

CRYSTALLINE WATERPROOFING

ANY CONCRETE WE IMPROVE!

Vandex[®]

WATERPROOFING SINCE 1946



VANDEX INVENTED AN INDUSTRY – THE FIRST CRYSTALLINE PATENT IN THE WORLD.



The German patent confirmation from 1952. In 1943 the Danish chemist Lauritz Jensen patented the new crystalline active concrete waterproofing method. In 1946 he founded his first company and called it VANDEX („water out“).

Impressum:

Pictures of the crystal formations in this brochure are all unique to VANDEX SUPER. Digital photomicrographs of the crystals were produced by the Petrographic Laboratory of the Euclid Chemical Company USA. The scanning electron photomicrographs were produced by a European University in 2012.

CHALLENGES MEET – SINCE 1946 – THE GLOBAL VILLAGE

ECONOMICAL AND SAFE USE OF TECHNOLOGY AND SOLUTIONS LEADS TO A BETTER SUSTAINABLE FUTURE.

Modern life, with its constantly increasing demand for services to meet the requirements of a growing human population is putting an ever-increasing demand on infrastructure and utilities facilities.

Construction of roads, railways, waterways, airports and ports, as well as housing, schools, universities, recreational facilities, nursing homes, not to forget electric power, potable water, waste water and other utilities represents a huge economic investment.

Although the world is not an equal place in this respect, the scale of the Worldwide economic investment in infrastructure is such that the maintenance of these facilities represents an important task for generations to come.

In other words, every investment in today's construction projects directly leads to maintenance requirements in the future. Running costs, energy consumption, recycling, BREE, and LEED are unavoidable topics for anyone involved in the planning of urban development or the construction of infrastructure projects.

Vandex has been well positioned to meet this challenge since its very foundation in 1946. Vandex products are used to preserve and protect

structures through our 7 core technologies for the waterproofing and protection of all types of concrete. Vandex provide innovative yet simple solutions for keeping structures dry and safe, and avoiding chemical attack – even in demanding environments such as those required in the potable water industry.

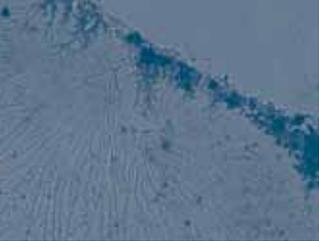
Vandex invented crystalline waterproofing technology in 1943 – founding a whole new industry and gaining Worldwide recognition for its performance and unparalleled high quality in waterproofing and protection.

This brochure presents our latest findings from our studies into the core crystalline chemistry and the resulting effects on modern high quality concrete. You are most welcome to request further information once you have made your way through.

We are looking forward to hearing from you in any case.

Sincerely

The Vandex team of chemists, engineers, sales and administrative staff on our green planet



ANY CONCRETE WE IMPROVE

When it comes to stability and durability, concrete is an excellent building material. However, this depends on how well you protect it. Fortunately Vandex provides a solution. Vandex products stop water from penetrating concrete. For drinking water applications, Vandex coatings also exceed the required high hygienic standards. As one of the market leaders with exceptional technical skills and knowledge, Vandex has for decades had an excellent international reputation. Vandex is certified to ISO 9001 and 14001 quality and environmental management systems which verifies that Vandex meets the requirements of international quality and environmental management standards.

The Vandex management system offers the customer major advantages:

- consistently high product quality
- innovative products responding to actual customer needs
- a service package which safeguards engineering consultation and proper application of Vandex products
- compliance with legal requirements
- protection of the environment
- safety of all employees

With these tools the optimal waterproofing solution can always be found and implemented for any situation.

LATEST SCIENTIFIC CONFIRMATION OF VANDEX CRYSTALL

Permeability Testing, CRD-C 48-92

At the completion of the test, the treated specimens (15.2 cm x 15.2 cm) did not exhibit any water leakage. All specimens were tested for 14 days under 200 psi (462 feet of head pressure [13.8 bar]). An independent laboratory test report is available upon request.

Water Penetration, DIN 1048

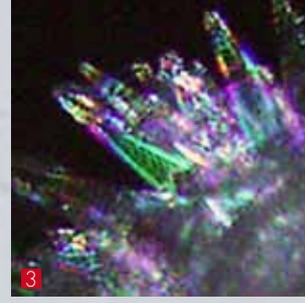
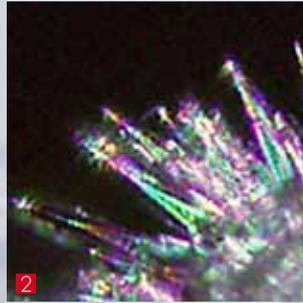
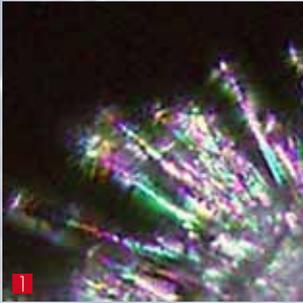
Treated specimens (19.1 cm x 39.4 cm x 10.2 cm) exhibited an average water penetra-

tion of 9 mm when tested for 72 hours under 72 psi (166 feet of head pressure [5.0 bar]). An independent laboratory test report is available upon request.

Compressive Strength, psi (MPa) ASTM C 109	
7 days.....	2,500 (17.2)
28 days.....	3,500 (24.1)

Freeze/Thaw Resistance, ASTM C 666
300 cycles98 % Relative Dynamic Modulus

HOW TO GROW CRYSTALS – CONTROLLED CRYSTAL GROWTH



Photomicrograph magnification 400x.

The pictures show the ACTUAL Vandex chemistry developing under a microscope

- 1 As viewed in cross polarized light, after the crystals initially form, available water will promote more crystal growth as shown by the green crystal near the center of each image.
- 2 The green crystal continues growth.
- 3 The green crystal has grown considerably as have other crystals.

Chemical reaction between hydration product of cement and Vandex active ingredients with resulting crystal formation. The crystals are shown in cross polarized light producing the colours in these images (above).

LINE PERFORMANCE

Flexural Strength, psi (MPa) ASTM C 348
 7 days..... 600 (4.1)
 28 days 900 (6.2)

Scaling Resistance, ASTM C 672
 50 cycles 0 Rating, No Scaling

Chemical Resistance, ASTM C 267
 Treated specimens and ASTM C 494 (5,450 psi [37.6 MPa]) untreated reference specimens were immersed in brake fluid, pool chlorine (5 ppm),

ethylene glycol (100 %), mineral oil (100 %), toluene (100 %), sodium hydroxide (50 %) and hydrochloric acid (10 %). The compressive strength and weight change of each specimen was determined after 1, 7, 14, 28, 56, and 84 days. The treated specimens either outperformed or were the same as the reference specimens. An independent laboratory test report is available upon request.

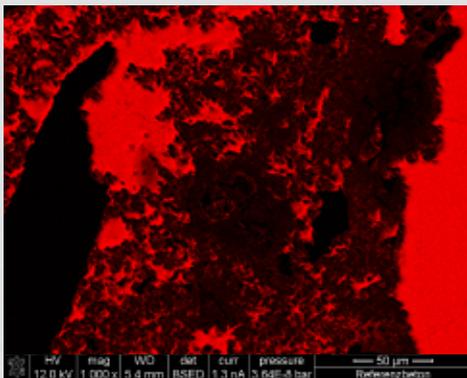


THE RESULT PROTECTED AND WATERPROOF

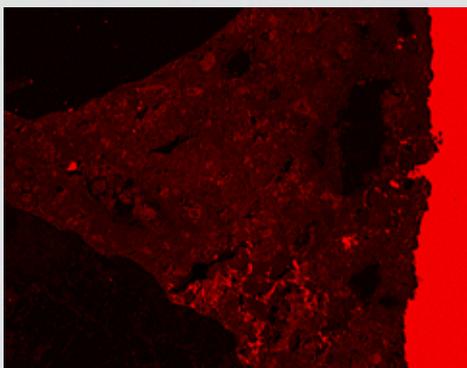
NEW RESEARCH INTO CRYSTALLINE SURFACE BLOCKING

Investigation of untreated and Vandex treated concrete samples by high resolution scanning electron microscope by a European University in 2012.

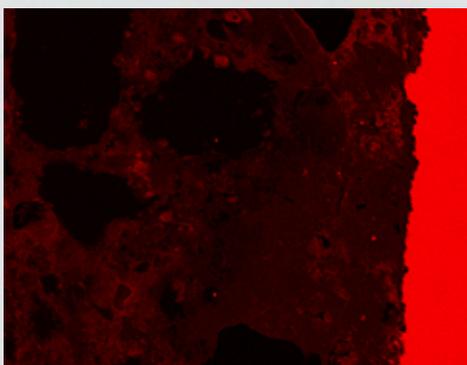
The surface of the concrete is to the right hand side in the pictures. The red colour shows the penetration into the concrete of low viscosious control substance.



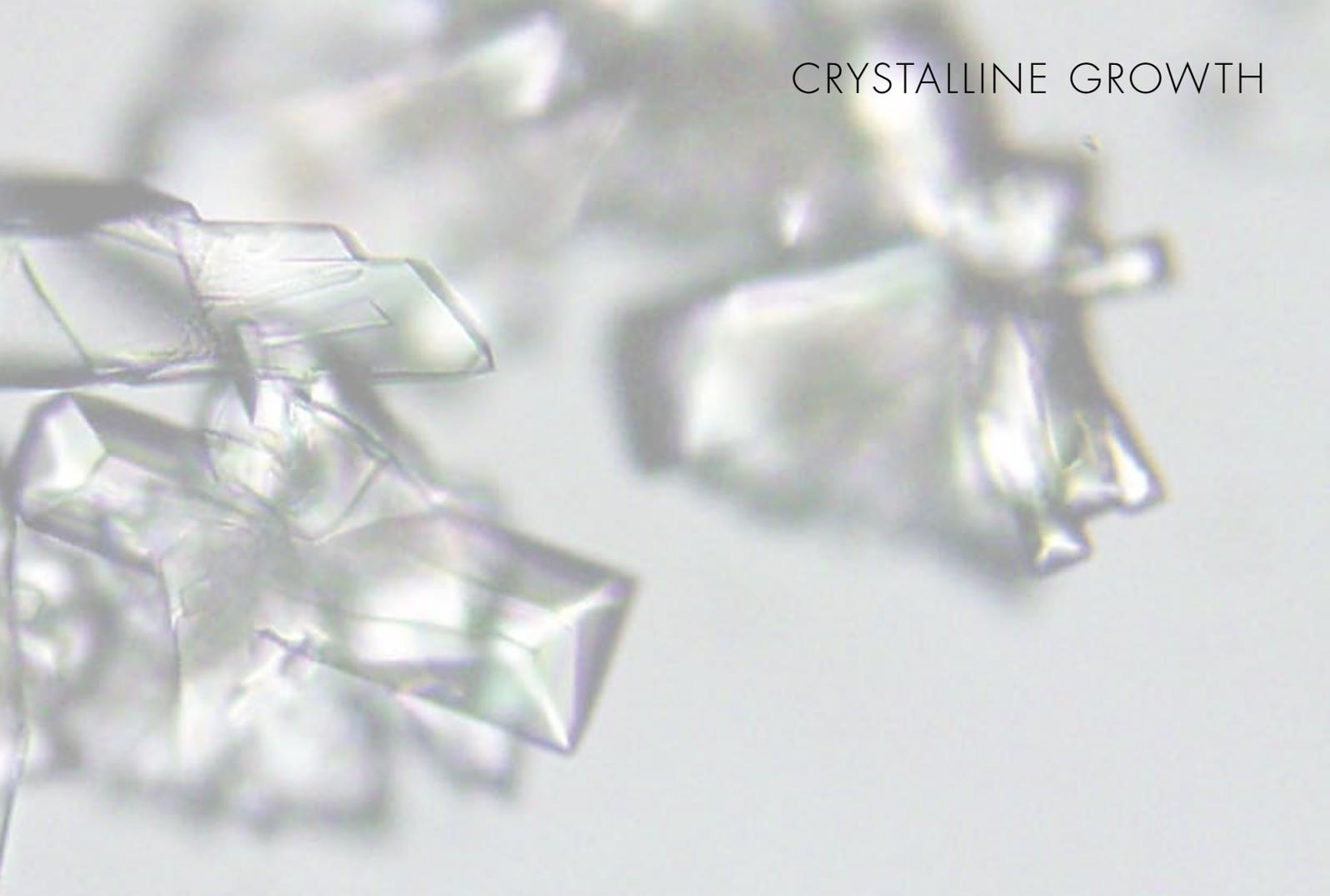
Top: untreated concrete, penetration of the resin indicates the original porosity of the cement paste that is relatable to the permeability of the paste.



Middle: VANDEX SUPER crystalline powder sprinkled into fresh concrete
Significantly reduced penetration of the resin indicates reduced porosity and reduced permeability of the paste to liquid water.



Bottom: 2 layers of VANDEX SUPER crystalline slurry applied to cured concrete
Significantly reduced penetration of the resin indicates a very dense, non-porous concrete and reduced permeability of the paste to liquid water.



THE UNIVERSE OF WATER & HUMIDITY – THAT'S VANDEX

- ✓ *Thinking of water is thinking of Vandex*
- ✓ *Vandex business is water*
- ✓ *Vandex assist in sustainable economical use of water*
- ✓ *Vandex assist in protecting potable water against pollution*
- ✓ *Vandex take pride in protecting the environment*

Water is our most precious resource. It is essential for life, but can also have destructive effects. We at Vandex have made it our mission to provide protection for structures threatened by water everywhere in the world. This is how the company has established itself over the years as a worldwide market leader in the field of concrete waterproofing and protection.

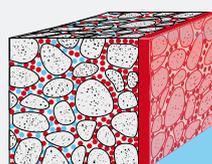
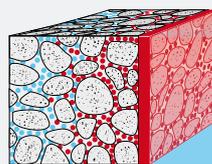
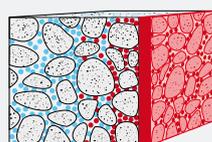
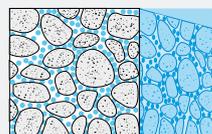
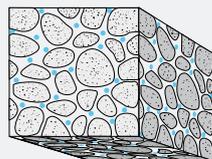
CRYSTALLINE POTABLE WATER APPROVED





VANDEX MAKES ANY CONCRETE AN EVEN BETTER MATERIAL

1. Section of dry concrete wall showing the natural free lime and moisture in the capillary system.
2. Concrete wall exposed to water. The water has forced it's way into the capillaries. Longterm effect: leaky, damaged concrete.
3. Vandex crystalline treatment: The reaction between the free lime, moisture and the Vandex chemicals has set in.
4. The concrete is now watertight. Vandex crystals penetrate the concrete forming chemical complexes which substantially constrict the capillaries but still allow water vapour to pass.
5. Vandex crystals remain in the concrete, ready to reactivate upon water impact. The crystals have now penetrated deeply into the solid concrete.



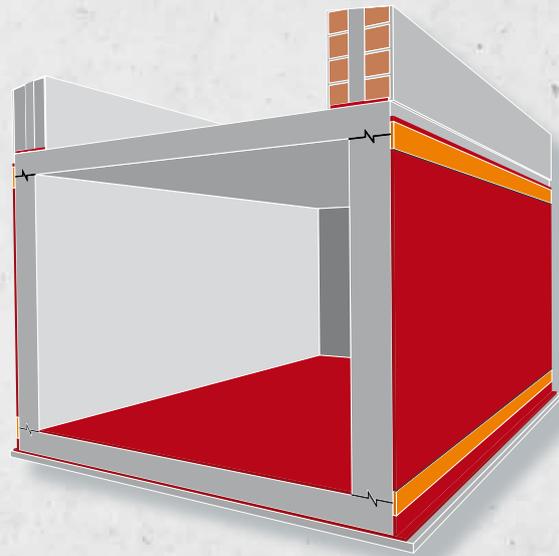
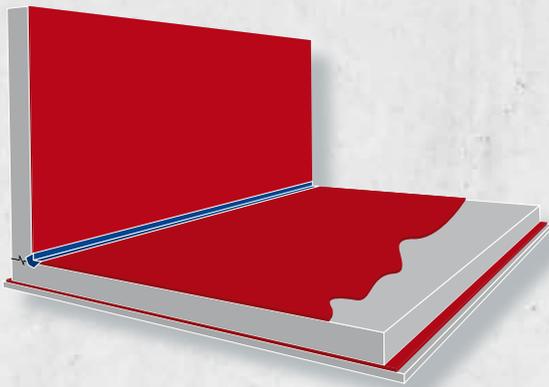
CRYSTALLINE IMPROVED CONCRETE FACTS

Topic	Improvement	Benefit
Chloride-Barrier	5 fold reduction of Chloride diffusion	✓ higher abrasion resistance of the concrete
Sulphate Resistance	Virtually eliminate sulphate attack for a period of 20 – 30 years	✓ higher ageing resistance of the concrete
Wear / Abrasion	Weight loss by abrasion reduced 70 – 75 % by Taber-Abraser	✓ concrete protection against: sea water, waste water, aggressive ground water, chemical solutions
Vapour diffusion	When using VANDEX SUPER below an Epoxy floor coating no blisters formed.	✓ concrete is still able to breathe
Waterproofing	...after partial removal of VANDEX SUPER no moisture detected...	✓ waterproofing function remains integral in concrete
Compressive strength	Up to +7.3 % increase when powder sprinkled	✓ increased performance of concrete generally

THE SOLUTION SINCE 1946

THE CRYSTALLINE RULE

- Crystalline waterproofing
- Waterproof mortar
- Joint solution



VANDEX –

A FULLY ACCREDITED COMPANY



VANDEX PRODUCTS ARE TESTED PRODUCTS

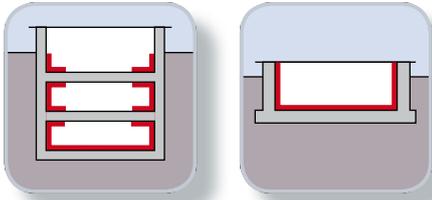
The cementitious Vandex products are regularly tested by approved and independent testing laboratories in various countries all over the world. These tests serve as neutral proof of the effectiveness and special properties of the various

products. The group of concrete repair products was specially tested for its physical properties and compatibility with concrete. The relevant products are approved for use in direct contact with drinking water.

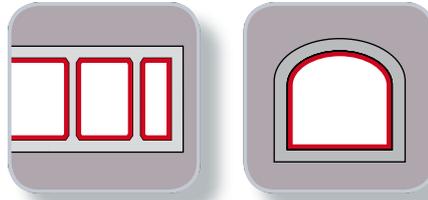
VANDEX CRYSTALLINE PRODUCTS AT WORK



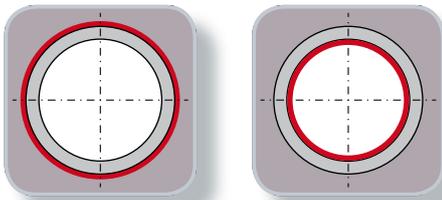
Structural and industrial engineering



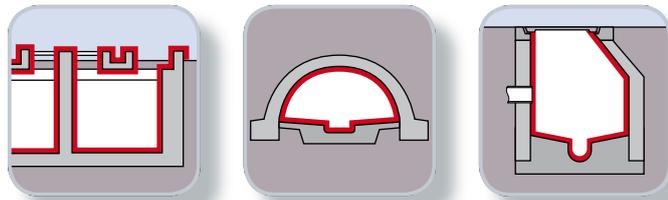
Drinking water reservoirs



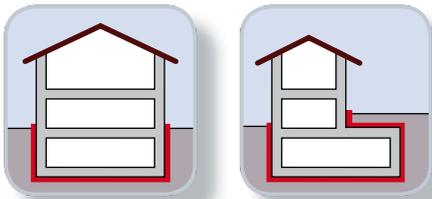
Tunnel



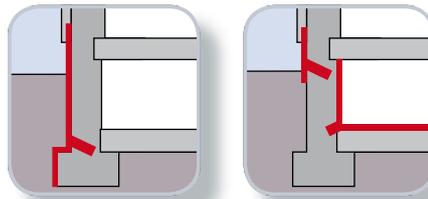
Sewage water treatment



Civil engineering



Refurbishment of old buildings



OTHER BUSINESS FIELDS



Protection of potable water:

Environmental contaminants make supplying clean potable water an important task, and Vandex is decisively involved in the solution.



Waste water treatment:

Waste water does not belong in the environment, but in a perfectly sealed waste water treatment plant – for that reason, Vandex offers products for lining intake pipes and processing plants.



Below ground waterproofing:

You can always rely on Vandex crystalline technology to waterproof and protect concrete structures as it is an integral technology becoming a long lasting part of the concrete.



Concrete repair:

Deteriorated concrete needs to be repaired – optimally with products from Vandex.



Refurbishing older structures:

Protective coatings that have proven themselves in the repair of older structures are consistently the subject of ongoing development at Vandex.

YOUR PARTNER IN INTERNATIONAL PROJECTS



Service - Quality - Environment

Research and Development

Vandex is an organisation which through innovation, know-how, experience and strong motivation supports its products with appropriate services in the fields of research & development, testing and engineering thus adding significant value to the basic qualities and benefits of the Vandex products.



Technical Service

Vandex gives priority to responding to customer requirements concerning products or systems and to developing products and services which provide attractive customer benefits. Vandex's technical services for users, designers and applicators assure a high degree of customer satisfaction. Training and consulting is offered locally or at the head office.



Quality and Environment

The Vandex group has been certified according to the ISO 9001:2008 „Quality management systems“ since 1994 and to the ISO 14001:2004 „Environmental management systems“ since 2004. This verifies that the Vandex companies meet the requirements of international quality and environmental standards.



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CRYSTALLINE WATERPROOFING

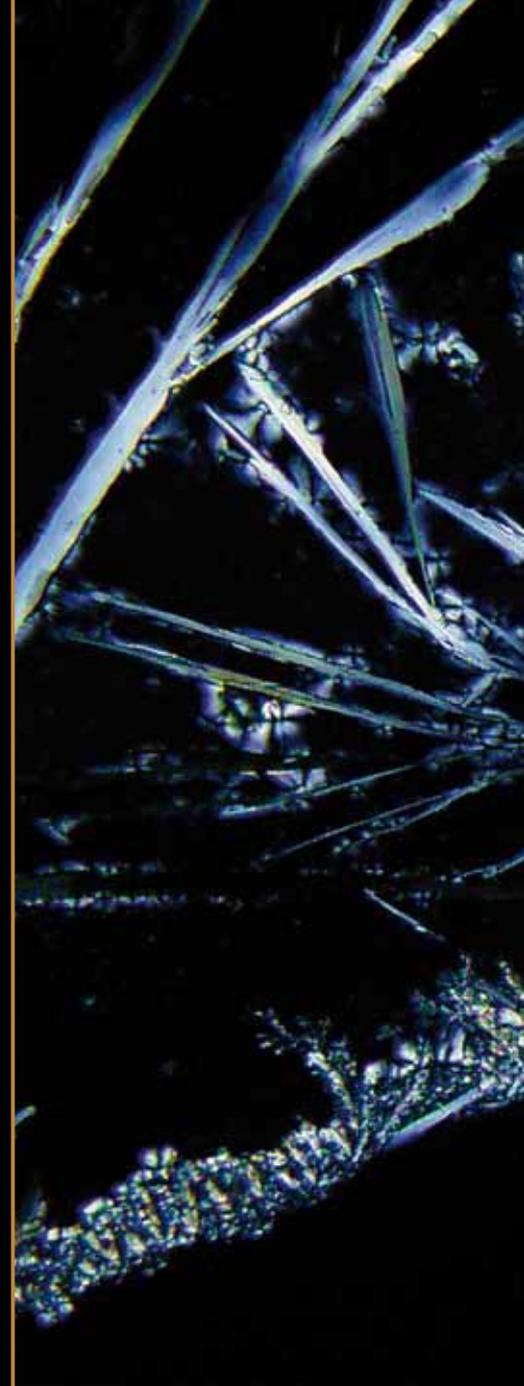


DRINKING WATER
SEWAGE SYSTEMS
CIVIL ENGINEERING

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