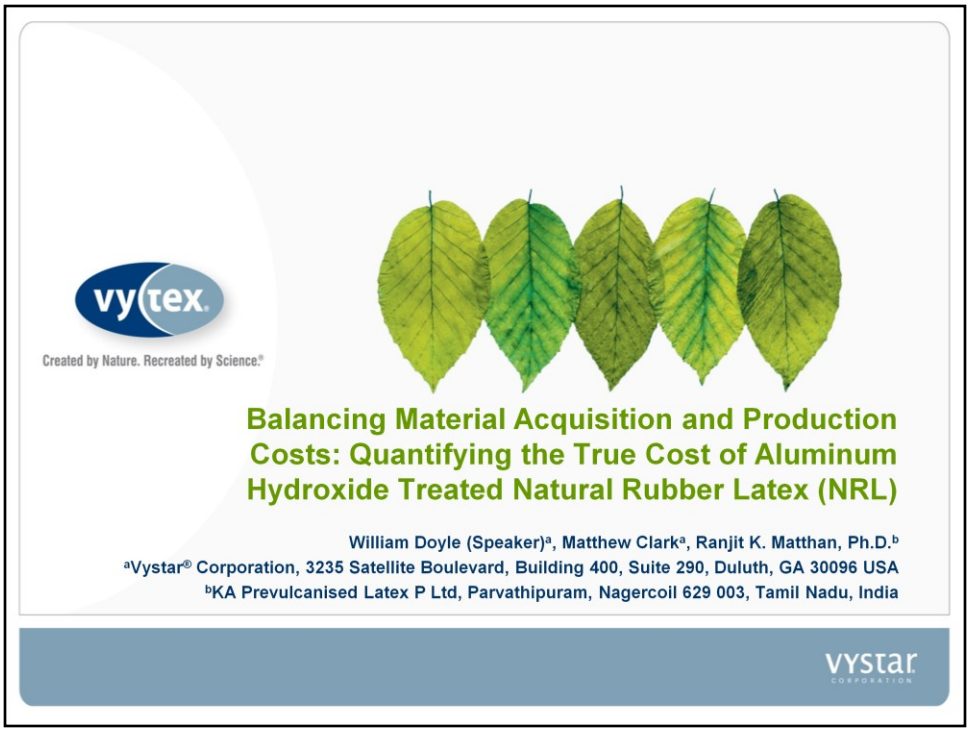
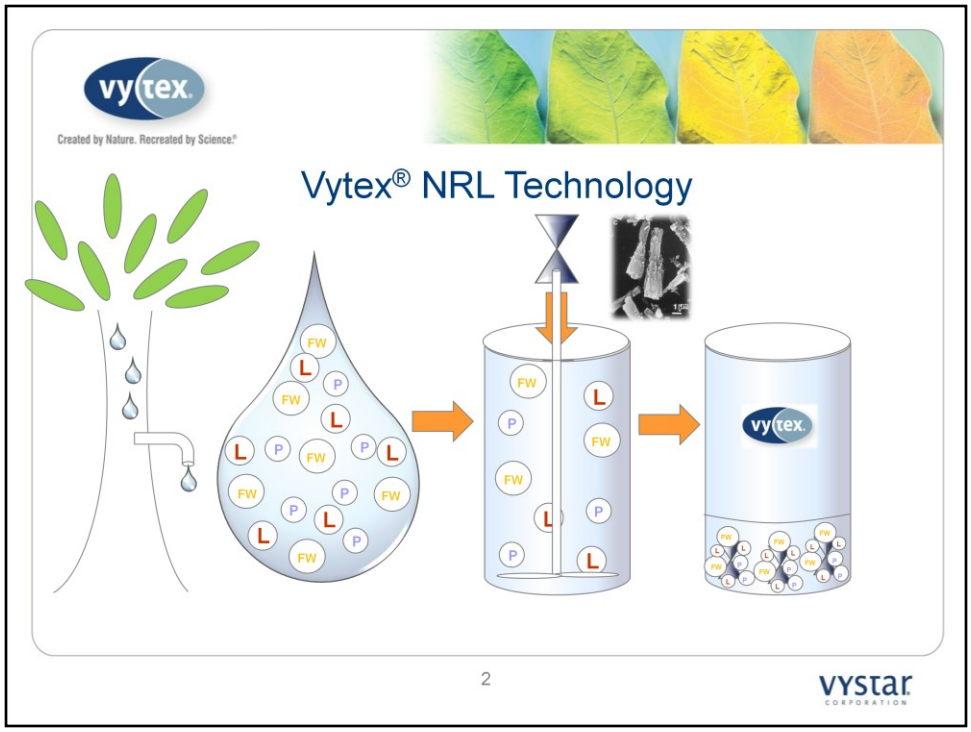


This presentation was presented at the Smither's Rapra Latex and Synthetic Polymer Dispersions 2010 Conference, March 24, 2010 in Amsterdam, The Netherlands, as the lecture companion to the technical paper of same name.

Several independent 3rd party testing facilities helped provide test data that is presented in the paper and presentation:

- Stratoshift Technologies- Malaysia
- GrupoAgroIndustrialOccidente- Guatemala
- Revertex- Malaysia
- KA Prevulcanised Latex P - India
- Kanam Latex Industries –India
- Confidential Foam Manufacturer- USA

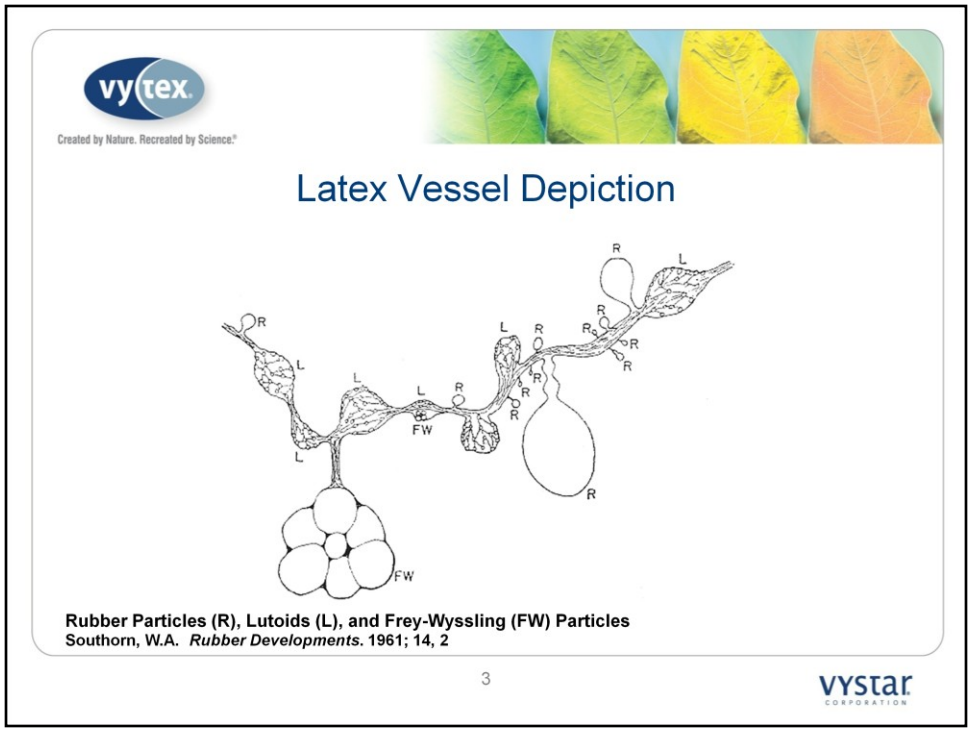


Latex feedstock contains proteins and other non-rubbers including lutoids and Frey-Wyssling particles, shown in the middle water drop. The latex feedstock is introduced to a slurry of aluminum hydroxide $Al(OH)_3$, represented by the dumbbell shape. The proteins and non-rubbers are adsorbed onto the reactive surface areas of the aluminum hydroxide, as depicted in picture (c) during centrifugation.

Note that adsorption is dependent on the physical and chemical characteristic of the protein as well as the conditions of adsorption, such as pH, temperature, particle size, etc.

Because $Al(OH)_3$ is insoluble, it can be introduced into the liquid latex but more importantly, it is removed with the proteins adsorbed onto the outer surface in the bottom layer (skim layer) which can be recovered and recycled.

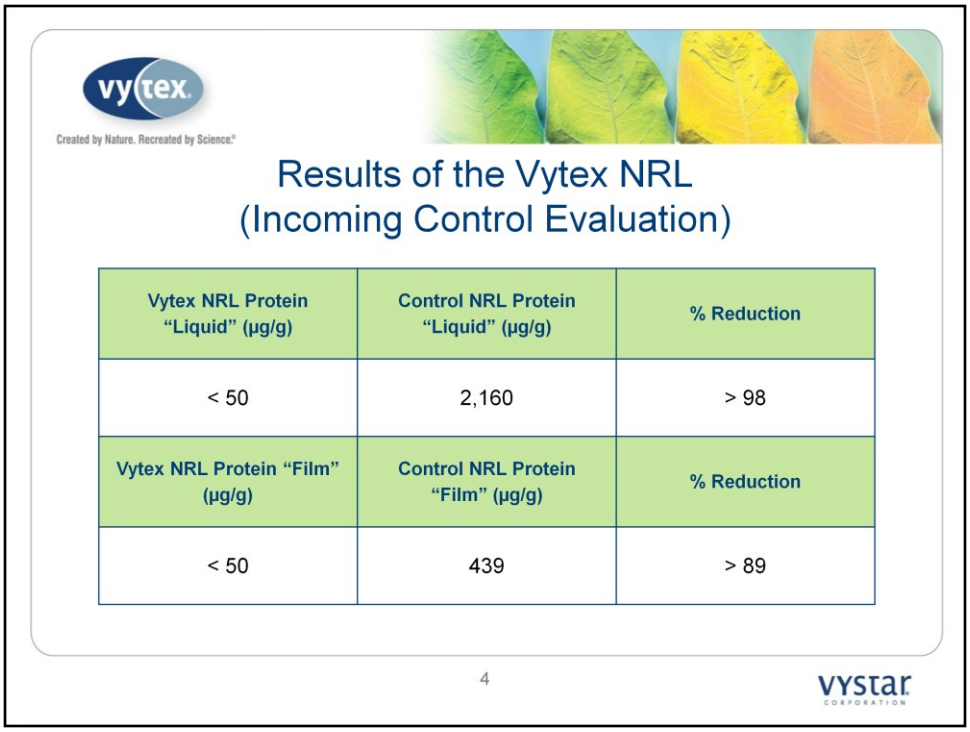
The remaining purified top layer is the Vytex® NRL.



$Al(OH)_3$ gels have been used to characterize carotenoids. Separation of carotenoids from plant extracts on $Al(OH)_3$ loaded cellulose paper has been previously reported.

This provides evidence that carotenoid pigments can be adsorbed to the surface of $Al(OH)_3$ during the modification process resulting in carotenoids associated with both lutoids and Frey-Wyssling particles being removed with the $Al(OH)_3$ yielding a cleaner, whiter natural rubber latex.

Previous papers have demonstrated the successful exchange between proteins and $Al(OH)_3$. This takes it one step further- opposite charges with Frey Wyssling particles & lutoids- same as proteins.



The results illustrate protein levels in both liquid and cast films. The liquid Vytex NRL is an average of Malaysian and Guatemala latices compared against standard natural rubber latex from Southeast Asia. The Vytex NRL shows a greater than 98% reduction in proteins over the control in the liquid phase.

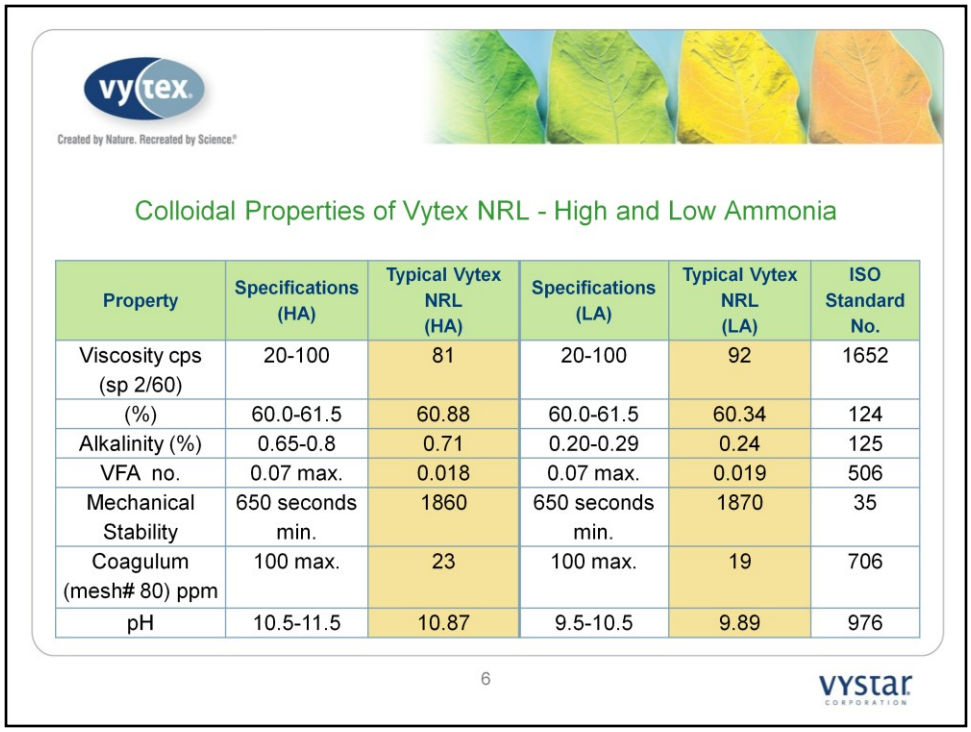
In the cast film samples, proteins are reduced by 89% for Vytex NRL films compared with standard latex controls. Both films were from samples produced in Guatemala.

It can be concluded that there is a significant reduction in proteins using the Vytex NRL in both liquid latex and cast films compared to standard latex.

It is important to note that alarmingly latex itself is held to standards that cannot be met by today's testing methods. Some users demand zero protein levels even though test methods do not have detection at those levels.

Over 40,000 types of products are made from natural rubber in various forms. To date, Vytex NRL has been successfully used in every application that is currently using standard NRL.

The removal of non-rubber constituents from Vytex NRL results in a very stable latex compound is whiter in appearance and lacks the odor common in standard latex.



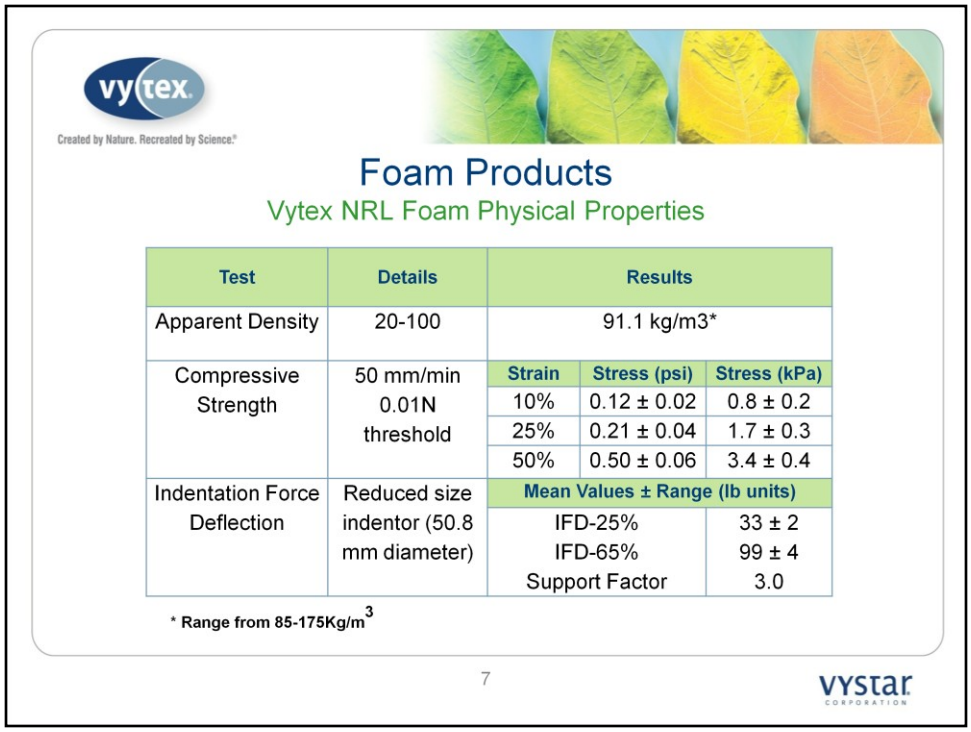
Property	Specifications (HA)	Typical Vytex NRL (HA)	Specifications (LA)	Typical Vytex NRL (LA)	ISO Standard No.
Viscosity cps (sp 2/60)	20-100	81	20-100	92	1652
(%)	60.0-61.5	60.88	60.0-61.5	60.34	124
Alkalinity (%)	0.65-0.8	0.71	0.20-0.29	0.24	125
VFA no.	0.07 max.	0.018	0.07 max.	0.019	506
Mechanical Stability	650 seconds min.	1860	650 seconds min.	1870	35
Coagulum (mesh# 80) ppm	100 max.	23	100 max.	19	706
pH	10.5-11.5	10.87	9.5-10.5	9.89	976

The chart illustrates the testing results of colloidal properties for Vytex NRL HA (high ammonia) and LA (low ammonia) compared against the ISO standard specifications noted.

These parameters are tested and measured for every batch of Vytex NRL HA & LA produced. Manufacturers require that the colloidal properties are within a specific range and as the chart shows Vytex NRL HA & LA are within ISO specifications for every property and demonstrates parity to standard NRL.

The specific batch colloidal results are included with every shipment as part of the Certificate of Analysis (COA).

In addition to the protein levels, the primary difference between Vytex NRL and standard latex is mechanical stability. Most times this stability is acceptable, sometimes not based on industry. In either case, each raw material can be adjusted to achieve the manufacturer's required results.



This chart depicts the key performance characteristics for foam products; density, compressive strength and indentation force deflection. The results illustrated are reported by a leading bedding manufacturer and derived from a sample of 100% natural rubber latex foam made with Vytex NRL:

Apparent Density which is a measure of the "fluffiness" of a material in its supplied form and the type of usage the foam will receive. The higher the density, the higher the durability and quality of the foam. *It is the measurement of pricing as well.* To put it simply, the higher the density, the longer the product will last. Apparent density is calculated as the mass of material divided by its volume (including voids inherent in the material as tested) using calipers and balance.

The Compressive Strength measures the maximum compressive load (sustained by a specimen) divided by the original cross-sectional area. It is the ability of a material to resist a uniaxial compressive load.

Indentation Force Deflection (IFD)- measurement of foam firmness and the surface feel of the foam. Firmness is independent of foam density, although it is often thought that higher density foams are firmer. It is possible to have high density foams that are soft – or low density foams that are firm, depending on the IFD specification. IFD specification relates to comfort.

The IFD is measured by indenting (compressing) a foam sample 25 percent of its original height. The amount of force (in pounds) required to indent the foam is its 25 percent IFD measurement. The more force required, the firmer the foam. Flexible foam IFD measurements range from 10 pounds (super soft) to about 80 pounds (very firm).

The Support Factor is the foam's ability to "push back" against weight and prevent the foam from "bottoming out". Support Factor is a ratio of 65% IFD : 25% IFD. The higher the support factor, the better quality of the foam. The foam will support weight better with a higher support factor. Foams with support factors of 2.0 or above are better suited for load bearing applications like seat cushions.

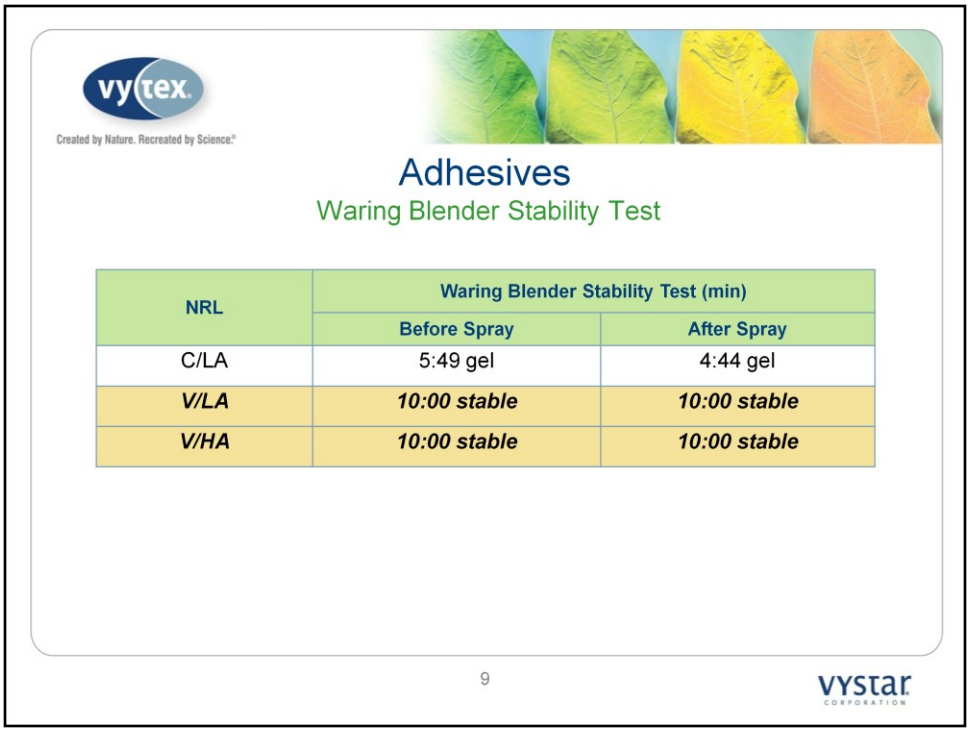
Overall, Vytex NRL foams have better stability, a cleaner appearance and significantly reduced odor over foams made with standard NRL.

NRL usage in foam is predicted to increase substantially due to growing demand and awareness for green bedding products. This global movement has foam manufacturers increasing their natural blends and Vytex NRL is a good alternative material due to its stable nature, with the added cost benefit of potentially reducing the amount of compounding additives, such as whitening agents and fragrances.

Protein results as reported by a large medical dressing manufacturer showing a 95% reduction in proteins compared to their standard NRL.

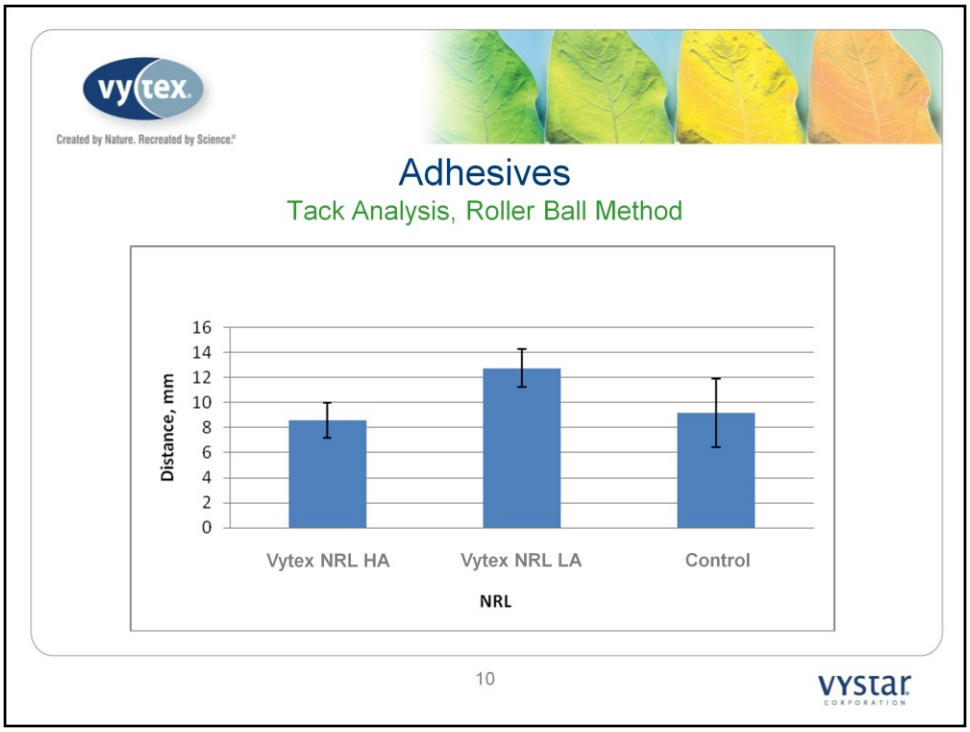
It is essential that non-dipped applications, such as cohesive bandages, use ultra low protein latex since post-leaching practices to remove proteins are not utilized within these product applications. The starting protein levels are the ending levels in most adhesive applications; there are no additional post-processing steps that can be used to achieve low protein levels in adhesives as typically found in dipped product applications such as gloves and condoms.

A combination of ultra low protein, greater stability, improved processing makes Vytex NRL the next generation of NRL for adhesive applications.



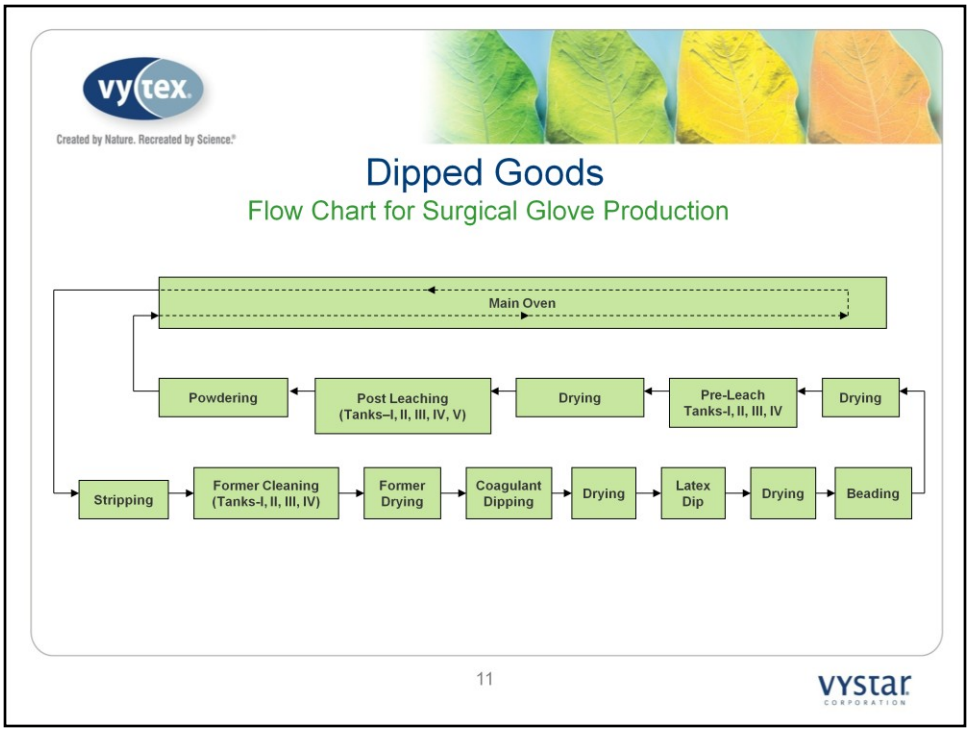
The individual latices were placed in a high speed blender and evaluated for stability properties before and after spraying.

Testing results show that the Vytex NRL, with its ultra low protein content, has exceptional high sheer stability compared to standard NRL. The stability of Vytex NRL is due to the controlled removal of non-rubbers in the liquid latex.



The tack of the latex samples was examined, using the industry standard roller ball method. Results from this test found the properties for all materials were at acceptable levels.

The Vytex NRL samples have greater reproducibility and smaller errors bars than the control, demonstrating a more consistent product compared to standard latex. All materials dried clear without any observable inclusions or irregularities.

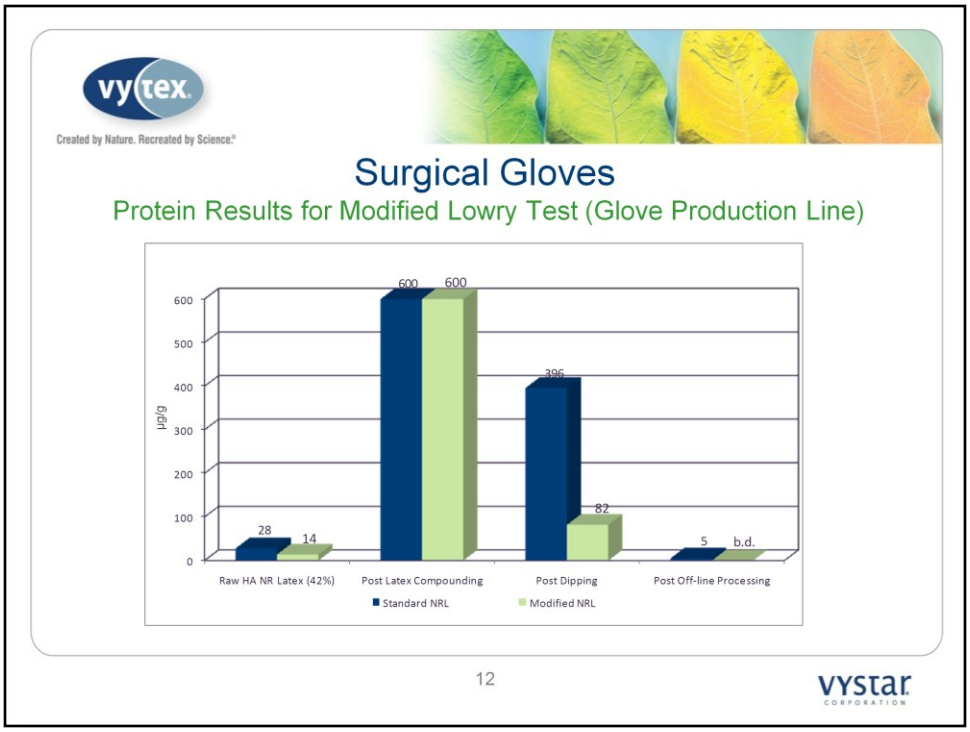


The flow chart depicts production cycle for a surgical glove manufacturer.

Note the multiple processing stages where water and energy are utilized, particularly in the pre and post leaching and former cleaning stages. The purpose of the pre and post leaching stages is to remove the compounding chemicals and to reduce protein levels.

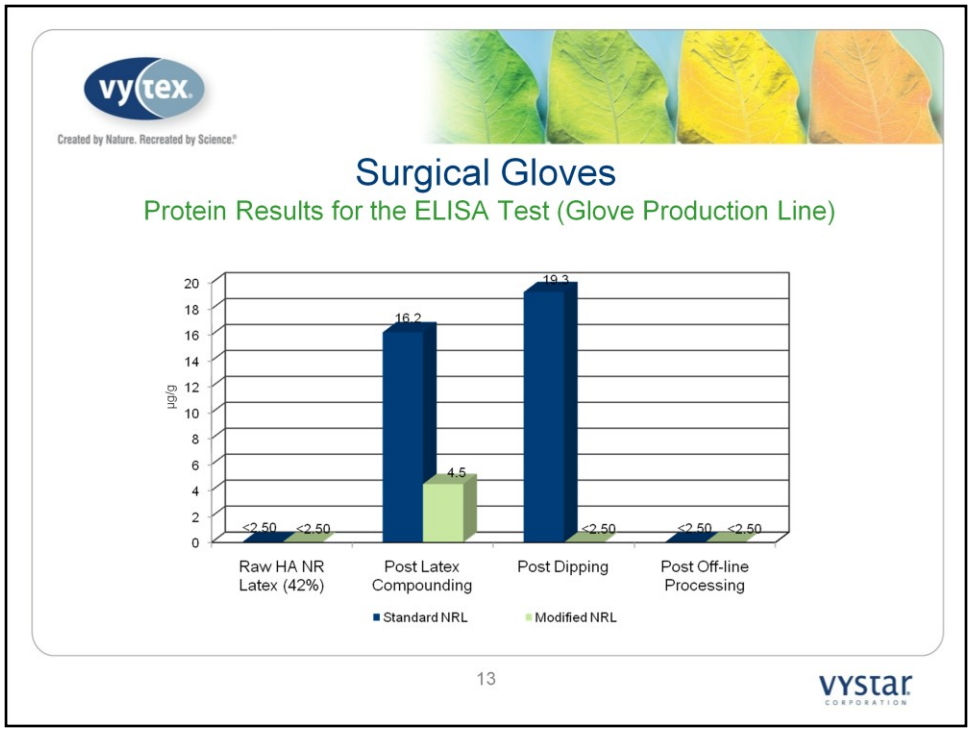
There is a great opportunity to reduce the required number of processing steps in a typical manufacturing environment by replacing standard NRL with Vytex NRL thereby decreasing water and energy costs and a manufacturers environmental impact.

In addition to the above steps, there are further offline processes which also use water and energy and there are reported savings here as well which are in the process of being quantified.



The chart shows a comparison of Vytex NRL and standard NRL using the Modified Lowry (ASTM D-5712-05) test method for total extractable proteins as reported by a global surgical glove manufacturer. Results confirm that gloves made with Vytex NRL achieved low protein levels after post dipping and while standard NRL required post off line leaching to achieve low protein levels.

The extractable protein removal is also more efficient in the Vytex NRL process as seen in the post dipping data.

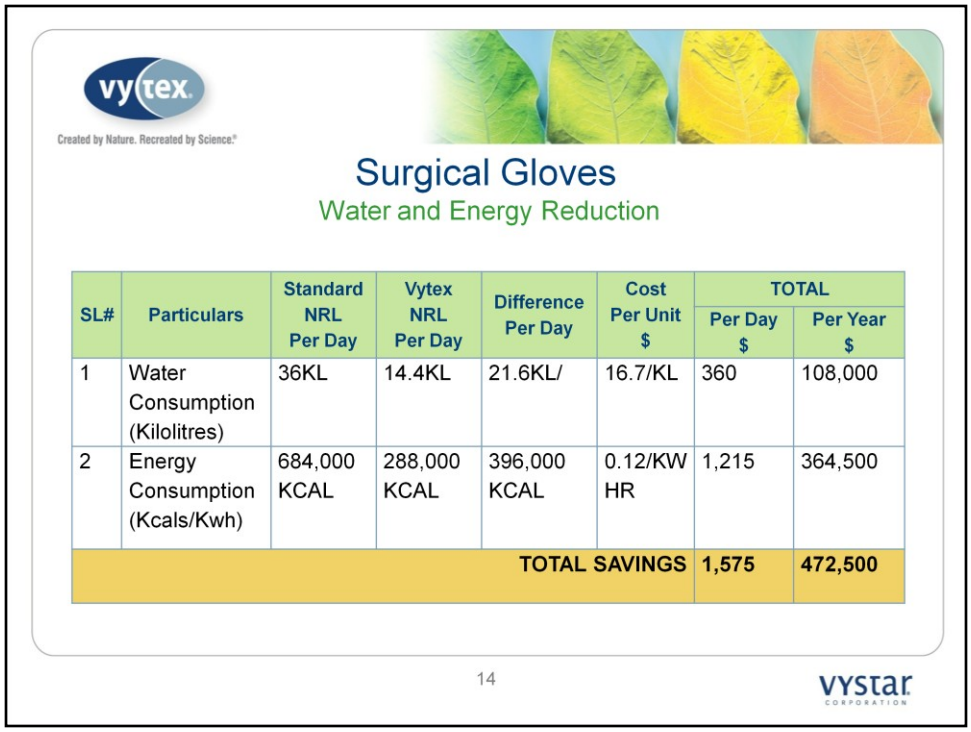


Depicted are the actual ELISA (ASTM 6499-07) antigenic protein test results for surgical gloves made with Vytex NRL and surgical gloves made with standard NRL produced at a major international surgical glove manufacturer's manufacturing facility.

The results reveal gloves made with Vytex NRL maintain low protein status at all stages of production, while the standard NRL gloves required off-line post leaching to achieve low protein status. The antigenic protein levels are low and are efficiently removed as seen in the post dipping data.

This is key for several reasons:

1) Using Vytex NRL allows manufacturers to achieve the recommended protein levels set forth by ASTM and SMG (Standard Malaysian Glove) (<10 µg/g antigenic proteins) after post dipping and does not require any additional post off-line leaching processes to achieve low protein status.
2) The opportunity to achieve the recommended protein levels after post dipping offers manufacturers using Vytex NRL **time & cost savings benefits** by eliminating post off- line leaching processes.



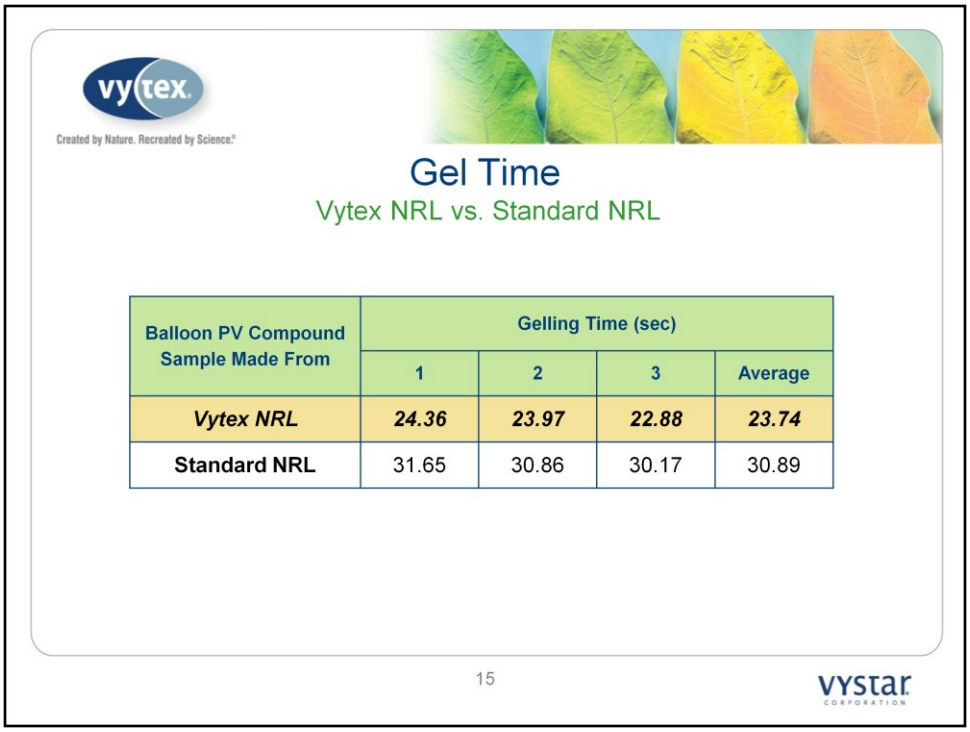
SL#	Particulars	Standard NRL Per Day	Vytex NRL Per Day	Difference Per Day	Cost Per Unit $	TOTAL	
						Per Day $	Per Year $
1	Water Consumption (Kilolitres)	36KL	14.4KL	21.6KL/	16.7/KL	360	108,000
2	Energy Consumption (Kcals/Kwh)	684,000 KCAL	288,000 KCAL	396,000 KCAL	0.12/KW HR	1,215	364,500
					TOTAL SAVINGS	1,575	472,500

The savings case study was calculated by a surgical glove manufacturer located in India. At a production rate of 110,000 pairs per day using the data in Table 6 of technical paper, the cost savings per pair is $0.0143 or $472, 000 in an annual cost saving opportunity when using Vytex NRL compared to standard latex. The offline water and energy savings for powder removal (prior to surface treatments e.g. chlorination/neutralization) are also being assessed and could provide additional savings.

In addition to the reduction in energy and water consumption, the Zn levels in the total discharges are reduced, thereby improving environmental compliance and potential for sewer and waste savings as well.

Note: Your cost savings will differ based on plant line configurations, processing methodologies and local costs of water and energy. The manufacturing scenario above is applicable to any dipped goods application where leaching is utilized to lower protein levels.

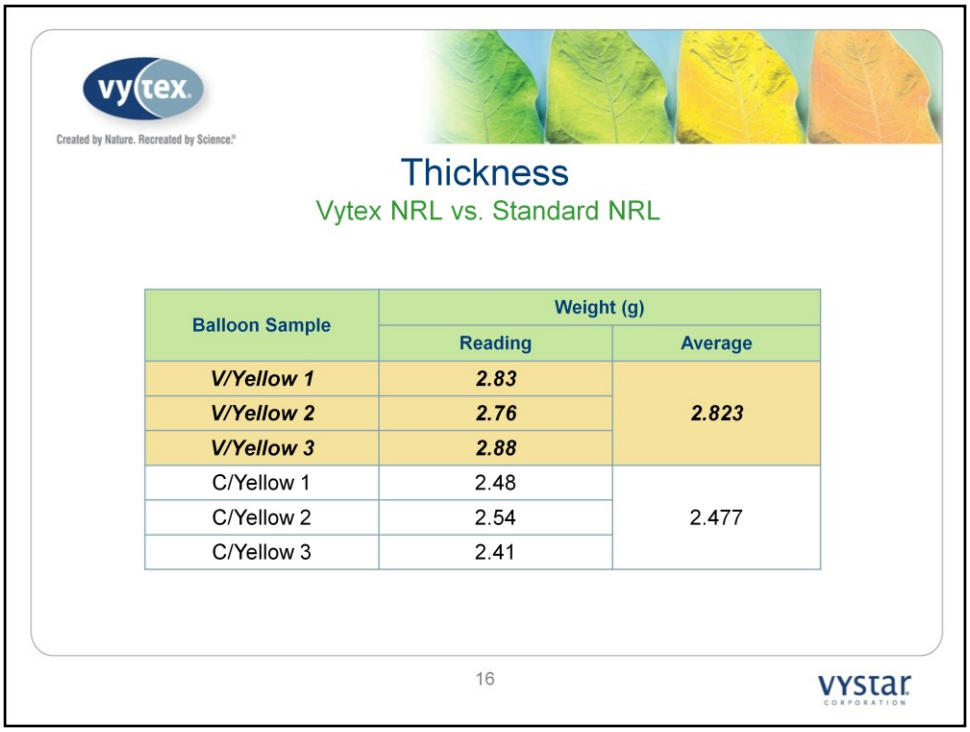
In this particular case study, the cost savings offsets the acquisition cost premium associated with Vytex NRL.



Balloon PV Compound Sample Made From	Gelling Time (sec)			
	1	2	3	Average
Vytex NRL	***24.36***	***23.97***	***22.88***	***23.74***
Standard NRL	31.65	30.86	30.17	30.89

Chart depicts the gel times of balloon compounds reported for Vytex NRL and standard NRL conducted by independent testing laboratory.

Results: Vytex NRL demonstrated an average gel time of 7 seconds faster than standard NRL. A reduced gel time decrease drying temperature and time, translating into a probable decrease in energy costs.

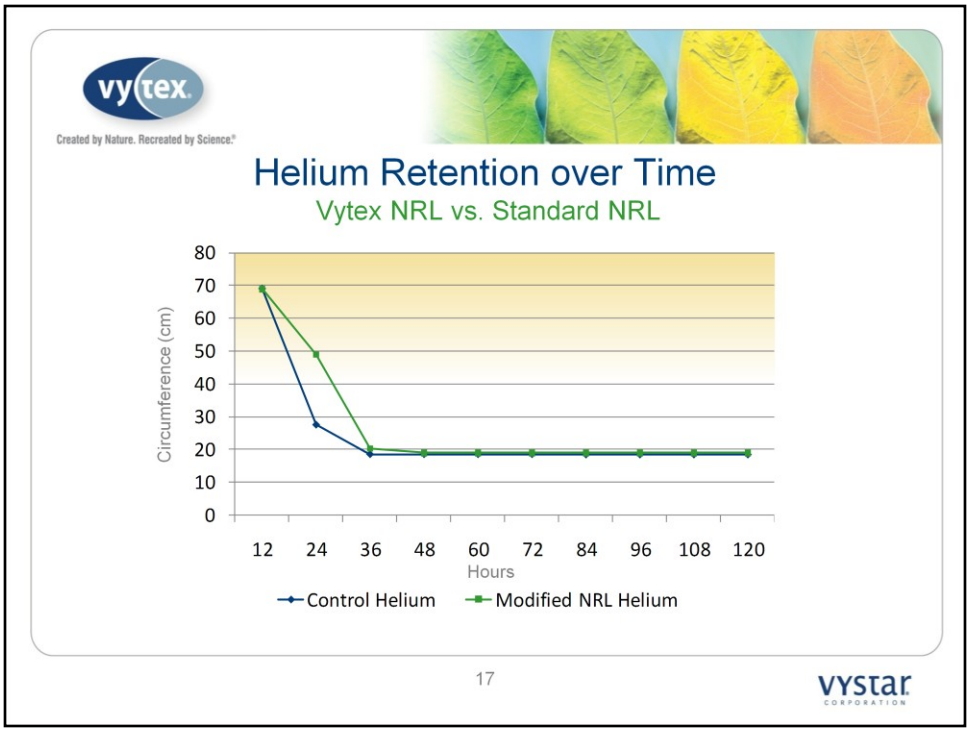


Balloon Sample	Weight (g)	
	Reading	Average
V/Yellow 1	***2.83***	***2.823***
V/Yellow 2	***2.76***	
V/Yellow 3	***2.88***	
C/Yellow 1	2.48	2.477
C/Yellow 2	2.54	
C/Yellow 3	2.41	

The pick-up from the dipping process of Vytex NRL and standard NRL was assessed on the weight of the balloons made from each in independent testing.

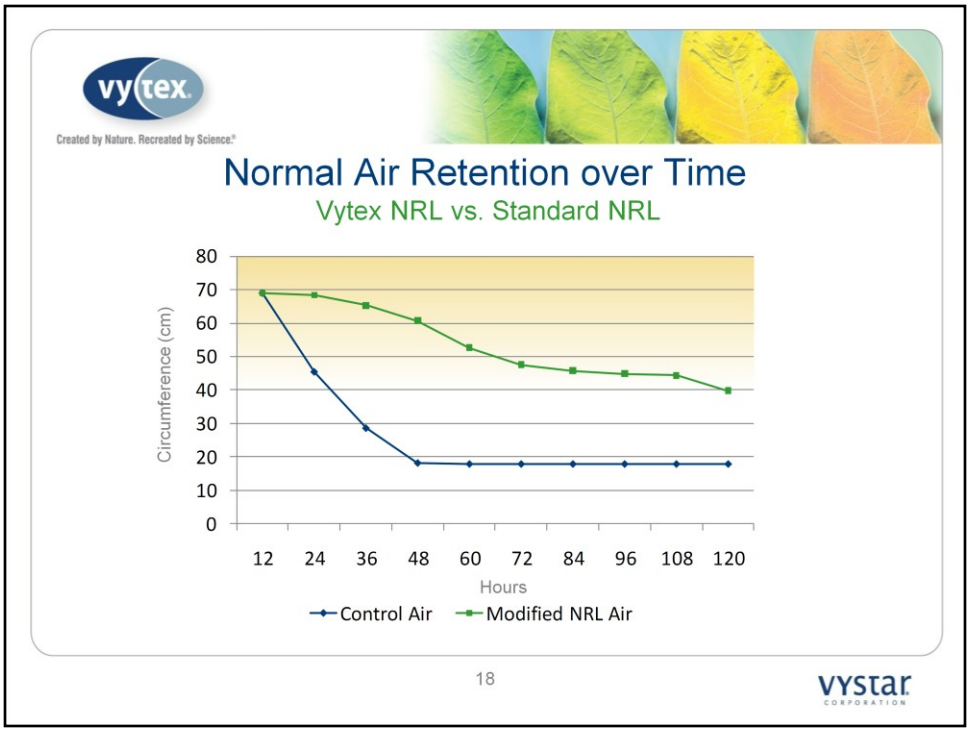
The thickness was measured using a standard thickness gauge and the weight was determined using an analytical balance.

The Results: The Vytex NRL balloons were 13.9% heavier than the standard NRL control. This suggests that dipping times can be reduced to achieve the same weight parameters.

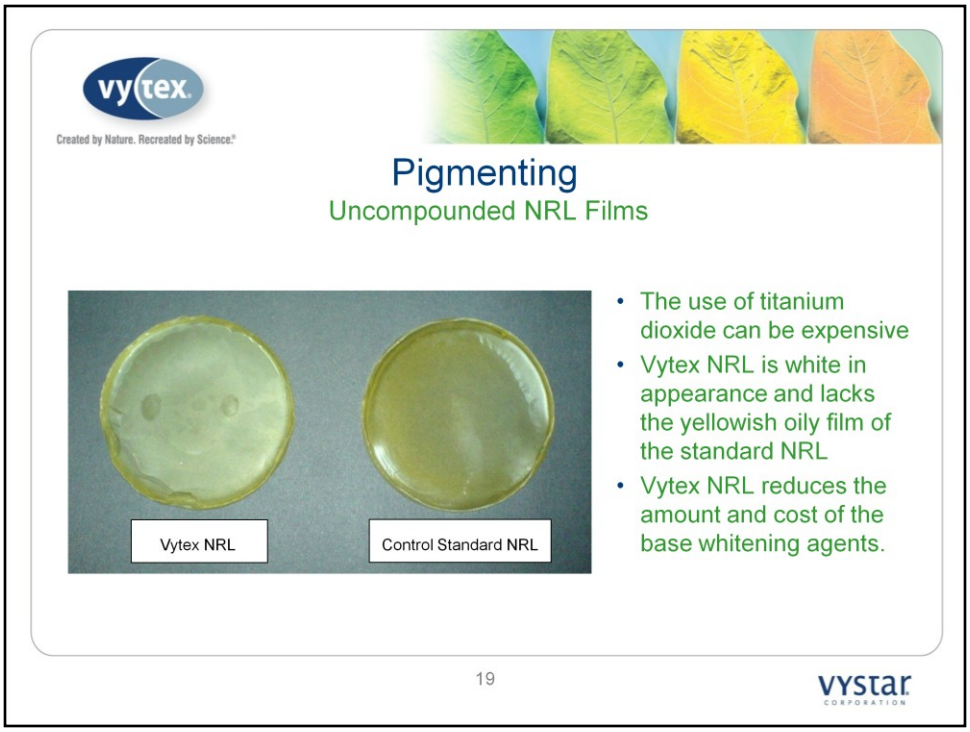


Independent testing was conducted to test our hypothesis that the removal of the non-rubbers from Vytex NRL would lead to tighter rubber particle integration, preventing the wicking loss of gas and air from within the balloon.

This first chart depicts the helium retention of Vytex NRL balloons compared to standard NRL. Balloons made with the Vytex NRL demonstrated approximately a 50% greater retention of helium after 36 hours compared to the standard NRL.

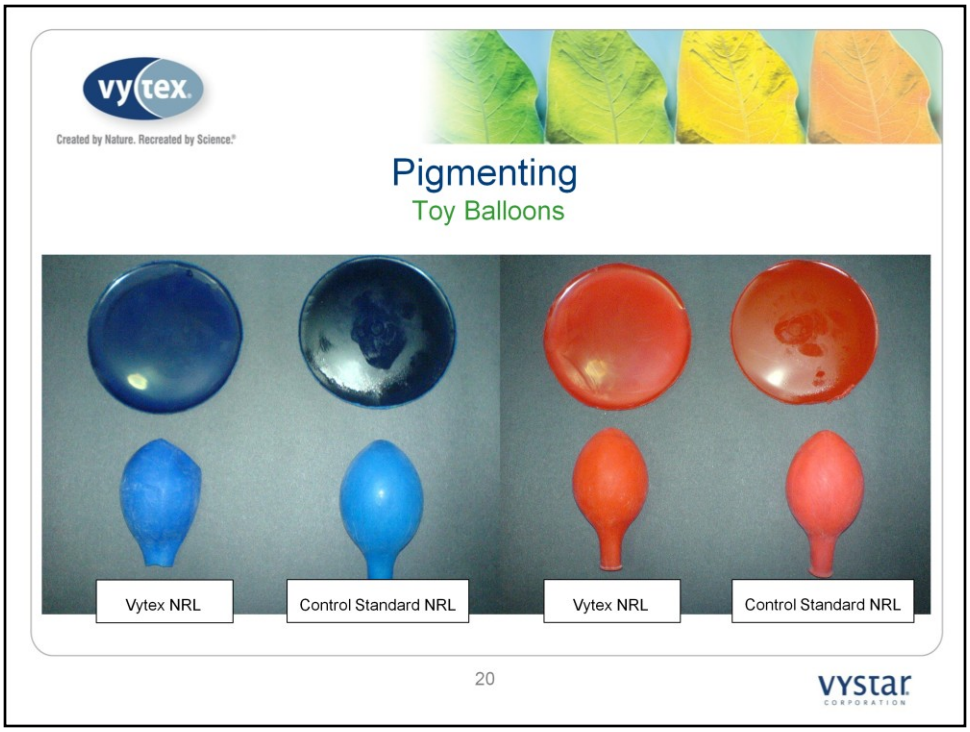


In same laboratory evaluation, when comparing air retention of Vytex NRL and standard NRL, balloons made with Vytex NRL maintained air retention at 60.6% on the fifth day compared to the standard NRL.



This shows the color differences between Vytex NRL and standard NRL. When liquid latex is dried and cured, the film dries semi-transparent yellow as seen above. Whiteners such as titanium dioxide or calcium carbonate are often added to latex to express whiteness in a finished product.

When viewing the Vytex NRL film on left compared to the control film on right, there is a marked difference in the Degree of yellowing between the Vytex NRL and the control. Evidence from the films demonstrates that this addition could be eliminated or significantly reduced using Vytex NRL, an additional material cost savings for the manufacturer.

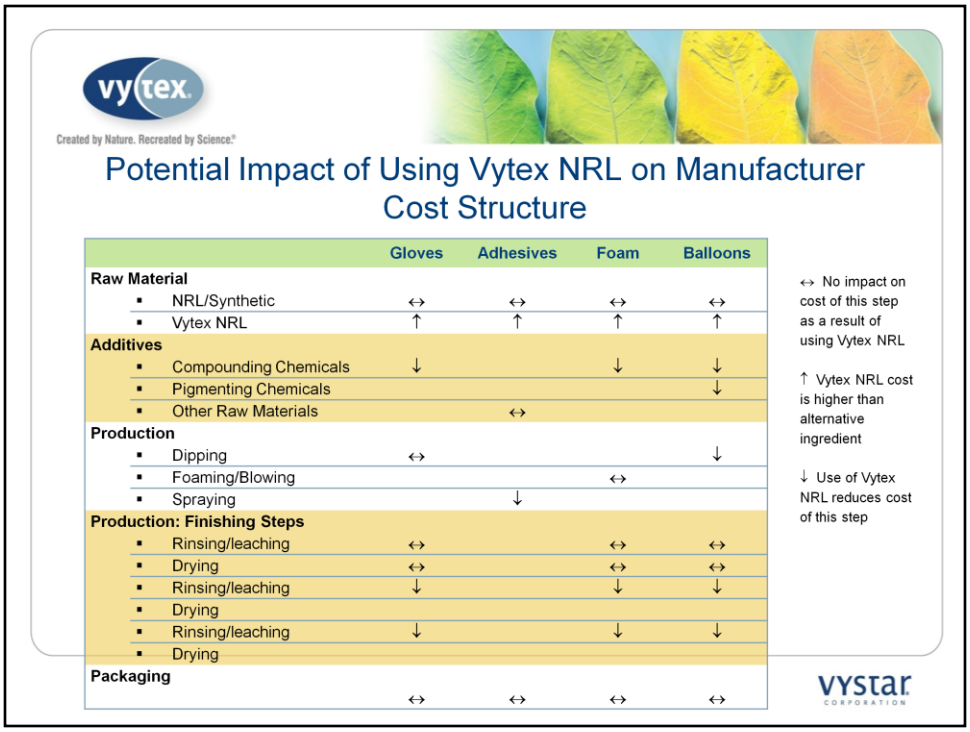


These side by side pictures highlight a comparison between Vytex NRL and standard NRL in colored balloons conducted at an independent testing lab. The same amount of pigment was used for both the Vytex NRL and control NRL.

Using typical industry practices, when the pigments are introduced, an oily yellowish tone was commonly observed with the blue and red in the regular latex. In contrast, the oily tone was absent on the pigmented balloons made with Vytex NRL as has now been verified by a major global balloon manufacturer.

As the pictures above illustrate, balloons made with Vytex NRL produced much more vibrant colors. Additionally, it can be assumed that Vytex NRL would require less pigment to achieve the same color tone and intensity as the Standard NRL, yielding another area of cost savings that can be achieved with the use of Vytex NRL.

Further cost savings can be achieved through the partial replacement of titanium dioxide with fine particle calcium carbonate dispersions to boost the color vibrancy of the Vytex NRL for certain colors such as red and blue.

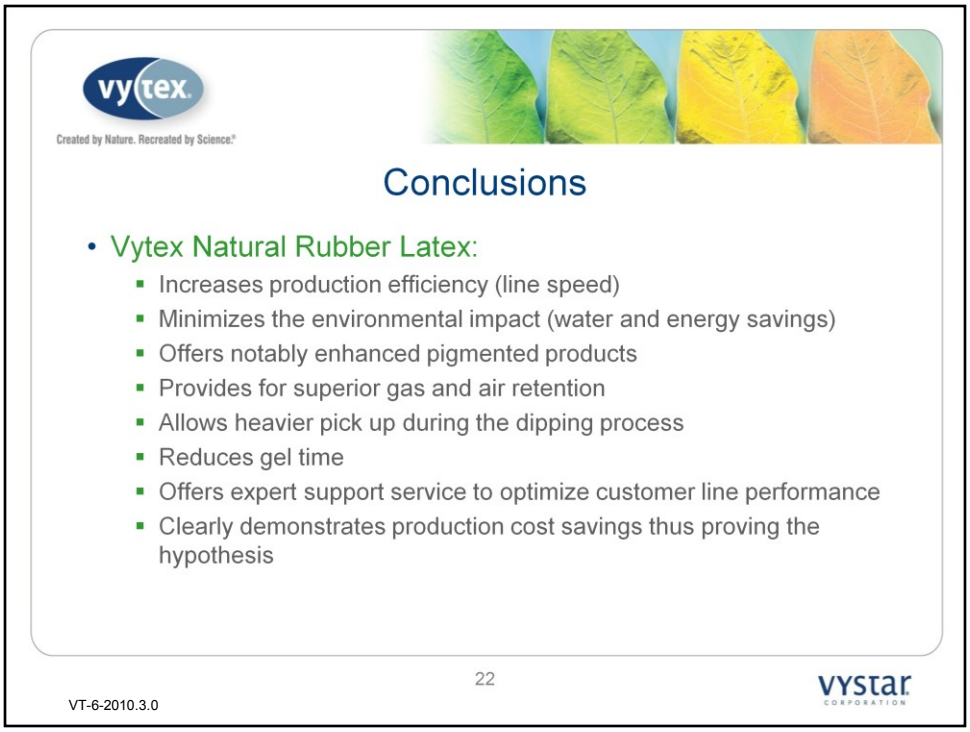


Looking at the costs across the entire production cycle, this chart allows you to see specifically the cost impact of Vytex NRL at each process step and by product application.

For example, the use of Vytex NRL can reduce the cost of compounding chemicals in gloves, foam and balloons But has no impact in adhesives. Decreased pigmenting in balloons and other dipped products such as breather bags, condoms and rubber tubing can be accomplished with Vytex NRL.

Within production – the secondary rinsing/leaching step can be eliminated in gloves, foam and balloons, reducing overall water and energy expense.

Collectively, the results detailed above illustrate that manufacturers can achieve savings in water, energy and material costs when upgrading to Vytex NRL.



Ultra low protein Vytex NRL provides enduring benefits to manufacturers through performance enhancements, significantly reduced protein levels and production cost savings and improvements.

These benefits include:

- Increases production efficiency – increased line speeds and output due to Vytex NRL's stability and consistency
- Reduces environmental impact – manufacturer case study documents the potential water and energy savings in a surgical glove operation
- More vibrant colors in balloons, condoms and gloves offering a point of differentiation in a highly competitive market
- Balloons stay inflated longer when compared to standard NRL leading to enhanced customer satisfaction
- Better pick up during the dipping process reduces raw material consumption
- Reduces gel time, lowering drying time and temperature and reducing energy costs
- Extensive global network of technical advisors and support
- Increased performance attributes, coupled with the documented cost savings potential, demonstrates that the initial Vytex NRL acquisition cost premium can be offset – sometimes more can be less.