AFLatex technologies

REINVENTADO CAUCHO
- LIBRE DE AMONIACO -

AFLatex technologies

PROCESAMIENTO DE LATEX SIN AMONIACO

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AFLatex technologies

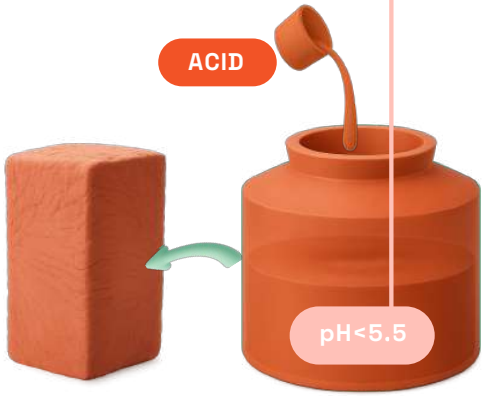
Environmentally friendly natural rubber & latex eliminates toxic additives

- Odorless and non-toxic Nitrosamine free
- Superior mechanical properties
- No water treatment facilities required
- Eliminates health risks to rubber industry workers
- Lower allegenic protein content
- Extended latex shelf life to over 6 years
- In-house R&D and patented technologies
- Working in partnership with multiple companies

Natural rubber latex **and pH**

ACIDIC

1 2 3 4 5 6



CONTROLLED COAGULATION (88%)

NEUTRAL

7

NATURAL RUBBER LATEX

ALKALINE

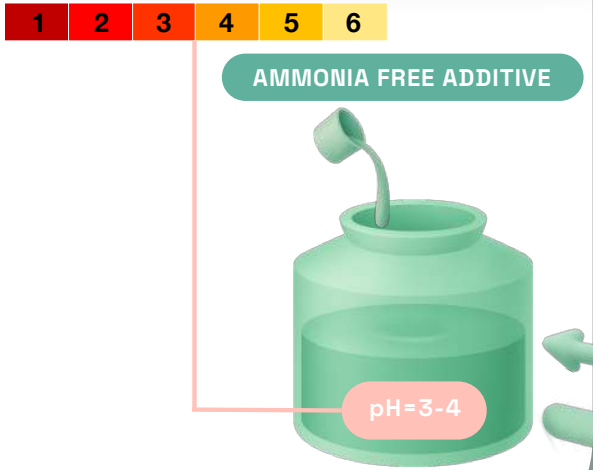
8 9 10 11 12 13 14

Ammonia, ZnO and TMTD

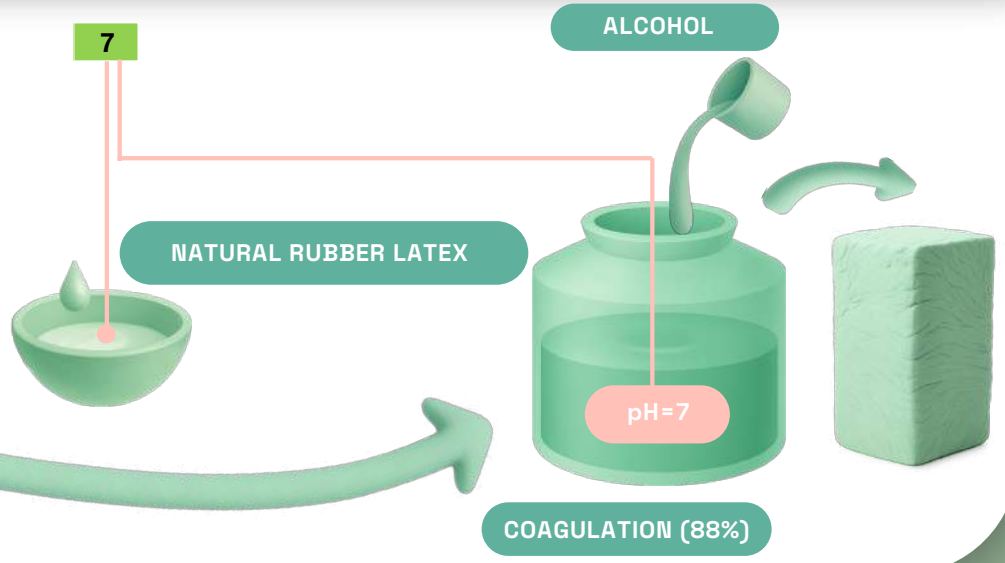
PRESERVATION AND STABILIZATION (12%)

Natural rubber latex **and pH**

ACIDIC

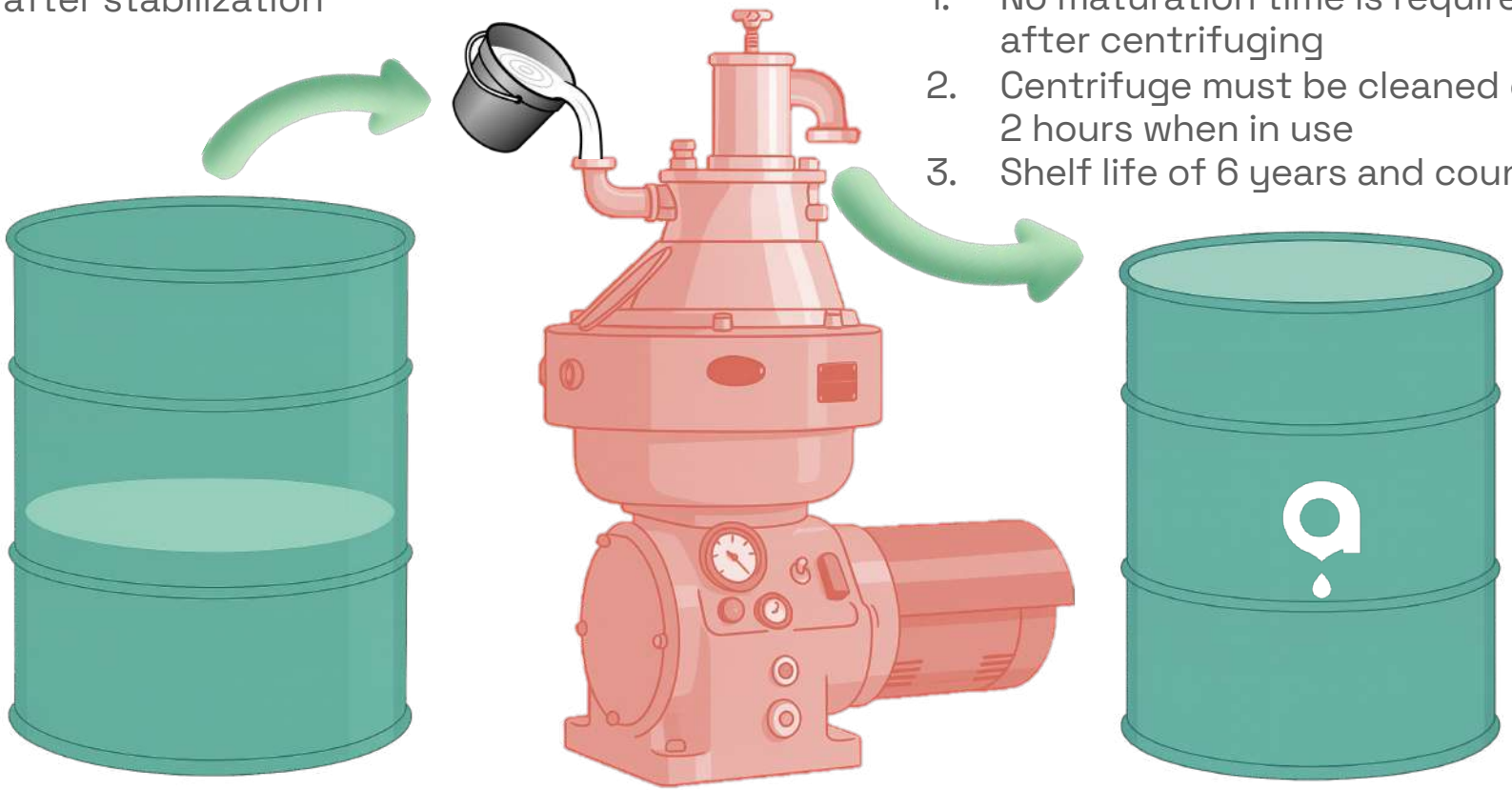


NEUTRAL



AFLATEX CENTRIFUGING PROCESS

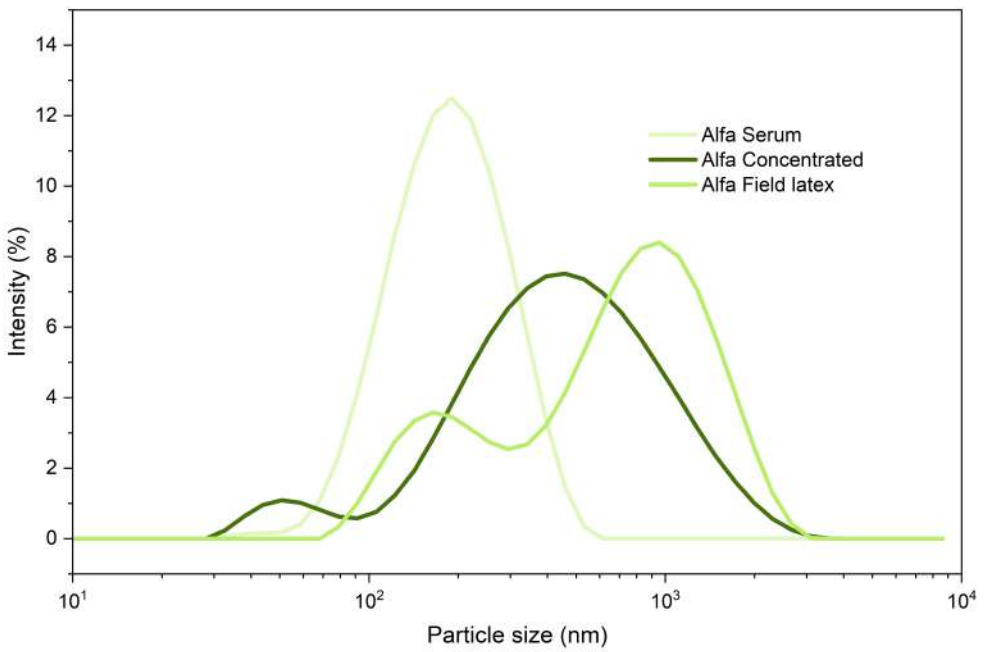
Notes: Latex can be centrifuged anytime after stabilization

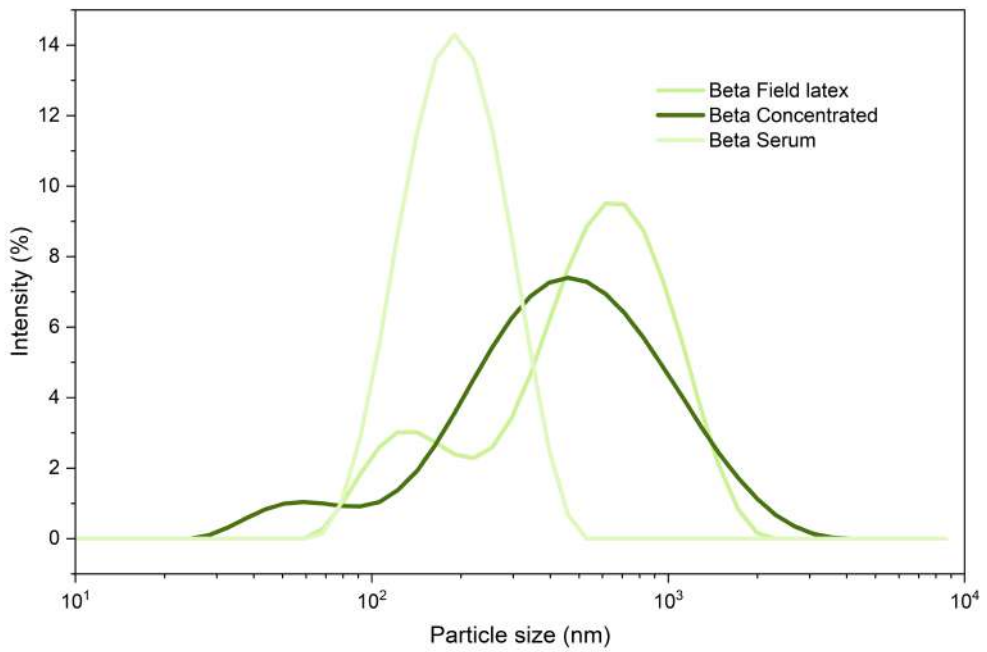


Notes:

1. No maturation time is required after centrifuging
2. Centrifuge must be cleaned every 2 hours when in use
3. Shelf life of 6 years and counting

PARTICLE SIZE DISTRIBUTION





NITROSAMINE TESTING

TABLE 1: NITROSAMINES TESTING

AFLatex Alfa Field Latex	
PARAMETER	**RESULTS, ug/kg**
N-Nitroso-di-n-propylamine	<10
N-Nitrosomethylethylamine	<10
N-Nitrosodi-n-butylamine	<10
N-Nitrosodimethylamine	<10
N-Nitrosodiethylamine	<10
N-Nitrosopyrrolidine	<10
N-Nitrosopiperidine	<10
N-Nitrosomorpholine	<10
N-Nitrosodiethylphenylamine	<10
N-Nitrosomethylphenylamine	<10
N-Nitrosodiisononylamine	<10
N-Nitrosodibenzylamine	<10

TABLE 2: NITROSAMINES TESTING

AFLatex Alfa Concentrated Latex	
PARAMETER	**RESULTS, ug/kg**
N-Nitroso-di-n-propylamine	<10
N-Nitrosomethylethylamine	<10
N-Nitrosodi-n-butylamine	<10
N-Nitrosodimethylamine	<10
N-Nitrosodiethylamine	<10
N-Nitrosopyrrolidine	<10
N-Nitrosopiperidine	<10
N-Nitrosomorpholine	<10
N-Nitrosodiethylphenylamine	<10
N-Nitrosomethylphenylamine	<10
N-Nitrosodiisononylamine	<10
N-Nitrosodibenzylamine	<10

ALL NITROSAMINES WERE UNDETECTED

EPA 8270-SIM Testing: Performed at ARDL

Adapted from ASTM 1076-15

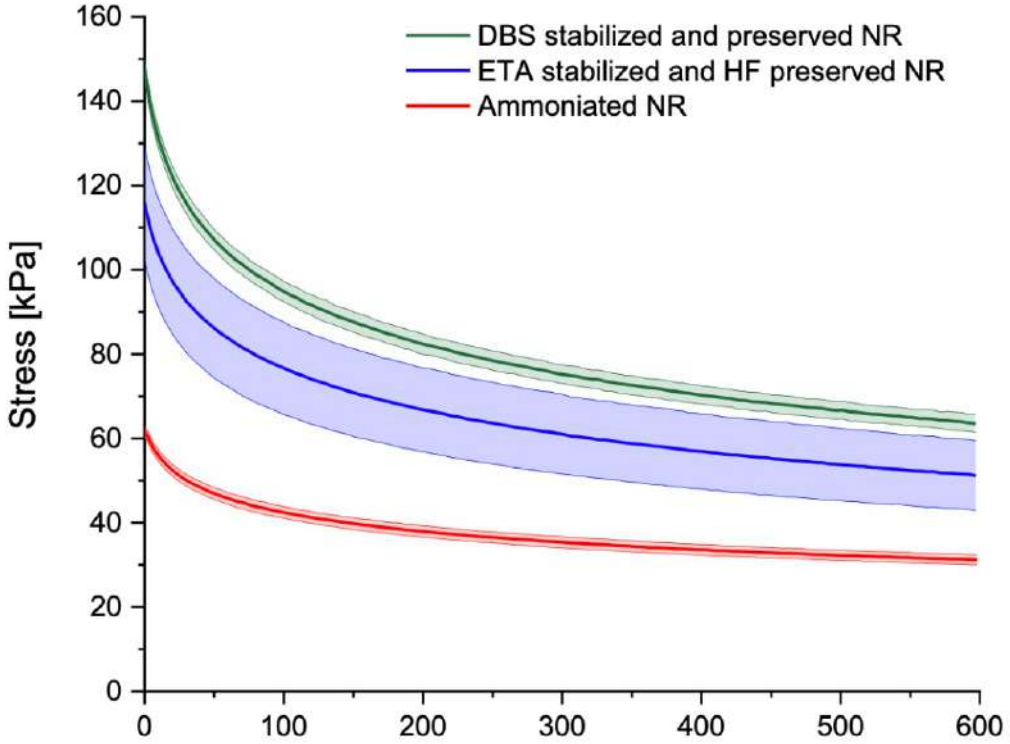
Note:

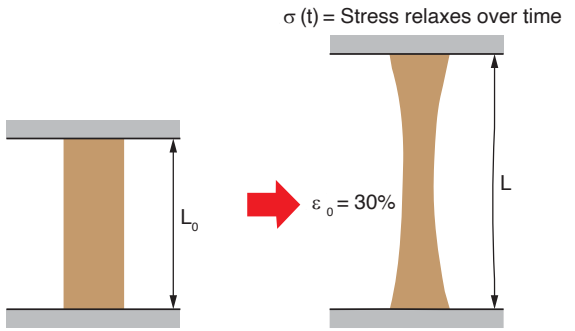
Centrifuged ammoniated latex is
diluted to 55% DRC with 1.6% ammonia solution

AFLatex is diluted to 55% DRC with distilled water

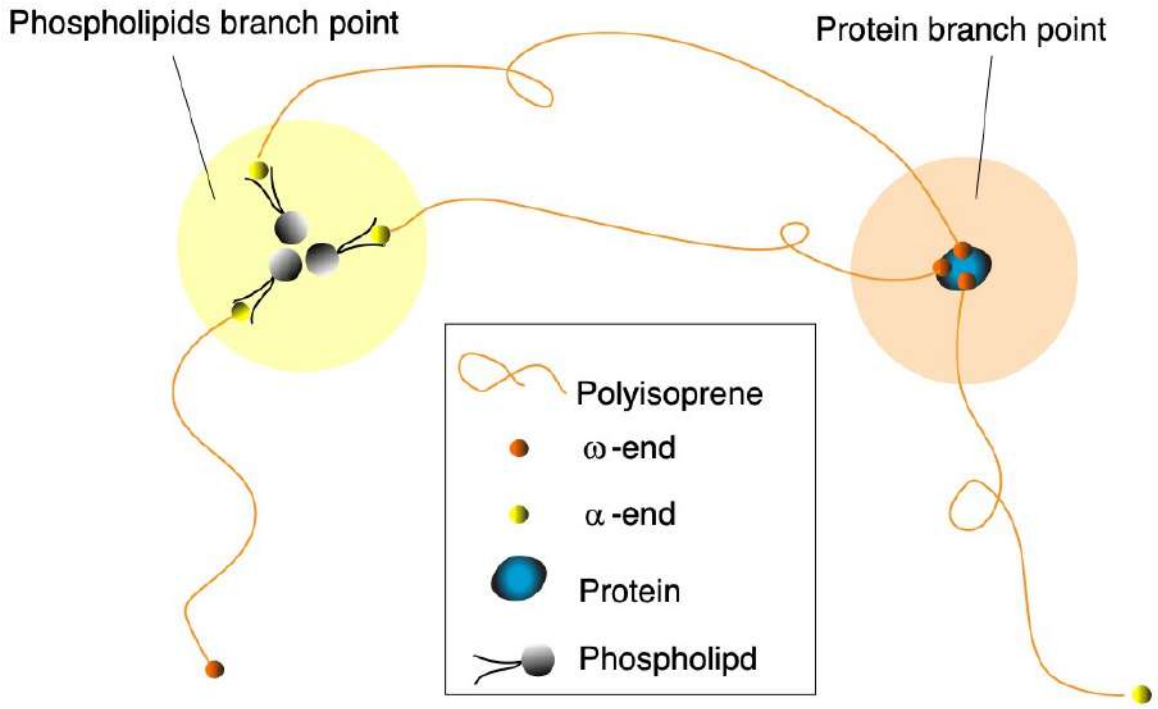
ALFA: MST between 800 and 1000 seconds
BETA: MST between 800 and 1200 seconds

AFLatex VS Ammoniated Natural Rubber

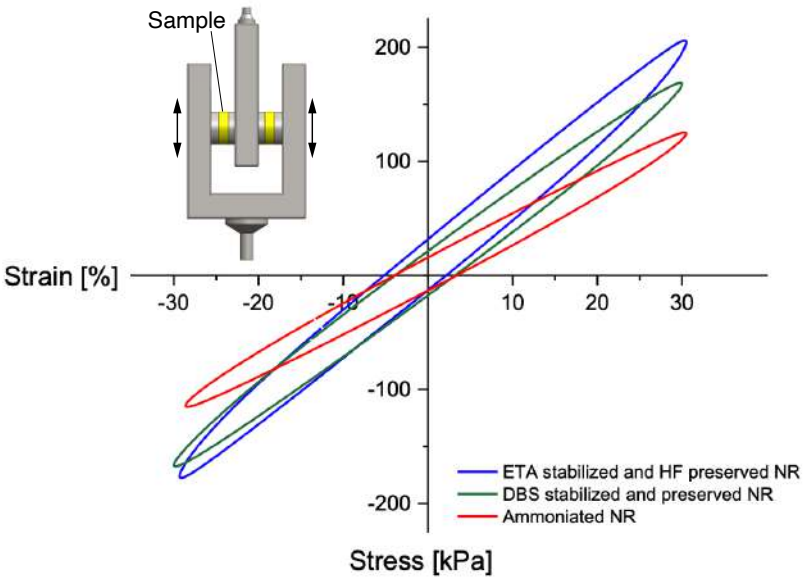


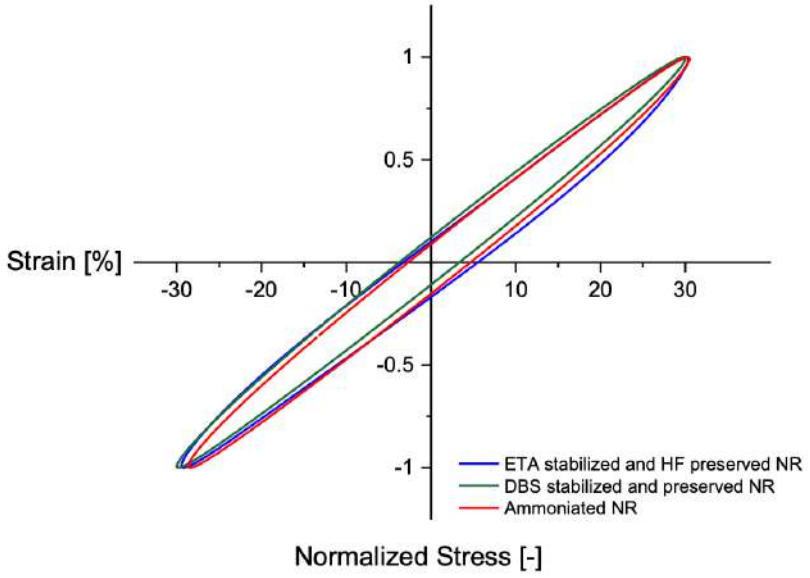


Protein and Phospholipids Branch Points



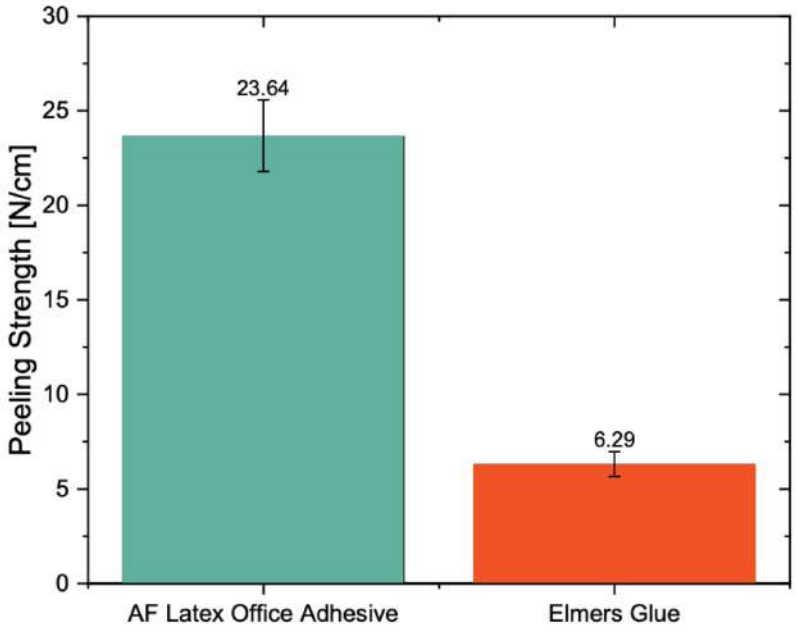
AFLatex VS Ammoniated Natural Rubber



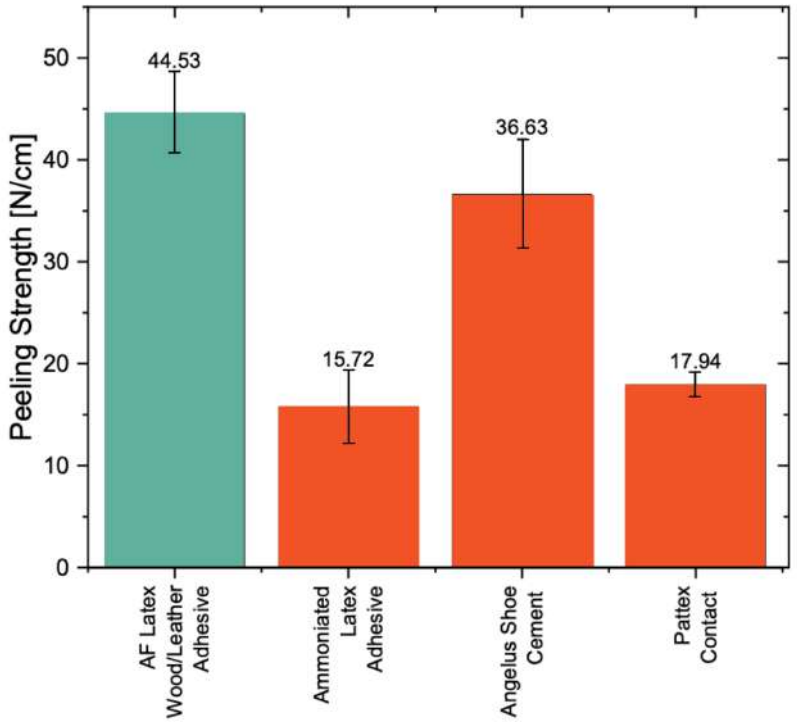


Peel Test

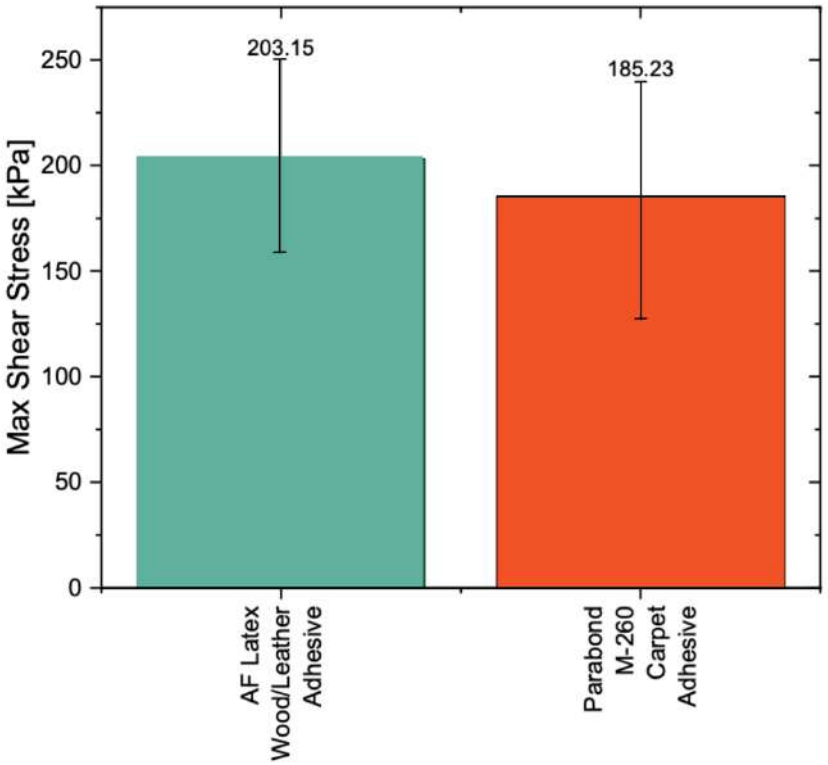
FIELD LATEX 35% DRC

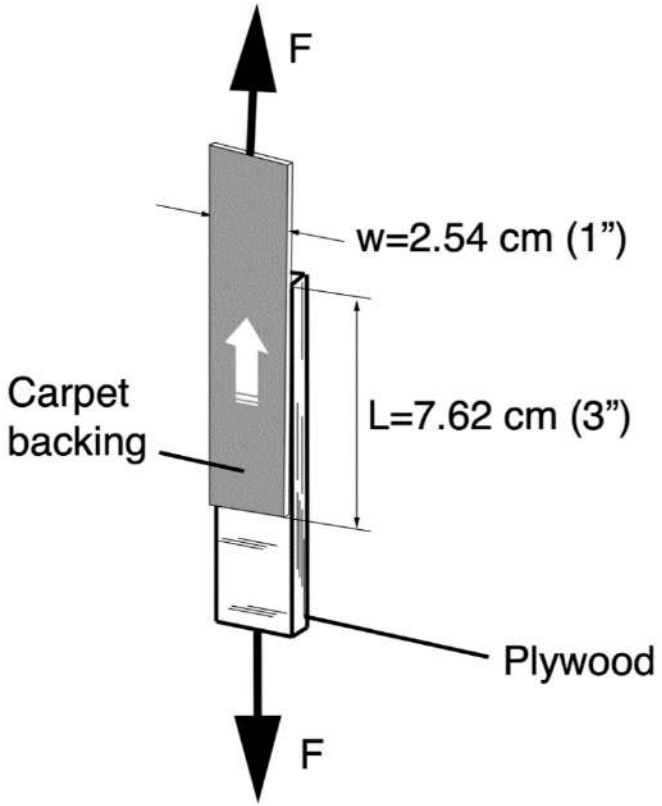


CENTRIFUGED LATEX 60% DRC



CENTRIFUGED LATEX 60% DRC





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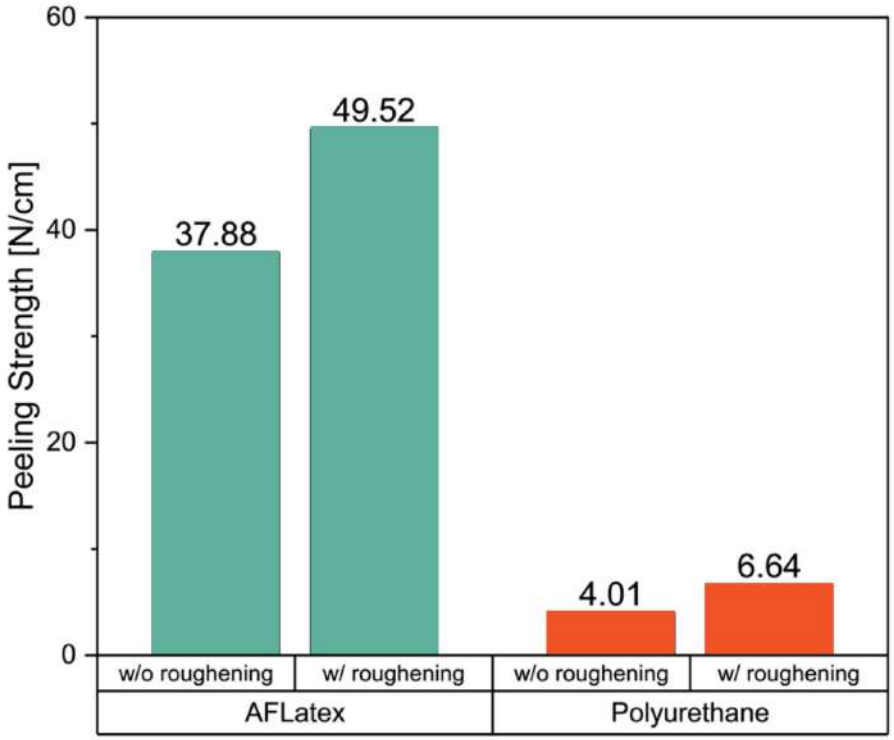


Adhesive performance across multiple surfaces
- Peel strength -

NATURAL RUBBER TO NATURAL RUBBER

+425%
IMPROVEMENT

RUBBER TO LEATHER

+30%
IMPROVEMENT

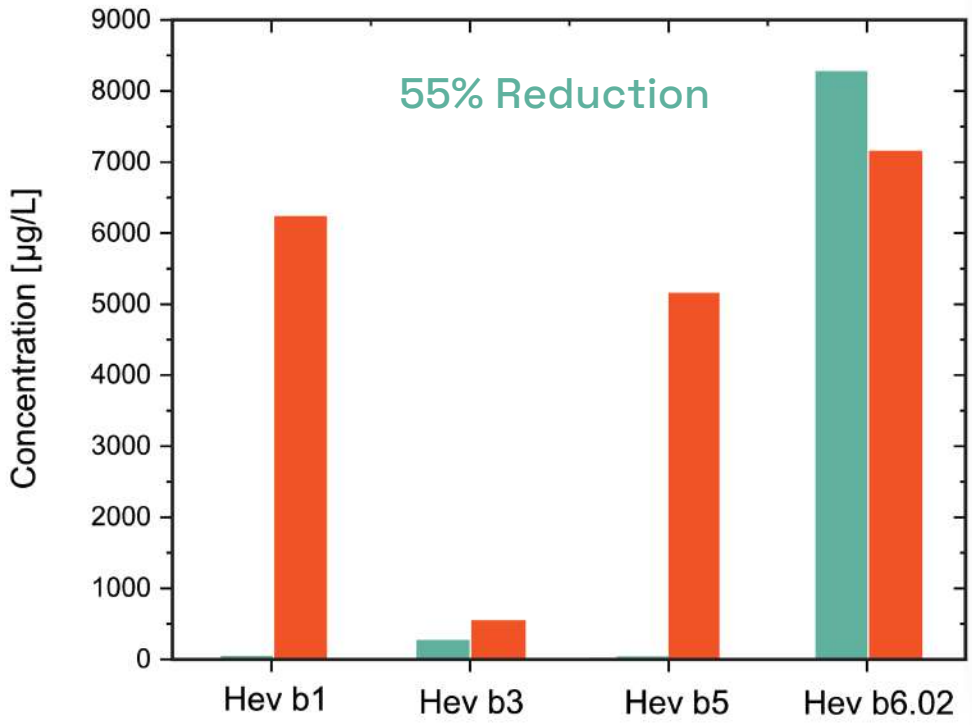
BOARD TO RUBBER

+41%
IMPROVEMENT

LEATHER TO LEATHER

+150%
IMPROVEMENT

ELISA TEST RESULTS ASTM 7427



MAIN ALLERGENS

Affects Spina Bifida Patients	**Hev b1**
Affects Spina Bifida Patients	**Hev b3**
Affects Health Care Workers	**Hev b5**
Affects Health Care Workers	**Hev b6.02**

AFLatex VS Ammoniated Natural Rubber

AFLATEX is Nitrosamine Free

Mechanical Strength
73% increase

Allergenic Proteins
55% reduction

Shelf Life
1000% increase

Cosmetics and Facial Masks

AMMONIA FREE – NITROSAMINE FREE
60% DRC LATEX IS BEING ADOPTED BY VARIOUS COMPANIES IN THE US

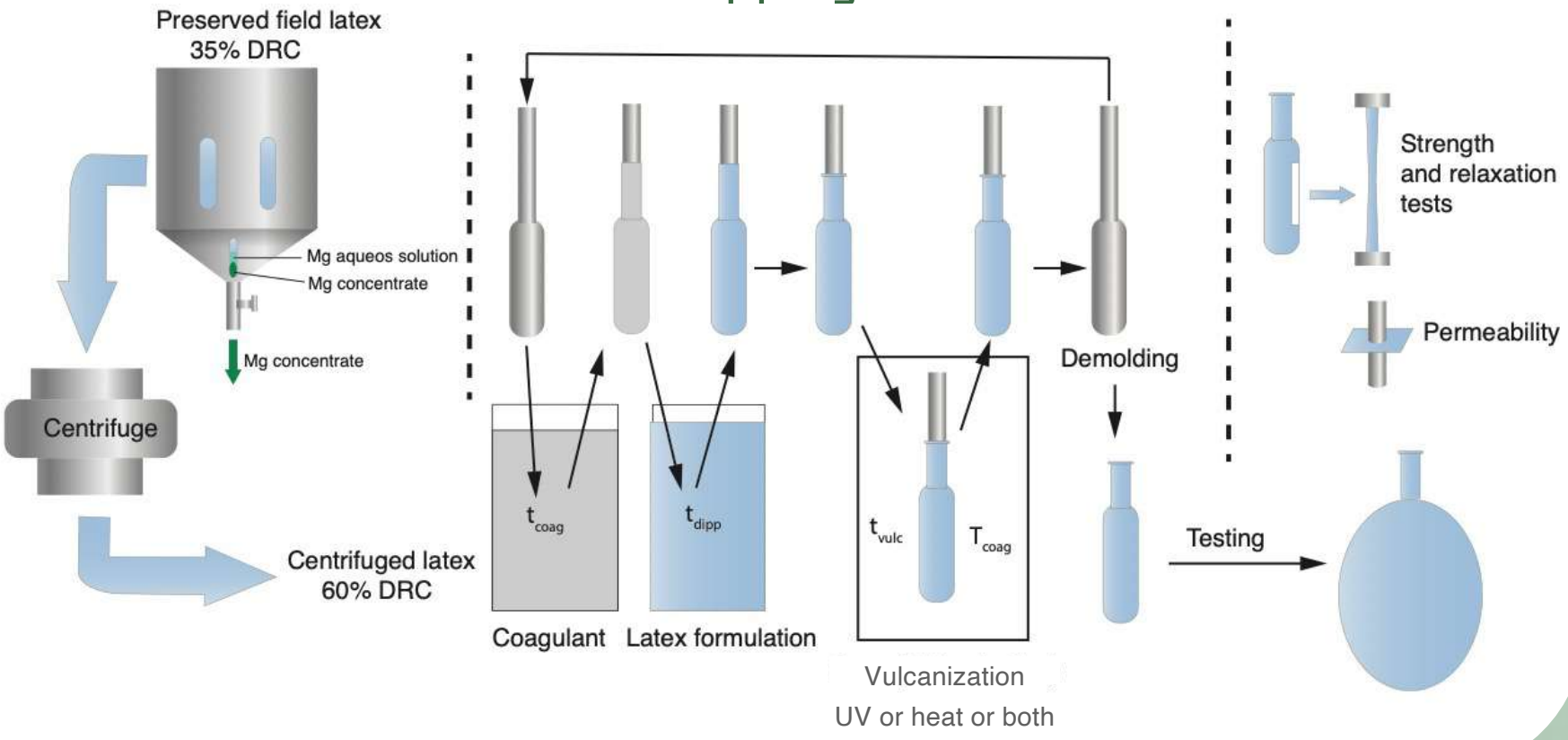
REPLACING AMMONIATED LATEX

Dipping Process

CURRENTLY OPTIMIZING THE COAGULANT AND LATEX FORMULATIUON

TESTING STRENGTH, RELAXATION BEHAVIOR AND PERMEABILITY PROPERTIES

AFLatex Dipping Process



DIPPING PROCESS

DIPPING PROCESS

GUANTES LASHER

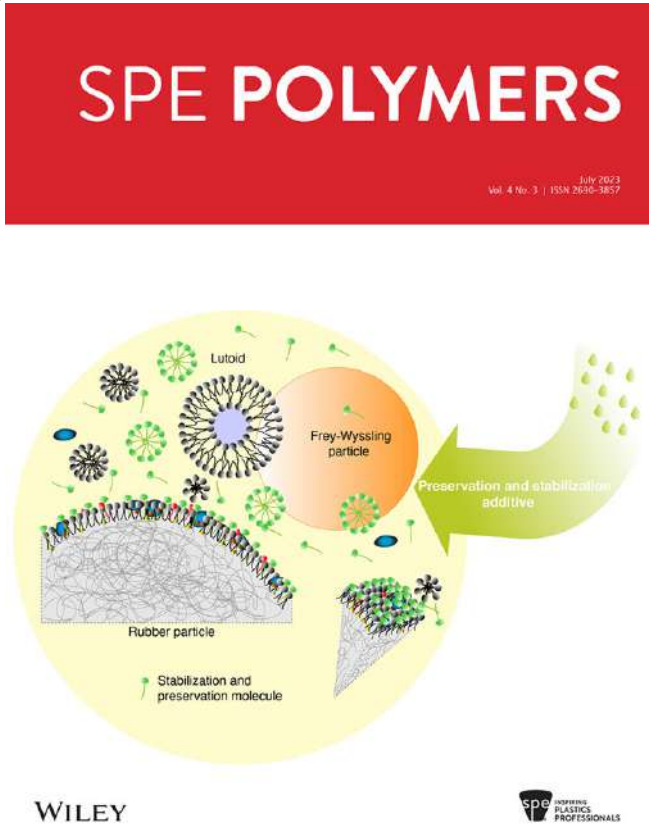
www.lasher.com.co

CASTING PROCESS

CURRENTLY COLLABORATING WITH **WHATTHEFUTURE** IN AMSTERDAM USING AFLATEX AND THEIR 3DTI TECHNOLOGY

WHAT THE FUTU RE

CASTING PROCESS



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Osswald, T.A., Rodríguez, J.C., Adler, E.P., Estela Garcia, J.E., Pardo Morales, G. and Román, A.J., "A Novel Ammonia-Free Preservation and Stabilization Process for Natural Rubber Liquid Latex in an Acidic Environment," Latex Handbook, Chapter, TechnoBiz (2024)

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Dibisa, O., J.C., Román, A.J.,Cabush, H., O'Brien, G., Kuang, X. and Osswald, T.A.,"Ammonia-Free Natural Rubber Latex Photo-Resin for Sustainable 3D Printing of Highly Stretchable and Tough Elastomers," *SPE-Polymers*,1-16, DOI: 10.1002/pls2.70011 (2025)

ALSO PUBLICATIONS IN RESEARCH OUTLOOK, RUBBER NEWS, RUBBER WORLD AND SLTCAUCHO

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LET`S REINVENT RUBBER
FROM FILTHY TO FUTURE-PROOF