



Industrial
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Solutions

What Engineers Should Consider Before Specifying a Mixer

Because the right choice isn't always clear-cut.



When performance, compliance, and long-term reliability matter, the right mixing system can make or break your process.

Whether you're working in food, chemical, pharmaceutical, or water treatment environments, specifying a mixer is not just about horsepower and tank size – it's about engineering the right solution for the application.

With solutions from Vak Kimsa as a reference point, here's what engineers should evaluate before locking in a mixer specification.



UNDERSTAND THE PROCESS OBJECTIVE

Start with the end in mind:

- Are you blending miscible liquids?
- Suspending solids?
- Dissolving powders?
- Promoting heat transfer?
- Preventing sedimentation?

Different goals require different flow patterns:

- Axial flow for top-to-bottom circulation
- Radial flow for shear and dispersion
- High-shear mixing for emulsification and fine particle reduction
- Clarity at this stage prevents over- or under-engineering the system.



KNOW YOUR FLUID PROPERTIES

Fluid behaviour drives impeller selection, motor sizing, and power draw.

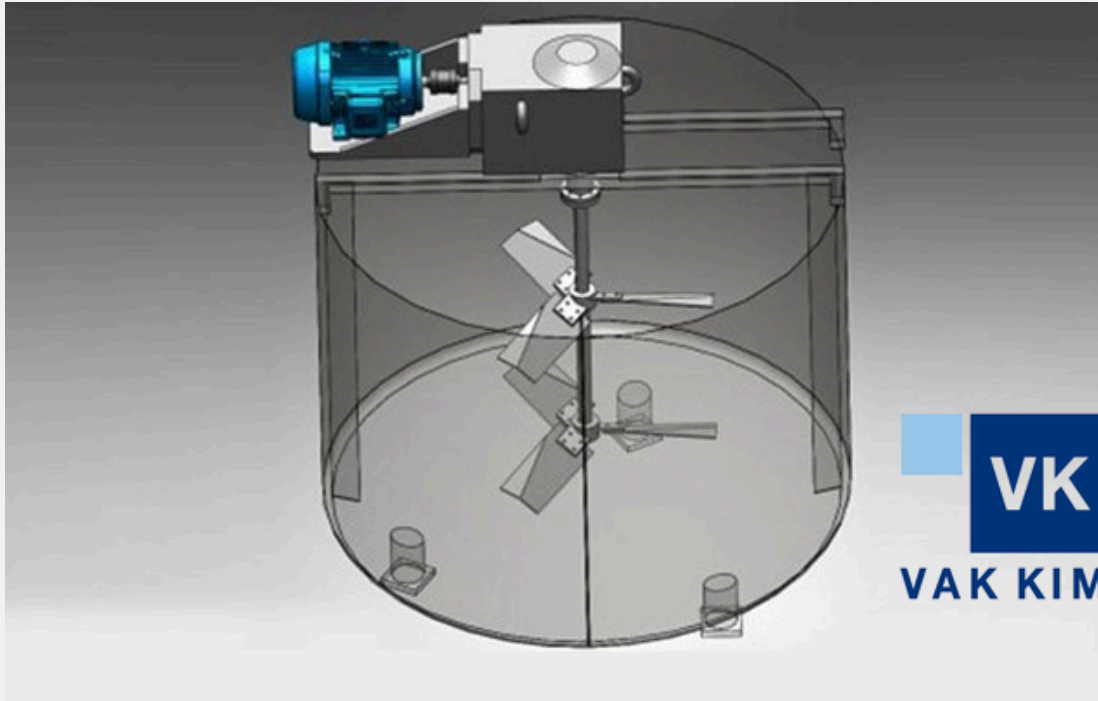
Key parameters include:

- Viscosity (and whether it changes during mixing)
- Density
- Solids loading
- Particle size
- Temperature sensitivity
- Shear sensitivity

A low-viscosity liquid behaves very differently from a non-Newtonian slurry. Specifying without rheological data often leads to inefficiency or mechanical stress.



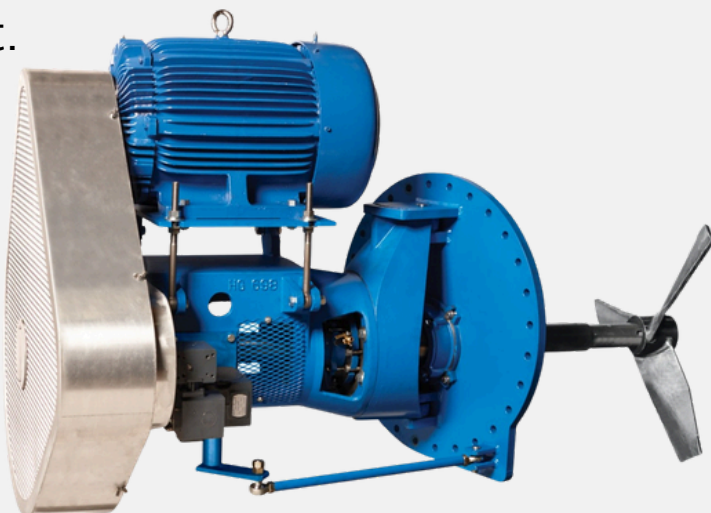
TANK GEOMETRY MATTERS MORE THAN YOU THINK



Mixer performance depends heavily on vessel design:

- Tank diameter and height ratio
- Presence (or absence) of baffles
- Flat, cone, or dished bottoms
- Top-entry vs side-entry configuration
- Mounting constraints

An optimised mixer from **Vak Kimsa** is typically engineered in conjunction with tank geometry – not selected independently of it.



POWER & TORQUE REQUIREMENTS

Engineers must calculate:

- Required tip speed
- Power per unit volume
- Starting torque
- Load variations during operation

Oversizing wastes energy. Under-sizing causes process inconsistency or motor failure. **Variable frequency drives** (VFDs) may also be worth specifying for flexibility and energy control.

$$V = f(\pi \cdot D \cdot N, P/V, T_{\text{start}}, \Delta T)$$



MATERIALS & COMPLIANCE

In regulated industries, materials of construction are critical.

Consider:

- Stainless steel grades (e.g., 304 vs 316L)
- Surface finishes (Ra values for hygienic applications)
- CIP/SIP compatibility
- ATEX or hazardous-area certification
- Seal types (mechanical seal, double seal, mag drive)

The right compliance strategy ensures both safety and audit readiness.

MAINTENANCE & LIFECYCLE COST

Initial purchase price rarely reflects total cost of ownership.

Evaluate:

- Ease of seal replacement
- Bearing accessibility
- Spare parts availability
- Downtime risk
- Energy efficiency
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Well-designed systems – such as those engineered by Vak Kimsa – prioritise modularity and serviceability to reduce long-term operational costs.



SCALABILITY & FUTURE PROOFING

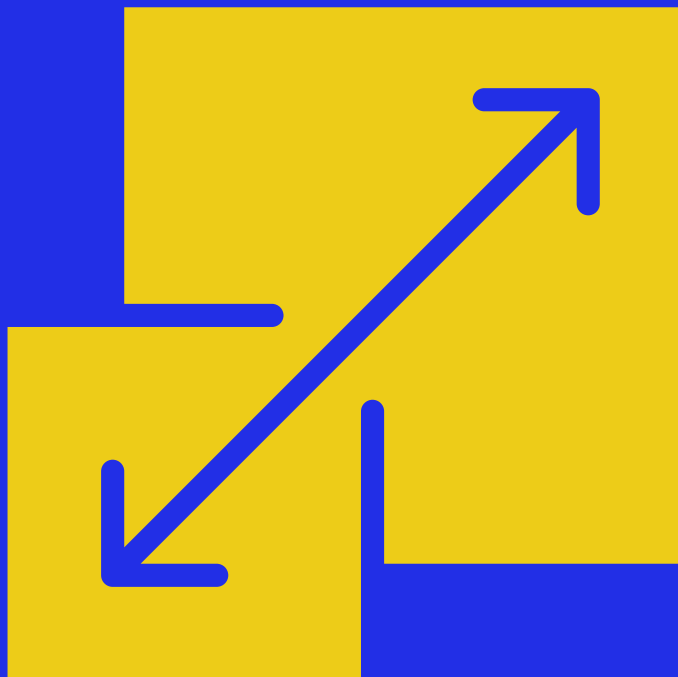
Ask yourself the question;

Is this a pilot system scaling to full production?

Will the batch size increase?

Could product viscosity change over time?

Designing for future flexibility avoids expensive retrofits later.



Final Thought

Specifying a mixer isn't just selecting equipment – it's defining process performance, operational reliability, and long-term cost control.

The most successful projects treat mixing as an engineered system rather than a catalogue purchase. Partnering with experienced manufacturers like Vak Kimsa ensures the solution is tailored to your application, your compliance requirements, and your production goals.

If you're at the specification stage, it pays to ask deeper questions before signing off.

