

Overview of Application

Rapid-Hardening Concrete for Airport Pavements
and Motorways



Concretum® Q-FLASH 2/20



Runway



Stands



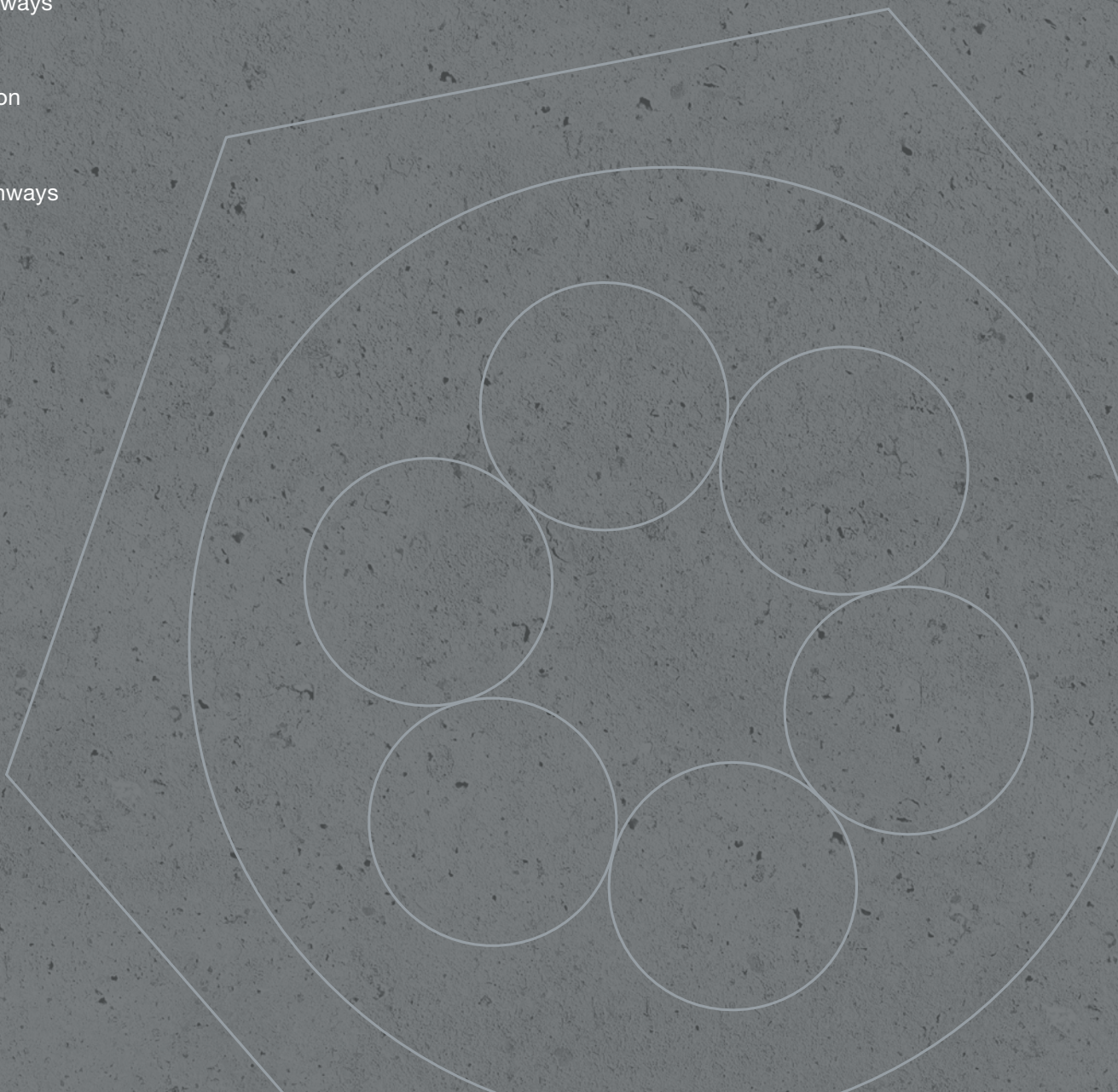
Taxiways



Apron



Highways



Concretum® Q-FLASH 2/20

Concretum® Q-FLASH 2/20 is the newest generation of rapid-hardening concrete. The concrete can be produced, transported and processed like conventional concrete. Different to standard concrete, Concretum® Q-FLASH 2/20 achieves a compressive strength of 20 N/mm² just 2 hours after pouring. The concrete is also recyclable, without restrictions. The main application for use is reconstruction of transport surfaces with high traffic volumes for example, motorways, runways, taxiways and standing areas, among others. The rapid-hardening nature of Concretum® Q-FLASH 2/20 and its resulting rapid strength development allows these reconstructions to be carried out without interrupting traffic operations. Concretum® Q-FLASH 2/20 has been in use in international airports since 2004.

CONCRETE SPECIFICATIONS

Exposure class	XC4, XD3, XF4
Strength class	C50/60
Consistency class	C0 to C2
Max. aggregate size	8 to 32 mm
Aggregates	rounded / crushed
Alkali-Aggregate-Reaction	resistant

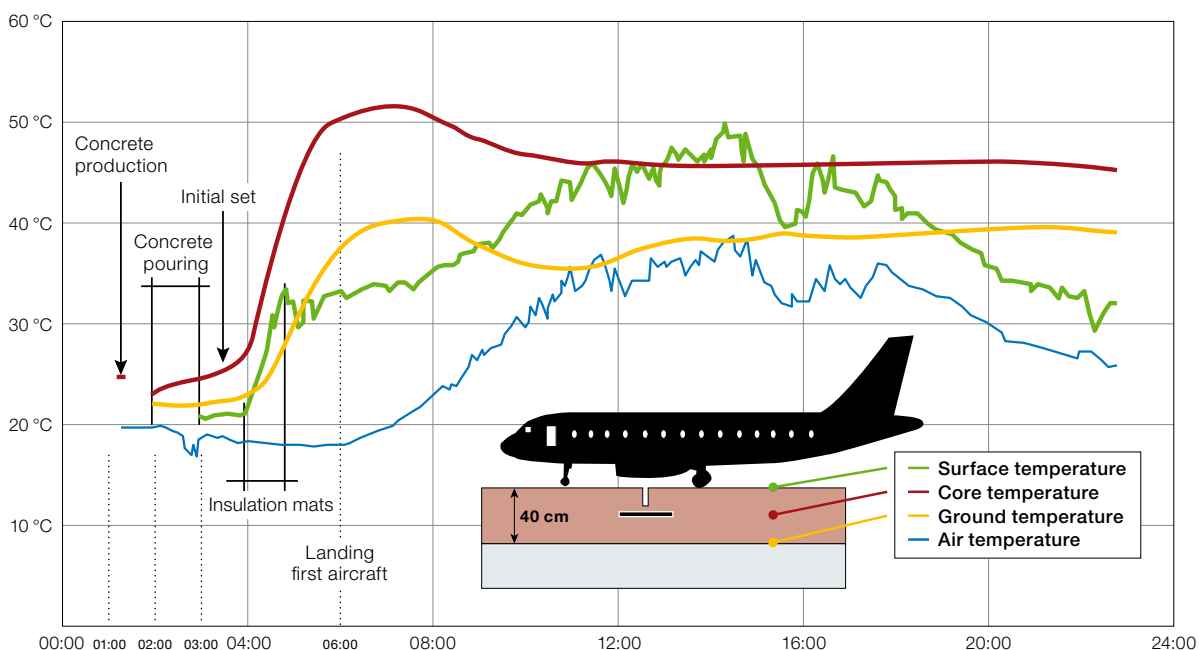
The concrete comprises pure mineral rapid-hardening cement, aggregate, water and admixtures. The admixtures serve to control the consistency and open time. The concrete is ideally suited for rapid overnight concrete pavement renewal projects and conforms to the regional construction standards and guidance documents for airport constructions.

CONCRETE PROPERTIES

$f_c > 20 \text{ N/mm}^2$	2 hours
$f_b > 3 \text{ N/mm}^2$	2 hours
Shrinkage $\epsilon_{SH 91 d}$	$\leq 0.25 \%$
Heat of hydration	210 J/g (equivalent to low heat cement)
Moisture < 4 CM-%	3 hours

EU: It can be used for all exposure classes according to EN 206.
 UK: Suitable for constructions according to "SPEC 33 – Pavement Quality Concrete for Airfields".
 US: Conforms to ASTM C1157-17 and is suitable for constructions according to the FAA Advisory Circular "150/5370-10H – Standard Specifications for Construction of Airports".

TEMPERATURE DEVELOPMENT





AREA OF APPLICATION

Concretum® Q-FLASH 2/20 is ideal for replacing actively used concrete traffic surfaces. Experienced concrete paving specialists, equipped with the necessary tools, skillfully process and pour this concrete to meet required standards. The concrete is produced in a designated plant, then transported and poured on-site by the construction company. Concretum Construction Science AG provides invaluable support to both the concrete plant and construction company, leveraging years of experience, and adapting to regional and project-specific needs. The concrete is poured accordingly, based on the project's size and stage.

Adaptable methods

Concretum®
Q-FLASH 2/20 can be placed using a slipform paver or manually using a screed.

Adaptable temperatures

Concretum®
Q-FLASH 2/20 can be placed within a wide range of ambient temperatures.

Adaptable set-ups

Concretum®
Q-FLASH 2/20 can be used for different set-ups such as on-site or batch plant production.

Adaptable size

Concretum®
Q-FLASH 2/20 can be used for large-scale, single slabs, or small patches.

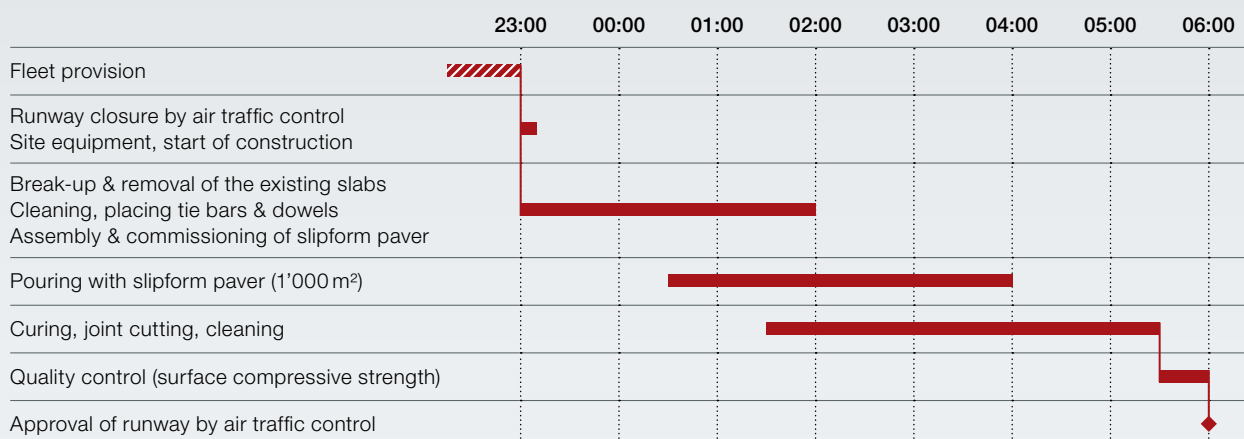


CONSTRUCTION PROCESS FOR AIRPORTS

The construction process benefits from several favorable conditions:

- concrete plant in direct proximity (on-site concrete plant)
- Implementation of slipform paver

With these factors taken into account, it is possible to achieve a stage performance of **1'000 m²** per night, even considering a closure period of approximately 7 hours. Furthermore, by adjusting the size of the stages, it becomes feasible to reduce the closure times even further, enhancing overall efficiency.



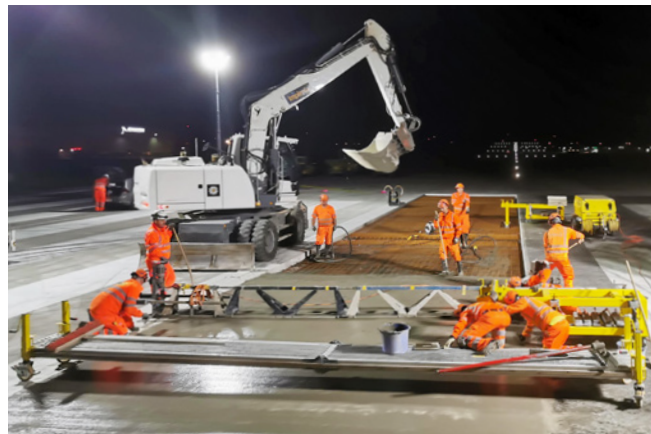
APPLICATION AREAS IN AIRPORTS



Placement with slipform paver Large-scale

Product	Concretum® Q-FLASH 2/20
Area per night	> 1'000 m ²
Volume per night	> 300 m ³
Type of batching	batching plant on-site
Thickness	30–40 cm
Night shift (closure)	6–8 h

Concretum® Q-FLASH 2/20 is machine laid using conventional slipform pavers, requiring an on-site or nearby (preferably air-side) concrete batching plant with a minimum output capacity of 200 m³/h for smooth material logistics. Experienced contractors can replace up to 1'000 m² in a single night shift (closure). Utilizing a slipform paver enables the complete renewal of the center section of a runway within a construction season. These pavers are ideal for large areas requiring adjacent slab renewal, with a minimum processing area of 600–700 m² per site and per night shift for optimal efficiency. Applications include runways, taxiways, high-speed taxiways, aprons, and aircraft stands.



Placement manually with screed Single bays (slabs)

Product	Concretum® Q-FLASH 2/20
Area per night	50–250 m ²
Volume per night	15–60 m ³
Type of batching	batching plant nearby
Thickness	20–40 cm
Night shift (closure)	5–8 h

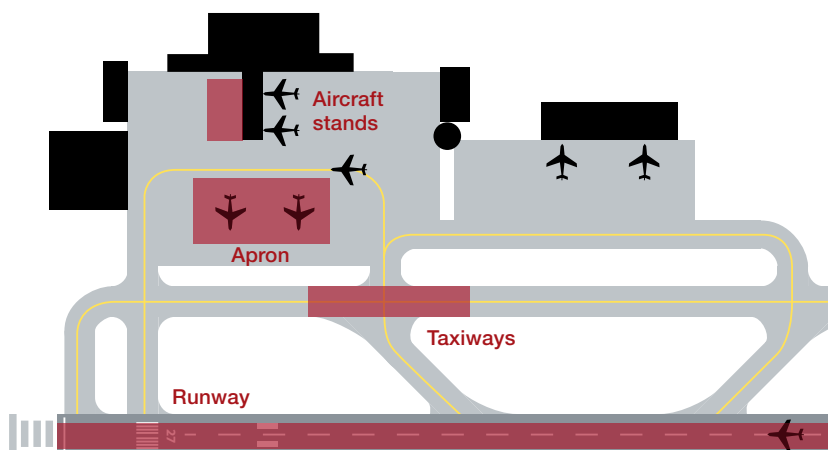
Concretum® Q-FLASH 2/20 enables manual placement. Depending on factors such as the construction area, equipment availability, and contractor expertise, up to 250 m² can be renewed in a single night shift. To support the process, a nearby concrete batching plant with a minimum output capacity of 40 m³/h is necessary. Transportation time, including security gate procedures, should not exceed 30 minutes. It is possible to renew up to 3 independent slabs within a 200-meter distance. The application scope covers the renewal of slabs on runways, taxiways, high-speed taxiways, aprons, and aircraft stands.

Effective planning and clear assignment of responsibilities are crucial in complex projects with multiple interfaces. This ensures minimal errors and maximizes efficiency. The quality of concrete and surface is contingent upon the expertise of the contractor's staff and the equipment employed.

CONCRETUM CONSTRUCTION SCIENCE AG PROVIDES ALL SUPPORT NECESSARY THROUGHOUT THE PROJECT

The project planning includes:

- Developing tender specifications
- Creating detailed construction programs for confined night shifts
- Evaluating the suitability of an on-site concrete batching plant or appropriate aggregates
- Designing the concrete mix
- Scheduling and preparing the work efficiently





Placement manually with mobile batching plant

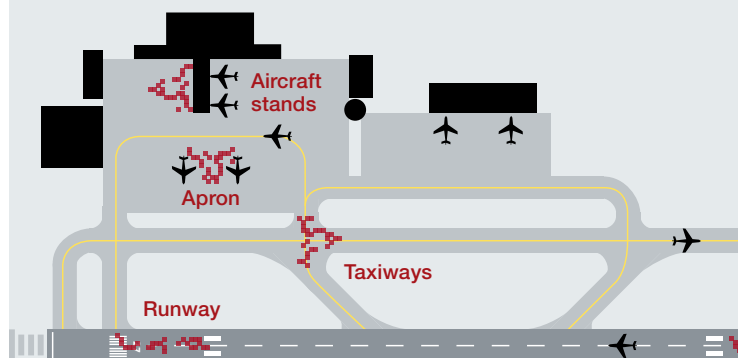
Single bays (slabs)

Product	Concretum® Q-FLASH 2/20
Area per night	10–200 m ²
Volume per night	5–40 m ³
Type of batching	mobile batching truck
Thickness	20–40 cm
Night shift (closure)	4–8 h

Concretum® Q-FLASH 2/20 allows for manual placement, utilizing a mobile concrete batching truck on-site. There are three possible options for slab renewals:

- The mobile batching truck contractor solely handles concrete production as a subcontractor, while the main contractor is responsible for excavating the old slab and laying the rapid-hardening concrete.
- A subcontractor performs batching and laying of rapid-hardening concrete using a mobile batching truck, with the main contractor handling the excavation.
- The contractor undertakes excavation, batching, and laying of rapid-hardening concrete with a mobile batching truck. This method proves to be the most efficient, minimizing interfaces among involved contractors/parties.

Renewal of up to three single or half slabs is achievable. The application scope includes replacing slabs on runways, taxiways, high-speed taxiways, aprons, and aircraft stands.



Placement of mortar for small patches

Small areas

Product	Concretum® Q-CON
Area per night	0.5–5 m ²
Volume per night	40–2'000 l
Type of batching	concrete mixer
Thickness	10–25 cm
Night shift (closure)	min. 4 h

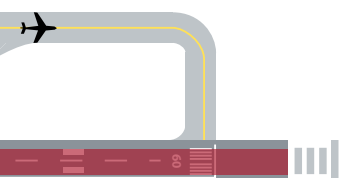
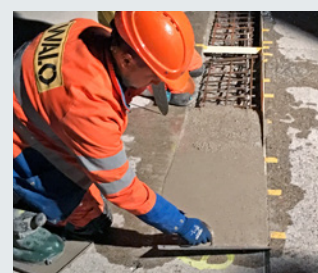
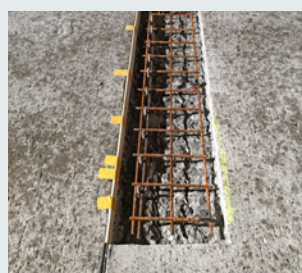
Concretum® Q-CON is mixed on-site utilizing a high-power compulsory mixer with a minimum capacity of 100 liters.



Small local repairs

Product	Concretum® Q-REP G
area per night	0.01–0.5 m ²
Volume per night	20–1'000 l
Type of batching	concrete mixer
Thickness	5–10 cm
Night shift (closure)	min. 2 h

Concretum® Q-REP G is mixed on-site using a high-power compulsory mixer with a minimum volume capacity of 50 liters.



Overview of Application

Concretum® Q-FLASH 2/20



**YOUR PARTNER
WORLDWIDE:**

Concretum Construction Science AG
Steinackerstrasse 56
CH-8302 Kloten
Switzerland

Phone +41 44 445 13 46
info@concretum.com

www.concretum.com



**YOUR PARTNER
FOR SWITZERLAND:**

Ebicon AG
Breitloostrasse 7
CH-8154 Oberglatt
Switzerland

Phone +41 43 411 28 20
info@ebicon.ch

www.ebicon.ch

