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Biofuel leaders to gather in Berlin

A preview of the Biofuels International Conference and Expo

A $500 million problem

Why cooling capacity is so important for ethanol production

Regional focus: biofuels in Asia

Rayeman Elements provides solutions for both densification and drying

Getting the most from DDG's

Rayeman Elements has long been involved in developing technology and equipment for bulk densifying dried distiller's grains (DDGs) alongside a range of other materials 'from feed to bioenergy to fuel'. Now, the company is branching out into the drying sector, and has recently secured a major order of production dryer units with ethanol producer Marquis Energy. Here, *Biofuels International* speaks with company CEO and president Samantha Western.

Counter rotating twin screws for Rayeman Compression Dryer

When and how did Rayeman come to start working with ethanol producers?

We began with beef cattle supplement feed in a bulk densified form with no binders or fillers. We always intended to sell the equipment and license the technology, however, in order to get the idea and the product known and accepted, we built and operated a supplemental feed plant in Nebraska for several years in order to enter the market. We believed that setting up our equipment at the ethanol plants was the best, most cost-effective way to go, as the grain is right there, with a different perceived value than it is when it is trucked or railed in. As it turns out, there is still inherent value even if the equipment is not directly onsite at an ethanol plant, but rather in its own feed manufacturing plant.

Samantha Western, CEO and president of Rayeman Elements

As our development of the technology and equipment progressed, we were able to begin testing other products for the bulk densification and found we were able to bulk densify nearly anything we were given, including corn stover, cottonseed, wood char, municipal waste, high protein DDGs, and even Oreo cookies, just to mention a few. During all of our R&D with the bulk densification, we realised the need for a safer, more efficient and more cost-effective dryer system and were able to develop the Rayeman Compression Dryer, which uses heat (generated by mechanical compression/shearing of material combined with a small percentage of electrical heat rather than heat generated by combustible gas), has no chance for explosion as the temperature of the material stays below 212 degrees F, puts out far lower VOCs, produces the lightest colour, most consistent flowable grain, which is mirrored with a lower operating and capital cost all in a much smaller footprint.

The company's bulk densification equipment is sold to both ethanol plants and feed manufacturers. Are there any special considerations (technical or otherwise) that need to be taken into account when working with ethanol plants?

Actually, no – there are no special considerations. The only major requirements prior to setting up the equipment are the proper power source, which is 480 three phase. It is actually a very simple set up once it is put in place, and extremely easy to operate. The ethanol plants have the existing power. An independent feed manufacturing plant may need to put in the necessary power, but there haven't been any issues in getting this accomplished so far.

What are the benefits, for an ethanol producer, of condensing their distiller's grains into cubes with no fillers or binders?

The nutritional value of the cube increases, as there are no fillers or binders taking up precious nutritional space in the cube, and therefore, it is an added value product which can be sold at a premium price point, for example $135.00 on average above DDGS price. It is an excellent way for the ethanol producer to diversify their revenue stream and bring in additional funds on a product they can make in-house. The return on investment for this equipment is between 18 and 36 months, depending on output numbers.

Another area of expertise for Rayeman Elements is dryers. Why is drying capacity so important to an ethanol producer?

As distiller's grain has clearly become almost, if not just as, important to the ethanol industry as the ethanol it produces, the dry version has the most value, as it captures a higher selling price because it can be transported (wet

distillers' grain is up to 70% water and is not cost-effective to ship long distances) and/or exported. Dryers in the industry have seen some difficulties in the past with inconsistent output material, as well as combustibility and the high levels of VOCs off-gassed into RTOs for treatment. Rayeman Elements is looking to tackle some of these issues with a safer, cleaner, more cost effective, easier operating dryer, in hopes of boosting the quality and quantity of dry grains able to be produced at the ethanol plants.

What are the benefits of an increase in dryer capacity? How is Rayeman helping clients achieve these benefits?

Distiller's grains are a commodity, not only in the US, but around the world. There are standards which must be met to achieve the highest selling price – and quality cannot be sacrificed for quantity. The Rayeman Compression Dryers are an improvement to the industry, as they are incredibly versatile and can be added to an ethanol plant's existing drying system for increased capacity (removing more moisture either prior to entering the existing dryers or when exiting existing dryers, to increase output numbers and quality), as well as stand-alone systems to encompass all drying needs of an ethanol producer.

Could you tell us about the dryer solution which Rayeman Elements offers for high protein products?

Because the Rayeman Compression Dryer operates at lower temperatures, there is little-to-no risk of the grain, protein, or syrup burning during the drying process. Our dryer works through compression and releasing of the material and squeezing the water out of the grain, allowing the vapour to be released at lower temperatures, thus creating a lighter, higher quality product at the end of the process.

Additionally, the Rayeman Compression Dryer keeps the material from clumping inside the system, so there are no "balls" of material wherein the middle of the ball cannot be dried. It is a much more flowable grain coming out, as well as the reduction in VOC's, smaller footprint, and lower operating costs, not to mention ease of operation overall.

Rayeman Compression Dryer

Rayeman Elements recently announced the sale of multiple production dryer units to Marquis Energy. How will Marquis use these units in its facility, and what benefits will they bring?

The first dryer going in at Marquis will be a front-end unit, meaning the WDGs will go into the Rayeman Compression Dryer directly from the ethanol process and remove 16% of the moisture in the grain (going from 65% moisture to 49% moisture at a lower costs) before entering their existing dryers. This will enable them to increase their daily output of dry grain from 920 tons per day to 1320 tons per day, without having to purchase all new full dryer systems right out of the gate. ●

For more information:
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