Chembase Treatment System (CTS)

Application and treatment of rural road sub-base layers

Product: Chembase® C-SSSB1 | Research and development

“It costs you nothing to find out how much you can save.”

What is a rural road?

Low-traffic roads

Roads in forested and rangeland settings serving residential, recreational and resource management uses.

Access to property

Local roads whose main job is access to adjacent properties and arterial routes.

Public or private

They may be owned or managed by government or by private parties.

TYPICAL TRAFFIC

- **Cars and light trucks**
- **Some buses**
- **Heavy trucks**
- **Local farm traffic**

Challenges on rural roads

Poor signage

A lack of signs and accurate maps.

Blind curves

Limited view of the road ahead.

Narrow width

Not enough room for vehicles to pass safely.

No shoulders

No shoulder or guard rails.

Soft surface

Weak or unsealed pavement.

Damaged surface

Potholes and broken edges.

Obstacles

Stock, wildlife and debris on the road.

Steep hills

Sharp grades.

How rain destroys a road, and how CTS helps

Without treatment

1. **Rain breaks through**
   Intense rainfall pushes through the topcoat.
2. **Water enters the base**
   Moisture reaches the road base.
3. **Structural damage**
   Serious damage occurs at the base layer.
4. **Road failure**
   Total failure, loss of access and large-scale repairs.

With CTS

- **Water-resistant base**
  A stable road base, even in high-rainfall tropical areas.
- **Topcoat failure is not the end**
  The road stays usable if the topcoat fails.
- **Simple patching**
  The topcoat can be patched without time pressure.
- **Fewer repairs**
  Repair frequency, and the cost to councils, is significantly reduced.

Rural roads in numbers

20%+

of Australian rural roads need ongoing repair or major upgrades

25,000 t

of material can be needed per kilometre of two-lane bitumen road

22%

of global carbon dioxide emissions come from road construction and road use

US$5 bn

a year in emergency, medical and health costs in the US from poorly maintained rural road shoulders

CTS significantly reduces how often rural roads need repair, and therefore the cost to councils throughout the country.

Figures as quoted in the Chembase R&D brochure. Original sources are not named.

One product, supplied in two parts

PART A

Polymer-Stabiliser

+

PART B

Activator

Chembase®
C-SSSB1

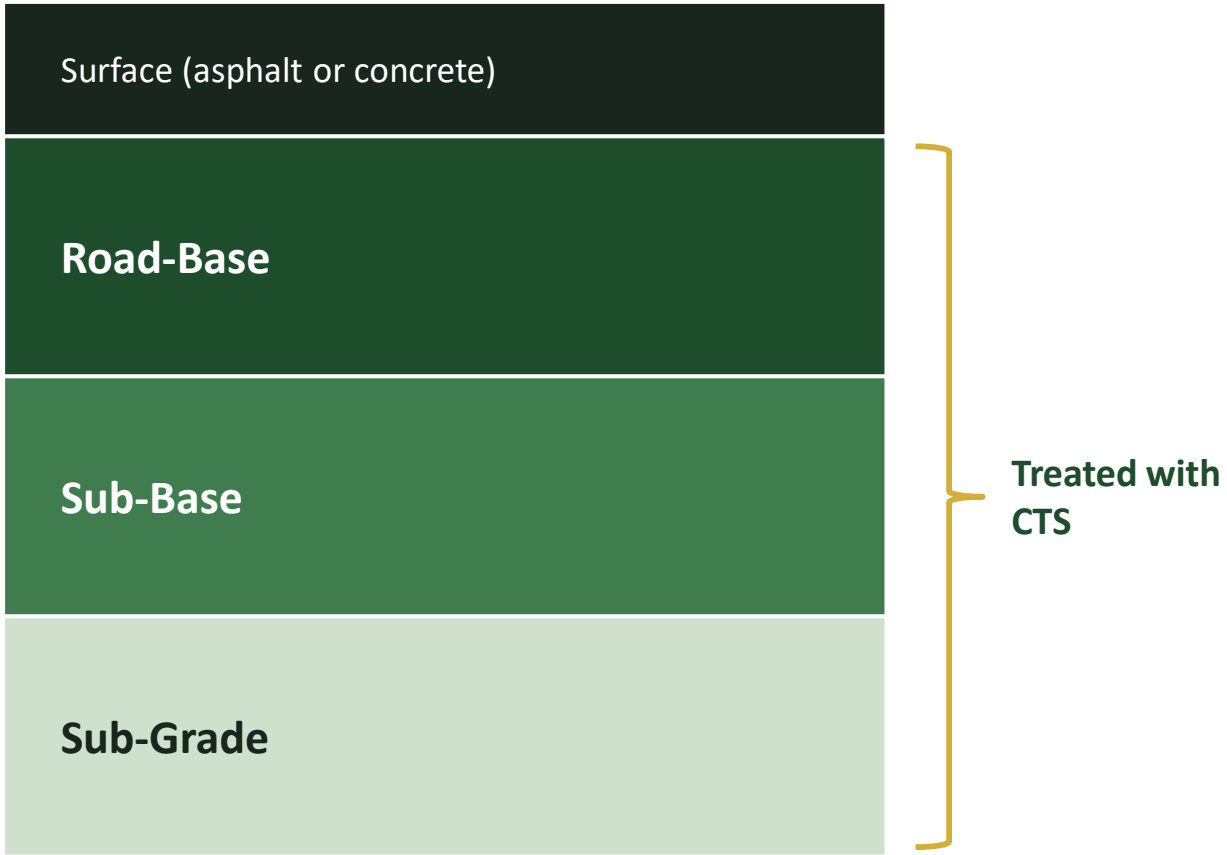
Five characteristics
combined in one product

A simplified range

- Five different chemistry characteristics are now combined into a single Chembase product.
- The application and treatment methods stay the same.
- The same characteristics, benefits and advantages are retained.

Naming: CTS stands for Chembase Treatment System. Chembase is also known as Chembase International and Chembase International Group.

Where CTS works: beneath the road surface



Indicative cross-section

CTS modifies the properties of the existing soil to improve performance and durability.

- **Greater strength**
- **Higher load-bearing capacity**
- **Resistance to moisture-related issues**

Chembase and conventional road construction work together.

From stabilised layers to lower costs

1

Stabilised base layers

CTS stabilises the road-base, sub-base and sub-grade.

2

Less water, fewer potholes

Water leakage and potholes are reduced in the treated area.

3

Less maintenance

The treated area needs less ongoing repair.

4

Lower cost, longer life

Reduced costs and greater longevity for the treated area.

Performance benefits of treated layers

CBR increase

Raises the California Bearing Ratio (CBR), a standard measure of soil strength.

Water resistance

Treated layers resist water, limiting moisture-related damage.

Liquefaction resistant

Treated soil resists liquefaction, the loss of strength in saturated ground.

Freezing-condition tolerance

Tolerates freezing conditions.

Oil and petroleum barrier

Prevents oil and petroleum penetrating the treated soil.

Longevity

A long service life for the treated area.

Practical and environmental benefits

On site

Workable in any weather
Application is not held up by conditions.

Stable once diluted
The diluted product will not oxidise.

Re-compactable
Treated soil can be re-compacted (20 years).

Savings
Less maintenance and reduced costs.

Safety and sustainability

Safe to use
Product-safe and environmentally safe.

Waste plastic and glass
Shredded plastic or stained glass added to treated soil increases CBR.

Ash waste
Ash added to treated soil increases CBR.

Saltwater
Saltwater can replace fresh water, and increases CBR.

Brick pavements
Can be used in brick pavement manufacturing.

Economic and social benefits

- Higher agricultural production and changing crop patterns
- Lower transport costs and efficient delivery of farm inputs
- New jobs outside agriculture, including cottage and agro-industries
- Produce, cattle and stock reach market in long wet periods
- Faster access to products, information, services and social links
- Well-stabilised shoulders reduce accidents when vehicles pull off

A good road network using CTS helps bring rural communities into the mainstream economy.

What makes a road sustainable

Lower impact

Built to reduce environmental impacts, with an alignment that respects ecological constraints and how vehicles use it.

Resilient

Able to withstand future pressures such as climate change and resource scarcity.

Adaptable

Ready for changing uses: higher traffic volumes, public transport, cycling and walking.

Lean road construction practices

- Balance earthworks to optimise cut and fill
- Use local sources to minimise imported materials
- Use stabilising additives to adapt local marginal materials
- Manage and revegetate impacts on the local environment
- Capture and treat road water run-off
- Optimise pavement thickness for expected conditions and loads
- Schedule capital spending effectively and deliver rapidly

Chemical stabilisation with CTS is set to become more common as the transport cost and carbon footprint of cement and lime rise.

Typical rural lane widths

Type of roadway	Feet	Metres
Arterial	11–12	3.3–3.6
Collector	10–12	3.0–3.6
Local	9–12	2.7–3.6

Ranges for rural lane width, as reproduced in the Chembase R&D brochure.

It costs you nothing to find out how much you can save

Talk to Chembase about treating your road-base, sub-base and sub-grade layers.

INDEPENDENT UNIVERSITY REPORTS

Reports from The University of Sydney and UNSW (University of New South Wales) are available at www.chembase.com.au

CHEMBASE INTERNATIONAL GROUP

+61 2 8566 3344

info@chembase.com.au

www.chembase.com.au

Chembase International Group Pty Ltd
ABN 98 660 823 316