

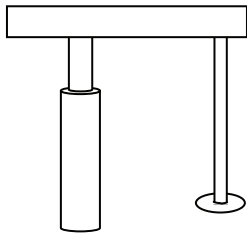


Coating Preparation at WMU

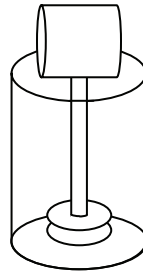
- Shipping & Receiving** Receive liquids in totes, drums or pails. Dry materials in bags. Both forklift and clamp trucks are available. Shipping by client-preferred vendor or through pilot plant.
- Tanks & Containers** Eight tanks, see descriptions that follow. All have convex bottoms that empty from the bottom center. Smaller portable containers are available.
- Pumps** Multiple drum pumps, diaphragm pumps (one portable), and progressive cavity pumps. Pumps and tanks connections via quick disconnect flexible hosing.
- Mixers** Table below summarizes selection, details follow on next page
- Measure** Dry Mass weighed and added into tanks
 Wet Water metered into tanks using flow meter. All other liquid materials are mass weighed.
- Leftovers** Client choice: return to sender, donate to pilot plant, or disposal (may incur a handling fee, consult plant).
- Storage** Long-term storage of rolls or materials, before or after a trail, is dependent upon space availability and requires prior approval.

Mixer / Tank	Volumetric Capacity gallon (liter)		Variable Speed	Vacuum Exhaust	Steam	Insulated	Temp. Controlled		Impeller
	Minimum	Maximum					Metered Water	Heated Jacket	
Blend - Supply	42 (190)	250 (950)	X	X	X	X	X	X	4-lobe axial flow
Blend - Supply	42 (190)	250 (950)	X	X	X	X	X	X	4-lobe axial flow
Starch Slurry		280 (1273)	X	X		X	X		Two 3-lobe axial flow
Starch Paste		200 (910)	X			X	X		3-lobe axial flow
Starch Enzyme		200 (910)	X			X	X		4-lobe axial flow
Blend / Cook	20 (75)	90 (340)	X	X	X	X	X	X	4-lobe axial flow
Blend / Disperse	75 (280)	450 (1700)	X	X		X	X		Two shafts with 2 stacked open rotor (radial flow) each, high shear or low shear
Blend / Disperse	20 (75)	90 (340)	X	X		X	X		2 stacked open rotor (radial flow), high shear or low shear
Blend / Disperse	25 (95)	50 (190)	X				X		1-open rotor (radial flow) high shear or low shear, floor mount unit for drum dispersion

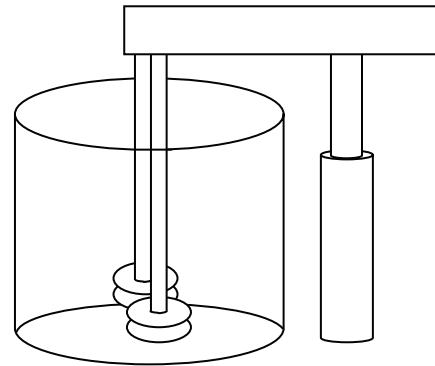
High Shear Dispersion – radial flow impellers



- 25-50 gal (95-190 liters)
- Floor mounted
- Height of blades adjustable
- One open rotor blades
- Portable drums, tanks and totes used to facilitate dispersion of small volumes

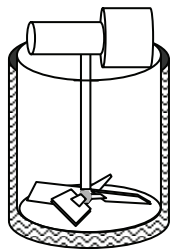


- 20-90 gal (75-340 liters)
- Vacuum dust exhaust
- Metered water
- Two open rotor blades

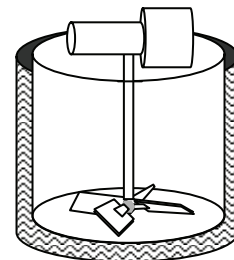
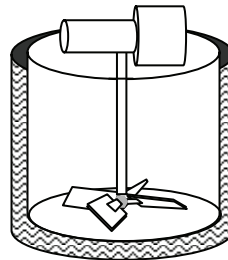


- 75-450 gal (280-1700 liters)
- Height of blades adjustable
- Vacuum dust exhaust
- Metered water
- Two sets of 2-open rotor blades

Blending – axial flow impellers

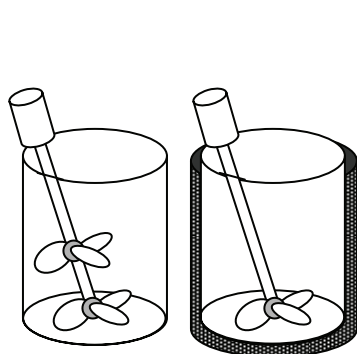


- 20-100 gal (90-375 liters)
- Vacuum dust exhaust
- Live steam - batch makedown
- Metered water
- Water jacket, temperature controlled
- 4-lobe impeller



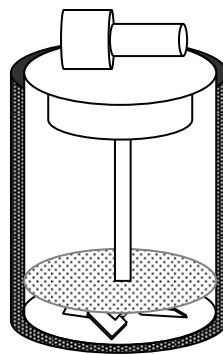
- (2) 42-250 gal (190-950 liters) tanks
- Coater supply tanks, each feeds either side or both
- Vacuum dust exhaust
- Metered water
- Water jacket or live steam temperature controlled
- 4-lobe impeller
- Progressive cavity pump outlet – feeds to filters, then coater, returns via progressive cavity pump, each with variable speed control

Cooking – Starch continuous batch makedown – steam or enzyme



Starch Slurry

Starch Paste (Converted)



Enzyme Tank

- Produces a continuous 4 gpm (15 lpm) flow of converted starch in 200 gallon (910 liter) batches at 30% solids
- Axial flow impellers
- Metered water into all three tanks – ambient to 150°F (65°C)
- Enzyme and paste tanks have insulated jackets
- Slurry tank includes a dust vacuum exhaust
- First blend tank, mentioned above, can also be used for batch cooking of starch, protein, PVOH ...