	5mm	0.38mm	51µm	25µm	Borosilicate
513-7LPV-7	500	7"	10mm	0.46mm	38µm	13µm	Borosilicate
513-7LPV-8	500	8"	10mm	0.46mm	38µm	13µm	Borosilicate

Low Pressure/Vacuum Tube for Autosamplers

Catalog No.	MHz Rating	Bottom NMR Tube Length	Length after removing the Vacuum Adapter	Concentricity	Camber	Glass Type
535-LPV-200M	600	137 ± 1mm	199 ± 1mm	13 µm	6 µm	Borosilicate
528-LPV-200M	500	137 ± 1mm	199 ± 1mm	25 µm	13 µm	Borosilicate
507-LPV-200M	300	137 ± 1mm	199 ± 1mm	51 µm	25 µm	Borosilicate

Low Pressure/Vacuum Shigemi Tubes

Low Pressure/Vacuum Shigemi® tubes feature a susceptibility matched bottom and plunger to reduce the boundary gradients at the edges of the Rf coil and a valve that offers a flame-free seal for air sensitive or volatile liquid samples.

- Select tube based on solvent used: Chloroform-d, Methenol-d_4, Deuterium Oxide, or DMSO-d_6
- Tubes available for Bruker®, JEOL®, Agilent®(Varian®) spectrometers

Assembly

PTFE holder with Inner Insert

Positioning Rod

Low Pressure/Vacuum Shigemi Tubes

Catalog No.	Description	O.D.	Bottom Length	Matched Solvent	Compatibility
CMS-005B-LPV	Gas-tight Shigemi® Tube Complete Set	4.965mm	8mm	Chloroform-d	Bruker®
CMS-005J-LPV		4.965mm	12mm		JEOL®
CMS-005V-LPV		4.965mm	15mm		Agilent®(Varian®)
MMS-005B-LPV	Gas-tight Shigemi® Tube Complete Set	4.965mm	8mm	Methanol-d_4	Bruker®
MMS-005J-LPV		4.965mm	12mm		JEOL®
MMS-005V-LPV		4.965mm	15mm		Agilent®(Varian®)
DMS-005B-LPV	Gas-tight Shigemi® Tube Complete Set	4.965mm	8mm	DMSO-d_6	Bruker®
DMS-005J-LPV		4.965mm	12mm		JEOL®
DMS-005V-LPV		4.965mm	15mm		Agilent®(Varian®)
BMS-005B-LPV	Gas-tight Shigemi® Tube Complete Set	4.965mm	8mm	Deuterium Oxide	Bruker®
BMS-005J-LPV		4.965mm	12mm		JEOL®
BMS-005V-LPV		4.965mm	15mm		Agilent®(Varian®)
529-C	Positioning Rod	—	—	Universal	All
529-B	PTFE Holder	—	—		All

Quick Pressure Vacuum Tube

Wilmad's Quick Pressure Valve Sample Tubes are specially designed to simplify the work of NMR studies for catalysis, gas-liquid phase reactions, air sensitive samples and elevated temperature studies using low boiling point solvents.

- Easy to operate - one turn to open, one to close
- Larger opening for convenient sample addition
- Lightweight, concentric design for better performance
- Offered with Wilmad Precision Tubes - thin, medium and heavy wall
- Choice of Viton® or Kalrez® O-ring for different applications
- Adapters available for both 1/16" and 1/8" tubing

Quick Pressure Valve (QPV) Tubes (Parts for Basic Tubing Connection Included)

Catalog No.	MHz Rating	O.D.	Length	Wall Thickness	Concentricity/ Camber	Recommended Max Pressure
528-QPV-7	500	5mm	7"	0.38mm	25 / 13 µm	100 psi
528-QPV-8	500	5mm	8"	0.38mm	25 / 13 µm	100 psi
524-QPV-7	300	5mm	7"	0.77mm	76 / 51 µm	150 psi
524-QPV-8	300	5mm	8"	0.77mm	76 / 51 µm	150 psi
522-QPV-7	300	5mm	7"	1.40mm	51 / 51 µm	200 psi
522-QPV-8	300	5mm	8"	1.40mm	51 / 51 µm	200 psi
507-QPV-7	300	5mm	7"	0.38mm	51 / 25 µm	100 psi
507-QPV-8	300	5mm	8"	0.38mm	51 / 25 µm	100 psi

Pressure/Vacuum Sample Tube

Wilmad's Pressure/Vacuum Tube is the most reliable NMR tube for medium range pressure (<300 psi) experiments in the market. It is designed to connect to a 1/8" metal (stainless steel or brass) vacuum line using SwageLok® fittings or a rubber vacuum hose and a glass connector (OF-60). The PV-ANV valve is made of PTFE and all other parts are Pyrex® or equivalent glass. Valve is opened simply by turning counterclockwise.

Each Pressure/Vacuum tube is supplied with a PV-ANV valve, but not with a Swagelok® nut or ferrules. Order these separately (see connectors table).

Pressure/Vacuum Sample Tubes

Catalog No.	MHz Rating	O.D	Length	Wall Thickness	Concentricity	Camber	Recommended Max Pressure
528-PV-7	500	5mm	7"	0.38mm	25 µm	13 µm	100 psi
528-PV-8	500	5mm	8"	0.38mm	25 µm	13 µm	100 psi
528-PV-9	500	5mm	9"	0.38mm	25 µm	13 µm	100 psi
524-PV-7	400	5mm	7"	0.77mm	76 µm	51 µm	150 psi
524-PV-8	400	5mm	8"	0.77mm	76 µm	51 µm	150 psi
524-PV-9	400	5mm	9"	0.77mm	76 µm	51 µm	150 psi
522-PV-7	500	5mm	7"	1.40mm	51 µm	51 µm	200 psi
522-PV-8	500	5mm	8"	1.40mm	51 µm	51 µm	200 psi
522-PV-9	500	5mm	9"	1.40mm	51 µm	51 µm	200 psi

Pressure/Vacuum Sample Tubes - *continued*							
Catalog No.	**MHz Rating**	**O.D**	**Length**	**Wall Thickness**	**Concentricity**	**Camber**	**Recommended Max Pressure**
507-PV-7	300	5mm	7”	0.38mm	51 µm	25 µm	100 psi
507-PV-8	300	5mm	8”	0.38mm	51 µm	25 µm	100 psi
507-PV-9	300	5mm	9”	0.38mm	51 µm	25 µm	100 psi
513-7PV-7	500	10mm	7”	0.46mm	38 µm	13 µm	90 psi
513-7PVM-7	500	10mm	7”	0.92mm	38 µm	13 µm	150 psi
513-7PVM-8	500	10mm	8”	0.92mm	38 µm	13 µm	150 psi
513-7PVM-9	500	10mm	9”	0.92mm	38 µm	13 µm	150 psi
513-7PVH-7	450	10mm	7”	1.45mm	51 µm	13 µm	200 psi
513-7PVH-8	450	10mm	8”	1.45mm	51 µm	13 µm	200 psi
513-7PVH-9	450	10mm	9”	1.45mm	51 µm	13 µm	200 psi

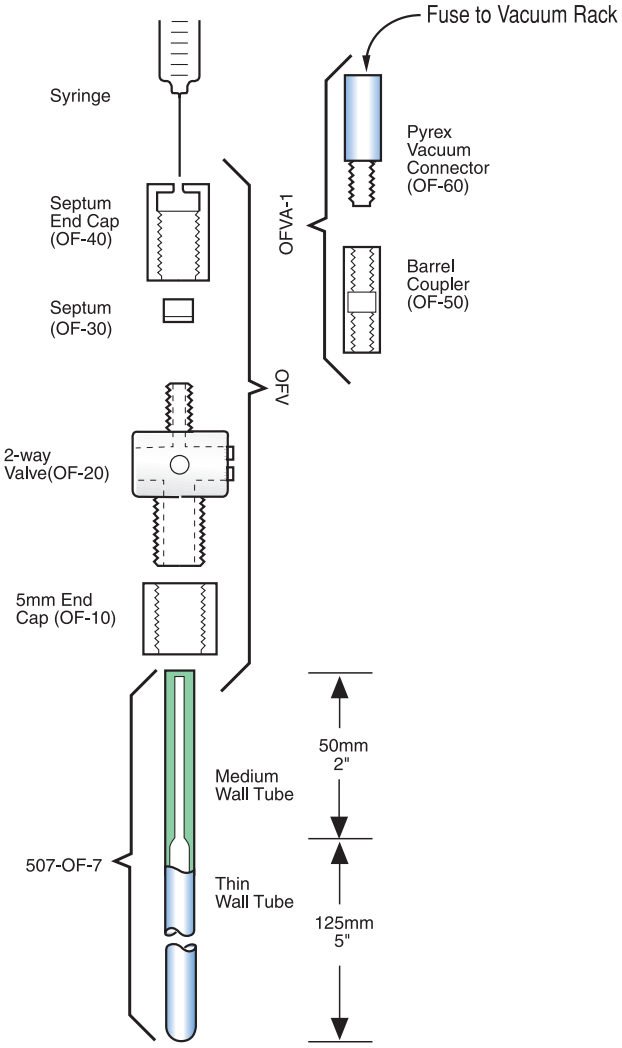
Connectors for Pressure/Vacuum Sample Tube			
Catalog No.	**MHz Rating**	**O.D.**	**Length**
250-1A-2 250-1B-2 250-1C-2	Swagelok® Nut for 1/8” OD Tubing	Brass Stainless Steel PTFE	6
250-2A-2 250-2B-2 250-2C-2	Front Ferrule for 1/8” OD Tubing	Brass Stainless Steel PTFE	10
250-3A-2 250-3B-2 250-3C-2	Back Ferrule for 1/8” OD Tubing	Brass Stainless Steel PTFE	10
250-4A-2 250-4B-2	Swagelok® Male Connector for 1/8” tubing	Brass Stainless Steel	1
OF-60	Pyrex® Vacuum Connector	Borosilicate Glass	1
OF-80	End Cap	Polypropylene	1
OF-70	Stepped Cone Ferrule	PTFE	4
PV-ANV	Replacement Valve	PTFE	1
PV-ANV-O	Replacement O-Ring for PV-ANV Valve	Viton™	1

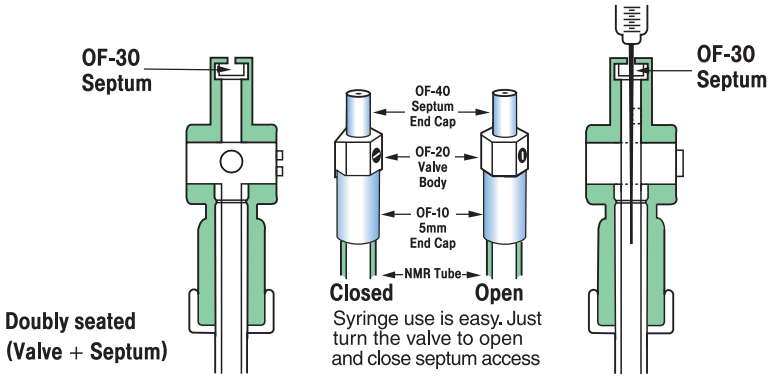
Connections: The upper portion of the needle valve is threaded and I.D. bevelled to accept Swagelok® 1/8” tubing nut and ferrule, which makes it simple to connect the “PV” tubes to a compressed gas cylinder or directly to a vacuum rack as shown on the above picture. The needle valve can be tightly closed using a small wrench (flat surfaces are provided on the valve). Components of the Pressure/Vacuum Valve NMR Tube and compatible fittings are available separately (see connectors). Tube available in 7, 8, or 9” lengths. Order shortest length possible to minimize overall weight.

Omni-Fit NMR Tubes

Wilmad's Omni-Fit NMR Tubes are designed for easy injection of chemicals through a gas-tight syringe without using a glove box for air-sensitive samples.

The Omni-Fit Tube consists of a 507-PP tube topped by a sturdy 2" section of medium-walled tubing which supports the valve system.





Omni-Fit Sample Tubes Only			
Catalog No.	**MHz Rating**	**O.D.**	**Length**
507-OF-7	300	5.0mm	7"
507-OF-8	300	5.0mm	8"
507-OF-9	300	5.0mm	9"

Valve and Spare Parts for Omni-Fit Sample Tubes		
Catalog No.	**Description**	**O.D.**
OFV	Omni-Fit Valve System with Complete Accessories	5mm
OF-10	Omni-Fit 5mm End Cap	5mm
OF-20	Omni-Fit 2-way Valve	5mm
OF-30	Omni-Fit Septa (pkg/6)	5mm
OF-40	Omni-Fit Septa Cap	5mm
OF-50	Omni-Fit Barrel Coupler	5mm
OF-60	Omni-Fit Vacuum Connector	5mm
OFVA-1	Omni-Fit Adapter Set	5mm

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Accessories for Liquid-Phase NMR

Sample Success

From tube testers, to caps, to washers, Wilmad's selection of accessories will give your experiments the best results possible.

Gas-Tight NMR Tube Caps

Gas-Tight NMR Tube Caps are ideal for experiments that require an air-tight environment under vacuum or low pressure less than 1 bar. Use these caps with Wilmad medium walled and heavy walled NMR tubes for better seal and robustness in variable temperature experiments. Septa allow easy access via syringe needle.

Gas-Tight NMR Tube Caps					
Catalog No.	**Cap Type**	**Fits Tubes With O.D.**	**Color**	**Material**	**Package Qty.**
521-PC-100	Superior Pressure	5mm	Opaque	Polyethylene	100
521-PC-1000	Superior Pressure	5mm	Opaque	Polyethylene	1000
WG-3889-10	Septum	3 & 4mm	White	Natural Rubber	10
WG-3889-100	Septum	3 & 4mm	White	Natural Rubber	100
WG-3890-10	Septum	3 & 4mm	Red	Natural Rubber	10
WG-3890-100	Septum	3 & 4mm	Red	Natural Rubber	100
WG-3891-10	Septum	5mm	White	Natural Rubber	10
WG-3891-100	Septum	5mm	White	Natural Rubber	100
WG-3892-10	Septum	5mm	Red	Natural Rubber	10
WG-3892-100	Septum	5mm	Red	Natural Rubber	100
WG-3895-10	Septum	10mm	White	Natural Rubber	10
WG-3895-100	Septum	10mm	White	Natural Rubber	100
WG-3896-10	Septum	10mm	Red	Natural Rubber	10
WG-3896-100	Septum	10mm	Red	Natural Rubber	100

Disposable NMR Tube Caps

Wilmad's Disposable NMR Tube Caps are made from high quality Polyethylene or Ethylene Vinyl Acetate. Different colors help to track samples.

Note: Please avoid using Wilmad's Disposable NMR Tube Caps when $CDCl_3$ serves as the reference solution as the material(s) could be dissolved. For $CDCl_3$, we recommend PTFE tube caps shown on the next page.

Disposable NMR Tube Caps

Catalog No.	Fits Tube O.D.	Material	Color	Package Qty.
521-G-100	4.0mm	Polyethylene	Blue	100
521-BLK-100	5.0mm	Ethylene Vinyl Acetate	Black	100
521-BLK-1000	5.0mm	Ethylene Vinyl Acetate	Black	1000
521-BLU-100	5.0mm	Ethylene Vinyl Acetate	Blue	100
521-BLU-1000	5.0mm	Ethylene Vinyl Acetate	Blue	1000
521-GRN-100	5.0mm	Ethylene Vinyl Acetate	Green	100
521-GRN-1000	5.0mm	Ethylene Vinyl Acetate	Green	1000
521-ORG-100	5.0mm	Ethylene Vinyl Acetate	Orange	100
521-ORG-1000	5.0mm	Ethylene Vinyl Acetate	Orange	1000
521-PUR-100	5.0mm	Ethylene Vinyl Acetate	Purple	100
521-PUR-1000	5.0mm	Ethylene Vinyl Acetate	Purple	1000
521-RED-100	5.0mm	Ethylene Vinyl Acetate	Red	100
521-RED-1000	5.0mm	Ethylene Vinyl Acetate	Red	1000
521-WHT-100	5.0mm	Ethylene Vinyl Acetate	White	100
521-WHT-1000	5.0mm	Ethylene Vinyl Acetate	White	1000
521-YLW-100	5.0mm	Ethylene Vinyl Acetate	Yellow	100
521-YLW-1000	5.0mm	Ethylene Vinyl Acetate	Yellow	1000
521-PNK-100	5.0mm	Ethylene Vinyl Acetate	Pink	100
521-PNK-1000	5.0mm	Ethylene Vinyl Acetate	Pink	1000
521-AQA-100	5.0mm	Ethylene Vinyl Acetate	Aqua	100
521-AQA-1000	5.0mm	Ethylene Vinyl Acetate	Aqua	1000
521-SKY-100	5.0mm	Ethylene Vinyl Acetate	Sky Blue	100
521-SKY-1000	5.0mm	Ethylene Vinyl Acetate	Sky Blue	1000
521-FUH-100	5.0mm	Ethylene Vinyl Acetate	Fuchsia	100
521-FUH-1000	5.0mm	Ethylene Vinyl Acetate	Fuchsia	1000
521-ASST-100	5.0mm	Ethylene Vinyl Acetate	Assorted	100
521-ASST-1000	5.0mm	Ethylene Vinyl Acetate	Assorted	1000
521-C-100	10.0mm	Polyethylene	Red	100
521-99010153-100	5.0mm (with hole for coaxial insert)	Ethylene Vinyl Acetate	Red	100

Wilmad PTFE NMR Tube Caps

Wilmad's PTFE NMR Tube Caps are machined to exact specifications with a smaller gyroradius and more homogeneous mass distribution than disposable caps for better spinning stability. These caps are recommended in experiments at high to ultra high field and experiments using chloroform as reference solution.

Wilmad PTFE NMR Tube Caps					
Catalog No.	Fits Tubes With O.D.	Fits Tube Style	Material	Color	Package Qty.
WG-1264-3	3mm	Precision	PTFE	White	25
WG-1264-4	4mm	Precision	PTFE	White	25
WG-1264-5	5mm	Precision	PTFE	White	25
WG-1265-10	5mm	Precision	PTFE	White	10
WG-1265-100	5mm	Precision	PTFE	White	100
WG-1264-8	8mm	Precision	PTFE	White	25
WG-1264-10	10mm	Precision	PTFE	White	25

Spinner Turbines for Bruker® Spectrometers

Bruker® Room Temperature 5 & 10mm Spinner Turbine

Highlights

- Less probe insert damage due to better insert sample control
- Longer upper barrel stabilizer with 3mm yellow band
- Can be mixed with originals during sample changer operation

Bruker® Variable Temperature 5 & 10mm Spinner Turbines

Highlights in addition to previous

- Far less likely to break than ceramic spinners if dropped on a hard surface
- Weight is comparable to room temperature spinners
- Long life high-temperature top and bottom O-rings

Bruker® Room Temperature 5 & 10mm Spinner Turbines		
Catalog No.	Application Temperature	Description
STB-5	Ambient	5mm Spinner for Bruker®
STB-5-TACHO	—	Replacement Tacho-Strip
TURBINE-ORING- BLACK	—	Replacement 5mm Viton® O-Ring
STB-10	Ambient	10mm Spinner for Bruker®

Bruker® Variable Temperature 5 & 10mm Spinner Turbines		
Catalog No.	Application Temperature	Description
B-PEEK-5	-150 to 200° C	5mm PEEK Spinner for Bruker®
B-PEEK-5-O-RING	—	Replacement 5mm Viton® O-Ring
B-PEEK-10	-150 to 200° C	10mm PEEK Spinner for Bruker®
B-PEEK-10-O	—	Replacement 10mm O-Ring

Bruker® 3 to 5mm Spinner Turbine with Exchangeable Fingers

Highlights in addition to previous

- Allows a portion of the VT air to pass straight through the sample inside the spinner turbine therefore reducing VT gradients and micro sonic flutter due to any high VT flow
- Includes high temperature external O-rings at the top and bottom for long life and a firm grip on the sample
- Optimized for non-spinning experiments but compatible with spinning experiments
- No need to adjust eject air to eject sample
- The mass multiplier ring is not included but can be purchased separately

Bruker® Variable Temperature 3 to 5mm Spinner Turbines with Exchangeable Fingers			
Catalog No.	**Application Temperature**	**Description**	**Material**
B-PEEK-3-NS	-150 to 200° C	Bruker® Spinner Turbine with 3mm PEEK exchangeable fingers	PEEK
B-PEEK-4-NS	-150 to 200° C	Bruker® Spinner Turbine with 4mm PEEK exchangeable fingers	PEEK
B-PEEK-5-NS	-150 to 200° C	Bruker® Spinner Turbine, with 5mm PEEK exchangeable fingers	PEEK
UNI-FINGER-PEEK-3	-150 to 200° C	3mm Finger for B-PEEK-X-NS Turbines (Two Required), Double VT O-Ring	PEEK
UNI-FINGER-PEEK-4	-150 to 200° C	4mm Finger for B-PEEK-X-NS Turbines (Two Required), PEEK, Double VT O-Ring	PEEK
UNI-FINGER-PEEK-5	-150 to 200° C	5mm Finger for B-PEEK-X-NS Turbines (Two Required), PEEK, Double VT O-Ring	PEEK
UNI-MASS-MULTI	—	Mass Multiplier Ring for Bruker® Style Spinner Turbines with 1 or 2 O-Rings at the top	—

Spinner Turbines for Agilent® (Varian®) Spectrometers

Agilent® Room Temperature 5mm & 10mm Spinner Turbine

Highlights

- Can be mixed with originals in sample changer operation
- Does not jam at top of upper barrel during insert operation

Agilent® Room Temperature 5 & 10mm Spinner Turbines		
Catalog No.	**Application Temperature**	**Description**
STV-5	Ambient	5mm Spinner for Agilent®
STV-5-TACHO	—	Replacement Tacho-Strip
TURBINE-ORING-RED	—	Replacement 5mm O-Ring

Agilent® Variable Temperature 5mm & 10mm Spinner Turbine

Highlights in addition to previous

- Weight compatible with room temperature spinners
- Cost effective as compared to the originals
- Long life high-temperature top and bottom O-rings

Agilent® Variable Temperature 5 & 10mm Spinner Turbines		
Catalog No.	**Application Temperature**	**Description**
V-PEEK-5	-150 to 200° C	5mm PEEK Spinner for Agilent®
TURBINE-ORING-RED	—	Replacement 5mm Viton® O-Ring

Agilent® 3 to 5mm Spinner Turbine with Exchangeable Fingers

Highlights in addition to previous

- Allows a portion of the VT air to pass straight through the sample inside the spinner turbine therefore reducing VT gradients and micro sonic flutter due to any high VT flow
- Includes high temperature external O-rings at the top and bottom for long life and a firm grip on the sample
- Optimized for non-spinning experiments but compatible with spinning experiments
- No need to adjust eject air to eject sample
- The mass multiplier ring is not included but can be purchased separately

Agilent® 3 to 5mm Variable Temperature Spinner Turbines with Exchangeable Fingers

Catalog No.	Application Temperature	Description	Material
V-PEEK-3-NS	-150 to 200° C	Agilent® Spinner Turbine with 3mm PEEK exchangeable fingers	PEEK
V-PEEK-4-NS	-150 to 200° C	Agilent® Spinner Turbine with 4mm PEEK exchangeable fingers	PEEK
V-PEEK-5-NS	-150 to 200° C	Agilent® Spinner Turbine with 5mm PEEK exchangeable fingers	PEEK
UNI-FINGER -PEEK-3	-150 to 200° C	3mm Finger for V-PEEK-X-NS style turbines (Two Required), Double VT O-Ring	PEEK
UNI-FINGER -PEEK-4	-150 to 200° C	4mm Finger for V-PEEK-X-NS style turbines (Two Each Required), PEEK, Double VT O-Ring	PEEK
UNI-FINGER -PEEK-5	-150 to 200° C	5mm Finger for V-PEEK-X-NS style turbines (Two Each Required), PEEK, Double VT O-Ring	PEEK
UNI-MASS-MULTI	—	Mass Multiplier Ring for V-NS Style Spinner Turbines with 1 or 2 O-Rings at the top	

Tube Washers

Multi-Tube Jet Solvent NMR/EPR Tube Washer/Dryer

Wilmad's Multi-Tube Jet Solvent Washer/Dryer is recommended for research labs that routinely clean NMR and EPR tubes; a single unit can accommodate up to 5 tubes at once. When an inverted tube is inserted onto the solvent transfer tubing and the open end is immersed under wash solvent in the solvent cup, a reliable vacuum-tight seal will be formed and generate solvent flow under vacuum. After solvent is fully consumed, air flow will follow to turn the unit into a dryer.

A filter flask with vacuum sidearm is required.

Features:

- 5 PTFE coated stainless steel solvent transfer tubes fit 3, 4, and 5mm NMR/EPR tubes
- PTFE solvent cup and tubing make this unit resistant to common organic solvents
- Flanged reservoir connection eliminates joint freeze
- Grease-less joint between the solvent cup and glass reservoir eliminates possibility of contamination
- Complete disassembly without tools for easy cleaning
- Hands free during washing/drying cycle
- Calibrated length mark for 4, 7, 8 and 9" tube

Multi-Tube Jet Solvent NMR/EPR Tube Washer/Dryer

Catalog No.	Compatible with	Description
WG-1209-1	#9 Silicone Stopper Joint	Complete Multi-Tube Washer/Dryer
WG-1209-J1	24/40 Taper Joint	Complete Multi-Tube Washer/Dryer
WG-1209-J2	29/32 Taper Joint	Complete Multi-Tube Washer/Dryer
WG-1209-5	—	Replacement Solvent Cup

Economy Single Tube Solvent Jet Washer/Cleaner

After fitting the washer to a filter flask, an inverted sample tube is inserted into the washer and solvent is introduced into the reservoir using a series of wash bottles. You can perform numerous wash steps and finish by pulling vacuum to dry the tube.

A filter flask with vacuum sidearm is required.

Economy Single Tube Solvent Jet Washer/Cleaner			
Catalog No.	**Fits Tubes with O.D.**	**For Tubes with Length**	**Washer Connection**
WG-1207-5	5mm	7”	Plain
WG-1207-5-8	5mm	8”	Plain
WG-1207-10	10mm	7”	Plain
WG-1207-J5	5mm	7”	24/40 Joint
WG-1207-J5-8	5mm	8”	24/40 Joint
WG-1207-J10	10mm	7”	24/40 Joint

Note: The 5mm Single Tube Washer is compatible with 5mm Thin-Walled Tubes only.

Universal Solvent Jet NMR Tube Washer

Wilmad’s Universal Solvent Jet Washer can be used for any length sample tube by a simple adjustment of the flexible PTFE tubing. It is especially recommended for cleaning gas-tight sample tubes.

By loosening and re-tightening the tubing fitting on the assembled washer head, the PTFE tubing that extends into the sample tube is adjusted to the proper length. The washer head is then affixed to a filter flask (with sidearm) and the side tubing is inserted into a washing solvent reservoir. After an inverted sample tube is placed over the PTFE tubing, a vacuum is applied to the flask and the sample tube is pressed against the rubber gasket to form an air-tight seal that starts the solvent flow. By lifting the PTFE tubing out of the solvent reservoir, the sample tube can be air-dried.

A filter flask with vacuum sidearm is required.

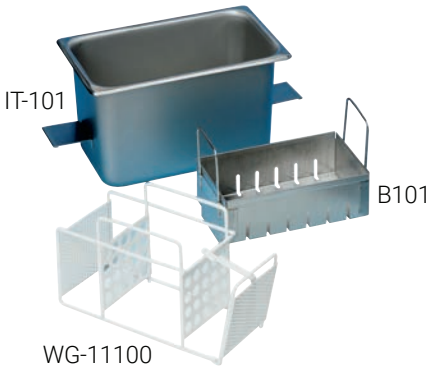
Universal Solvent Jet NMR Tube Washer		
Catalog No.	**Fits Tubes with O.D.**	**Washer Connection**
WG-7200-1	2.5-5mm	Plain
WG-7200-J1	2.5-5mm	24/40 Joint
WG-7200-J2	6.5-25mm	24/40 Joint

Ultrasonic Cleaning Systems

The Ultrasonic Cleaning Systems can wash up to 20 tubes at a time and are recommended for NMR research facilities. Operating at 21,000 sonic vibrations per second, these versatile, compact units can be used with aqueous detergent solutions or organic solvents (tank manufactured from stainless steel).

Note: Covers, Baskets, Trays & Racks are sold separately

Capacity: 1 gallon (approximately 3.8 liters)
Tank Dimensions: 9" x 5" x 6" deep
Outer Dimensions: 10 ½" x 6 ½" x 11" high



Ultrasonic Cleaning System Units		
Catalog No.	**Voltage**	**Description**
SC-101T	110/120	Ultrasonic Cleaner with 0-30 Minute Timer
SC-101TH	110/120	Ultrasonic Cleaner with 0-30 Minute Timer & Heater
SC-121TH	230	Ultrasonic Cleaner with 0-30 Minute Timer & Heater

Detergent	
Catalog No.	**Description**
101-GAL	1 Gallon Alkaline Cleaning Concentrate

Accessories	
Catalog No.	**Description**
C-100	Cover, Stainless Steel
B-101	Basket, Stainless Steel
IT-101	Liquid Tight Stainless Steel Tray
WG-11100	Poly Coated NMR Tube Rack

Liquid Nitrogen Dewar Flask

The liquid nitrogen flask is extremely useful for a wide range of applications in basic science research, such as cell cryo-preservation, sample degasification by freeze-pump-thaw cycle and cold trap for experiments involving vacuum lines.

Features:

- Unique metal base increases stability
- High vacuum minimizes liquid nitrogen loss during storage

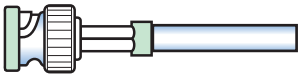
Liquid Nitrogen Dewar Flask						
Catalog No.	**Base**	**I.D.**	**Total Height**	**Inside Depth**	**Max Volume**	**Cross Reference**
LN2DF-600-1	3" Aluminum	80mm	180mm	150mm	600 mL	Pope Scientific 8640

Combination pH Electrode

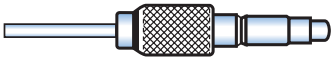
For use in 5 mm thin-walled NMR sample tubes up to 8" in length. Glass probe dimensions are 3mm O.D. x 180mm length.

pH Range: 0-14
Resolution: 0.02 pH Units
Resistance at 20° C: 100-1000 MΩ
Temperature Range: 0-70° C
Sodium Error: 0.1 at pH 12
Reproducibility: 99% within

Connectors



6030-02-BNC



6030-02-6

pH Electrode	
Catalog No.	**Description**
6030-02-BNC	pH Electrode with BNC Connector

Electrode Solutions		
Catalog No.	**Volume**	**Description**
18513	250 mL	Reference Solution - 3M KCl saturated with AgCl
18823	125 mL	Electrode Storage Solution - 3M KCl

NMR Protective Tube Carrier

The NMR tube carrier holds one 5mm O.D., 7" length NMR tube.

- Pocket clip keeps sample secure during pocket transportation
- Made from shatterproof polymer material
- In the case of an accident it provides protection to lab personnel from hazardous materials and broken glass

NMR Tube Carrier		
Catalog No.	**Description**	**Package Qty.**
WG-6192	NMR Protective Tube Carrier w/ Pocket Clip	3

NMR Tube Rack

Sturdy, stable polypropylene rack made specifically for organizing and protecting 5mm thin-walled NMR tubes.

NMR Tube Racks			
Catalog No.	**Material**	**Fits Tube with Maximum O.D.**	**Capacity**
820-A	Polypropylene	5mm	72 tubes

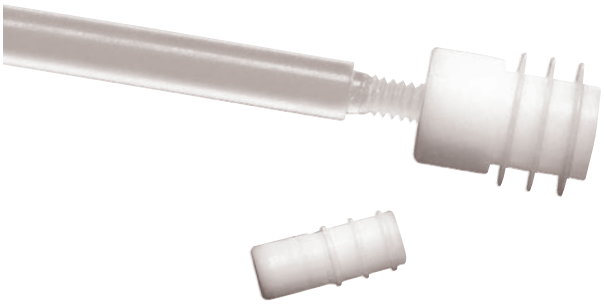
Pressure Sensitive NMR Tube Labels

Wilmad's Pressure Sensitive NMR Tube Labels are a handy alternative to marking tubes. Each label fits the circumference of the NMR tube precisely with no overlapping to guarantee sample tube symmetry in spinning experiments.

Pressure Sensitive NMR Tube Labels		
Catalog No.	**For Tubes with O.D.**	**Package Qty.**
WGL-5	5mm	480
WGL-10	10mm	400

Vortex Plugs and Positioning Rods

Vortex Plugs are recommended for spinning experiments where a vortex is created in your sample. PTFE flexible fins fit snugly into Precision Thin-Wall NMR tubes. A positioning rod is needed to place the plug at the correct height in the NMR tube. An air vent in the plug's center assures easy insertion. Not recommended for variable temperature experiments.



Vortex Plugs

Catalog No.	Fits Tubes with O.D.	Fits Tubes with Wall Thickness	Material	Description
529-B	5mm	0.38mm	PTFE	Holder
529-C	5-15mm	—	Kel-F®	Positioning Rod
WG-504	5-15mm	—	Stainless Steel	Positioning Rod

Spinner Bearing NMR Sample Tube Tester

How do you keep bent & misused NMR tubes from damaging your instruments? Have every tube pass the spinner bearing test before use.

Warped tubes bind in the spinner bearing, good tubes spin freely. Keep a tube tester beside every NMR spectrometer. It will be the best investment you ever make.

Available for 5, 8 and 10mm O.D. NMR tubes.

Spinner Bearing NMR Sample Tube Tester

Catalog No.	Description	Fits Tubes with O.D.
SB-5-7	Spinner Bearing Tube Tester	5mm
SB-8-7	Spinner Bearing Tube Tester	8mm
SB-10-7	Spinner Bearing Tube Tester	10mm

NMR Pipettes

Wilmad Sample Transfer NMR Pipettes are designed for easy transfer of liquid samples contained in 5mm OD and larger NMR tubes, long neck volumetric flasks or chromatography columns.

- Manufactured from high quality ASTM Type 1 Class A borosilicate glass
- Resistant to most organic solvents
- Transparency provides easy control of sample loading
- Easily attach a latex bulb (804), sold separately
- Manufactured in a clean room
- Free from organic and inorganic contamination
- Special shaping process ensures a smooth surface to minimize sample loss

Wilmad Long-Tip Sample Transfer NMR Pipettes

Catalog No.	Description	Length	Fits with Tube	Package Qty.
803A	Long Tip Pipette	13.75" Overall	7", 8", 9", 5mm minimum O.D.	100
802	Short Pasteur Pipette	5" tip	5mm minimum O.D.	100
804	Latex Bulb for all Pipettes	—	—	50

NMR Filter and Funnel

Wilmad's Bulb Filter removes large particles from samples that may impact shimming and spectrum quality.

Two designs available: one with luer lock tip for stainless steel needles, the other with a glass tip. Both fit most sizes of Wilmad NMR tubes. The sintered glass tip removes particles larger than 60 µm.

NMR Filter and Funnel	
Catalog No.	**Description**
815	NMR Funnel
807	Regular Tip Filter
808	Luer Tip Filter
809	Rubber Bulb

Wilmad's Powder Funnel is designed to load large amounts of liquid reagents into NMR tubes. The tip fits into 5mm or larger NMR tubes.

Hamilton® Gas-Tight Syringe (PTFE Luer Lock)

Wilmad offers PTFE Luer Lock syringes that are ideal for the handling of air-sensitive and/or volatile samples with precise control over sample volumes.

Features:

- Gas and liquid tight
- Reproducible (volumes to ± 1%)
- Made of inert borosilicate glass, PTFE, and stainless steel
- Pressure tight to 200 psi

Hamilton® Gas-Tight Syringe (PTFE Luer Lock)		
Catalog No.	**Max. Volume**	**Graduation Interval**
81220	500 µL	10 µL
81320	1000 µL	20 µL
81420	2500 µL	50 µL

Syringe Needles

Stainless steel needles are designed for septum punctures. PTFE needles, offered in various diameters, provide a convenient method of sample loading and washing in small-volume NMR experiments.

Syringe Needles					
Catalog No.	**Material**	**O.D.**	**I.D.**	**Length**	**Package Qty.**
90022	Stainless Steel	0.71mm	0.41mm	2"	6
90052	Stainless Steel	0.71mm	0.41mm	5"	6
91026	Stainless Steel	0.46mm	0.26mm	6"	6
90630	PTFE	0.79mm	0.33mm	12"	1
90628	PTFE	0.84mm	0.38mm	12"	1
90626	PTFE	0.91mm	0.45mm	12"	1
90624	PTFE	1.02mm	0.56mm	12"	1
90622	PTFE	1.14mm	0.69mm	12"	1
90620	PTFE	1.35mm	0.86mm	12"	1
90619	PTFE	1.57mm	0.97mm	12"	1
90618	PTFE	1.68mm	1.07mm	12"	1
90617	PTFE	1.80mm	1.19mm	12"	1
90616	PTFE	2.01mm	1.35mm	12"	1
90615	PTFE	2.11mm	1.50mm	12"	1

Solid-State NMR Consumables & Accessories

Solid State Significance

MAS Rotors provide the NMR spectroscopist with the ultimate alternative for analysis of solid samples. The need to solvate is eliminated!

Pyrex® Tube for Varian® NanoProbe

Wilmad Varian® Nanoprobe tubes are 100% compatible with the Varian NanoProbe system in analysis of solids and semi-solids.

- Manufactured to tight tolerances that enable a maximum rotating speed of 2.5kHz
- Tube body is manufactured from Type 1 Class A borosilicate glass for optimized variable temperature performance
- Cap and bottom plugs are made of Kel-F® or Ertalyte®, allowing for excellent chemical resistance

Properties of Cap and Plug Materials

Material	Chemical Components	Temperature Range	Additional Remarks	Finished Length	Overall Length
Ertalyte®	C, H, O, Polyethylene Tetraphthalate Polyester (PET-P) F, Cl, C	Ambient to 99° C	Not for strong acids, strong bases or chlorinated solvents; otherwise, excellent chemical resistance	11.5mm	23mm
Kel-F®	F, Cl, C	-20 to 70° C	Excellent chemical resistance commonly used for 1H studies	14.0mm	25mm

Non-GHX type Varian® NanoProbe

Catalog No.	Temperature Range	Description	Material	Volume
WP-502-4225/C		Tube with bottom	Pyrex®	
WP-502-4225/O		Tube without bottom	Pyrex®	

GHX type Varian® NanoProbe

Catalog No.	Temperature Range	Description	Material	Volume
WP-7021-4225F/110	-20 to 70° C	Tube with bottom and Kel-F® cap	Various	110 µL
WP-7021-4225F/40	-20 to 70° C	Tube with Kel-F® cap and bottom plug	Various	40 µL

Rotor & Cap for Bruker® & Agilent/Varian® MAS-NMR

MAS-NMR rotor bodies are manufactured from the highest quality Zirconia, Kel-F®, Torlon®, & Vespel® providing the ultimate solution for analysis of solid samples.

Note: "DB" is the abbreviation for Bruker® "Double Bearing" style rotor. "BL" is the abbreviation for Bruker® "Boden Lager" (Bottom Bearing) style rotor.

- MAS rotors and caps are 100% compatible with most solid state NMR spectrometers
- Thoroughly inspected before and after the precision machining process to ensure there are no material irregularities
- Spin testing is performed to only the highest specified spinning speed, assuring performance without overspinning the rotor
- Spinning speeds of up to 12 kHz for 7mm O.D. rotors
- Some caps are fitted with O-rings for improved sealing
- Zirconia rotor body has a strength of 1,000 MPa, greater than Si_3N_4

Rotor & Cap for Bruker® MAS Probe

Catalog No.	For Bruker® MAS Probe	Temperature Range	Description	Material	Remarks
WP-501-2180	2.5mm	-150 to 650° C	Both Ends Open Rotor	Zirconia	V_{max}=35 kHz
WP-602-2181	2.5mm	-30 to 70° C	Cap	Vespel®	
WP-602-2182	2.5mm	-30 to 70° C	Bottom Plug	Vespel®	
WP-501-2180-SET1	2.5mm	-30 to 70° C	One 2.5mm Rotor, Two Vespel® Caps and Bottoms	Various	V_{max}=35 kHz
WP-501-3180	3.2mm	-150 to 650° C	Rotor Body, Both Ends Open	Zirconia	V_{max}=24 kHz
WP-501-3180-SET1	3.2mm	-30 to 70° C	One 3.2mm Rotor, Two Vespel® Caps and Bottoms	Various	V_{max}=24 kHz
WP-602-3181	3.2mm	-30 to 70° C	Rotor Cap	Vespel®	
WP-602-3182	3.2mm	-30 to 70° C	Bottom Plug	Vespel®	
WP-603-3181	3.2mm	-20 to 70° C	Rotor Cap	Kel-F®	
WP-603-3182	3.2mm	-20 to 70° C	Bottom Plug	Kel-F®	
WP-501-4180	4mm	-150 to 650° C	Rotor Body	Zirconia	V_{max}=18 kHz
WP-501-4181	4mm	-150 to 650° C	Rotor Body w/ Laser Marked Serial Number and Tachometer Mark on the Base	Zirconia	V_{max}=18 kHz
WP-601-4181	4mm	Ambient	Cap	Kel-F®	
JK-601-4181	4mm	-20 to 70° C	Cap with One O-ring	Kel-F®	
JK-602-4181	4mm	-100 to 200° C	Cap with One O-ring	Macor®	
JK-603-4181	4mm	-100 to 200° C	Cap with One O-ring	Torlon®	
JK-604-4181	4mm	-100 to 200° C	Cap with One O-ring	Vespel®	
WP-501-4180-SET-1	4mm	-100 to 200° C	One Rotor, Two Kel-F® Caps, One Torlon® Cap	Various	V_{max}=18 kHz
WP-501-4180-SET-2	4mm	-100 to 200° C	Two Rotors, Four Kel-F® Caps, One Torlon® Cap	Various	V_{max}=18 kHz
WP-501-4180-SET-5	4mm	-100 to 200° C	Five Rotors, Ten Kel-F® Caps and Three Torlon® Caps	Various	V_{max}=18 kHz
WP-501-7180	7mm	-150 to 650° C	Rotor Body	Zirconia	V_{max}=8 kHz
WP-601-7181	7mm, BL	-20 to 70° C	Cap	Kel-F®	
JK-601-7181	7mm, BL	-20 to 70° C	Cap with One O-ring	Kel-F®	
JK-601-7181-L	7mm, BL	-20 to 70° C	Long Cap with Two O-rings	Kel-F®	
JK-601-7181LWH	7mm, BL	-20 to 70° C	Long Cap with Two O-rings and Axial Hole	Kel-F®	
JK-601-7181-WH	7mm, BL	-20 to 70° C	Cap with One O-ring and Axial Hole	Kel-F®	
JK-603-7181	7mm, BL	-100 to 200° C	Cap with One O-ring	Torlon®	
WP-501-7180-SET-1	7mm	-100 to 200° C	One Rotor with Two Kel-F® Caps and One Torlon® Cap	Various	
WP-501-7180-SET-2	7mm	-100 to 200° C	Two Rotors with Four Kel-F® Caps and Two Torlon® Caps	Various	
WP-501-7180-SET-5	7mm	-100 to 200° C	Five Rotors with Ten Kel-F® Caps and Five Torlon® Caps	Various	

All items will be manufactured upon request and have a lead time of 2- 4 weeks

Solid State NMR Rotor Cap Remover

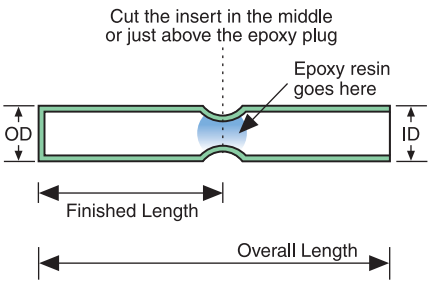
One of the most challenging parts of a solid state NMR experiment is to remove the end cap or base plug. This zero turn cap remover eliminates possible damage to the cap and rotor.

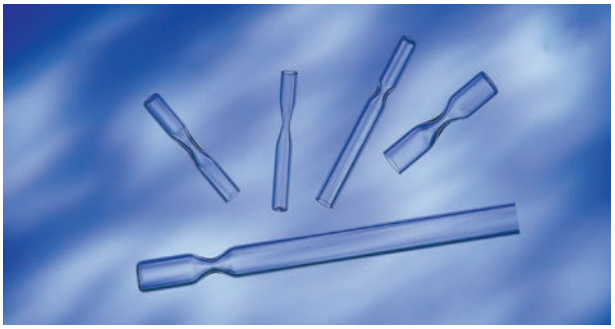
Solid State NMR Rotor Cap Remover		
Catalog No.	**Compatability**	**Material**
RS-301-2180	2.5mm Rotors	Stainless Steel
RS-301-3180	3.2mm Rotors	Stainless Steel
RS-301-4180	4mm Rotors	Stainless Steel

Pyrex® MAS Rotor Inserts

Wilmad's Pyrex® MAS Rotor Inserts are designed for air-sensitive samples and semi-solid samples such as gels or highly viscous liquids. The sample can be sealed into the insert tube by heat-sealing with a torch or applying a small drop of epoxy (we recommend E-6000® Craft Adhesive) to the constricted part as shown in the picture below. After the epoxy is set and dry (24 hours), the sealed insert is then cut through the constriction with a glass saw.

Using a small funnel powder samples can be packed into the insert. Gelatinous samples can be warmed and transferred to the insert using a syringe. A glove box may be required for the sealing of air-sensitive samples.





Pyrex® MAS Rotor Inserts					
Catalog No.	**For MAS Rotor**	**O.D.**	**I.D.**	**Finished Length**	**Overall Length**
DWGSK2576-1	WP-501-4180 Bruker® 4mm	2.99mm	2.24mm	14.0mm	25mm
DWGSK2356	WP-501-7180 Bruker® 7mm	5.59mm	4.57mm	13.2mm	68mm
DWGSK2594	WP-501-7180 Bruker® 7mm	5.59mm	5.00mm	13.2mm	68mm

Stainless Steel Micro-Spatula

- Fits into most 4mm or larger OD NMR tubes
- Makes solid state and gel-phase sample transfers easier

Stainless Steel Micro Spatula		
Catalog No.	**Length**	**Material**
806	250mm	Stainless Steel

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