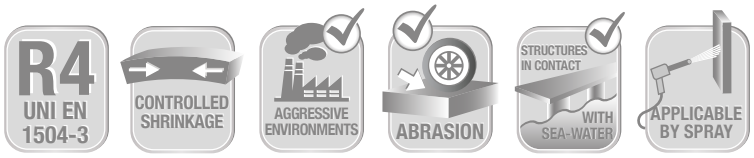
FLUECO 100 AR

ABRASION-RESISTANT, THIXOTROPIC, CONTROLLED-SHRINKAGE, RHEOPLASTIC GROUT APPLICABLE BY SPRAY FOR STRUCTURAL REPAIRS



DRACO

AP-REV.01-18

REFURBISHMENT and **PROTECTION** LINE

THIXOTROPIC CEMENTITIOUS GROUT FOR REPAIRS

Flueco 100 AR (Abrasion-resistant) is a pre-blended, ready-to-use, fibre-reinforced grout. It is based on selected aggregates, special additives, polymers and cement with superior development of resistance. When added to water it produces a thixotropic, controlled-shrinkage mix.

FLUECO 100 AR develops high initial and final mechanical strength. It is waterproof and specifically formulated for spraying in very aggressive environments. It provides high bonding to steel and concrete.

FLUECO 100 AR is very resistant to abrasion, with final abrasion resistance factors that are higher than those of hard crystalline minerals, such as granite.

BENEFITS

The main benefits of using **FLUECO 100 AR** are:

- ✓ **Superior mechanical strength and abrasion resistance:** the final abrasion resistance factors of **FLUECO 100 AR** are higher than those of hard crystalline minerals, such as granite.
- ✓ **Rapid development of resistance: FLUECO 100 AR** develops resistance rapidly with brief curing times, thus permitting the structure to be used after a short period.
- ✓ **Waterproof and resistance to freeze thaw cycles:** the specific formulation of **FLUECO 100 AR** and the high quality of its components make it completely waterproof and increase its resistance to freeze thaw cycles.
- ✓ **Resistance to sulphates and chemical and environmental attack: FLUECO 100 AR** has high compactness, low capillary porosity and high resistance to aggressive agents present in the environment such as chlorides and sulphates, and it is not subject to carbonatation.
- ✓ **Absence of cracks caused by plastic shrinkage: FLUECO 100 AR** has no crazing or plastic shrinkage cracks **thanks to the use of special synthetic fibres** that impede cracking.
- ✓ **High bonding to substrates: FLUECO 100 AR** has been specifically formulated to increase mortar / support bonding, thus simplifying application.
- ✓ **Quick to mix and easy to apply: FLUECO 100 AR** can be pumped over long distances and sprayed dry or wet to create thick layers. It can be subjected to stress after just a short curing.

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FLUECO 100 AR

WHERE TO USE

FLUECO 100 AR has been formulated for maintenance, structural repair and restoration in industrial and urban areas where high concentrations of aggressive agents cause the degrading of concrete and rebars of reinforced concrete and pre-stressed RC. **FLUECO 100 AR** can be used for:

- ✓ Harbour works, docks, and other structures in contact with seawater.
- ✓ The repair of structures such as columns, beams, floors and screeds in normal and pre-stressed concrete, whether for partial or complete restoration of the structures.
- ✓ Hydraulic works subject to abrasion and chemical and physical attacks in a naturally highly aggressive environments such as features of dams, dock gates, bulk heads, canals etc.
- ✓ The building and repairing of water purification and treatment plants, as well as sewerage systems.
- ✓ Repairing buildings exposed to repeated stress such as metalworking, heavy traffic or in areas close to furnaces.

APPLICATION PROCEDURE

SUBSTRATE CLEANING

- **Remove all flaking parts** from the concrete in the area to be repaired, including grout slurry, either by mechanical chipping or pressure washing and taking care not to damage the structures;
- **Remove spots, efflorescence or soaked-in stains** of grease oils, paints, lime, dust, dirt etc.;
- **Remove any earlier repairs** if irreparably damaged or deteriorated;

SUBSTRATE PREPARATION

- **Roughen the surface** mechanically by bush hammering, chiselling or pressure washing (this last avoids damage to the substrate and is recommended for large areas) to reach the sound, compact concrete and enhance bonding between the mortar and substrate. The surface should be roughened with unevenness to a depth of at least 5 mm while the edges around the area to be repaired must be scarified to a depth of at least 10 mm with a sharp edge finish. Roughening of the surface layer is needed both to promote bonding of the mortar, and to ensure the expansive properties develop correctly.
- **Wet the surface with water under pressure to saturation.** This procedure avoids the substrate absorbing water from the mix as this could lead to cracking and reduce the bonding strength of the mortar. This operation also allows the removal of any fragments remaining from the roughening of the concrete substrate. Excess water must evaporate completely before restoration is carried out.

REBAR PROTECTION

- **Sandblast the reinforcement bars** and remove all loose particles such as rust flakes or fragments of material that could lead to corrosion or impair bonding. Scarification of the substrate by hydroblasting also effectively cleans the bars, making sandblasting unnecessary.
- **Protect the reinforcement bars** by re-alkalising them with the corrosion-inhibiting agent DRACOSTEEL.

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MORTAR PREPARATION

The mixing of the mortar **FLUECO 100 AR** is carried out using an on-site concrete mixer. Pour the mixing water into the cement mixer according to the desired consistency, with reference to proportions indicated in Table 1.

To prepare small quantities of product use a suitable vessel or container and respect the recommended mixing proportions. We recommend the use of a mechanical agitator at low speed to reduce air entrapment.

PRECAUTIONS IN HOT CLIMATES

- Store **FLUECO 100 AR** away from direct sunlight;
- Carry out the work in the early hours of the morning, and stop work when the sun is strongest. It is better to resume working in the late afternoon, as long as the structure has been wet continuously for at least 6 hours before work starts;
- To achieve optimum performance from **FLUECO 100 AR** you should ensure proper curing by applying PROBETON CURING N by spray or by brush.

PRECAUTIONS IN COLD CLIMATES

- Store **FLUECO 100 AR** in a heated environment where possible;
- Do not use the product at temperatures below 0 ° C;
- Start work in the later hours of the morning;
- Make sure that the substrate is not frozen;
- **Substrate saturation with water** - Carry out all the procedures to prepare the substrate then saturate the concrete or masonry with water continuously for at least 6 hours before laying **FLUECO 100 AR**. Any excess water on the surface must be removed with compressed air or cloths.

APPLICATION

FLUECO 100 AR can be put applied by both wet and dry spraying. The finishing times for **FLUECO 100 AR** are approximately half an hour during the summer and about 1 hour in the cold season. The minimum thickness that can be applied is 3 cm. For layer thickness greater than 10 cm we recommend the addition of aggregates with high hardness to obtain concrete with a grain size between 0 - 15 mm (Contact Technical Department, Draco). The surface must be finished with a sponge float as soon as setting begins.

VERTICAL APPLICATION

To apply **FLUECO 100 AR** vertically we recommend dry spraying. When choosing the pumps you must take into account that the maximum diameter is 8 mm, and the average thickness of each coat will be approx. 4 - 5 cm. For thicker layers we recommend applying more than one coat, allowing at least 30 minutes between each one (in colder climates the waiting time between coats may be longer).

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FLUECO 100 AR

HORIZONTAL APPLICATION

FLUECO 100 AR can be used for shaping or levelling concrete beds. The maximum thickness that can be applied in a single coat is 25 cm. From 3,5 to a maximum of 4 litres of water must be added per 25 kg of **FLUECO 100 AR** depending on the desired workability. Mixing time is three minutes.

INFILTRATION OF WATER FROM THE SUBSTRATE

The sources of any water penetration or seepage on the substrate must be located and blocked to avoid leaching of the repair before the grout has completely set. This is possible by using our quick-setting mortar **HYDROPLUG**, or where possible by creating specific drain-offs.

CURING

To ensure proper curing of the product even in dry climates, or where surfaces are exposed to excessively windy or sunny conditions, we recommend the use of the curing membrane PROBETON CURING N.

PACKAGING AND STORAGE

FLUECO 100 AR is packaged in 25 kg bags.

If kept in its original packaging and properly stored under cover in a dry place, the product maintains its characteristics for a year.

REFERENCE STANDARDS

FLUECO 100 AR meets the requirements defined by EN 1504-9 "Products and systems for the protection and repair of concrete structures: definitions, requirements, quality control and evaluation of conformity" general principles for the use of products and systems."

FLUECO 100 AR complies with the minimum requirements defined by EN 1504-3
"Structural and non-structural repair" for structural mortars of class R4.

"MEETS EN 1504-3 CLASS R4 FOR STRUCTURES EXPOSED TO AIR (PCC) AND IN PERMANENT CONTACT WITH WATER (CC)"

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FLUECO 100 AR

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PRODUCT CHARACTERISTICS

APPEARANCE	Granular powder
COLOUR	Dark grey
MAXIMUM AGGREGATE SIZE	10 mm
CHLORIDE ION CONTENT (≤0.05%)	< 0.005%
PACKAGING	25 kg bag

APPLICATION DATA

MIX COLOR	Grey
MIXING WATER	3,5 ÷ 4 l per 25 kg bag (14-16%)
DENSITY OF MIX - UNI EN 12190	2240 kg/m^3
pH OF MIX	>12
MIX CONSISTENCY - UNI EN 13395	170 mm
TEMPERATURE OF USE	+5 ° C to +35 ° C
POT LIFE OF MIX	approx. 60 minutes (20° C - 50% RH)
COMPLETE HARDENING	approx. 28 days at 20° C
WAITING TIME BETWEEN COATS	at least approx. 30 minutes (23° C - 50% RH)
THICKNESS OF APPLICATION	4 - 5 cm (25 cm horizontally)
CONSUMPTION	approx. 2050 kg/m^3 approx. of grout

TECHNICAL SPECIFICATIONS

FLUECO 100 AR, produced by **Draco Italiana SpA**, is a pourable, ready-to-use expansive, rheoplastic grout to be used for the precision anchoring of machinery, structures or metal elements to suitably prepared concrete substrates. The product shall be characterised by high adhesion to the substrate, maximum fluidity and resistance to stress and shall be in accordance with EN 1504-3 for R4-class structural mortar and the minimum requirements defined in EN 1504-6. All instructions and precautions followed must comply with the recommendations given by the manufacturer: **Draco Italiana SpA**. Technical assistance available on request.

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FINAL PERFORMANCE 14% MIXING WATER THIXOTROPIC CONSISTENCY (+20° C - 65% RH)

CHARACTERISTICS	TEST METHOD	REQUIREMENTS IN ACCORDANCE WITH EN-1504-3 FOR CLASS R4 MORTARS	PRODUCT PERFORMANCE
COMPRESSIVE STRENGTH	EN 12190	≥ 45 MPa (after 28 days)	30 MPa at 1 day 55 MPa at 3 days 59 MPa at 7 days 80 MPa at 28 days
FLEXURAL STRENGTH	EN 196/1	None	6 MPa at 1 day 9 MPa at 3 days 10 MPa at 7 days 11 MPa at 28 days
COMPRESSIVE MODULUS OF ELASTICITY	EN 13412	≥ 20 GPa (after 28 days)	35 GPa
BOND STRENGTH ON CONCRETE (substrate of type MC 0.40 w/c ratio = 0.40) according to EN 1766	EN 1542	≥ 2 MPa (after 28 days)	2 MPa
RESISTANCE TO ACCELERATED CARBONATATION	EN 13295	Depth of carbonatation ≤ meets specifications reference concrete (MC 0.45 w / c ratio = 0.45) according to UNI 1766	meets specifications
CAPILLARY ABSORPTION	EN 13057	≤ 0.5 kg/m^2· h^{-05}	0.25 kg/m^2 · h^{-05}
THERMAL COMPATIBILITY measured as bonding according to EN 1542 on concrete MC 0.4 UNI EN 1766 - freeze-thaw cycles with de-icing salts	EN 13687/1	≥2 MPa (after 50 cycles)	2.3 MPa
REACTION TO FIRE	EN 13501-1	Euroclass A1	A1
ABRASION RESISTANCE (BOHME)	UNI EN 13813	Reference concrete RcK 25 MPa:Class A12	Class A3
RESISTANCE TO SULPHATE	ASTMC 88	in magnesium sulphate/ curing at 7 days	No degradation after attack
BLEEDING	UNI 8998	Absent	

Legal notice - SLCMP version dated 01.03.2017

In the technical specifications herein, Draco Italiana s.p.a. used the indicators therein specified, with the relevant standards.

Please check if this Sheet and the figures therein contained apply to the product batch you are interested in or if they have been overridden by any later release. If in doubt, check whether this Sheet matches the one applicable at the time of finalising the sales agreement, at **www.draco-edilizia.it**, and/or contact our Engineering Department.

No advice provided by our staff, either verbally or in writing at your request, about the potential applications of the Products shall be binding under the sales agreement or shall be considered an integral part of the agreement. Such advice is based on our experience and on the best available practical and/or scientific knowledge; as such, it shall not be binding or conditional on the buyer or user. Please try our products first to find out whether they are fit for your intended use or application; in any case, you shall be solely responsible for your choice.

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