

THE ULTIMATE PERFORMANCE STARCH

# PURITY GUM<sup>®</sup> Ultra Emulsifier



Double your beverage emulsion oil load —  
and experience **greater productivity.**

Whether you're developing a new formulation or reformulating an existing product, PURITY GUM Ultra emulsifier is the starch solution that defines new levels of productivity in the manufacturing of beverage emulsions. Enjoy savings and sustainability benefits throughout the process—from production to warehousing and shipping.





## PURITY GUM ULTRA RAISES THE BAR

### The Challenge To Stabilize High Oil Load Beverage Emulsions

The main limitation of traditional emulsifiers in stabilizing higher oil loads is that higher oil loads require a greater amount of emulsifiers, which causes too high of a viscosity in processing. As a result, typical oil loads for beverage emulsions are less than 15%.

Another limitation is that emulsions are thermodynamically unstable; increasing oil load and reducing the emulsifier level makes the emulsions much more difficult to stabilize.

PURITY GUM Ultra starch uses a patented technology that optimizes the molecular structure of the starch making it a powerful emulsifier with four times the emulsifying power of traditional beverage emulsifiers. It is capable of doubling the oil load, which in turn doubles manufacturing throughput, dramatically reducing processing costs.

## Unique performance, powerful results.

PURITY GUM Ultra starch is a revolutionary new emulsion technology that consistently outperforms other emulsifiers.

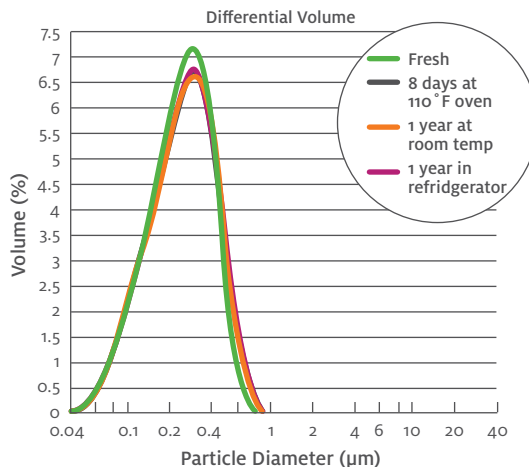
- Excellent performance in high oil load (up to 30%).
- Functional in delivering flavors, actives, nutrients and oil soluble ingredients into a broad range of applications
- Superior emulsification in weighted and non-weighted systems.
- Produces equivalent beverage turbidity to gum arabic at lower cost in use.
- Stable in alcohol-based systems up to 20% alcohol by volume.
- Can eliminate or reduce time-consuming processing steps.
- Stable at a broad pH range (2.5 to 8.0).

### PERFORMANCE AT DIFFERENT RATIOS

| OIL : STARCH RATIO | EMULSION              | EMULSION                    | EMULSION  | BEVERAGE  |
|--------------------|-----------------------|-----------------------------|-----------|-----------|
|                    | Particle size (fresh) | Particle size (57°C/1 day)* | Viscosity | Turbidity |
|                    | Mean                  | Mean                        | CPS       | NTU       |
| 24 : 4             | 0.21                  | 0.254                       | 70        | 216       |
| 24 : 5             | 0.214                 | 0.26                        | 316       | 225       |
| 24 : 6             | 0.227                 | 0.272                       | 796       | 227       |

\*Stress test corresponding to six-month shelf life

### EXCELLENT EMULSION STABILITY AT ALL AGING CONDITIONS (24% OIL LOAD)

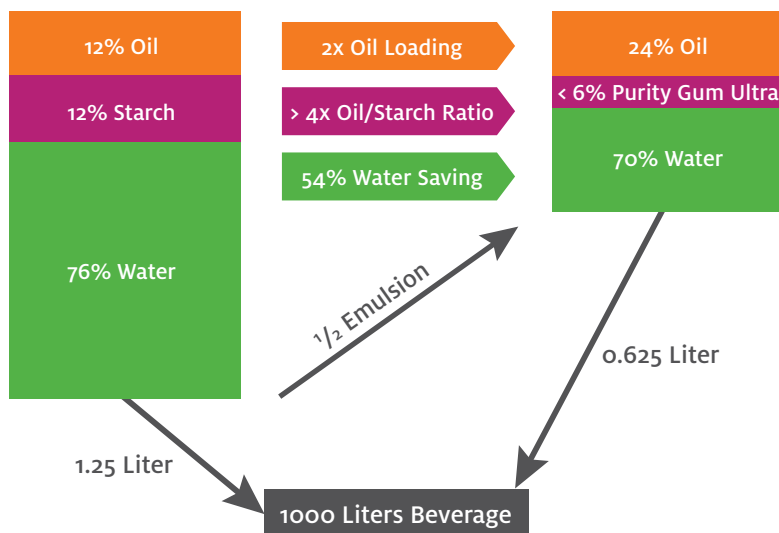


1 day at 57°C is equivalent to 8 days at 110°F (43.3°C), and both correspond to about 6 months at ambient temperature.

# Emulsification in beverage production

Concentrated emulsions are typically produced in bulk quantity and shipped to bottlers to produce the final beverages, where emulsions are added to beverage syrup typically containing water and corn syrup. This practice saves companies from shipping more water than necessary, allowing their operation to be more efficient and sustainable. Therefore, a desirable emulsifier needs to deliver both flavor (or color) and turbidity effectively, and maximize the oil load and minimize water usage in emulsion concentrates.

## ULTIMATE PERFORMING STARCH FOR ULTIMATE PROCESS SAVING



## OIL LOAD EMULSION COMPARISONS

| PRODUCT             | LOW OIL LOAD (12%) |                        | HIGH OIL LOAD (24%) |                        |
|---------------------|--------------------|------------------------|---------------------|------------------------|
|                     | EMULSIFIER %       | OIL : EMULSIFIER RATIO | EMULSIFIER %        | OIL : EMULSIFIER RATIO |
| PURITY GUM® ULTRA   | 3                  | 4 : 1                  | 6                   | 4 : 1                  |
| CONVENTIONAL STARCH | 12                 | 1 : 1                  | Failed all level    | Failed all level       |
| GUM ARABIC          | 21                 | 1 : 1.75               | Failed all level    | Failed all level       |

Only PURITY GUM Ultra starch allows you to create emulsions at exceptionally high oil loads without failing.

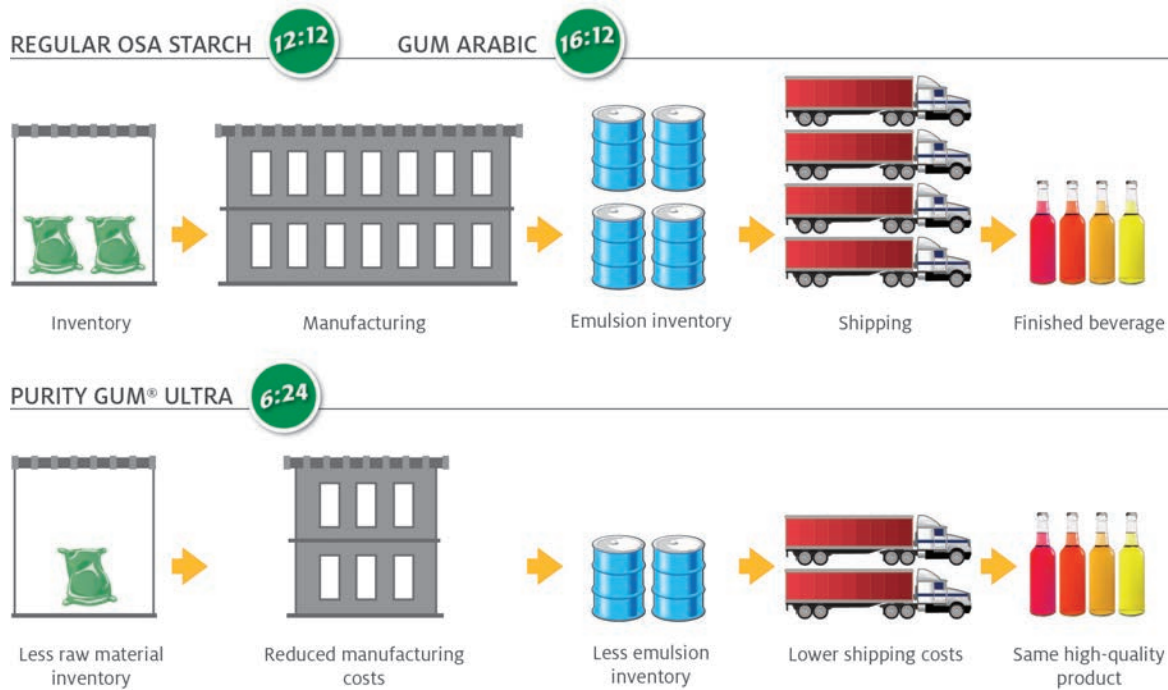
## COUNT ON PURITY GUM ULTRA FOR INCREASED EFFICIENCY

PURITY GUM Ultra starch significantly enhances manufacturing productivity, potentially reduces capital expenditure, and reduces environmental impact

- Reduced variable manufacturing costs, less warehouse costs, reduced shipping weights
- Greater asset utilization, potentially postponing capital expenditure in concentrate production
- Reduced carbon footprint aligning with corporate sustainability initiatives



## REINVENTING THE PROCESS CHAIN



*PURITY GUM® Ultra starch delivers savings throughout the supply chain — from ingredient inventory through manufacturing and warehousing and on through shipping to the finished beverage. It also leads to savings in energy and natural resources, potentially reducing your carbon footprint.*

Corn Products and National Starch  
are now **Ingredion**.



### GET STARTED TODAY

Ready for unprecedented productivity?  
Ask our experts about PURITY GUM Ultra.

**1-866-961-6285** | [ingredion.us/specialties](http://ingredion.us/specialties)

Developing ideas.  
**Delivering solutions.**<sup>™</sup>

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