What are NovaXan™ and OptiXan™?

A Natural Polysaccharide with Unique Properties

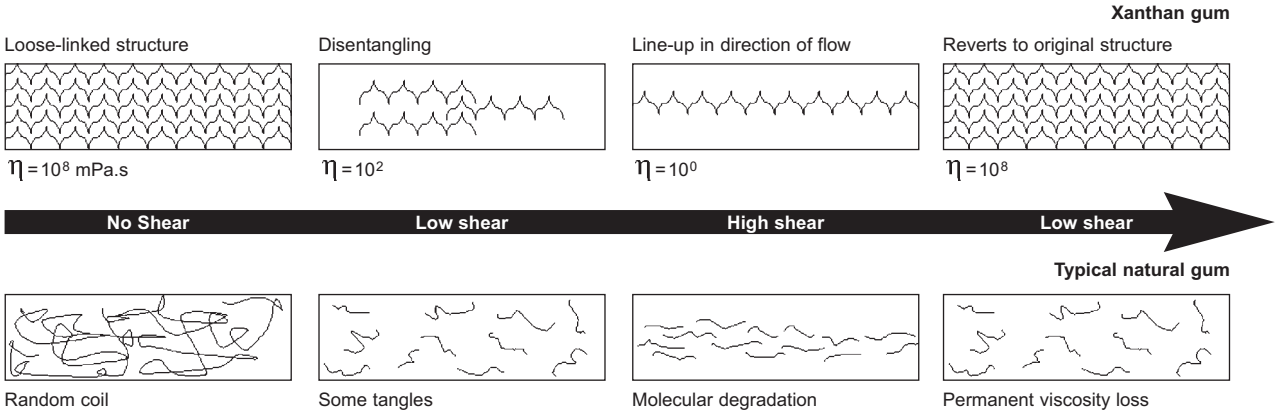
Xanthan gum is a polysaccharide produced by the fermentation of the bacterium *Xanthomonas campestris*. This organism is found in nature on the leaf surfaces of green vegetables, particularly the cabbage family.

Using this organism, ADM produces its NovaXan™ and OptiXan™ xanthan gums in a large, dedicated production unit. The careful control of aeration, agitation, pH balance and temperature ensures the production of a natural polymer that has all the desired properties. The finished product is a light tan-coloured free-flowing powder which is easy to store and handle.

NovaXan™ **OptiXan™**

The chemical structure of the xanthan gum molecule in aqueous solution confers three unique properties:

- excellent flow control, even at very low concentrations
- long-lasting suspension of particulates, even in complex formulations
- ability to withstand severe shear, heat treatment, enzymic attack and high salt levels



UNIQUE BENEFITS

- **Excellent flow control, even at very low concentrations**
- **Long lasting suspension of particulates, even in complex formulations**
- **Ability to withstand severe shear, heat treatment, enzymic attack and high salt levels**

ADM offers more than 700 high-quality ingredients and the skill to combine them with any food or beverage. **RESOURCEFUL BY NATURE™**

www.admworld.com | +31 (0)75 64 64 646 | ingredients@admworld.com

GO WITH THE FLOW

In applications where pourability and flow are needed from a viscous, clinging fluid, xanthan gum solutions will provide the pseudoplastic flow characteristics you need.

When poured, mixed, pumped or sprayed, a xanthan gum solution will immediately show a dramatic fall in viscosity, therefore making it easy to process. When the shear force is removed, the viscosity immediately reverts to its original level; the finished product returns to its stable 'at rest' form.

The diagram below compares what happens when high shear is applied to solutions containing xanthan gum versus other natural and modified thickeners such as guar gum and CMC, at the same viscosity.

The rigid structure of the matrix of xanthan molecules instantly dissociates when shear is applied. It then re-associates to the original structure when the shear is removed, suspending any particulates or oil droplets within it.

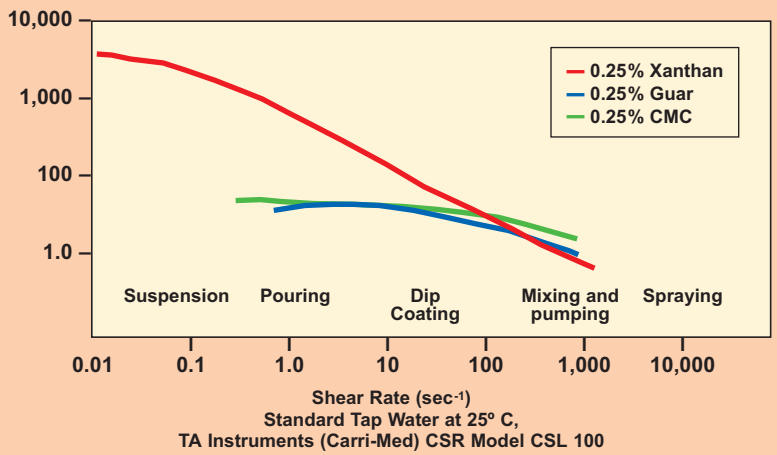
When the same shear is applied to other natural thickeners, the twisted worm-like molecules which typify their structure – and provide their viscosity – are unable to match the performance of xanthan gum.

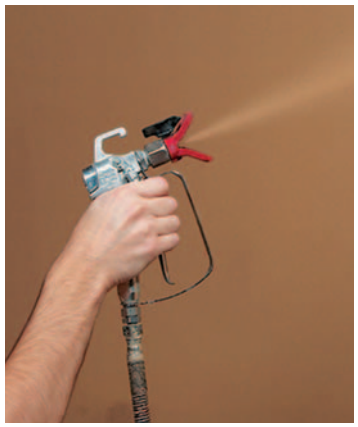
The molecular structure of these other thickeners, which take time to disentangle, causes their fall in viscosity to be both slower and less complete. Moreover, under high shear conditions, the worm-like molecules can break into smaller units. Once the shear is removed, they are then less able to re-combine which reduces their ability to act as suspending agents and results in a permanent loss of functionality.

KEEPING PARTICULATES IN SUSPENSION

The ability of xanthan gum to perform as a long-lasting, highly effective stabiliser which holds particulates in solution is valuable to manufacturers who want to offer long shelf-life products with no risk of separation and sedimentation.

The importance of low-shear measurement in quantifying this long-term stability is shown by the viscosity / shear rate profiles of 0.25% solutions in the graph below. While the viscosity curve for guar and CMC flatten when the shear rate drops below 10 sec^{-1}, the xanthan gum solution curve continues to build viscosity. At a shear rate of 0.001 sec^{-1}, xanthan gum is 100 times more viscous than either of the alternatives. As increasing shear is applied, the viscosity of the xanthan gum solution drops sharply providing the ease of pouring and pumping that is so useful for processing and application. When the shear stress is removed, xanthan gum's viscosity instantly recovers to its original value.





FO XG 35/03/05