

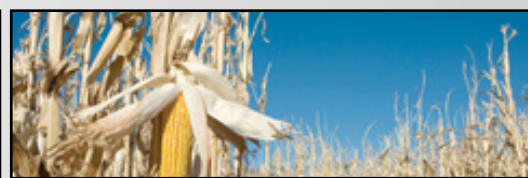
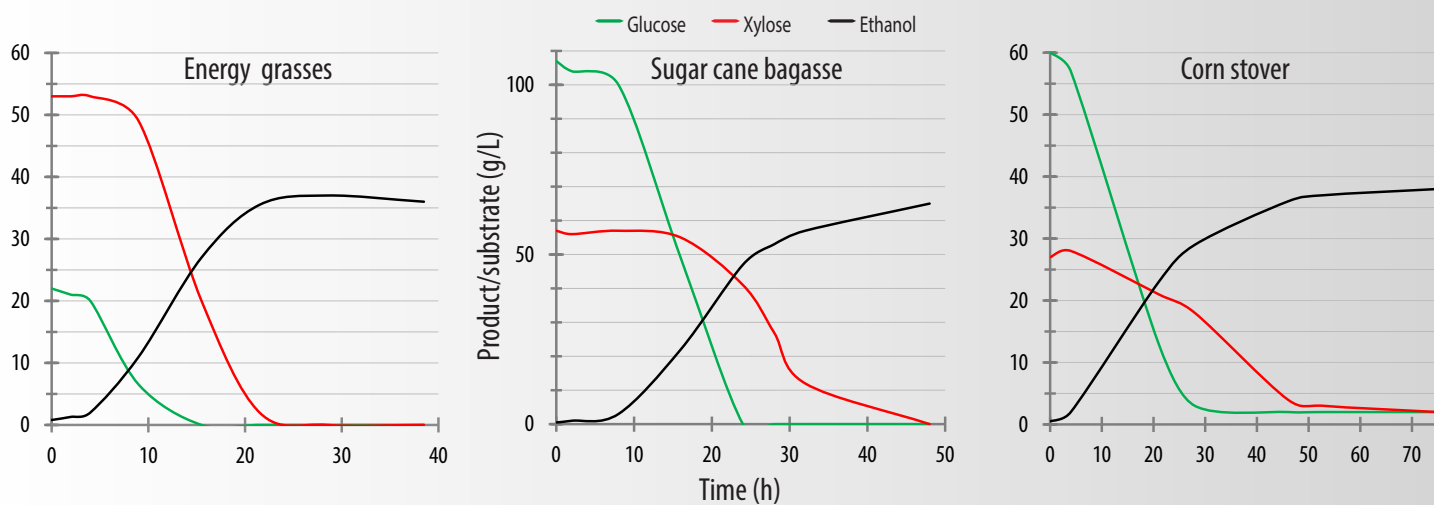
XyloFerm®

Cellulosic yeast for G2 ethanol production

XyloFerm® is robust prototrophic yeast strain for producing ethanol from C6 and xylose streams. XyloFerm® offers minimal by-product formation with a high tolerance for inhibitors common with cellulosic substrates. XyloFerm® is a Gen 2 yeast platform from Taurus Energy AB (Sweden) and is marketed and distributed in United States by Lallemand Biofuels & Distilled Spirits.

Xyloferm® Attributes

- Rapid xylose fermentation
- Can reach ethanol titers above 100g/L
- Pitch 0.1-1.5 g/L depending on hydrolysate and pitching method
- Inhibitor resistant xylose fermentation (furfural, HMF, acetic)
- Temperature range 30- 35°C, pH range 5 to 6
- Ethanol yields between 0.41 and 0.49 g/g
- Minimal by-product formation (<3%)
- Suited for G2 and G1.5 fermentation
- Results confirmed at 4 m³ demo scale
- Performance proven in batch and fed-batch SHF and SSF



Biomass	Glucose (g/L)	Xylose (g/L)	Acetic Acid (g/L)	Time (h)*	Yield (g/g)	Titer EtOH (g/L)
Wheat Straw	6	30	2,6	48	0,48	17
Corn Stover	60	27	0,9	48	0,49	42
Hardwood	21	10	2,1	24	0,49	15
Corn Cobs	128	88	3,2	48	0,48	103
Bagasse	105	55	1,2	48	0,41	65
Energy Grass	52	32	3,0	24	0,46	39

*Time until 95% sugars consumed at 33°C, pH 5.5

GUIDELINES FOR PRODUCT STORAGE:

Xyloferm® is supplied as a stabilized cream yeast (20% solids) packaged in 1000 kg (2205 lb) totes.

The product is stable for up to 3 months from date of manufacture when stored at refrigeration temperatures (33.8 - 40°F, 1- 4°C).

The product is stable for approximately 1 week when removed from refrigeration and stored at plant temperatures (86°F, 30°C).

DIRECTIONS FOR USE:

Due to the variety of different substrates and pretreatment conditions, dosing of Xyloferm® will vary from condition to condition. Please consult your local technical sales representative for more detailed information for your specific plant.

The optimal temperature range for fermentation is 86°F-95°F (30°C-35°C). The yeast are able to tolerate short temperature excursions up to 100°F (38°C), though this is to be avoided especially in the later stages of fermentation when ethanol and inhibitory compound concentration is high. The ideal pH range for fermentation is 5 to 6. The yeast should be provided sufficient nutrients to ensure a robust and complete fermentation. It is preferable to have added nitrogen, supplied for instance as 500-1500 ppm urea or 200-700 ppm of ammonia, or a combination of the two.

Due to more inhibitory compounds that are liberated from various pretreatments, a nutrient package will be necessary to complete fermentation.

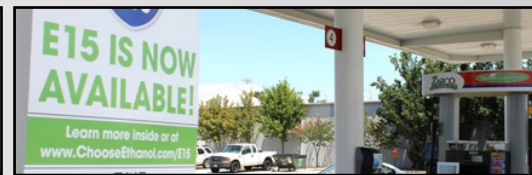
REGULATORY COMPLIANCE:

Facilities using intergeneric microorganisms are subject to premanufacturing review procedures under the Toxic Substances Control Act (TSCA) 40 C.F.R. § 725. Xyloferm® has met the review requirements via completion of a Microbial Commercial Activity Notice (MCAN). This product is only to be used as a processing aid in the production of fuel ethanol and distillers co-products and is not to be used as a direct addition to food or animal feeds.

XyloFerm® is GRAS when consumed as an inactivated biomass component in distillers grains in accordance with 21 C.F.R. § 570.30 (b). Contact Taurus Energy for more information.

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**LALLEMAND BIOFUELS
& DISTILLED SPIRITS**



Taurus Energy