

# featured technical expert Q&A

## Christine Banaszek

Charles Ross & Son Co.



The beginning of Christine Banaszek's career in the baking industry was entirely providential, according to her. After earning her chemical engineering degree, Ms. Banaszek worked in academia, teaching undergraduate students at the University of Philippines – Diliman while pursuing a master's degree in environmental engineering. She says this might be the track she'd still be on today had she not answered an email from the former executive vice president of Charles Ross & Son Co., who was recruiting engineering graduates.

"One of the senior professors handed me the printed email and quietly prophesied, 'Christine, this is for you.' I replied within a couple of hours and the rest is history," Ms. Banaszek said. "It was certainly a 'kairos' moment beyond my own self-made plans."

Ms. Banaszek has been with Charles Ross & Son Co. for 16 years, starting as an application engineer. She was then promoted to sales manager, where she helps oversee domestic and international sales.

"It's a very rewarding journey to be in this particular industry,"

she said. "It offers countless opportunities to gain mastery of not just the mixing equipment side of the business but also an incredibly wide range of applications across the process industries. Sixteen years later and I'm still excited to be part of envelope-pushing projects. There's always novel ingredients, chemistries and processes around the corner. Proper mixing and blending is at the heart of virtually any production."

Ms. Banaszek said the best part of her job is learning new applications and collaborating with individuals from all around the world.

"Mixing really is a universal unit operation," she said. "I get a front row seat to product trends and advances that go on to change the world and how we live in it."

### What do bakers risk if they don't stick to a maintenance and sanitation plan for their mixers?

This could compromise product quality, yield, service life of the equipment and overall manufacturing cost.

### What are the most critical maintenance tasks that need to be performed on a mixer?

The mixer must be routinely monitored for cleanliness, shaft run-out, excessive noise or vibration, leaks and secure electrical connections. Calibration of sensors and readouts (speed, temperature, vacuum level, etc.) is also important.

### What will a robust mixer plan entail?

With proper maintenance, the right mixing equipment will run seamlessly for decades. Lubrication for bearings and gear reducers, as well as seals upkeep, are the typical items in a mixer maintenance plan. Most machines are CIP-capable, but some parts, like valve assemblies and stuffing boxes, benefit from periodic disassembly for inspection and deep cleaning. Your mixer vendor should be able to guide you regarding recommended spare parts for wear items and the quantities to have on hand.

### How does a maintenance plan support consistent product quality?

A well-specified mixer will do its job reliably and produce repeatable results insofar as it is properly installed, operated and maintained.

### How are mixers being designed today to make maintenance and sanitation easier?

Easy maintenance and sanitation starts with proper mixer selec-

tion. In reality, most products can be made in a number of mixers and through a variety of manufacturing methods. Taking the time and due diligence to identify the best mixing strategy has long-term benefits, not just in terms of achieving the target production capacity but also simple maintenance, easy cleanup, shorter downtimes and longer service life.

Once the right mixer is selected, it can then be optimized for sanitation: high polish on stainless steel surfaces, interchangeable mix vessels, sanitary fittings and valves that can be quickly taken apart for thorough cleaning, drain ports, ample access to the agitators, CIP spray nozzles, etc. On the controls side, the appropriate control system provides electronic soft start, overload protection and other features that help prevent premature wear and mechanical failure. Maintenance and calibration schedules can also be pre-programmed into PLC recipe controls so operators are less likely to overlook such procedures. In the end, investing in a mixer of superior, robust construction from a reputable manufacturer matters. Even if a maintenance plan is strictly followed, there's a higher risk of breakdowns if the equipment is not well-built in the first place.

### How do certain ingredients affect the kind of mixer you'll need?

The right mixing equipment plays a major role in creating the product exactly to specifications. It carries out the desired homogenization, solubilization, emulsification or deagglomeration. Poor mixing will invariably manifest as inconsistencies in stability, texture, taste, color and overall quality. When blending all dry ingredients, bulk density and batch capacity will determine the appropriate blender size. If certain ingredients tend to form undesirable lumps, the shear intensity required to break down

those lumps is considered during mixer selection. For example, Tumble Blenders are routinely used for gentle mixing of free-flowing solids. Turning at relatively low speeds, the V-shaped or double cone vessel systematically splits and recombines the batch with each revolution with highly predictable results. For some formulations though, this blending action is too gentle. Switching to a Ribbon Blender — inherently a higher shear device due to its double ribbon agitator turning at higher tip speeds — could eliminate lumps and shorten batch times. More stubborn agglomerates may require high-speed chopper blades installed on the Ribbon Blender's sidewall or cover.

As for liquid and semi-solid applications, viscosity is a main parameter for mixer selection, in addition to shear. Viscosity will often dictate the overall mixer design, including blade geometry, diameter and speed. A wide range of mixer options are available: single-shaft low speed agitators and high-speed dispersers, high shear rotor/stator devices, multi-shaft mixers and planetary mixers. Finally, efficient transfer of the finished product from the mixer must be taken into consideration as well.



Will the product flow by gravity or will it need to be pumped or pushed out of the mixing vessel? Is it sticky? These factors will help determine the suitable type and size discharge valve.

Testing is almost always a good idea. Ask about proof-of-concept demonstrations at the vendor's facility utilizing your actual raw materials, or rental equipment for more in-depth mixing trials at your facility.