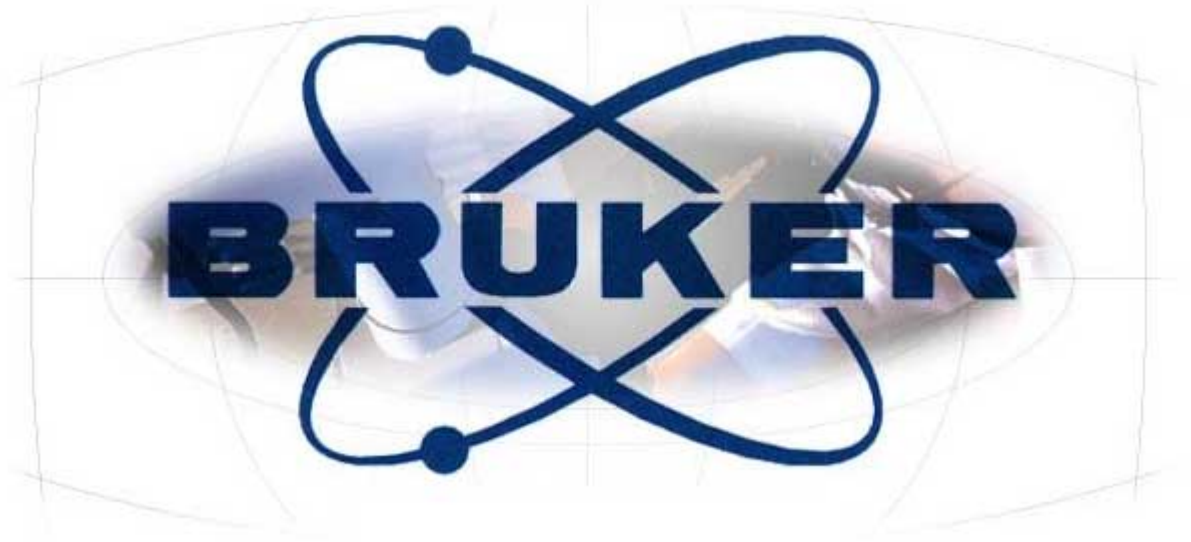
CortecNet

PRESENTS



CONSUMABLES

2003

CONTACT & ORDERING INFORMATION

1. Minimum order is : 300 € HT.
2. Shipping conditions:
- 25 € HT if order < 600 € HT ;
- free of charges if order > 600 € HT ;

3. No Special Conditions for Bruker.
4. Payment terms : 30 days net.

PLEASE INQUIRE FOR BIG QUANTITY TO GET SPECIAL PRICES

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SUMMARY

SOLID NMR AND HR MAS CONSUMABLES

SOLID NMR ROTORS AND INSERTS

Product Number	Description	O.D. (mm)	Other sizes	Material	T° range & Max. speed	Remarks	Package contents	Quantity	Unit Price
H8416	MAS rotor ZrO_2 BL2.5	2.5	I.D. : 1.5mm Ext. length : 12mm Sample vol. : 12µL	Zirconia [ZrO_2]	Room [-30 to +70°C] Standard [35 kHz]	for all 2.5 mm probes	1 MAS rotor ZRO_2 2.5/12 (P/N : HZ05165) 2 Drive caps BL2.5 (P/N : HZ05269) 2 SP1 BL2.5 rotor bottom caps (P/N : HZ05276)	1 - 2 3 - 5 6 - 8 9 - …	
K1911	MAS rotor Si_3N_4 BL4 	4	I.D. : 3mm Ext. length : 18mm Int. length : 12.6mm Sample vol. : 92µL	Silicon nitride [Si_3N_4]	Variable [-150 to +150°C] Standard [15 kHz]	for all 4 mm probes	1 MAS rotor SI_3N_4 4/18B (P/N : HZ1663) 2 Kel-f BL4 caps (P/N : H6304) 1 BN_3 BL4 cap (P/N : H6239)	1	
H7615	MAS rotor ZrO_2 BL4, HS	4	I.D. : 2.5mm Ext. length : 18mm Sample vol. : 62µL	Zirconia [ZrO_2]	Room [-30 to +70°C] High [18 kHz]	for all 4 mm probes	1 MAS rotor 4/18B HS (P/N : HZ2584) 3 SP1 BL4 caps (P/N : HZ2920)	1 - 4 5 - …	
K1910	MAS rotor ZrO_2 BL4 	4	I.D. : 3mm Ext. length : 18mm Int. length : 12.6mm Sample vol. : 92µL	Zirconia [ZrO_2]	Variable [-150 to +150°C] Standard [15 kHz]	for all 4 mm probes	1 MAS rotor ZRO_2 4/18B (P/N : H6283) 2 Kel-f BL4 caps (P/N : H6304) 1 BN_3 BL4 cap (P/N : H6239)	1 - 4 5 - 9 10 - …	
K1914	MAS rotor ZrO_2 BL4, HT	4	I.D. : 3mm Ext. length : 18mm Int. length : 12.6mm Sample vol. : 92µL	Zirconia [ZrO_2]	High [-150 to +250°C] Standard [15 kHz]	for all 4 mm probes	1 MAS rotor ZRO_2 4/18B (P/N : H6283) 1 Kel-f BL4 cap (P/N : H6304) 1 MAS cap MACOR BL4 (P/N : K1935)	1 - 4 5 - 9 10 - …	
K1922	MAS rotor Si_3N_4 BL7 	7	I.D. : 6mm Ext. length : 18mm	Silicon nitride [Si_3N_4]	Variable [-150 to +150°C] Standard [6 kHz]	fot BL7 probes	1 MAS rotor SI_3N_4 7/18B (P/N : HZ1620) 1 Kel-f BL7 cap with hole (P/N : H6244) 1 Kel-f BL7 cap without hole (P/N : HZ1662) 1 BN_3 BL7 cap with hole (P/N : HZ1651)	1	

SOLID NMR ROTORS AND INSERTS

Product Number	Description	O.D. (mm)	Other sizes	Material	T° range & Max. speed	Remarks	Package contents	Quantity	Unit Price
K1922	MAS rotor Si_3N_4 BL7 	7	I.D. : 6mm Ext. length : 18mm	Silicon nitride [Si_3N_4]	Variable [-150 to +150°C] Standard [6 kHz]	fot BL7 probes	1 MAS rotor SI_3N_4 7/18B (P/N : HZ1620) 1 Kel-f BL7 cap with hole (P/N : H6244) 1 Kel-f BL7 cap without hole (P/N : HZ1662) 1 BN_3 BL7 cap with hole (P/N : HZ1651)	1	
H7464	MAS rotor ZrO_2 BL7, HS	7	I.D. : 5.5mm Ext. length : 18mm	Zirconia [ZrO_2]	Room [-30 to +70°C] High [8 kHz]	fot BL7 probes	1 MAS rotor ZRO_2 7/18B (D=4) (P/N : HZ1834) 3 SP1 BL7 caps (P/N : HZ1835)	1 - 4 5 - …	
K1912	MAS rotor ZrO_2 BL7, HT	7	I.D. : 6mm Ext. length : 18mm	Zirconia [ZrO_2]	High [-150 to +250°C] Standard [6 kHz]	fot BL7 probes	1 MAS rotor ZRO_2 7/18B (P/N : H6241) 1 Kel-f BL7 cap without hole (P/N : HZ1662) 1 MAS cap MACOR BL7 (P/N : K1931)	1 - 4 5 - …	
K1921	MAS rotor ZrO_2 BL7 	7	I.D. : 6mm Ext. length : 18mm	Zirconia [ZrO_2]	Variable [-150 to +150°C] Standard [6 kHz]	fot BL7 probes	1 MAS rotor ZRO_2 7/18B (P/N : H6241) 1 Kel-f BL7 cap without hole (P/N : HZ1662) 1 Kel-f BL7 cap with hole (P/N : H6244) 1 BN_3 BL7 cap with hole (P/N : HZ1651)	1 - 4 5 - 9 10 - …	
P2885	MAS rotor ZrO_2 DB7/18 	7	I.D. : 6mm Ext. length : 18mm	Zirconia [ZrO_2]	Variable [-150 to +150°C] Standard [6 kHz]	for DB7/18 probes	1 MAS rotor ZRO_2 7/18B (P/N : H6241) 1 Kel-f DB7/18 cap with hole (P/N : H6156) 1 Kel-f DB7/18 cap without hole (P/N : H6302) 1 BN_3 DB7/18 cap with hole (P/N : H6303)	1 - 4 5 - …	
B0437	Rotor STRETCH 7	7	I.D. : 5mm Ext. length : 33mm	Zirconia [ZrO_2]	Variable [-150 to +150°C] Standard [5 kHz]	for 7 mm AMS BL7 STRECH probes for glass sample of 5 mm		1	
B0495	Rotor STRETCH 7	7	I.D. : 5mm Ext. length : 33mm	Zirconia [ZrO_2]	Variable [-150 to +150°C] Standard [5 kHz]	for 7 mm AMS BL7 STRECH probes		1	
H6251	7 mm BL7 hermetic insert	7		Kel-f	Room [-20 to +70°C]	for moisture sensitive experiments for BL7 rotors	1 top MAS rotor insert (P/N : HZ2034) 1 bottom MAS rotor insert (P/N : HZ2038) 1 Cylindric screw M2X20 MS (P/N : H1833)	1	
H7873	MAS rotor BL10 ZrO_2	10	I.D. : 9mm Ext. length : 18mm	Zirconia [ZrO_2]	Variable [-150 to +250°C] Standard [4 kHz]	for all 10 mm probes	1 MAS rotor 10/18B (P/N : HZ2386) 2 Kel-f BL10 caps (P/N : HZ03929) 1 SP1 BL10 cap (P/N : HZ04039) 1 MAS cap MACOR BL10 (P/N : HZ04040)	1 - 4 5 - …	

CRAMPS ROTORS AND SPACERS

Product Number	Description	O.D (mm)	Other sizes	Material	T° range & Max. speed	Remarks	Package contents	Quantity	Unit Price
H7359	MAS rotor CRAMPS Kel-f with spacer HZ2405	4	I.D. : 3mm Ext. length : 18mm	Kel-f	Room [-20 to +70°C] Standard [15 kHz]	for DB7/18 probes	1 MAS rotor ZRO_2 4/18B (P/N : H6283) 1 Spacer CRAMPS BL4 Kel-f (P/N : HZ2405) 2 Kel-f BL4 caps (P/N : H6304) 1 Cylindric screw M2X25 MS (P/N : H5202)	1 - 4 5 - 9 10 - …	
H7358	MAS rotor CRAMPS PE with spacer HZ2245	4	I.D. : 3mm Ext. length : 18mm	PE [Polyethylene]	Room [-20 to +70°C] Standard [15 kHz]	for all 4 mm probes	1 MAS rotor ZRO_2 4/18B (P/N : H6283) 1 Spacer CRAMPS BL4 PE (P/N : HZ2245) 2 Kel-f BL4 caps (P/N : H6304) 1 Cylindric screw M2X25 MS (P/N : H5202)	1	
H7360	MAS rotor CRAMPS PTFE with spacer HZ1872	4	I.D. : 3mm Ext. length : 18mm	PTFE [Teflon]	Room [-20 to +70°C] Standard [15 kHz]	for all 4 mm probes	1 MAS rotor ZRO_2 4/18B (P/N : H6283) 1 Spacer CRAMPS BL4 PTFE (P/N : HZ1872) 2 Kel-f BL4 caps (P/N : H6304) 1 Cylindric screw M2X25 MS (P/N : H5202)	1	
HZ2405	Spacer CRAMPS BL4 Kel-f	4		Kel-f	Room [-20 to +70°C]	for MAS CRAMPS rotor BL4 only	1 RM Kel-f RD (P/N : 19333)	1	
HZ2245	Spacer CRAMPS BL4 PE	4		PE [Polyethylene]	Room [+10 to +50°C]	for MAS CRAMPS rotor BL4 only	1 RM PE round (P/N : 65424)	1	
HZ1872	Spacer CRAMPS BL4 PTFE	4		PTFE [Teflon]	Room [+10 to +50°C]	for MAS CRAMPS rotor BL4 only	1 RM PTFE round (P/N : 55278)	1	
K1921CR	MAS rotor CRAMPS Kel-f with spacer H6250 	7	I.D. : 6mm Ext. length : 18mm	Kel-f	Room [-20 to +70°C] Standard [6 kHz]	for all BL7 rotors	1 MAS rotor ZRO_2 7/18B (P/N : H6241) 1 Spacer HR MAS BL7 Kel-f (P/N : H6250) 2 Kel-f BL7 caps without hole (P/N : HZ1662) 1 Cylindric screw M2X25 MS (P/N : H5202)	1	
P2885CR	MAS rotor CRAMPS DB Kel-f 	7	I.D. : 6mm Ext. length : 18mm	Kel-f	Room [-20 to +70°C] Standard [6 kHz]	for DB7/18 rotors	1 MAS rotor ZRO_2 7/18G (P/N : H6306) 1 Spacer HR MAS DB7/18 Kel-f (P/N : K7032701) 2 Kel-f DB7/18 caps without hole (P/N : H6302) 1 Cylindric screw M2X25 MS (P/N : H5202)	1	
H6250	Spacer CRAMPS BL7 Kel-f	7		Kel-f	Room [-20 to +70°C]	for MAS CRAMPS rotor BL7 only	1 RM Kel-f RD (P/N : 65010)	1	
K7032701	Spacer CRAMPS DB7/18 Kel-f	7		Kel-f	Room [-20 to +70°C]	for MAS CRAMPS rotor DB7/18 only	1 Cylindric screw M2X25 MS (P/N : H5202) 1 RM Kel-f RD (P/N : 65010)	1	

HR MAS ROTORS AND SPACERS

Product Number	Description	O.D. (mm)	Other sizes	Material	T° range & Max. speed	Remarks	Package contents	Quantity	Unit Price
HZ05537	HR MAS rotor BL4 Kel-f with spacer HZ04642	4	I.D. : 3mm Ext. length : 18mm Sample vol. : 12µL	Kel-f	Room [-20 to +70°C] Standard [12 kHz]	for 4 mm HR MAS probes	1 HR MAS rotor 4 labelled (P/N : HZ05867) 3 Kel-f BL4 caps (P/N : H6304) 1 HR MAS insert BL4 Kel-f (P/N : HZ04642) 1 MAS Thead pin M2X2 Kel-f (P/N : HZ04800) 1 Cylindric screw M2X25 (P/N : H5202)	1 - 4 5 - 9 10 - …	
HZ05538	HR MAS rotor BL4 Teflon with spacer HZ3909	4	I.D. : 3mm Ext. length : 18mm Sample vol. : 12µL	PTFE [Teflon]	Room [-20 to +70°C] Standard [12 kHz]	for 4 mm HR MAS probes	1 HR MAS rotor 4 labelled (P/N : HZ05867) 3 Kel-f BL4 caps (P/N : H6304) 1 HR MAS insert 12µL BL4 PTFE (P/N : HZ3909) 1 MAS Thead pin M2X2 Kel-f (P/N : HZ04800) 1 Cylindric screw M2X25 MS (P/N : H5202)	1 - 4 5 - 9 10 - …	
HZ07213	HR MAS rotor BL4 Teflon with spherical spacer HZ07123	4	I.D. : 3mm Ext. length : 18mm Sample vol. : 50µL	PTFE [Teflon]	Room [-20 to +70°C] Standard [12 kHz]	for 4 mm HR MAS probes	1 MAS rotor 4/18 HR T=13.2 (P/N : HZ07124) 3 Kel-f BL4 caps (P/N : H6304) 1 HR MAS insert 50µL BL4 PTFE (P/N : HZ07123) 1 MAS Thead pin M2X2 Kel-f (P/N : HZ04800) 1 Cylindric screw M2X25 MS (P/N : H5202)	1 - 4 5 - 9 10 - …	
H8320	Spacer HR MAS BL4 Kel-f full	4	Sample vol. : 12µL	Kel-f	Room [-20 to +70°C]	for BL4 HR MAS rotors only	1 HR MAS insert 12 µL BL4 Kel-f (P/N : HZ04642) 1 HR MAS spacer BL4 U Kel-f (P/N : HZ04641) 1 MAS Thead pin M2X2 Kel-f (P/N : HZ04800) 1 Cylindric screw M2X25 MS (P/N : H5202)	1	
H8548	Spacer HR MAS BL4 Kel-f set top	4	Sample vol. : 12µL	Kel-f	Room [-20 to +70°C]	for BL4 HR MAS rotors only	1 HR MAS insert 12 µL BL4 Kel-f (P/N : HZ04642) 1 MAS Thead pin M2X2 Kel-f (P/N : HZ04800) 1 Cylindric screw M2X25 MS (P/N : H5202)	1 - 4 5 - …	
H11087	Spacer HR MAS BL4 PTFE	4	Sample vol. : 50µL	PTFE [Teflon]	Room [-20 to +70°C]	for BL4 HR MAS rotor HZ07213 only	1 HR MAS insert 50µL BL4 PTFE (P/N : HZ07123) 1 MAS Thead pin M2X2 Kel-f (P/N : HZ04800) 1 Cylindric screw M2X25 MS (P/N : H5202)	1	
H8549	Spacer HR MAS PTFE set top	4	Sample vol. : 12µL	PTFE [Teflon]	Room [-20 to +70°C]	for BL4 HR MAS rotors only	1 HR MAS insert 12µL BL4 PTFE (P/N : HZ3909) 1 MAS Thead pin M2X2 Kel-f (P/N : HZ04800) 1 Cylindric screw M2X25 MS (P/N : H5202)	1 - 4 5 - …	
HZ04875	Tool for HR MAS spacer					for HR MAS BL4 rotors		1	

ROTOR CAPS FOR SOLID NMR AND HR MAS

Product Number	Description	O.D. (mm)	Material	T° range	Remarks	Quantity	Unit Price
HZ05269	Drive cap BL2.5	2.5	Vespel [SP1]	Room [-30 to +70°C]	top cap for BL2.5 rotors	1 - 9 10 - 49 50 - …	
HZ05276	SP1 BL2.5 rotor bottom cap	2.5	Vespel [SP1]	Room [-30 to +70°C]	bottom cap for BL2.5 rotors	1 - 9 10 - 49 50 - …	
H6239	BN_3 BL4 cap	4	Boron nitride [BN_3]	Variable [-150 to +150°C]	for BL4 rotors	1 - 9 10 - 49 50 - …	
H6304	Kel-f BL4 cap	4	Kel-f	Room [-20 to +70°C]	for BL4 rotors	1 - 4 5 - 9 10 - 49 50 - …	
HZ2920	SP1 BL4 cap	4	Vespel [SP1]	Room [-30 to +70°C]	for high speed BL4 rotors	1	
B200154	ZrO_2 BL4 cap	4	Zirconia [ZrO_2]	Variable [-150 to +650°C]	more strong than HZ05951 caps for BL4 rotors	1	
HZ05951	ZrO_2 BL4 cap	4	Zirconia [ZrO_2]	Variable [-150 to +650°C]	for BL4 rotors	1	
HZ1651	BN_3 BL7 cap with hole	7	Boron nitride [BN_3]	Variable [-150 to +150°C]	cap with hole for BL7 rotors	1 - 9 10 - 49 50 - …	
H6244	Kel-f BL7 cap with hole	7	Kel-f	Room [-20 to +70°C]	cap with hole for BL7 rotors	1 - 4 5 - 9 10 - 24 25 - …	
HZ1662	Kel-f BL7 cap without hole	7	Kel-f	Room [-20 to +70°C]	cap without hole for BL7 rotors	1 - 4 5 - 9 10 - 24 25 - …	
HZ1835	SP1 BL7 cap	7	Vespel [SP1]	Room [-30 to +70°C]	for high speed BL7 rotors	1	
B200158	ZrO_2 BL7 cap	7	Zirconia [ZrO_2]	Variable [-150 to +650°C]	for BL7 rotors	1	
H6303	BN_3 DB7/18 cap with hole	7	Boron nitride [BN_3]	Variable [-150 to +150°C]	cap with hole for DB7/18 rotors	1 - 9 10 - 49 50 - …	
H6156	Kel-f DB7/18 cap with hole	7	Kel-f	Room [-20 to +70°C]	cap with hole for DB7/18 rotors	1 - 4 5 - 9 10 - …	
H6302	Kel-f DB7/18 cap without hole	7	Kel-f	Room [-20 to +70°C]	cap without hole for DB7/18 rotors	1 - 4 5 - 9 10 - …	
HZ03929	Kel-f BL10 cap	10	Kel-f	Room [-20 to +70°C]	for BL10 rotors	1	
HZ04039	SP1 BL10 cap	10	Vespel [SP1]	Room [-30 to +70°C]	for high speed BL10 rotors	1	

ROTOR CAP REMOVERS

Product Number	Description	O.D. (mm)	Remarks	Unit price
HZ05503	MAS BL2.5 rotor cap removers	2.5	for BL2.5 caps	
HZ05754	MAS BL4 rotor cap removers	4	for BL4 caps	
HZ05755	MAS BL7 rotor cap removers	7	for BL7 caps	
HZ04177	MAS BL10 rotor cap removers	10	for BL10 caps	

SOLID NMR SAMPLING ACCESSORIES

Product Number	Description	O.D. (mm)	Sample vol. (mL)	Remarks	Unit price
HZ05526	MAS filling funnel	2.5		for BL2.5 rotors	
HZ3329	MAS filling funnel	4		for BL4 standard rotors	
HZ3328	MAS filling funnel	7		for BL7 and DB7/18 standard rotors	
HZ05528	MAS rotor packer	2.5		manual sample packer ; for BL2.5 rotors	
K8111001	MAS rotor packer 	4		manual sample packer for BL4 standard rotors	
K6011001	MAS rotor packer 	7		manual sample packer for BL7 et DB7/18 standard rotors	
P4035	Sample packer			electric sample packer for MAS 4 and 7 rotors	
68299	Syringe pipette 0.1 mL		0.1	for HR MAS sample preparation	
68298	Pipette tip			tip for syringue pipette (P/N : 68299)	

SOLID NMR TUBES AND OTHER ACCESSORIES

Product Number	Description	O.D. (mm)	Length (mm)	Remarks Package contents	Unit price
B0621	Sample tube for 5mm SB wideline	5	26	for HP Wideline probe 1 5mm cap SB wideline probe (P/N : B0617) 1 Sample tube 5 x 26mm long (P/N : B1680)	
B0617	Cap for 5mm SB wideline probe	5		for 5 mm HP wideline probes	
B0623	Sample tube for 10mm SB wideline	10	24	for HP Wideline probe 1 Cap for 10mm SB wideline probe (P/N : B0619) 1 Sample tube 10 x 24 mm long, flat bottom (P/N : 90175)	
B0619	Cap for 10mm SB wideline probe	10		for 10 mm HP wideline probes	
16112	Black marker pen			Color : black	
16113	White marker pen			Color : white	
16114	Silver marker pen			Color : silver	

LIQUID NMR CONSUMABLES

SPINNERS

Product Number	Description	O.D. (mm)	Material	Frequence range (MHz)	T° range	Remarks	Package contents	Quantity	Unit price
H00177	Spinner 5 + 2.5 mm Kel-f SB 	2.5 & 5	Kel-f	100 to 400	Room [-20 to +70°C]	for Standard Bore (SB) probes	2 Toric joints 8 x 3 FPM75 (P/N : 23062)	1	
H00177A	Spinner 5 + 2.5 mm Kel-f SB 	2.5 & 5	Kel-f	500 and more	Room [-20 to +70°C]	for Standard Bore (SB) probes	1 Toric joint 8 x 3 FPM75 (P/N : 23062)	1 - 29 30 - …	
Z42616	Spinner 5 + 2.5 mm ceramic SB light	2.5 & 5	Ceramic	100 to 400	Variable [-150 to +150°C]	for Standard Bore (SB) probes		1	
H00804	Spinner 5 mm ceramics SB 	5	Ceramic	100 to 400	Variable [-150 to +150°C]	for Standard Bore (SB) probes		1	
H00804A	Spinner 5 mm ceramics SB 	5	Ceramic	500 and more	Variable [-150 to +150°C]	for Standard Bore (SB) probes		1	
Z42616A	Spinner 5 + 2.5 mm ceramic SB light	5	Ceramic	500 and more	Variable [-150 to +150°C]	for Standard Bore (SB) probes		1	

Product Number	Description	O.D. (mm)	Material	Frequence range (MHz)	T° range	Remarks	Package contents	Quantity	Unit price
Z9874	Spinner 8 mm ceramics SB 	8	Ceramic	100 to 400	Variable [-150 to +150°C]	for Standard Bore (SB) probes		1	
Z9874A	Spinner 8 mm ceramics SB 	8	Ceramic	500 and more	Variable [-150 to +150°C]	for Standard Bore (SB) probes		1	
Z9513	Spinner 8 mm Kel-f SB	8	Kef-f	100 to 400	Room [-20 to +70°C]	for Standard Bore (SB) probes		1	
Z9513A	Spinner 8 mm Kel-f SB 	8	Kef-f	500 and more	Room [-20 to +70°C]	for Standard Bore (SB) probes		1	
H00306	Spinner 10 mm Kel-f SB 	10	Kel-f	all frequencies	Room [-20 to +70°C]	for Standard Bore (SB) probes	2 Toric joints 12 x 3 FPM75 (P/N : 28539)	1	
H00805	Spinner 10 mm ceramics SB 	10	Ceramic	all frequencies	Variable [-150 to +150°C]	for Standard Bore (SB) probes		1	
H00806	Spinner 15 mm Kel-f SB	15	Kel-f	all frequencies	Room [-20 to +70°C]	for Standard Bore (SB) probes	1 Toric joint 15 x 1 NBR70 (P/N : 23025)	1	
H00810	Spinner 15 mm Kel-f WB 	15	Kel-f	all frequencies	Room [-20 to +70°C]	for Wide Bore (WB) probes	1 Toric joint 15 x 2.50 FPM75 (P/N : 28541)	1	
H00807	Spinner 15 mm ceramics SB 	15	Ceramic	all frequencies	Variable [-150 to +150°C]	for Standard Bore (SB) probes	1 Toric joint 15 x 1 NBR70 (P/N : 23025)	1	
H00814	Spinner 15 mm ceramics WB 	15	Ceramic	all frequencies	Variable [-150 to +150°C]	for Wide Bore (WB) probes	1 Toric joint 15 x 2.50 FPM75 (P/N : 28541)	1	

Product Number	Description	O.D. (mm)	Material	Frequence range (MHz)	T° range	Remarks	Package contents	Quantity	Unit price
H00811	Spinner 20 mm Kel-f WB 	20	Kel-f	all frequencies	Room [-20 to +70°C]	for Wide Bore (WB) probes	1 Toric joint 20 x 2.50 FPM75 (P/N : 28653)	1	
H00815	Spinner 20 mm ceramics WB 	20	Ceramic	all frequencies	Variable [-150 to +150°C]	for Wide Bore (WB) probes	1 Toric joint 20 x 2.50 FPM75 (P/N : 28653)	1	
H01815	Spinner 25 mm Kef-f WB	25	Kel-f	all frequencies	Room [-20 to +70°C]	for Wide Bore (WB) probes	1 Toric joint 25 x 2.50 FPM75 (P/N : 23028)	1	
Z5113	Spinner 25 mm ceramic WB	25	Ceramic	all frequencies	Variable [-150 to +150°C]	for Wide Bore (WB) probes	1 Toric joint 25 x 2.50 FPM75 (P/N : 23028)	1	
H02815	Spinner 30 mm Kel-f WB	30	Kel-f	all frequencies	Room [-20 to +70°C]	for Wide Bore (WB) probes	1 Toric joint 30 x 2 FPM75 (P/N : 28652)	1	
Z5114	Spinner 30 mm ceramic WB	30	Ceramic	all frequencies	Variable [-150 to +150°C]	for Wide Bore (WB) probes	1 Toric joint 30 x 2 FPM75 (P/N : 28652)	1	

SPINNERS FOR AUTOMATIC SAMPLE CHANGER

Product Number	Description	O.D. (mm)	Material	Frequence range (MHz)	T° range	Remarks	Package contents	Quantity	Unit price
Z42516	Spinner 5 + 2.5 mm POM SB 	2.5 & 5	POM	100 to 400	Room [+10 to +50°C]	for Standard Bore (SB) probes for automatic sample changers only		1 - 5 6 - 11 12 - …	
W5000323	Spinners 5 + 2.5 mm POM SB engraved set 	2.5 & 5	POM	100 to 400	Room [+10 to +50°C]	for Standard Bore (SB) probes for automatic sample changers only	10 Z42516 engraved (n0)	1	
W5000324	Spinners 5 + 2.5 mm POM SB engraved set 	2.5 & 5	POM	100 to 400	Room [+10 to +50°C]	for Standard Bore (SB) probes for automatic sample changers only	30 Z42516 engraved (n0)	1	
Z42516A	Spinner 5 + 2.5 mm POM SB 	2.5 & 5	POM	500 and more	Room [+10 to +50°C]	for Standard Bore (SB) probes for automatic sample changers only		1 - 5 6 - 11 12 - …	
Z9514	Spinner 8 mm POM SB	8	POM	100 to 400	Room [+10 to +50°C]	for Standard Bore (SB) probes for automatic sample changers only		1	
Z9514A	Spinner 8 mm POM SB	8	POM	500 and more	Room [+10 to +50°C]	for Standard Bore (SB) probes for automatic sample changers only		1	
Z5293	Spinner 10 mm POM SB 	10	POM	all frequencies	Room [+10 to +50°C]	for Standard Bore (SB) probes for automatic sample changers only	2 Toric joints 12 x 3 FPM75 (P/N : 28539)	1	
Z5294	Spinner 15 mm POM SB 	15	POM	all frequencies	Room [+10 to +50°C]	for Standard Bore (SB) probes for automatic sample changers only	1 Toric joint 15 x 1 NBR70 (P/N : 23025)	1	

SPINNERS ACCESSORIES

Product Number	Description		Remarks	Unit price
Z3914	Sample position gauge SC SB		for Standard Bore (SB) spinners / tubes	
Z3915	Sample position gauge SC WB		for Wide Bore (WB) spinners / tubes	
Z4346	Self adhesive reflector SB		for SB 5 to 15 mm spinners	
Z4347	Self adhesive reflector WB		for Wide Bore (WB) spinners	
Z42852	SB self adhesive reflector		for SB 2.5 mm spinners	
23062	Toric joint for SB 2.5 and 5 mm rotors		Toric joint 8 x 3 FPM75 for 2.5 and 5 mm spinners	
Z5490	Ring for ceramic rotors		for ceramic 2.5 and 5 mm rotors	

NMR TUBE STANDARDS - PROTON (^{1}H) STANDARDS

Product Number	Description	O.D. (mm)	Chemical composition / Concentration		Reference	Solvent	Nucleus	Parameter set-up	Unit price
Z10124	NMR sample 100 mg DBPA + 1% TMS	5	Bromopropionic acid [DBPAD]	100 mg	TMS (1%)	$CDCl_3$	^{1}H	Calibration of ^{1}H selective pulses	
Z10092	NMR sample 0.05M Cyclosporin	5	Cyclosporin	0.05 M		C_6D_6	^{1}H ; ^{13}C ; ^{15}N	1D and 2D experiments with 1H detection	
Z10135	NMR sample Dynamic range	5	H_2O CH_3OH CH_3CN $(CH_3)_3COH$	10000 ppm 100 ppm 10 ppm 1 ppm		54% D_2O	^{1}H	Dynamic test	
Z10230	NMR sample 3% $CHCl_3$ + .2% TMS	5	$CHCl_3$	3 %	TMS (0.2%)	Acetone-d_6	^{1}H	^{1}H resolution	
Z10248	NMR sample 1% $CHCl_3$	5	$CHCl_3$	1 %		Acetone-d_6	^{1}H	^{1}H resolution for high field spectrometer > 500MHz	
Z10226	NMR sample 5% ODCB + % TMS	5	*ortho*-Dichlorobenzene [ODCB]	5 %	TMS (1%)	Acetone-d_6	^{1}H	^{1}H resolution	
Z10102	NMR sample 15% ODCB + 3% TMS	5	*ortho*-Dichlorobenzene [ODCB]	15 %	TMS (3%)	Acetone-d_6	^{1}H	^{1}H resolution	
Z10103	NMR sample 15% ODCB + 3% TMS	10	*ortho*-Dichlorobenzene [ODCB]	15 %	TMS (3%)	Acetone-d_6	^{1}H	^{1}H resolution	
Z10109	NMR sample 10% $CHCl_3$ + 1% TMS	5	$CHCl_3$	10 %	TMS (1%)	Acetone-d_6	^{1}H ; ^{13}C	Old ^{1}H resolution test Used now for ^{13}C and ^{1}H pulses calibration	
Z10110	NMR sample 10% $CHCl_3$ + 1% TMS	10	$CHCl_3$	10 %		Acetone-d_6	^{1}H ; ^{13}C	Old ^{1}H resolution test Used now for ^{13}C and ^{1}H pulses calibration	
Z10107	NMR sample 50% $CHCl_3$ + 2% TMS	5	$CHCl_3$	50 %	TMS (2%)	Acetone-d_6	^{1}H ; ^{13}C	Old ^{1}H resolution test Used now for ^{13}C and ^{1}H pulses calibration	
Z10108	NMR sample 50% $CHCl_3$ + 2% TMS	10	$CHCl_3$	50 %	TMS (2%)	Acetone-d_6	^{1}H ; ^{13}C	Old ^{1}H resolution test Used now for ^{13}C and ^{1}H pulses calibration	
Z10131	NMR sample 90% $CHCl_3$	5	$CHCl_3$	90 %		Acetone-d_6	^{1}H ; ^{13}C	Old ^{1}H resolution test Used now for ^{13}C and ^{1}H pulses calibration	
Z10132	NMR sample 90% $CHCl_3$	10	$CHCl_3$	90 %		Acetone-d_6	^{1}H ; ^{13}C	Old ^{1}H resolution test Used now for ^{13}C and ^{1}H pulses calibration	

Product Number	Description	O.D. (mm)	Chemical composition / Concentration		Reference	Solvent	Nucleus	Parameter set-up	Unit price
Z10120	NMR sample 0.1% EB	5	Ethylbenzene [EB]	0.1 %		$CDCl_3$	^1H	^1H sensitivity	
Z10116	NMR sample 1% EB + .2% TMS	5	Ethylbenzene [EB]	1 %	TMS (0.2%)	$CDCl_3$	^1H	^1H sensitivity for low field<200MHz	
Z10137	NMR sample 1% EB + 2% TMS	5	Ethylbenzene [EB]	1 %	TMS (2%)	$CDCl_3$	^1H	^1H sensitivity for low field < 200MHz	
Z10127	NMR sample 4% CH_3OH	5	CH_3OH	4 %		CD_3OD	^1H	Temperature calibration between 180 and 300K	
Z10139	NMR sample 5% EB + 2% TMS	5	Ethylbenzene [EB]	5 %	TMS (2%)	$CDCl_3$	^1H	^1H sensitivity for low field < 200MHz	
Z10129	NMR sample 80% Glycol	5	Ethylene glycol	80 %		DMSO	^1H	Temperature calibration between 300 and 420K	
Z10128	NMR sample 4% CH_3OH	10	CH_3OH	4 %		CD_3OD	^1H	Temperature calibration between 180 and 300K	
Z10130	NMR sample 80% Glycol	10	Ethylene glycol	80 %		DMSO	^1H	Temperature calibration between 300 and 420K	
Z10241	NMR sample 0.002M Lysozyme	5	Lysozyme	0.002 M		90% H_2O / D_2O	^1H	2D and 1D ^1H experiments with water suppression	
Z10267	NMR sample 0.002M Sucrose	2.5	Sucrose	0.002 M		90% H_2O / D_2O	^1H	1D ^1H experiments with water suppression	
Z10246	NMR sample 0.002M Sucrose	5	Sucrose	0.002 M		90% H_2O / D_2O	^1H	1D ^1H experiments with water suppression	
Z10247	NMR sample 0.002M Sucrose	8	Sucrose	0.002 M		90% H_2O / D_2O	^1H	1D ^1H experiments with water suppression	
Z10213	NMR sample D_2O	5	D_2O	100 %			^2H	Lock	
Z10214	NMR sample D_2O	10	D_2O	100 %			^2H	Lock	

NMR TUBE STANDARDS - CARBON (^{13}C) STANDARDS

Product Number	Description	O.D. (mm)	Chemical composition / Concentration		Reference	Solvent	Nucleus	Parameter set-up	Unit price
Z10142	NMR sample 80% C_6H_6	5	C_6H_6	80 %		Acetone-d_6	^{13}C	^{13}C resolution test	
Z10143	NMR sample 80% C_6H_6	10	C_6H_6	80 %		Acetone-d_6	^{13}C	^{13}C resolution test	
Z10157	NMR sample 20 mg CHOLAC	5	Cholesteryl acetate [CHOLAC]	20 mg		$CDCl_3$	^{13}C	^{1}D - ^{13}C experiments	
Z10159	NMR sample 100 mg CHOLAC	5	Cholesteryl acetate [CHOLAC]	100 mg		$CDCl_3$	^{13}C	^{1}D - ^{13}C experiments	
Z10160	NMR sample 100 mg CHOLAC	10	Cholesteryl acetate [CHOLAC]	100 mg		$CDCl_3$	^{13}C	^{1}D - ^{13}C experiments	
Z10161	NMR sample 1g CHOLAC + 5% TMS	5	Cholesteryl acetate [CHOLAC]	1 g	TMS (5%)	$CDCl_3$	^{13}C	^{1}D - ^{13}C experiments	
Z10162	NMR sample 1g CHOLAC + 5% TMS	10	Cholesteryl acetate [CHOLAC]	1 g	TMS (5%)	$CDCl_3$	^{13}C	^{1}D - ^{13}C experiments	
Z10153	NMR sample 10% EB	5	Ethylbenzene [EB]	10 %		$CDCl_3$	^{13}C	^{13}C sensitivity with ^{1}H decoupling	
Z10154	NMR sample 10% EB	10	Ethylbenzene [EB]	10 %		$CDCl_3$	^{13}C	^{13}C sensitivity with ^{1}H decoupling	
Z10151	NMR sample 80% EB	5	Ethylbenzene [EB]	80 %		$CDCl_3$	^{13}C	^{13}C sensitivity for low field spectrometer < 200MHz	
Z10152	NMR sample 80% EB	10	Ethylbenzene [EB]	80 %		$CDCl_3$	^{13}C	^{13}C sensitivity for low field spectrometer < 200MHz	
Z10163	NMR sample ASTM	5	para-Dioxane	40 %		C_6D_6	^{13}C	^{13}C sensitivity without ^{1}H decoupling	
Z10164	NMR sample ASTM	10	para-Dioxane	40 %		C6D_6	^{13}C	^{13}C sensitivity without ^{1}H decoupling	

NMR TUBE STANDARDS – OTHER NUCLEUS

Product Number	Description	O.D. (mm)	Chemical composition / Concentration		Reference	Solvent	Nucleus	Parameter set-up	Unit price
Z10168	NMR sample 1% $B_{10}H_{14}$	10	$B_{10}H_{14}$	1 %		C_6D_6	^{10}B ; ^{11}B	^{10}B and ^{11}B sensitivity	
Z10176	NMR sample 2M KCl	10	KCl	2 M		D_2O	^{39}K ; ^{35}Cl	^{39}K and ^{35}Cl sensitivity	
Z10234	NMR sample 0.05% TFT	5	Trifluorotoluene [TFT]	0.05 %		Acetone-d_6	^{19}F	^{19}F sensitivity	
Z10235	NMR sample 0.05% TFT	10	Trifluorotoluene [TFT]	0.05 %		Acetone-d_6	^{19}F	^{19}F sensitivity	
Z10187	NMR sample 90% Formamide	5	Formamide	90 %		DMSO	^{15}N	^{15}N sensitivity	
Z10188	NMR sample 90% Formamide	10	Formamide	90 %		DMSO	^{15}N	^{15}N sensitivity	
Z10184	NMR sample 1M NH_4Br	10	NH_4Br	1 M		D_2O	^{14}N	^{14}N sensitivity	
Z10263	NMR sample Urea	5	Urea-^{15}N and methanol-^{13}C	0.1 M		DMSO	^{1}H ; ^{15}N and 1H ; ^{13}C and ^{15}N	Old: calibration of ^{15}N pulses on f2 channel New: calibration of ^{15}N and ^{13}C pulses on f2 channel	
Z10192	NMR sample 0.25M NaCl	10	NaCl	0.25 M		D_2O	^{23}Na	^{23}Na sensitivity	
Z10179	NMR sample H_2O	5	H_2O	100 %		H_2O	^{2}H ; ^{17}O	^{2}H and ^{17}O sensitivity	
Z10180	NMR sample H_2O	10	H_2O	100 %		H_2O	^{2}H ; ^{17}O	^{2}H and ^{17}O sensitivity	
Z10201	NMR sample 0.0485M TPP + 1% TMS	5	Triphenylphosphate [TPP]	0.0485 M	TMS (1%)	Acetone-d_6	^{31}P	^{31}P sensitivity	
Z10202	NMR sample 0.0485M TPP + 1% TMS	10	Triphenylphosphate [TPP]	0.0485 M	TMS (1%)	Acetone-d_6	^{31}P	^{31}P sensitivity	
Z10210	NMR sample 85% HMDS	10	Hexamethyldisiloxane [HMDS]	85 %		C_6D_6	^{29}Si	^{29}Si sensitivity	

NMR PROBE ACCESSORIES

DEWARS FOR LIQUID NMR PROBES

Product Number	Description	Remarks	Unit price
Z41059	Heating dewar SB-2 VSP 2.5	Frequence : 500 MHz Material : Quartz for SB-2 VSPfor 2.5 mm probes	
Z41104	Heating dewar SB-3 VSP 2.5	Frequence : 600 MHz Material : Quartz for SB-3 VSPfor 2.5 mm probes	
Z41265	Heating dewar SB-1 VSP 2.5	Frequence : 100 to 400 MHz Material : Quartz for SB-1 VSPfor 2.5 mm probes	
Z42507	Heating dewar SB-4 VSP 2.5	Frequence : 500 to 600 MHz Material : Quartz for SB-4 VSPfor 2.5 mm ring probes	
Z43423	Heating dewar SB-6 QBX 2.5	Frequence : 800 MHz Material : Quartz for SB-6 QBXfor 2.5 reversed / gradient probes	
Z43434	Heating dewar SB-6 QBX 2.5	Frequence : 800 MHz Material : Quartz for SB-6 QBXfor 2.5 reversed probes	
Z001022	Heating dewar SB-1 VSP 	Length : 378 mm Frequence : 100 to 400 MHz Material : Quartz for SB-1 VSP probes	
Z001023	Heating dewar SB-2 VSP 	Length : 448 mm Frequence : 500 MHz Material : Quartz for SB-2 VSP probes	
Z43268	Heating dewar SB-6 QBX	Frequence : 800 to 900 MHz Material : Quartz for SB-6 QBX probes	
Z4613	Heating dewar WB-1 VSP 	Frequence : 100 to 400 MHz Material : Quartz for WB-1 VSP micro-imaging probes	
Z4614	Heating dewar WB-1 VSP 	Frequence : 100 to 400 MHz Material : Quartz for WB-1 VSP probes	
Z7205	Heating dewar SB-3 VSP 	Length : 498 mm Frequence : 600 MHz Material : Quartz for SB-3 VSP probes	
Z7701	Heating dewar WB-2 VSP	Frequence : 500 to 600 MHz Material : Quartz for WB-2 VSP probes	
Z7708	Heating dewar SB-4 VSP	Frequence : 500 to 600 MHz Material : Quartz for SB-4 VSP WB ring probes	

DEWARS FOR SOLID NMR PROBES

Product Number	Description	Remarks	Unit price
Z43418	Heating dewar SB-1 QBX 2.5	Frequence : 400 MHz and more Material : Quartz for SB-1 QBXfor 2.5 reversed / gradient probes	
Z43419	Heating dewar SB-2 QBX 2.5	Frequence : 500 MHz Material : Quartz for SB-2 QBXfor 2.5 reversed / gradient probes	
Z43420	Heating dewar SB-3 QBX 2.5	Frequence : 600 MHz Material : Quartz for SB-3 QBXfor 2.5 reversed / gradient probes	
Z43421	Heating dewar SB-4 QBX 2.5	Frequence : 700 MHz Material : Quartz for SB-4 QBXfor 2.5 reversed / gradient probes	
Z43422	Heating dewar SB-5 QBX 2.5	Frequence : 750 MHz Material : Quartz for SB-5 QBXfor 2.5 reversed / gradient probes	
Z43429	Heating dewar SB-1 QBX 2.5	Frequence : 400 MHz and more Material : Quartz for SB-1 QBXfor 2.5 reversed probes	
Z43430	Heating dewar SB-2 QBX 2.5	Frequence : 500 MHz Material : Quartz for SB-2 QBXfor 2.5 reversed probes	
Z43431	Heating dewar SB-3 QBX 2.5	Frequence : 600 MHz Material : Quartz for SB-3 QBXfor 2.5 reversed probes	
Z43432	Heating dewar SB-4 QBX 2.5	Frequence : 700 MHz Material : Quartz for SB-4 QBXfor 2.5 reversed probes	
Z43433	Heating dewar SB-5 QBX 2.5	Frequence : 750 MHz Material : Quartz for SB-5 QBXfor 2.5 reversed probes	
HZ03526	Heating dewar MAS WB	Frequence : 500 MHz Material : Pyrex for MAS WB WVT+DVT probes	
HZ06333	Heating dewar MAS WB	Frequence : 750 MHz Material : Pyrex for MAS WB DVT probes	
HZ2411	Heating dewar MAS WB	Frequence : 500 MHz Material : Pyrex for MAS WB VTN (2D) probes	
HZ2579	Heating dewar MAS WB	Frequence : 100 to 400 MHz Material : Pyrex for MAS WB WVT+TRI (K) probes	
HZ2965	Heating dewar MAS SB	Frequence : 100 to 400 MHz Material : Pyrex for MAS SB VTN and HR MAS probes	
HZ2966	Heating dewar MAS SB	Frequence : 500 MHz Material : Pyrex for MAS SB VTN and HR MAS probes	
HZ2967	Heating dewar MAS SB	Frequence : 600 MHz Material : Pyrex for MAS SB VTN and HR MAS probes	
HZ2968	Heating dewar MAS SB 584	Frequence : 750 to 800 MHz Material : Pyrex for MAS SB 584 VTN and HR MAS probes	

Product Number	Description	Remarks	Unit price
K1D60127	Heating dewar HP WB	Frequence : 100 to 400 MHz Material : Pyrex for HP WB VTN (1D) probes	
K2D60127	Heating dewar MAS WB 	Frequence : 100 to 400 MHz Material : Pyrex for MAS WB VTN probes	
Z42907	Heating dewar SB-5 QBX	Frequence : 750 MHz Material : Quartz for SB-5 QBX probes	
Z43264	Heating dewar SB-1 QBX	Frequence : 400 MHz and more Material : Quartz for SB-1 QBX probes	
Z43265	Heating dewar SB-2 QBX	Frequence : 500 MHz Material : Quartz for SB-2 QBX probes	
Z43266	Heating dewar SB-3 QBX	Frequence : 600 MHz Material : Quartz for SB-3 QBX probes	
Z43267	Heating dewar SB-4 QBX	Frequence : 700 MHz Material : Quartz for SB-4 QBX probes	
Z48815	Heating dewar SB-8 QBX	Frequence : 400 MHz and more Material : Quartz for SB-8 QBX Inca probes	

HEATERS AND SAPRE PARTS FOR NMR PROBES

Product Number	Description	Remarks	Package contents	Unit price
W1100024	SC heater for HP CPX/MSL probe	for HP CPX/MSL probes		
W1100036	SC heater for HP WB probe	for HP WB probes	delivered without cable	
W1100316	SC heater for HR VSP probe	for HR VSP probes	delivered with cable	
W1100318	SC heater for MAS + HR QBX L=325SB	for MAS and HR QBX probes	delivered without cable (fix)	
W1100663	SC MAS heater + HR QBX L=370 SB	for MAS and HR QBX probes	delivered without cable (fix)	
W1100943	SC heater probe HR without cable	for all HR probes	delivered without cable (fix)	
W1100117	Heater connexion SC cable 	for all SC probes		
W1100123	Heater extension cable	length : 3m 7PIN Male/Female		
W1100399	SC screened heater for HR VSP probe	for all HR VSP probes	delivered with cable	

THERMOCOUPLES AND SPARE PARTS FOR NMR PROBES

Product Number	Description	Frequence range (MHz)	T° range (°C)	Remarks	Package contents	Unit price
W1100804	Thermocouple HP WB	100 to 400	-150 to +150	T with SST sheath		
W1100985	Thermocouple L=635 SB	200 to 400	-150 to +150	T with titane sheath	delivered without cable	
W1100401	Thermocouple HR 	200 to 500	-150 to +150	T with titane sheath	delivered with cable	
W1100986	Thermocouple L=424	SB 500 WB <500	-150 to +150	T with titane sheath	delivered without cable	
W1100903	Thermocouple HP WB	500 to 600	-150 to +150	T with SST sheath		
W1100988	Thermocouple L=540 WB	500 to 600	-150 to +150	T with titane sheath	delivered without cable	
W1100407	Thermocouple HR	600 to 600	-150 to +150	T with titane sheath	delivered with cable	
W1100987	Thermocouple L=476 SB	600 to 600	-150 to +150	T with titane sheath	delivered without cable	
W1100989	Thermocouple L=605 SB	750	-150 to +150	T with titane sheath	delivered without cable	
W1100022	Thermocouple HP CPX/MSL		-150 to +150	T with Inconel sheath	delivered with clamp	
W1100983	Thermocouple unit and heater SB		-180 to +1300	for SB micro-imaging probes		
W1101063	Thermocouple unit and heater WB		-180 to +1300	for WB micro-imaging probes		
W1100124	Thermocouple extension cable T			Length : 3m CH/CONST		
W1100360	Thermocouple extension cable E			Length : 3m CH/CONST		
W1100361	Thermocouple extension cable K			Length : 3m CH/AL		
W1100125	Thermocouple junction cable T MAS-DAB 			Length : 9m CH/CONST		
W1100630	Thermocouple junction cable E			Length : 9m CH/CONST		
W1100139	Thermocouple SC length adapter			for Thermocouple HR (P/N : W1100401)		

NMR TUBES FOR HR PROBES

Product Number	Description	Probe diam. (mm)	Tube sizes (mm)	Material	Remarks	Unit price
Z42511	Quartz tubing 5.575/6.10/43.5	2.5	O.D. : 18.5 I.D. : 17 Length : 58	Quartz	for VSP DF observation 2.5mm probes	
Z42512	Quartz tubing 8.96/10.0/48	2.5	O.D. : 18.5 I.D. : 17 Length : 58	Quartz	for VSP DF decoupling 2.5mm probes	
Z001041	Quartz tubing 5.80/6.80/64	5	O.D. : 18.5 I.D. : 17 Length : 58	Quartz	for DSP observation 5mm probes	
Z4334	Quartz tubing 8.96/10.0/58	5	O.D. : 18.5 I.D. : 17 Length : 58	Quartz	for VSP IF decoupling 5mm probes	
Z4337	Quartz tubing 5.575/6.10/64	5	O.D. : 18.5 I.D. : 17 Length : 58	Quartz	for VSP IF observation 5mm probes	
Z43749	Quartz tubing 5.575/6.10/55.0	5	O.D. : 18.5 I.D. : 17 Length : 58	Quartz	for QBX observation 5mm probes	
Z44383	Quartz tubing 9.33/10.0/46.0	5	O.D. : 18.5 I.D. : 17 Length : 58	Quartz	for QBX decoupling 5mm probes	
Z9108	Quartz tubing 5.575/6.10/54.5	5	O.D. : 18.5 I.D. : 17 Length : 58	Quartz	for VSP DF observation 5mm probes	
Z9109	Quartz tubing 8.96/10.0/49	5	O.D. : 18.5 I.D. : 17 Length : 58	Quartz	for VSP DF decoupling 5mm probes	
Z001052	Pyrex tube 17.0/18.5/58	10	O.D. : 18.5 I.D. : 17 Length : 58	Pyrex	for VSP IF decoupling 10mm probes	
Z4341	Pyrex tube 10.98/11.70/64	10	O.D. : 18.5 I.D. : 17 Length : 58	Pyrex	for VSP IF observation 10mm probes	
Z9469	Pyrex tube 10.98/11.70/54.5	10	O.D. : 18.5 I.D. : 17 Length : 58	Pyrex	for VSP DF observation 10mm probes	
Z9470	Pyrex tube 17.0/18.5/53	10	O.D. : 18.5 I.D. : 17 Length : 58	Pyrex	for VSP DF decoupling 10mm probes	

LIQUID NMR PROBE SPARE PARTS

Product Number	Description	Remarks	Unit price
Z4244	SB probe screwdriver	for HR VSP SB probes	
Z43835	Adjustment screwdriver QBX	for HR QBX probes	
Z4644	WB probe screwdriver	for HR VSP WB probes	

SOLID NMR PROBE SPARE PARTS

Product Number	Description	Remarks	Package contents	Unit price
68052	Watchmaker screwdriver			
HZ3877	MAS SB probe screwdriver	for MAS SB probes		
K0070301	HP WB probe screwdriver	for all HP WB probes		
H6208	Wrench for MAS WB coil	Amagnetic 1.5 for MAS WB coils		
Z4035	MAS spinning rate cable	for all MAS (ecl 03) probes		
H6393	HP mounting set	fixing hooks for all HP WB probes	1 WB Fixing screws set (P/N : K6062401) 1 WB bajonette hook (P/N : H6080)	

EPR PROBE ACCESSORIES

Product Number	Description	T° range (°C)	Remarks	Unit price
W1100320	RPE heater			
W1100321	RPE Thermocouple L105	-180 to +1300	K with SST sheath	
W1100108	Thermocouple unit and heater RPE set	-180 to +1300	CH/AL	
W1100785	Thermocouple unit and heater RPE set	-180 to +1300		
W1101252	Thermocouple unit and Heater RPE	-180 to +1300		

MINISPEC CONSUMABLES

TUBES

Product Number	Description	O.D. (mm)	Length (mm)	Remarks	Unit price
W1000558	Pack of 170 sample tubes 7.5/180mm	7.5	180	170 TUB7.5	
W1000546	Pack of 340 sample tubes 10/180mm with caps	10	180	340 TUB10 with caps	
W1000549	Pack of 200 sample tubes 13/180mm with caps	13	180	200 TUB13 with caps	
W1000550	Pack of 150 sample tubes 15/180mm with caps	15	180	1500 TUB15 with caps	
W1000552	Pack of 100 sample tubes 18/180mm with caps	13	180	100 TUB18 with caps	
W1000553	Pack of 80 sample tubes 20/180mm with caps	20	180	80 TUB20 with caps	
W1000554	Pack of 64 sample tubes 25/180mm with caps	25	180	64 TUB25 with caps	
W1000555	Pack of 48 sample tubes 30/180mm with caps	30	180	48 TUB30 with caps	
W1000556	Pack of 27 sample tubes 40/180mm with caps	40	180	27 TUB40 with caps	

INSERTS

Product Number	Description	O.D. (mm)	Length (mm)	Remarks	Unit price
W1000559	Pack of 800 glass inserts 8/45mm	8	45	TUB8/45 with bottom	
W1000548	Pack of 245 glass inserts 11/45mm	11	45	TUB11/45 with bottom	
W1000551	Pack of 110 glass inserts 16/45mm	16	45	TUB16/45 with bottom	

OTHER ACCESSORIES

Product Number	Description	Quantity	Unit price
W1000560	Pack of 40 rolls of paper	40 rolls	
W1000545	Pack of 40 rolls of paper for thermal print	10 rolls	

NMR GENERAL ACCESSORIES

ELECTRO-MAGNET ACCESSORIES

Product Number	Description	Quantity	Unit price
4445	Ion filter		
W1203847	Resin refill 0.75L	0.75 L	
W1203848	Resin refill 1.75L	1.75 L	
31917	Water electronic valve 24V		
W1210008	Progressive valve kit		

SUPRA-CONDUCTING MAGNET ACCESSORIES

Product Number	Description		Gas	Remarks	Unit price
W5000179	Anti vibration magnet system			for 2## type dewars	
53955	Full NMR air filter system				
Z002229	Two way valve				
W1203832	NTC temperature probe				
59583	Gas flow meter gallus g1.6				
W5000117	He meter with gas flow meter				
W5000118	He flow meter with one way valve		He		
Z29504	He standard transfer line		He	diam. : 10 mm sizes : Flex-660mm (F) / Leg-1676mm / Flex-1422mm (W) for He transfer	
53962	He transfer line		He	sizes : Flex-2060mm / Leg-665mm	
28190	Toric joint for transfer line NBR70		He	sizes : 9.20 x 2.60 mm for He standard transfer line (P/N : Z29601)	
Z29540	Nitrogen level sensor		N_2		
Z29601	Heat exchanger (OXFORD)		N_2	Oxford for N_2 funnel	
Z50593	Heat exchanger (BRUKER)		N_2	Bruker for N_2 funnel	
Z52397	Kit evaporator for nitrogen blinded magnet		N_2	N_2 evaporator for 600 MHZ magnets	
Z52767	Kit evaporator for nitrogen blinded magnet		N_2	N_2 evaporator for 500 MHZ magnets	
Z53446	Kit evaporator for nitrogen blinded magnet		N_2	N_2 evaporator for 300 to 400 MHZ magnets	
Z53623	Kit evaporator for nitrogen blinded magnet		N_2	N_2 evaporator for 200 to 500 MHZ magnets	

LIQUID NMR ELECTRONIC TUBES SPARE PARTS

Product Number	Description	Remarks	Unit price
3565	Electron tube 4CX350A for 100 to 300MHz	100 to 300 MHz	
14125	Electron tube 3CPX800 for 400MHz and more	400 MHz and more	
8398	Electron tube 4CX600J		
3567	Chimney tube		
3566	Tube socket		

VTU SYSTEM ACCESSORIES

Product Number	Description	Remarks	Unit price
W1100062	Flexible transfer line holder SC	Length : 180mm Round foot for all BVT systems	
W1100063	Flexible transfer line holder SC	Length : 290mm Round foot for all BVT systems	
Z53660	Flexible transfer line clamp	universal set for all BVT systems	
W1208346	Flexible transfer line clamp	for BCU05 cooling systems	
W1100559	VT N_2 rubber evaporation cap	rubber cap for 10L N_2 dewars	
58477	Cooling liquid type T, 2L can		
W1100138	Kit evaporator resistor VTU	Universal N_2 evaporator	
W1100037	Pot. for evaporator VTUR POT		
W1100354	Pot. heat limitation VTU		

OTHER ACCESSORIES

Product Number	Description	Remarks	Unit price
14970	Cooling oil HAAKE	Cold cooling medien SYNTH60	
W5000047	Shim system cooling set		
W5025	Blocks for Shim system WB imaging		

PLOTTER ACCESSORIES

Product Number	Description	Pen color	Remarks Package contents	Unit price
	For BR3037 plotter			
H009014	Black felt-tip pen	Black	for BR3037 plotter	
H00678	Ink pen holder BR30/37 		Full system for BR3037 plotter	
H9004	Graph paper MHz BR30/37		for BR3037 plotter	
2082	Huge Ball bearings ULZ511 		for BR3037 plotter	
3885	Little Ball bearings ULZ307 		for BR3037 plotter	
3887	Belt BR 30/37 		Sizes= 42 x 2 mm for BR3037 plotter	
2548	Potentiometer Novotechnik BR 		for BR3037 plotter	
H00713	Cable X BR30/37 		for BR3037 plotter	
H00934	Cable Y BR30/37 		for BR3037 plotter	
	For FP5301, FP6302 and MP3002 plotters			
34526	Print felt feather 0.3mm - Black 	Blue	for FP5301, FP6302 and MP3002 plotters	
34527	Print felt feather 0.4mm - Black 	Black	for FP5301, FP6302 and MP3002 plotters	
34528	Print felt feather 0.3mm - Red 	Red	for FP5301, FP6302 and MP3002 plotters	
34529	Print felt feather 0.3mm - Green 	Green	for FP5301, FP6302 and MP3002 plotters	
W5014	Pen holder for ceramic felt-tip pens		1 full body (P/N : W5000041) and 1 blocking nut (P/N : W5000042) for ceramic felt-tip pens FP5301, FP6302 and MP3200	
	For HP7550 plotter			
71006	Print Drawing Pen 0.35mm - Blue 	Blue	Pack of 4 pens for HP7550 plotter	
71007	Print Drawing Pen 0.35mm - Black 	Black	Pack of 4 pens for HP7550 plotter	
71008	Print Drawing Pen 0.35mm - Red 	Red	Pack of 4 pens for HP7550 plotter	
71009	Print Drawing Pen 0.35mm - Green 	Green	Pack of 4 pens for HP7550 plotter	

PLOTTER ACCESSORIES

Product Number	Description	Pen color	Remarks Package contents	Unit price
	For WX4636 and WX4731 plotters			
9067	Dig plot pen standard - Red 	Red	for WX4636 plotter	
9068	Dig plot pen standard - Green 	Green	for WX4636 plotter	
9069	Dig plot pen standard - Blue 	Blue	for WX4636 plotter	
9070	Dig plot pen standard - Black 	Black	for WX4636 plotter	
34581	Pressure ball pen - Blue 	Blue	for WX4636 and WX4731 plotters	
34582	Pressure ball pen - Black 	Black	for WX4636 and WX4731 plotters	
34583	Pressure ball point pen - Red 	Red	for WX4636 plotter	
34584	Pressure ball pen - Green 	Green	for WX4731 plotter	
W5001	Pen holder for ceramic felt-tip pens		for ceramic felt-tip pens WX4636	
34522	Pressure ball pen holder		for WX4636 and WX4731 plotters	
34511	Ball pen-holder WX4636		for WX4636 plotter	
9052	Roll of white paper PR505 P		L= 13 m for WX4636 plotter	
9072	Dig plot pen holder WX4731		for WX4731 plotter	
10242	Roll of paper PR511P WX4731		L= 40 m for WX4731 plotter	
15763	Roll of graph paper WX4731		L= 40 m for WX4731 plotter	

IR ACCESSORIES

IR SOURCES

Product Number	Description	Remarks	Unit price
5136	Hg source, single element		
5732	Globar Q302 single element		
82176	MIR source 6V single element	IR Source 5V-1.5A (without lead)	
82469	MIR source 12V 20W IFS28/55		
I12016	NIR Elem. Source 12V	12V	
I12898	MIR source 12V Vector 22		
IQ202/8	Source Hg 66 66V 88		
IQ202X1	Source Hg IFS113 & 120		
IQ325X3H	MIR round source 6V IFS 28/55		
IQ325X3S	MIR rectangular source 6V IFS 28/55		
IQ326X3	MIR rectangular source 12V IFS 28/55 		
5500	NIR source 24V 150W	Halogen lamp 24V-150W	
15337	NIR lamp 12V 50W		
15371	Lamp 12V 50W 5X	Halogen lamp 12V-150W	
82648	Lamp Halogen 12V 50W	Halogen lamp 12V-150W	
82816	Halogen lamp TR 12V/10V OSRAM		

IR WINDOWS

Product Number	Description	Reference	Window sizes (mm)	Unit price
I19133	Window ZnSe (6Mr Bbar)	ZnSe	45 x 3	
I6318	KBr window (6 MRAD)	KBr	49.5 x 3	
I6682	CsI window (6MR COATED)	CsI	49.5 x 3	
I8357	KBr window	KBr	45 x 5	
IF131-1	Quartz Infrasil window (6MR KL)	Quartz	49.5 x 6	
IF131-3	CaF_2 window (6MR KL)	CaF_2	49.5 x 5	
IF131-4	NaCl window (6MR KL)	NaCl	49.5 x 5	
IF131-5	KBr window (6MR KEIL)	KBr	49.5 x 5	
IF131-6	KrS_5 window (6MR KL)	KrS_5	49.5 x 5	
IF131-7	CsI window (6MR KEIL)	CsI	49.5 x 5	
IF131-8	Si window (6MR KEIL)	Si	49.5 x 5	
IF131-9	PE window	PE	49.5 x 5	

IR AIR DRYER ACCESSORIES

Product Number	Description		Remarks	Unit price
17739	Oil filter 1070X			
17740	Dust filter 1070Z			
82111	Oil filter 1050X			
82112	Dust filter 1050Z			
15999	Molecular sieve		Drying medium CO_2 WE894	
I17785	Molecular sieve (box of 500mL)			

OTHER IR ACCESSORIES

Product Number	Description		Remarks	Unit price
17116	He-Ne Single phase laser		He-Ne ; 0.8MW KAB L=1.80m	
17591	Single phase laser power supply		He-Ne ; 115/230V	
I19148	Laser W. Holder (Matrix)		800µW	
I21088	Uniphase Laser ASM 113V		113V	
I6866	Laser He-Ne Single Frequence 117D			
O001046	He-Ne laser tube IFS 113V		1.0mW ; 72"CBL ; POLAR	
11354	White lamp WL for IFS48			
7292	Plane mirror reference 40 x 30 x 3			
7297	Plane mirror reference 30 x 20 x 3			
5520	Microscope drying capsule			
17076	Drying capsule IFS25			
I19145	Dessication Element M15			
I22671	Desiccate Capsule Equinox			
IS119X3	Desiccate Capsule IFS28-55			
5063	Clutch flaps IFS113V			
5133	Motor for flaps IFS113V			
5164	Thermoswitch (globar)		6A / 250V 3455R	
11504	Membran for IFS48		GUMMI membrane	
I13340	Centrifugal pump, 220V - 50Hz		220V - 50Hz	
I18166	Quick Lock with Sample Holder			
IF213F	Bolometer filter 600 cm^{-1}			
IA191/1	Removal plate IFS113V / 120HR			
IA191/4	Removal plate IFS28/66/88			
I1161	Sample holder			
IA105	Pastille holder 13 mm		for 13mm pellets	


Technical data
and
Helpful Information

PROPERTIES OF ROTOR AND CAP MATERIALS			
Material	**Components**	**Temperature Range**	**Nuclei Studies**
BN_3 (Boron Nitride)	B ; N	-150 to +150°C	^{1}H, ^{13}C
Ceramic		-150 to +150°C	^{1}H, ^{13}C, ^{29}Si
Kel-F	F ; Cl ; C	-20 to +70°C	^{1}H
Macor	Al ; Si ; O ; B ; K ; F ; Boro-silicate glass ceramic with Mica	-150 to +250°C	^{13}C
PE (Polyethylene)	C ; H	Room temperature	
PTFE (Teflon)	F	Room temperature	^{1}H, ^{13}C
Si_3N_4 (Silicium Nitride)	Si ; N	-150 to +150°C	^{1}H, ^{13}C
SP1 (Vespel)	C ; H	-30 to +70°C	
Torlon	C ; N ; O ; H ; Poly (amide-imide)	-150 to +200°C	For multi-nuclei studies (except ^{13}C)
Zirconia	ZrO_2 with MgO	-150 to +650°C	For multi-nuclei studies

SPEED ROTATION FOR MAS AND HR MAS ROTORS			
OD (mm)	**Max Speed rotation (kHz)**	**Material**	**Cross-reference**
	NMR Solid rotors		
2.5	35	Zirconia	H8416 ; H8417 ; H8771
4 (Standard speed)	15	Silicium Nitride	K1911
	15	Zirconia	K1910 ; K1915 ; K1914 ; H8329
4 (High speed)	18	Zirconia	H7615 ; H8223
7 (Standard speed)	6	Silicium Nitride Zirconia	K1922 K1907 ; K1912 ; K1921
7 (High speed)	8	Zirconia	H7464 ; H8224
7 (STRECH)	5	Zirconia	B0495 ; B0437
10 (Standard speed)	4	Zirconia	H7873 ; H7874
	Cramps		
4	15		H7358 ; H7359 ; H7360
7	6		K1921CR ; P2885CR
	HR MAS		
4	12	Zirconia	H8431 ; H9383 ; HZ05537 ; HZ05538 ; HZ07213

HR-MAS SAMPLE PREPARATION

extract of "High Resolution Magic Angle Spinning Spectroscopy - User Manual, version 1.0" of Frank Engelke & Werner E. Maas ; July, 1997, Bruker Instruments, Inc.

MAS rotors, caps and inserts

The rotors most commonly used for MAS are made of zirconium oxide (Zirconia). Rotors can be either filled entirely with sample or they can be used with rotor inserts. Inserts are provided to improve shimming and RF inhomogeneity, and are useful when the amount of sample is limited. The maximum spinning rate for 4 mm Zirconia rotors is about 15 kHz, but is limited to lower speeds when using the spacers. A full rotor has a sample volume of about 50 µL; with a spherical insert the volume is reduced to about 12 µL. Numbered rotors are available to easily distinguish between different samples.

The function of the rotor cap is twofold: firstly, to close the rotors, and secondly, to provide the driving of the rotor. There are several types of caps available. The standard caps are made of Kel-F. This material will shrink at lower temperatures and soften at more elevated temperatures.
The most common type of rotor spacers provide a sample volume that is approximately spherical in order to improve the shimming of the probe (see figures 1 & 2).

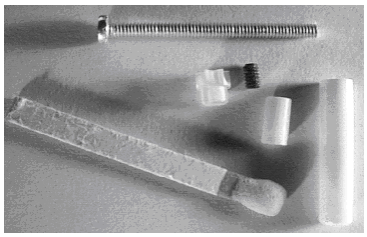


Figure 1: Zirconia rotor with Kel-F cap, upper spacer, cylinder head screw, and sealing grub screw to provide a spherical sample volume.

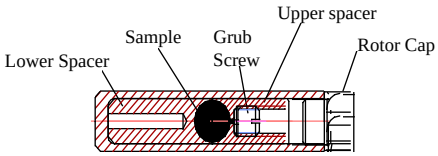


Figure 2: Schematic drawing of the rotor with spherical insert.

Sample loading

In order for the rotor to spin stable and fast, the rotor has to be well balanced. Load the sample loosely into the rotor barrel and tap the rotor lightly on a hard surface. Do not attempt to pack the material tightly into the spinner. If you wish to add more sample into the rotor, it is better to spin up the rotor first, so that the sample is packed against the walls of the barrel, and then add additional material.
Liquid or viscous samples are easily loaded using a syringe or a small pipette. Solvent swelling can be done with the powdered sample in the rotor.
Push the rotor cap on all the way; if the cap is improperly positioned the rotor may not spin. Clean the outside of the rotor with a tissue, so that no sample ends up in the MAS stator. Mark half of the beveled rim on the bottom of the rotor with a black marker for optical spin rate detection.
For loading samples using spherical inserts, see Appendix B or the instruction sheet that came with the inserts.

Cap removal

The rotor cap is easily removed with a dedicated cap removal tool. Screw the tool body loosely to the cap clamp. Insert the cap all the way into the teeth of the clamp. Screw the tool body snugly, but not too tight, onto the clamp. Insert the rotor into the barrel clamp and remove the cap by simultaneously rotating and pulling the barrel clamp. Unscrew the cap clamp and push the cap out with the push pin. Be careful not to damage the caps. (For more complete instructions please refer to the guidelines delivered with the cap removal tool).

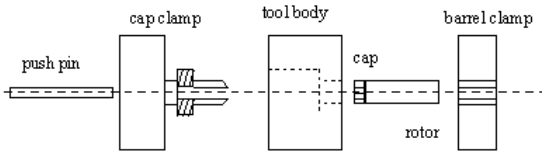


Figure: Schematic drawing of the cap removal tool.

HR-MAS SAMPLE PREPARATION

extract of "High Resolution Magic Angle Spinning Spectroscopy - User Manual, version 1.0" of Frank Engelke & Werner E. Maas ; July, 1997, Bruker Instruments, Inc.

Appendix : Use of a spherical insert

Important Note: The rotor bore and the spacer must be absolutely clean. The lower spacer will be destroyed if it is removed after being inserted into the bore!

1

Spray the "lower spacer" with coolant spray, or dip it into ***liquid nitrogen***, insert it slightly into the rotor bore and align the rotor axis (Fig. 1)

- Spray the spacer a second time with coolant spray and press it completely into the bore. Apply more coolant spray if needed. (Fig.2) **or**

- In the case where the spacer fits very tightly, first dip the rotor and spacer in liquid nitrogen and let them cool. The spacer can now be inserted much easier into the rotor (Fig.2)

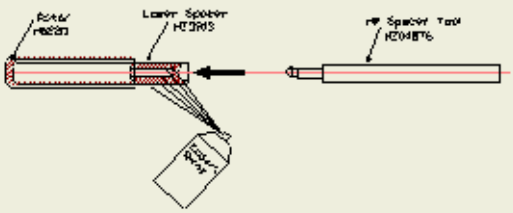


Figure 1

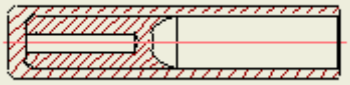
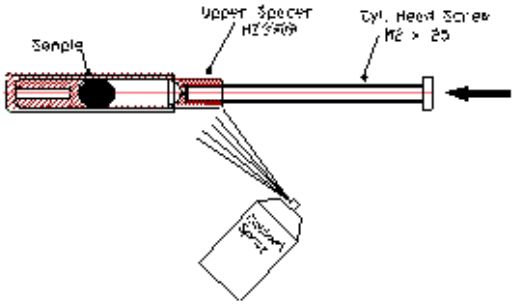


Figure 2

2

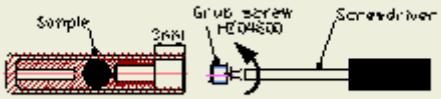
Insert the sample into the rotor. Screw the cylinder head screw M2 x25 into the "upper spacer", but do not tighten it!
Use the screw as a handle. Spray the "upper spacer" with coolant spray or dip it into liquid nitrogen and press it completely into the bore.
Excessive sample will spill out through the center hole and the thread.



3

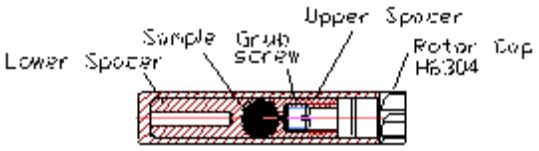
Put the grub screw on a screwdriver and screw it completely into the upper spacer.

When the assembly is done correctly ,the distance between the end of the upper spacer and the end of the rotor will be 3mm. The short end of the rotor packer (K8111001) is 2.9mm long, which will allow you to easily check for the correct fit.



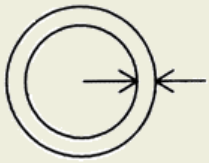
4

Push the rotor cap (Kel-F) all the way into the rotor.



IMPORTANT SPECIFICATIONS

The following specifications are very important parameters to consider when choosing the best tube to use for your application. Generally, the higher the field, the better the dimensional uniformity needed. Following is a brief explanation of what these specifications represent.

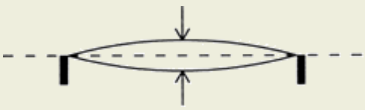


CONCENTRICITY :

The maximum variation in wall thickness, which represents how centered the I.D. is to the O.D.

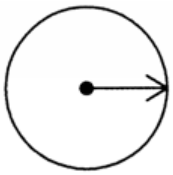
CAMBER :

Deviation from the theoretical axis of the tube, which represents the amount of bow in the tube.



CAMBER TIR :

The Total Indicator Reading or runout from the theoretical axis. Both notations are used in this catalog. They may represent the same absolute straightness, ie: camber 0.0005" = camber TIR 0.001"



ROUNDNESS :

Symmetry around the theoretical axis of the tube.

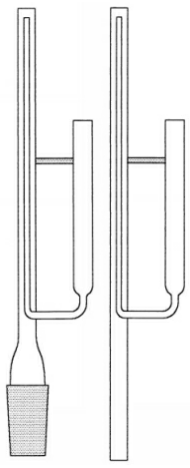
PRESSURE / VOLUME DATA

This information is presented for reference only. It is not a guarantee of performance, which will be dependent upon your applications and handling. Static testing is highly recommended before actual experiments are run. The calculation for pressure includes a safety factor of four. Volume data is approximate.

Sample Tube	Wall Thickness	Pressure	Volume at Sample Height	
			50 mm	60 mm
5 mm O.D.	0.38 mm	154 psi	0.67 mL	0.83 mL
5 mm O.D.	0.77 mm	307 psi	0.50 mL	0.56 mL
10 mm O.D.	0.46 mm	94 psi	3.30 mL	4.00 mL
10 mm O.D.	1.00 mm	203 psi	2.50 mL	3.00 mL

CLEANING NMR SAMPLE TUBES

It is important to understand that NMR sample tubes are NOT laboratory glassware and should not be treated as such. Because of the precision tolerances and the very thin wall weights, conditions suitable for labware will adversely affect these tubes.
If one is not overly concerned with cross-contamination, NMR tubes may be soaked in a mild cleaning solution and rinsed with deionized water. Follow this with a rinse of clean methanol or acetone, after which they may be air dried. A basic tube washer, such as shown here, will help with this procedure.
If moisture presents a problem, the tubes may be placed in a vacuum oven on a very flat surface (never standing and only in one layer). Heating should not exceed 100°C and one hour duration. When dried, cap and store the tubes in a desiccator.
For samples that are most difficult to remove, it is safer and more efficient to avoid radical and extensive cleaning methods - use of strong acids, etc.. Discard the tube and avoid cross-contamination. This is most practical when standard 5 mm tubes are used.



PYREX *versus* BOROSILICATE

New Era NMR tubes which are made of Type 1, Class B Borosilicate glass, offer the best ratio quality/price.
We recommend the use of the Pyrex NMR tubes (Type 1, Class A Borosilicate glass) in the case of :
-you need to seal the tube ;
-when your experiments need high or low temperatures.

Pyrex		Borosilicate	
Standards		**Standards**	
Type 1, Class A Borosilicate		Type 1, Class B Borosilicate	
Composition		**Composition**	
SiO_2	80.6%	SiO_2	73%
B_2O_3	13.0%	B_2O_3	10%
Na_2O	4.0%	Na_2O	2%
Al_2O_3	2.3%	Al_2O_3	7%
Misc. traces	0.1%	K_2O	2%
		BaO	< 0.1%
		CaO	0.7%
Properties		**Properties**	
Coeff. of Exp.	32.5 x 10^{-7} cm/cm/°C	Coeff. of Exp.	55 x 10^{-7} cm/cm/°C
Strain point	510°C	Strain point	517°C
Anneal point	560°C	Anneal point	565°C
Soften point	821°C	Soften point	789°C
Density	2.23 g/cm^3	Density	2.23 g/cm^3
Youngs mod	6.4 x 10^3 Kg/mm^2	Youngs mod	7.2 x 10^3 Kg/mm^2
Refract. Index	1.474°C @ Sodium D line	Refract. Index	1.490°C @ Sodium D line
Temp. limits	490°C (Extreme service)	Temp. limits	460°C (Extreme service)
	230°C (Normal service)		200°C (Normal service)
Max. thermal shock	160°C	Max. thermal shock	115°C
Applications		**Applications**	
Designed for use in all products requiring very high resistance to strong acids, alkalis, and products intended for use in heat applications such as autoclaves, hot plates, and open flame.		Designed for use in all products requiring very low pH shift when used with most reagents and pharmaceuticals.	
Warnings		**Warnings**	
Do not use hydrofluoric or hot phosphoric acid in glass. Do not use scratched or abrased glassware. Hot alkalis will etch glass.		Do not use hydrofluoric or hot phosphoric acid in glass. Do not use scratched or abrased glassware. Hot alkalis will etch glass. Will not seal to Pyrex glass.	

NMR SOLVENT DATA

■ The ^{1}H spectra of the residual protons and ^{13}C spectra were obtained on a Varian Gemini 200 spectrometer at 295°K. The NMR solvents used to acquire these spectra contain a maximum of 0.05% and 1.0% TMS (v/v) respectively. Since deuterium has a spin of 1, triplets arising from coupling to deuterium have the intensity ratio of 1:1:1. 'm' denotes a broad peak with some fine structures. It should be noted that chemical shifts, can be dependent on solvent, concentration and temperature.

▲ Approximative values only, may vary with pH, concentration and temperature.

Solvent	^{1}H Chemical shift ■ (ppm from TMS) (multiplicity)	JHD (Hz)	^{13}C chemical shift ■ (ppm from TMS) (multiplicity)	JCD (Hz)	^{1}H Chemical shift of HOD ▲ (ppm from TMS)
Acetic acid-d_4	11.65 (1) 2.04 (5)	 2.2	178.99 (1) 20.07 (7)	 20	11.5
Acetone-d_6	 2.05 (5)	 2.2	206.68 (1) 29.92 (7)	0.9 19.4	2.8
Acetonitrile-d_3	 1.94 (5)	 2.5	118.69 (1) 1.39 (7)	 21	2.1
Benzene-d_6	7.16 (1)		128.39 (3)	24.3	0.4
Chloroform-d	7.24 (1)		77.23 (3)	32.0	1.5
Cyclohexane-d_{12}	1.38 (1)		26.43 (5)	19	0.8
Deuterium oxide	4.80 (DSS) 4.81 (TSP)				4.8
Dimethylformamide-d_7	8.03 (1) 2.92 (5) 2.75 (5)	 1.9 1.9	163.15 (3) 34.89 (7) 29.76 (7)	29.4 21.0 21.1	3.5
Dimethylsulfoxide-d_6	2.50 (5)	1.9	39.51 (7)	21.0	3.3
Dioxane-d_8	3.53 (m)		66.66 (5)	21.9	2.4
Ethanol-d_6	5.19 (1) 3.56 (1) 1.11 (m)		 56.96 (5) 17.31 (7)	 22 19	5.3
Methanol-d_4	4.78 (1) 3.31 (5)	 1.7	 49.15 (7)	 21.4	4.9
Methylene chloride-d_2	5.32 (3)	1.1	54.00 (5)	27.2	1.5
Pyridine-d_5	8.74 (1) 7.58 (1) 7.22 (1)		150.35 (3) 135.91 (3) 123.87 (3)	27.5 24.5 25	5
Tetrahydrofuran-d_8	3.58 (1) 1.73 (1)		67.57 (5) 23.37 (5)	22.02 20.2	2.4-2.5
Toluene-d_8	 7.09 (m) 7.00 (1) 6.98 (5) 2.09 (5)	 2.3	137.86 (1) 129.24 (3) 128.33 (3) 125.49 (3) 20.4 (7)	 23 24 24 19	0.4
Trifluoroacetic acid-d	11.50 (1)		164.2 (4) 116.6 (4)		11.5
Trifluoroethyl alcohol-d_3	5.02 (1) 3.88 (4x3)	 2(9)	126.3 (4) 61.5 (4x5)	 22	5

SELECTION OF SUSCEPTIBILITY CONSTANTS		
Solvent	**- X (cgs)**	**Density (g/cc)**
Glycerol	0.78	1.26
Chloroform	0.74	1.48
Water	0.72	1.00
Deuterium Oxide	0.70	1.10
Carbon Tetrachloride	0.69	1.58
Dimethylsulfoxide	0.68	1.10
Toluene	0.62	0.86
Benzene	0.61	0.87
Ethanol	0.58	0.79
Diethyl Ether	0.53	0.71
Methanol	0.53	0.79
Acetone	0.46	0.78