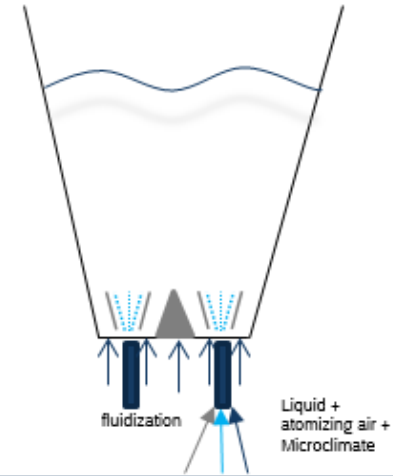
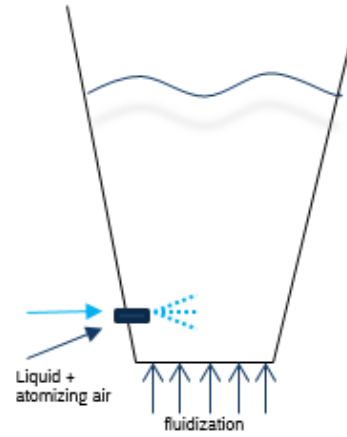
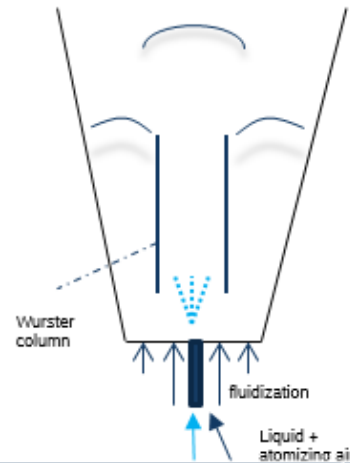
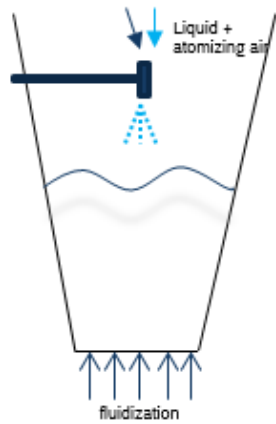


Fluid Bed Technology



	Top-Spray	Wurster Bottom Spray	Tangential / Radial spray	Hüttlin Bottom spray
Advantages	<ul style="list-style-type: none"> - Simple system - Acceptable results for granulation - Simple & Cheap integration into FB dryer 	<ul style="list-style-type: none"> - Traditional system for coating - Spatial separation of spraying and drying zones by tube - Defined particle circulation pattern - low RSD of the applied layer 	<ul style="list-style-type: none"> - Drying and granulation in one container - easy access to nozzles - higher density of granules than top spray - higher yield - Dry mill often unnecessary 	<ul style="list-style-type: none"> - All processes (Drying, Granulation, Coating) with one product container - Coating of fine particles to mini tablets in the same container - No limitations of number of nozzles - Spray cone protected by 3rd air supply, fully in - High yield (maximum bed height above nozzles) - High density of granules due to high speed (Diskjet) - Very homogeneous PSD (Granulation) - Perfect Coating with high spray rates and low RSD - Easy scale up - Greater process control - Dry mill not usually necessary
Disadvantages	<ul style="list-style-type: none"> - Challenge of vertical nozzle positioning and alignment - Granules have a low density due to low energy at spraying level - Spray losses due to spraying against process air flow 	<ul style="list-style-type: none"> - Spray losses - Setup: vertical position, diameter, length of the column - Column height adjustment mid batch due to increasing batch volume - Numerous bottom plates for different batch sizes - Risk Twin particles - Separate product container required - Limited starting particle size capabilities 	<ul style="list-style-type: none"> - Scale up issues, nozzles only radial - Minimum bed height limited - No of nozzles limited - Anti fouling air flow missing or not suitable 	<ul style="list-style-type: none"> - Compressed air or site channel blower for supply of microclimate needed