

# DRACOSPRITZ N50S

THIXOTROPIC FIBRE-REINFORCED POLYMER-MODIFIED CEMENT MORTAR FOR STRUCTURAL REPAIR WITH DRY- OR WET-PROCESS SPRAYED CONCRETE (SHOTCRETE)



**DRACOSPRITZ N50S** is a one-component cementitious mortar reinforced with alkali-resistant microfibres and modified by polymer resins. It can be applied by the dry or wet spray method on concrete, stone and/or brick substrates to create waterproof coatings highly resistant to sulphates and chemical attack in tunnels and canals. **DRACOSPRITZ N50S** is waterproof and durable; it has high initial and final mechanical strength, and high bond to steel, concrete and rocks.

## ADVANTAGES

**DRACOSPRITZ N50S is a one-component thixotropic fibre-reinforced cement mortar for shotcrete. The product has the following characteristics:**

- ✓ Versatile: it can be applied by the dry (with higher yield) or wet spraying method.
- ✓ Ready-to-use, one component, easy to apply.
- ✓ Durable with high mechanical strength, no bleeding, resistance to aggressive chemical environment and to freeze-thaw cycles, de-icing salts, as required by UNI EN 206:2014 up to XC4, XF4; XD3; XS3 and XA3 and in particular to sulphates.
- ✓ Low efflorescence due to reduced permeability resulting from lower mix porosity.
- ✓ High elastic deformability; lower modulus of elasticity than traditional concrete.
- ✓ Pneumatic dry transportation for over 100 metres to the place of installation is allowed.
- ✓ It can be applied where mortars cannot usually be applied by wet spray process.
- ✓ It does not contain alkaline accelerators, and therefore cannot modify the pH of the mixture or hardened concrete.
- ✓ Minimal waste.
- ✓ The alkali-resistant fibres of the micro-reinforcement make it strong enough to withstand mechanical stresses, increase resistance to cracking and tensile and flexural strength.
- ✓ High m<sup>2</sup>/day yield; excellent bond to substrate and high resistance to carbonation.
- ✓ Flexible product: by adding DRANITE AF 900, it is possible to make setting faster and stop minor water seepage.

**Note:** If higher physical-mechanical properties of **DRACOSPRITZ N50S** are required for structural reasons, you can add our flexible steel fibres FIBERCROME at a rate of 10-40 kg per m<sup>3</sup> to improve concrete matrix behaviour.

## USES

**DRACOSPRITZ N50S** is suited to the following applications:

- ✓ dry- or wet-mix shotcreting of tunnels, conduits, shafts;
- ✓ coatings, protective layers and structural overlays in tunnels, walls, slopes, etc.;
- ✓ repair and protection of river and canal banks, bulkheads and dams;
- ✓ surface consolidation of friable rocky soil on slopes;
- ✓ construction of walls, slabs and reinforced structural vaults using sprayed concrete.



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## SUBSTRATE PREPARATION

**DRACOSPRITZ N50S** can be sprayed on the substrate with or without an electro-welded mesh, thus ensuring no cracking or detachment from the substrate, provided that the latter is sufficiently uneven and roughened by water-jetting – note that sandblasting is not enough – and environmental conditions are good with no direct sunlight and strong wind. **DRACOSPRITZ N50S** shall be allowed to cure suitably after application. To this end, you can use **PROBETON CURING N**.

Respect construction joints; treat them with elastomeric products as described in the technical data sheet of Epojoint or Dracoflex P.

## MORTAR PREPARATION

To prepare one cubic metre (1 m<sup>3</sup>) of mortar, you need approx. 1,950 kg of **DRACOSPRITZ N50S**. Add 16 to 17 litres of water for every 100 kg of product. **DRACOSPRITZ N50S** can be used when ambient temperature is between +5°C and +35°C.



### HOT WEATHER PRECAUTIONS

- ▶ Store **DRACOSPRITZ N50S** away from direct sunlight.
- ▶ Use cold mixing water.
- ▶ Carry out work in the early hours of the morning.
- ▶ Provide adequate protection for the first 48 hours and allow curing of the repaired area with **PROBETON CURING N** (see technical data sheet); if this is not available, apply sheets and keep them constantly wet.



### COLD WEATHER PRECAUTIONS

- ▶ Store **DRACOSPRITZ N50S** in a heated environment where possible.
- ▶ Make sure that the substrate is not frozen.
- ▶ Protect from frost by covering the surfaces and repaired areas with waterproof and insulated tarps.

## APPLICATION

**DRACOSPRITZ N50S** can be wet sprayed, using conventional piston or rotor-stator pumps, or dry sprayed, in case of long pipes, using Aliva or Ocmer-type spraying machines, possibly with a lance with pre-humidification stage, in order to reduce the amount of airborne particles in the environment. Overlay thickness may vary from 1 to 4 cm; for single overlays of more than 4 cm, apply several layers and place in between a metal mesh anchored to the substrate and prepared prior to product application. **DRACOSPRITZ N50S** can also be reinforced with **FIBERCROM** flexible stainless fibres to obtain a **FRCM** system, when it is difficult to lay the mesh or in case of chemical attack and/or shear loads. Contact the **DRACO** technical department.

## PACKAGING AND STORAGE

**DRACOSPRITZ N50S** is packed in 25 kg bags.

If properly stored in a sheltered, dry place in its original container, **DRACOSPRITZ N50S** maintains its properties for 12 months.



## SPECIFICATIONS ITEM

When work includes dry or wet spraying of concrete, as it is indicated in these specifications, the ready-to-use thixotropic mortar with high flexural tensile strength, fibre-reinforced, resistant to environmental chemical attack, **DRACOSPRITZ N50S** by **DRACO Italiana SpA**, shall be used. Follow the instructions and recommendations provided by the manufacturer **DRACO Italiana SpA**.

## PRODUCT CHARACTERISTICS

APPEARANCE	Powder
COLOUR	Grey
CHLORIDE CONTENT OF FRESH MORTARS - UNI EN 1015-17 (requirement: $\leq 0.05\%$ )	0.021%
PACKAGING	25 kg bags
SHELF-LIFE	12 months
PARTICLE SIZE	Max diameter: 2.5 mm

## APPLICATION SPECIFICATIONS

MIXING WATER	4 to 4.25 l per 25 kg bag (16-17%)
YIELD	1,950 kg/m <sup>3</sup>
APPLICATION TEMPERATURE	+5°C to +35°C
BULK DENSITY (TEST WITH HARDENED PRISMS) - UNI EN 12190	2,230 kg/m <sup>3</sup>
WORKABILITY (FLOW TABLE TEST) - UNI EN 13395-1	170 mm
MIX POT LIFE	50 minutes
SETTING TIME - 16% hydration	Initial set time 3 hours – final set time 4 hours
WAITING TIME BETWEEN COATS	5-6 hours

### DRACOSPRITZ N50S - mixing water: 16% - DRANITE AF 900 dosage: 6%

#### Tests performed at the construction site at 20°C and 65% R.H.

INITIAL SET TIME	UNI EN 480-2	< 1 min
FINAL SET TIME	UNI EN 480-2	< 2 min
COMPRESSIVE STRENGTH	UNI EN 12190 modified	1.5 MPa after 1 hour
		4 MPa after 3 hours
		20 MPa after 1 day
		35 MPa after 7 days
		55 MPa after 28 days

## TECHNICAL CHARACTERISTICS - UNI EN 1504-3

CHARACTERISTIC	MINIMUM REQUIREMENTS	PERFORMANCE
<b>BOND STRENGTH - UNI EN 1542</b> to concrete substrate (MC=0.4) according to EN 1766	≥ 2 MPa	2.5 MPa
<b>RESISTANCE TO CARBONATION - UNI EN 13295</b>	Meets specifications	Meets specifications
<b>MODULUS OF ELASTICITY - UNI EN 13412</b>	≥ 20 GPa	23 GPa
<b>THERMAL COMPATIBILITY - UNI EN 13687-1</b> concrete substrate (MC=0.4) after 50 freeze-thaw cycles	≥ 2 MPa	2.5 MPa
<b>CAPILLARY ABSORPTION - UNI EN 13057</b>	≤ 0.5 kg/m <sup>2</sup> ·h <sup>-0.5</sup>	0.2 kg/m <sup>2</sup> ·h <sup>-0.5</sup>
<b>COMPRESSIVE STRENGTH - UNI EN 12190</b>	≥ 45 MPa	> 45 MPa - R4
<b>REACTION TO FIRE - UNI EN 13501-1</b>	Euroclass	A1
<b>DEPTH OF PENETRATION OF WATER UNDER PRESSURE (5 bar) - EN 12390-8</b>		< 5mm
<b>AVERAGE MECHANICAL STRENGTHS - MIXING WATER: 16%</b>		
<b>FLEXURAL STRENGTH - UNI EN 196</b>	6 hours	1 MPa
	12 hours	2 MPa
	1 day	5 MPa
	3 days	7 MPa
	7 days	8 MPa
	28 days	10 MPa
<b>COMPRESSIVE STRENGTH - UNI EN 12190</b>	6 hours	3 MPa
	12 hours	8 MPa
	1 day	25 MPa
	3 days	35 MPa
	7 days	40 MPa
	28 days	60 MPa

### Legal notes - SLCMP version of 01.03.2017

Draco Italiana s.p.a. has adopted the parameters indicated in this data sheet and the related standards for the calculation of the values and technical data contained herein.

Customers shall verify that this data sheet and the values indicated herein apply to their product batch and have not been superseded by later editions. If in doubt, verify that the sheet corresponds to the one available on the website [www.draco-edilizia.it](http://www.draco-edilizia.it) at the time the sales contract was executed and/or by previously contacting the Technical Department.

Any suggestions on the use of the Products provided by our personnel either orally or in writing upon the Customer's request do not constitute additional obligations to the purchase contract and do not imply a contractual obligation for the company. They are based on our experience and limited to the current state of practical and/or scientific knowledge. They are not binding for the client or for the installer. It is the Customer's responsibility to test our products and verify they are suitable for the type of application and use envisaged.