

Verbasnol™

*A NuLiv Science proprietary verbascoside produced
by a proprietary extraction technology*

Validated by HPLC as a true verbascoside (a caffeoyl
phenylethanoid glycoside (C₂₉H₃₆O₁₅))

A well studied multipotent antioxidant for topical
and oral skin applications

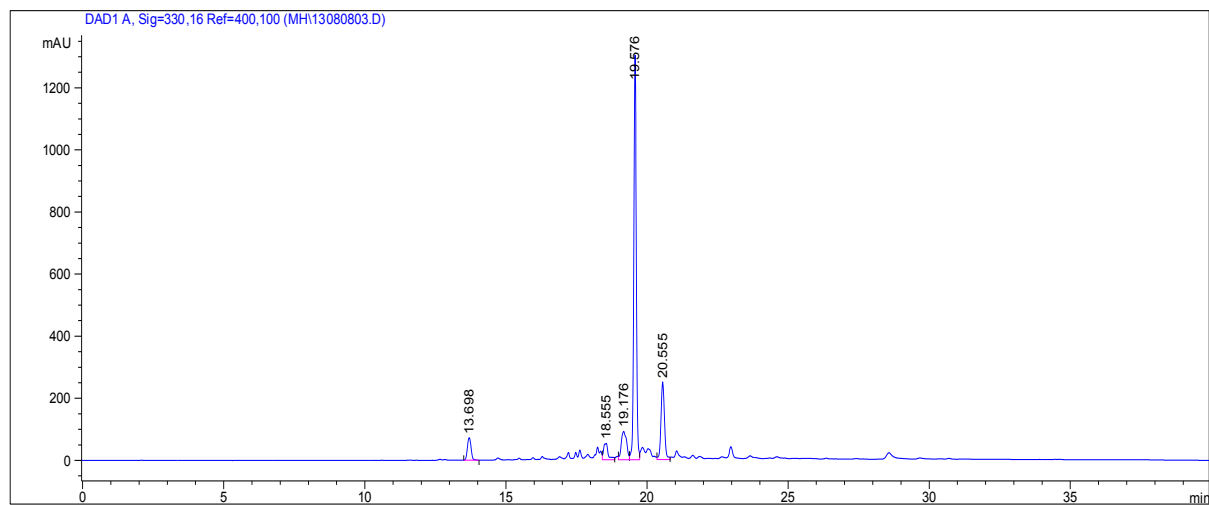
VERBASNOL™ VERBASCOSIDE

Verbasnol™ is NuLiv Science's proprietary verbascoside (a caffeoyl phenylethanoid glycoside ($C_{29}H_{36}O_{15}$)) extracted from *Rehmannia glutinosa* by a proprietary extraction technology. Verbasnol™ has been validated as a true verbascoside by HPLC chromatography.

Verbascoside has shown to be effective for:

- Anti-acne
- Anti-aging
- Anti-Erythema
- Anti-inflammatory
- Anti-Malassezia
- Anti-oxidant
- Collagenase inhibitor
- Sebum regulating
- Tyrosinase inhibitor

For details, please see "View Scientific Papers"



HOW VERBASCOSIDE WORKS

Propionibacterium acnes (*P. acnes*) is associated with acne lesions and leads to cutaneous inflammation. Verbascoside has anti-acne activity by inhibiting *P. acnes* growth. Verbascoside has shown to decrease the pro-inflammatory chemokine IL-8 expression to exert an anti-inflammatory activity on skin cells.

Verbascoside inhibits *Malassezia furfur*, a lipophilic yeast, growth that is implicated in numerous skin infections, including pityriasis versicolor, seborrheic and atopic dermatitis, dandruff and folliculitis.

Verbascoside exerts a remarkable antioxidative property by scavenging the free radical species that is implicated in oxidative stress in human skin aging. Verbascoside also inhibits the production of tyrosinase that catalyzes the production of melanin to darken the skin.

Verbascoside inhibits 5 α -reductase activity of skin sebum production to control androgen homeostasis in human skin.



ANTI-ACNE ACTIVITY



| Material Tested | Dilution | MIC (ug/ml) | % |
|-----------------|----------|----------------|------|
| Verbascoside | 1:16 | 625 | 0.06 |
| Triclosan | 1:8 | 400 | 0.04 |
| Salicylic Acid | <1:4 | >2000 | >0.2 |

Verbascoside was found to be effective against *P. acnes* at low use levels. Methods confirmed by spectrophotometry at 405nm with BioRad 3550-UV microplate reader.

ANTI-ACNE ACTIVITY

Protocol

- Evaluation of 29 volunteers (15-25 years old) affected by papulopustular (12) and comedonal (17) acne
- Cream containing 1% Verbascoside applied twice daily for 30 days
- Count of acneic lesions (closed comedones, open comedones, papules, pustules) on the face at 15 and 30 days
- Instrumental evaluation: skin hydration, color, TEWL, sebum (data not shown)



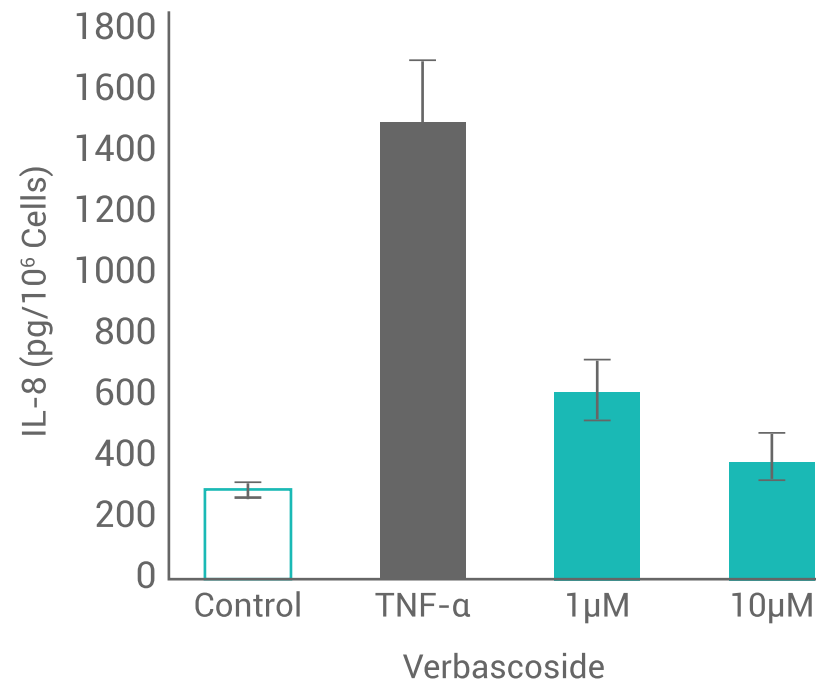
BEFORE



AFTER

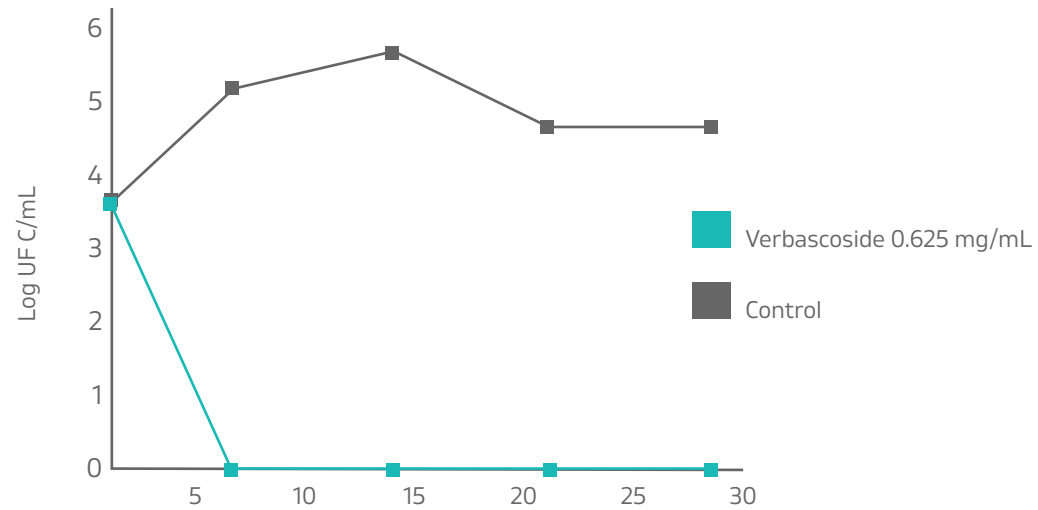
Verbascoside reduces acne lesions by 40% after just 30 days of treatment and provides a significant reduction in inflammation and pigmentation.

ANTI-INFLAMMATORY ACTIVITY



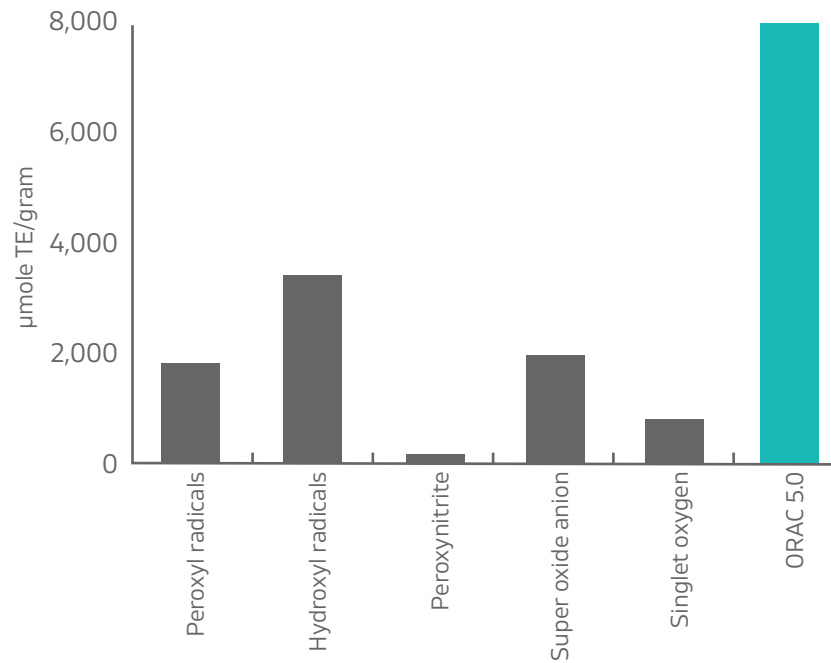
Verbascoside shows a strong anti-inflammatory activity since it induces a dose-dependent decrease of the expression of the pro-inflammatory chemokine IL-8 on primary cultures of human keratinocytes stimulated by TNF- α .

ANTI-MALASSEZIA FURFUR ACTIVITY



Verbascoside is a strong inhibitor of *Malassezia furfur* yeast growth with a MIC (Minimum Inhibitory Concentration) of 0.625 mg/mL.

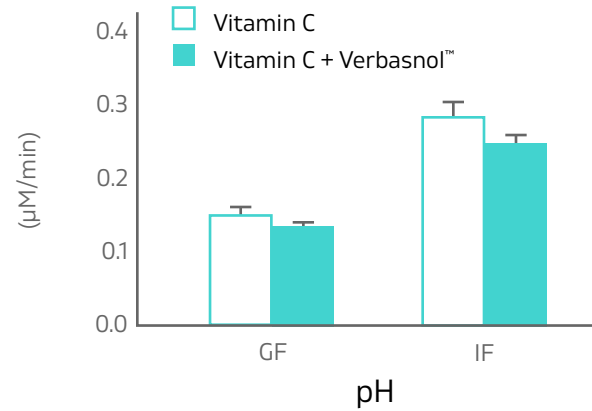
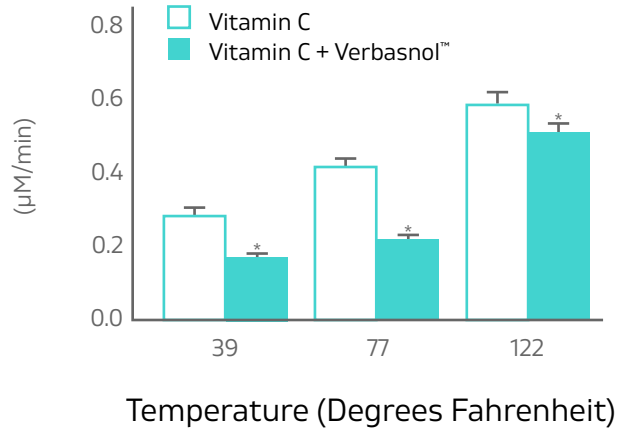
ANTI-OXIDANT ACTIVITY



Customer: NuLiv Science
Sample Identification: Batch #: B-14657
Description: VerbasNol (Verbascoside 10%), powder, MRTGH131122

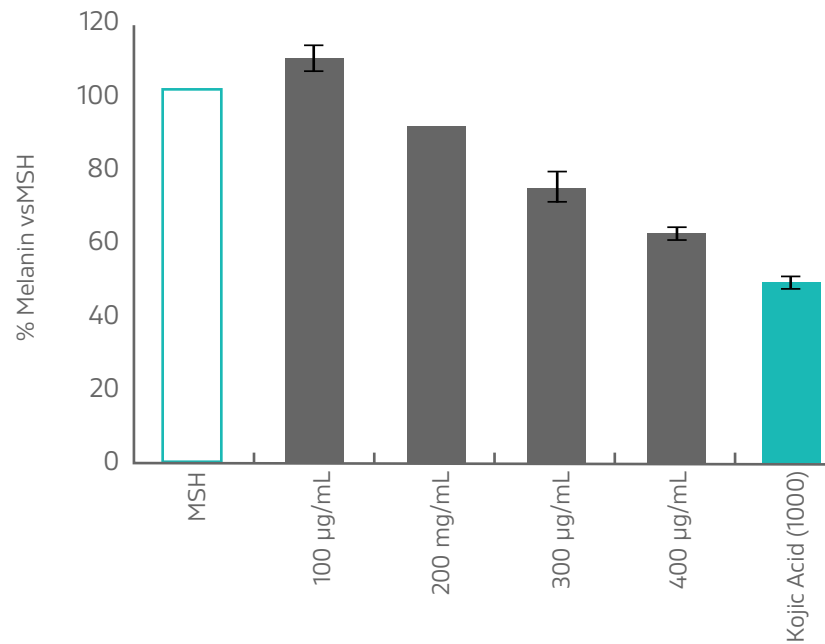
Verbascoside quenches all free radical species to offer total protection anti-aging function.

VITAMIN C DEGRADATION



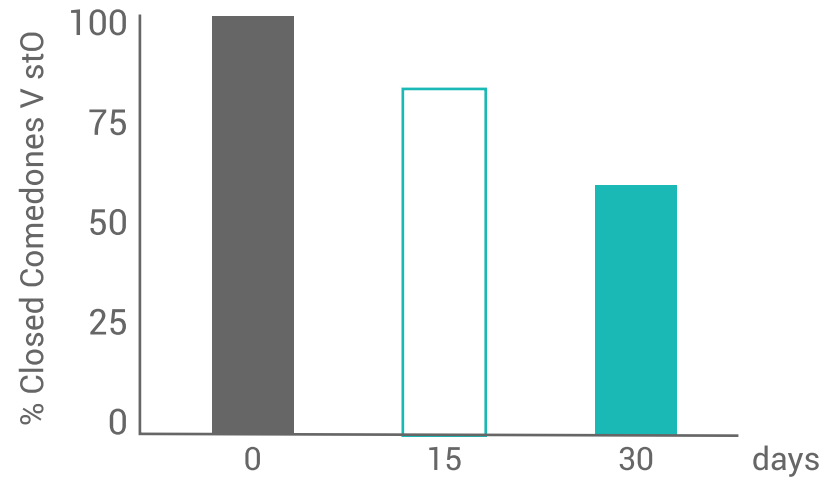
An internal study assessed the effect of Verbasnol™ on the stability of vitamin C at temperatures ranging from 39°F to 122°F and in gastric and intestinal fluids. Vitamin C is also easily degraded at high pH. In our gastrointestinal tract, pH varies from highly acidic in the stomach (pH 1-3) to neutral or slightly alkaline in the duodenum (pH 6) and along the jejunum and ileum (pH 6-7.5).

ANTI-TYROSINASE ACTIVITY



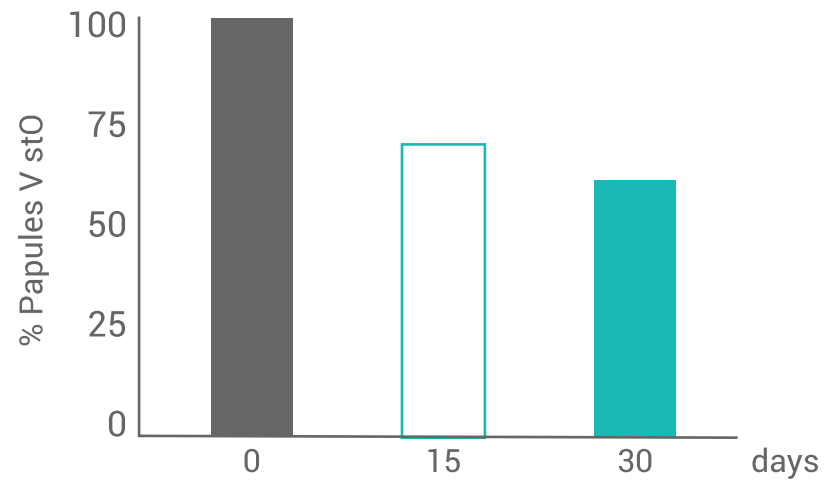
Verbascoside produces a significant reduction (~40%) at 400µg/mL, of the melanin synthesis in cultured melanocytes. This is comparable to the inhibition of ~50% reached by the positive reference standard (1000µg/mL kojic acid).

CLOSED COMEDONES



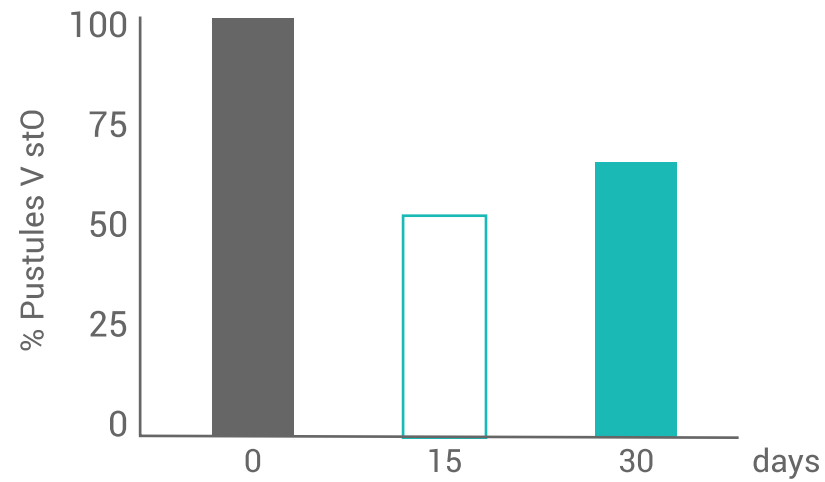
Reduction of the number of comedones (open and closed) in 93% of patients.

PAPULES



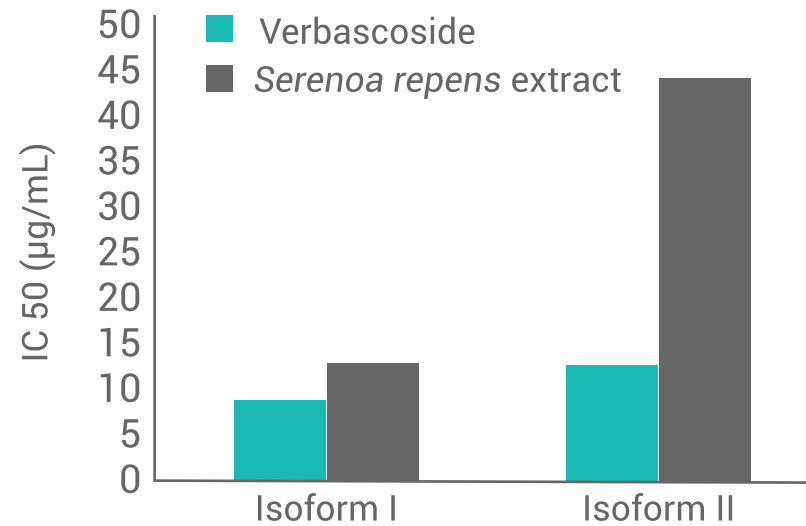
Reduction of the number of papules in 81% of patients

PUSTULES



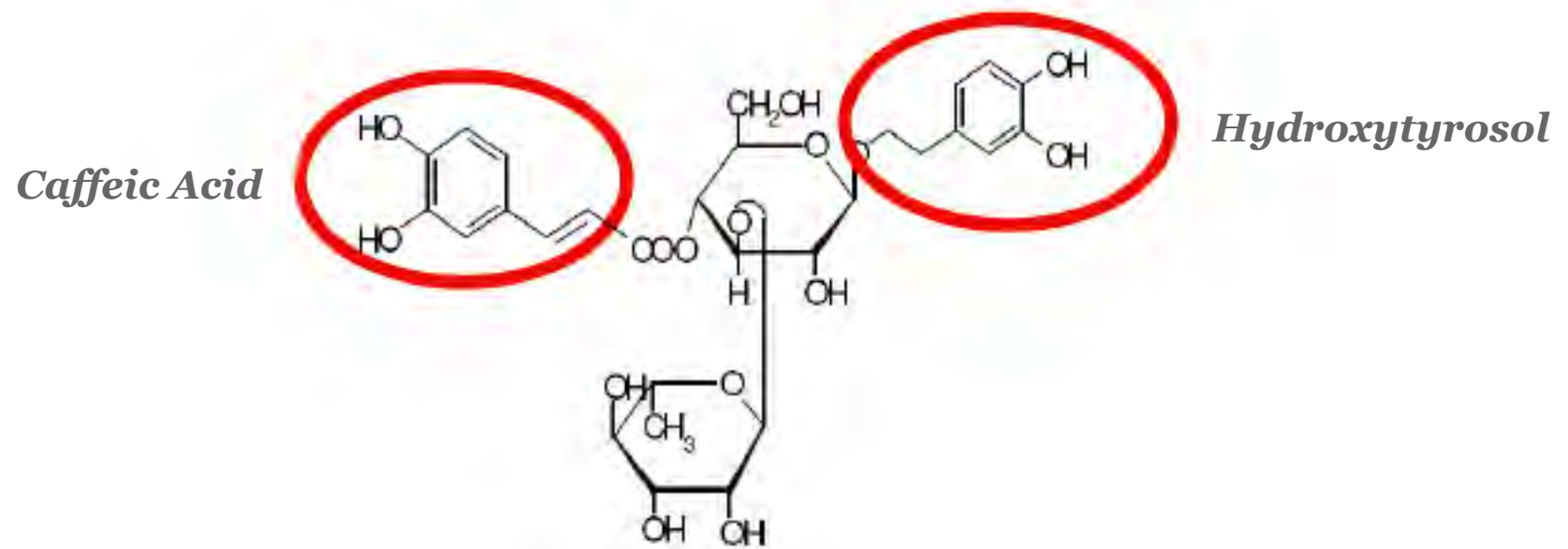
Reduction of the number of pustules in 81% of patients

SEBUM REGULATING ACTIVITY



Effective against 5α-reductase, enzyme involved in sebum production. Inhibits 5α-reductase, especially type II, more efficiently than *Serenoa repens* alcoholic extract, a common benchmark for this type of activity.

VERBASCOSIDE



Phenylpropanoids are Caffeic acid derivatives

TYPICAL PROPERTIES

Composition

Verbasno1™

Rehmannia glutinosa extract
titrated at 10% of verbascoside and maltodextrin

Appearance

Ambered-colored powder

Solubility

Freely soluble in water (Eur. Ph. 5th Edition)

Perservatives

Absent

Aflatoxins

Absent

GMO

Absent

Pesticides

Absent

Microbiology

Total microbial count: Bacteria < 100 CFU/g

Packaging

1kg

Storage

Store the product in the original, well-closed container, in a cool, dry area and protected from light

Shelf Life

24 months

Safety

Safety tested for both cosmetic and nutritional applications

FORMULATION GUIDELINES



Verbasol™ 10%

Use level: 0.5-1.0%

Suitable for O/W emulsions, serum, creams, gels. Introduce during the cooling phase. pH < 4.5. Compatible with alpha hydroxy acids and beta hydroxy acids. Including salicylic acid. Not compatible with alcohol.

For questions and additional information please contact



nulivscience.com