

Specac

Application Note

UK: +44 (0) 1689 892902

US: +1 866 726 1126

The Pearl™: A Chemical Compatibility Sheet



WWW.SPECAC.COM
Contact us for more information



Fort Washington,
America
+1 866 726 1126



London,
England
+44 (0)1689 892902

Beijing,
China
frank.li@specac.com



Singapore,
Asia
kamhar.woo@specac.com



AN17-02



The Pearl™ liquids transmission accessory is a revolutionary concept that opens the door to rapid routine liquid analysis by FTIR.

Precision engineering by British designers ensures that the Oyster cell produces a consistent pathlength every time. By contrast, the pathlength of a traditional cell changes everytime the cell is reassembled.

Using and cleaning the Oyster is straight forward: the top window lifts away for sample application and removal; replacement of the window returns the cell to the same pathlength. You can have confidence that your results will be consistent between every sample.

The Pearl is designed to accommodate a wide range of different chemical solvents. This note outlines the compatibility for many common solvents.



Specac's Liquid Transmission Accessory, The Pearl™

Chemical Compatibility

The Pearl™ liquid analysis accessory contains two horizontal 'Oyster' windows that form the sample cell.

The user can choose between CaF_2 and ZnSe for the window material to suit their needs. The window is in turn bonded with epoxy resin to hardened and chemically resistant stainless steel rings. A choice of parallel or wedged windows is available depending on your application. Table 1 summarises common solvents that are compatible with the Pearl and Oyster system.

Table 1 – Common solvents suitability for CaF_2 and ZnSe windows

Solvent	Chemical Formula	CaF_2	ZnSe
Water	H_2O	✓	✓
Methanol	CH_3OH	✓	✓
Ethanol	$\text{CH}_3\text{CH}_2\text{OH}$	✓	✓
Isopropanol	$\text{C}_3\text{H}_8\text{O}$	✓	✓
Butyl Alcohols	$\text{C}_4\text{H}_{10}\text{O}$	✓	✓
Acetone	$\text{C}_4\text{H}_6\text{O}$	✓	✓
Toluene	C_7H_8	✓	✓
Hexane	C_6H_{14}	✓	✓
Cyclohexane	C_6H_{12}	✓	✓
Gasoline/Petrol	Mixture	✓	✓
Diesel	Mixture	✓	✓
FAME + Diesel	Mixture	✓	✓
Benzene	C_6H_6	✓	✓

ZnSe is slightly less chemically resistant than CaF_2 , particularly with acids. An epoxy resin is used to bind the window to the stainless-steel housing so some caution should be applied if your analyses involve acids, bases, halogenated solvents or oxidising agents.

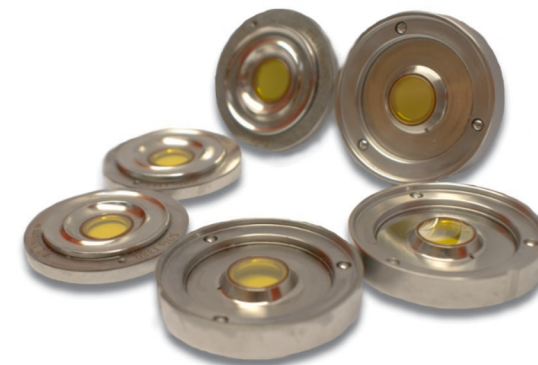
If in doubt, contact Specac to discuss your application. Long term exposure of the epoxy resin to such solvents may cause irreversible damage. Table 2 summarises the solvents with which care should be exercised, or avoided altogether to prevent damage to the Oyster cell.

Table 2 – List of incompatible samples. Key:
! = use sparingly / ? = contact Specac / X = not advisable

Solvent	Chemical Formula	CaF_2	ZnSe
Dichloromethane	$\text{C}_2\text{H}_2\text{Cl}_2$	!	!
Chloroform	CHCl_3	!	!
Tetrachloromethane	CCl_4	!	!
Other halogenated solvents	$\text{C}_x\text{H}_y\text{Cl}_z$	!	!
Dimethyl sulfoxide (DMSO)	$\text{C}_2\text{H}_6\text{OS}$	!	!
Dimethylformamide (DMF)	$\text{C}_3\text{H}_7\text{NO}$	!	!
TetrahydroFuran (THF)	$\text{C}_4\text{H}_8\text{O}$	!	!
Xylene	C_8H_{10}	!	!
Pyridine	$\text{C}_5\text{H}_5\text{N}$	?	?
Acetonitrile	$\text{C}_2\text{H}_3\text{N}$	?	?
Weak Acids/Bases	$[\text{H}]^+$ or $[\text{OH}]^-$	!	X
Strong Acids/Bases	$[\text{H}]^+$ or $[\text{OH}]^-$	X	X

Further Tips

- Avoid the use of oily rags or greasy cloths when wiping the surface.
- Do routine cleaning of exposed surfaces.
- Where possible, after cleaning away sample, wash with water for best results.
- Strong acids and high temperatures will cause damage to product.



Specac's Oyster-Cell™

Ordering Information

Pearl Base Unit: GS31000-X

Where the X indicates colour: (A) Blue, (B) Black, (G) Green, (O) Orange, (P) Purple, (R) Red, (Y) Yellow

Oyster Cell - Parallel

Pathlength	ZnSe	CaF_2
25 μm	GS31216	GS31316
50 μm	GS31211	GS31311
100 μm	GS31212	GS31312
200 μm	GS31213	GS31313
500 μm	GS31214	GS31314
1000 μm	GS31215	GS31315

Oyster Cell - Wedged

Pathlength	ZnSe	CaF_2
25 μm	GS31226	GS31326
50 μm	GS31221	GS31321
100 μm	GS31222	GS31322
200 μm	GS31223	GS31323
500 μm	GS31224	GS31324
1000 μm	GS31225	GS31325