

# Dissolution Vessel Characteristics

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## Standard Dissolution Vessels:

Standard Vessels are made from extruded glass tubing. The extrusion process creates glass tubing with significant variations in inside diameter, outside diameter, wall thickness and roundness. Extrusion dies wear and must be readjusted from time to time. This may result in larger variations from lot to lot than what may be expected within a specific lot. Manufacturers of extruded glass tubing have assigned tolerances which reflect the nature of the extrusion process. The chart below illustrates those tolerances.

	NOMINAL SIZE			OUTSIDE DIA		INSIDE DIA		BOROSILICATE GLASS	
	OD	WALL	ID REF	MAX	MIN	MAX	MIN	SOURCE	REFERENCE
DISTEK	107.25	3.0	101.25	108.5	106.0	103.3	99.2	KIMBLE TUBULAR	KIMAX KG-33 GLASS, # 9107252000
VANKEL	107.75	3.0	101.75	109.0	106.5	103.6	99.9	KIMBLE TUBULAR	KIMAX KG-33 GLASS, # 9107752002
CALEVA	110.00	3.0	104.00	111.8	108.2	106.8	101.2	SCHOTT DURAN	SCHOTT DURAN
ERWEKA	110.00	5.0	100.00	111.8	108.2	103.2	96.8	SCHOTT DURAN	SCHOTT DURAN
PHARMATEST									
HANSON									
SOTAX									

The next step in manufacturing is accomplished by experienced glass blowers who place cut lengths of tubing into a lathe and provide heat to soften the glass for further forming. One end is closed and formed by blowing air into the closed end forming a spherical radius with accuracy dependant on the skill of the operator. The opposite end is then heated and flanged with tooling and centrifugal force which also yields significant tolerance.

USP General Chapter 711 permits tolerances which reflect the above manufacturing process. Also, it should be known that Dissolution Instrument Manufacturers have not attempted to standardize on tubing selection for their vessels. The result is large differences in the basic size of vessels for various instrument brands. Some aftermarket vessel suppliers do not take this into account and provide one size for all. These vessels should not be used or at minimum should be used with caution.

Quality Lab Accessories offers both standard vessels and superior vessels which will be described following the standard vessel discussion. QLA does not offer one size fits all vessels. QLA standard vessels are available for various instrument brands. These vessels duplicate original equipment dimensions and are designed to be direct replacements.



### **AccuCenter™ Dissolution Vessels:**

QLA's *AccuCenter™* Vessels are *standard* vessels which have been enhanced by precision CNC grinding all three sides of the rim. This provides precise dimensions of the rim outside diameter, thickness, concentricity, squareness and vessel height. When mounted with AccuCenter adapters these vessels provide superior centering and verticality. These enhanced features help to achieve mechanical calibration to ASTM E 203-07 specifications. Instruments manufactured prior to the ASTM standard were designed to meet the requirements specified by USP general Chapter 711. These instruments may or may not meet the tighter ASTM centering requirements. AccuCenter vessels and rims were designed to assist with calibration to the tighter specification and should be considered as an economic alternative to standard vessels.

### **UltraCenter™ Dissolution Vessels:**

QLA's *UltraCenter™* Vessels are manufactured using a unique, highly developed process which results in extremely close dimensional tolerances. *UltraCenter™* Vessels are essentially identical to one another and are therefore interchangeable. When a broken vessel is replaced there is no need for recalibration. Vessel positions within the bath do not need to be controlled. When mounted with *UltraCenter™* mounting adapters, ultimate mounting precision may be achieved. The unique manufacturing process includes vacuum forming at high temperature onto a precision ground mandrel. The vessel rim is then precision ground on three sides to exacting tolerance. The extreme precision of all critical vessel features including the spherical radius provide more accurate dissolution results. Numerous studies have shown that variations in vessel geometry contribute to variability in dissolution results. Precise vessel geometry aids in chemical calibration with USP calibrator tablets by reducing the coefficient of variation (CV). Also, extremely precise vessel features and mounting geometry assist with enhanced mechanical calibration to ASTM E 2503-07 specifications. In conclusion, the absolute best possible mounted vessel geometry is achievable with *UltraCenter™* Dissolution Vessels.

### **AccuCenter™ Mounting Adapters:**

These adapters were specifically designed to achieve the best possible mounted geometry for *AccuCenter™* and *UltraCenter™* Dissolution vessels. Vessel mounting is with respect to the vessel inside diameter and is adjustable so that the vessel centerline may be positioned directly in line with the instrument spindle. This precise centering method helps achieve enhanced mechanical calibration to ASTM E 2503-07 standards. *AccuCenter™* Mounting Adapters are available for numerous Instrument brands and additional brands and models will be added in the future.

### **Ordering information:**

Instrument Manufacturer	Instrument Model No.	Adapter P/N
Hanson	SR8 Plus	ACCUBKT-HR
Hanson	Vision – not available	
Varian	7000	ACCUBKT-VK
Distek	2100 A, B, & C	ACCUBKT-DK
Erweka/Caleva	coming soon	
Coply	coming soon	
Pharmatest	not available	