

# **Addagrip 1000 System**

## **Concrete Pavement Protection**



**For Taxiways, Runways, Aircraft Stands and Helipads**

**PROTECTING AIRFIELD CONCRETE PAVEMENTS FOR OVER 30 YEARS**

# Addagrip 1000 System

## About Addagrip

Addagrip, part of the Terraco group of companies, is a leading manufacturer, formulator and specifier of quality resin surfacing systems since 1980. The range of high quality resin based products for external and internal use includes the Addagrip 1000 System concrete surface protection system.

## Addagrip 1000 system - the cost effective solution to spalled concrete

Surface weathering can cause the loss of coarse aggregate to your concrete pavement creating a 'FOD' hazard. The Addagrip 1000 System provides a simple and effective solution to prolong the life of your concrete pavement.

The Addagrip 1000 System has been designed to provide a cost effective and durable treatment for addressing the problem of spalled and frost damaged concrete pavements, predominantly on airfields. Quick and easy to apply with the minimum of disruption, the Addagrip 1000 System Resin not only protects, penetrates and seals the concrete surface but also prolongs its life by an estimated 10-20 years.

- **Cost effective**
- **Improves skid resistance**
- **Fast installation**
- **Less disruptive than replacing slabs**
- **Protection against fuel spillages and de-icers**
- **For taxiways, runways, aircraft stands and helipads**
- **Extends the life of concrete up to 10 - 20 years**

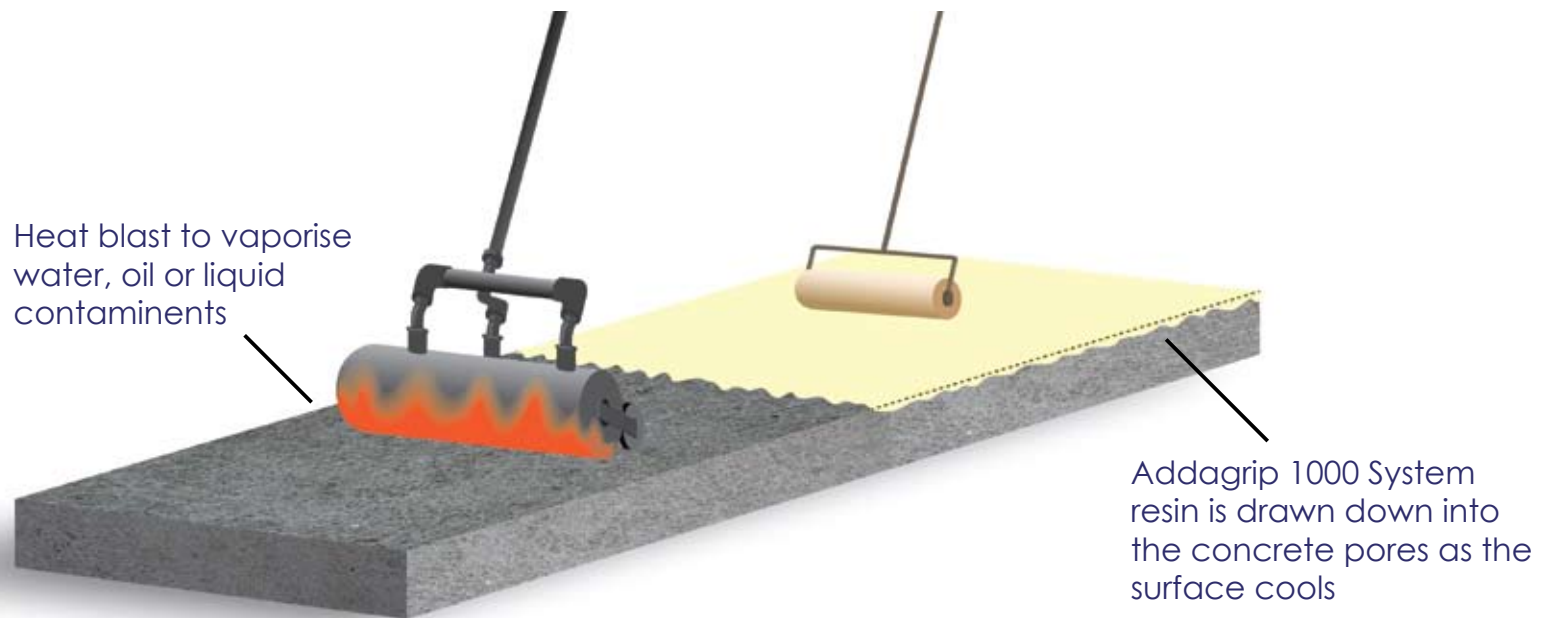
## Surface preparation

Before the Addagrip 1000 System Resin is applied, the surface is heat blasted using the Addagrip Hot Compressed Air System (HCA). This Addagrip HCA uses a combination of propane gas and compressed air which is ignited in a special chamber so that it burns at approximately 1000°C with a velocity blast of approximately 300m per second. Once the heat blast comes into contact with the concrete surface it causes water, oil or other liquid contaminants to vaporise leaving the concrete capillary pores within the top few millimetres open and empty.

## Application of Addagrip 1000 System

Immediately after the HCA process the Addagrip 1000 System Resin is rolled/squeegeed onto the surface. As the concrete cools the Addagrip 1000 System Resin is drawn down into the structure of the concrete.

A further application of Addagrip 1000 System Resin is then applied at the recommended rate to hold your chosen aggregate. Quartz or Emery in a range of grades is available to provide the finished wearing surface, typical grading for Quartz is 0.7-1.2mm or 0.8-1.4mm and a typical grading for Emery is 0.5-1.0mm, 0.5-1.5mm, 0.8-1.7mm and 1-2mm.



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Such is the versatility of the Addagrip 1000 System Resin that it is possible to undertake selective treatments in individual areas where weathering has taken place. This makes it ideal for application where limited resources require the most urgent areas to be prioritised.

The Addagrip 1000 System Resin has been utilised to make good poor quality or weathered concrete on both military and civil airfields throughout the UK and overseas over the last 30 years.

Not only is it used to rejuvenate concrete surfaces without the need for expensive replacement, but at the same time it protects and seals the surface helping to prevent FOD (Foreign Object Debris).

Projects undertaken have varied in size from 100 sqm up to areas in excess of 100,000 sqm and include Taxiways, Helipads, Aircraft Stands and Runways.



1000°C exiting at 300m per second.

Oil or liquid contamination is vapourised by the heat blast.

Any weakness in the surface will cause the concrete to spit.

# Concrete Pavement Protection

## Existing movement joints

When applying the Addagrip 1000 System Resin next to movement joints care should be taken not to melt/damage the existing jointing material with the HCA. The Addagrip 1000 System Resin should not be allowed to run or coat the joint.

If the Addagrip 1000 System Resin cures on the joint it must be removed as soon as possible as this could create a FOD issue. We recommend that all jointing material is removed prior to application of the Addagrip 1000 System Resin and replaced on completion.

## Application of Addagrip 1000 System Resin

Once the agreed quantity of Addagrip 1000 System Resin has been applied and the surface retains a uniform glossy finish you can apply the chosen dry quartz or Emery aggregate. If any areas look matt or dry, further Addagrip 1000 System Resin must be applied before the aggregate is applied.

Apply aggregate by allowing it to drop down evenly into the Addagrip 1000 System Resin and cover until all areas are totally saturated.

The surface when fully cured should be thoroughly swept or vacuumed using a suitable road sweeper or similar with nylon brushes to remove excess/loose aggregate. If the aggregate is clean and dry it can be reused.

## Addagrip 1000 System Aggregates

The suggested aggregates will vary depending on your individual project requirements, for high wear or maximum anti-skid properties Emery should be used. However, Emery will increase wear on tyres:

	Particle Shape	Colour	Hardness (Mohs)
0.7 – 1.2mm DK1 Quartz	Rounded	Grey	7.0
0.8 – 1.4mm DK1 Quartz	Rounded	Grey	7.0
0.5 – 1.0mm Emery	Angular	Dark Grey/Brown	9.0 (PSV 66-68)
0.5 – 1.5mm Emery	Angular	Dark Grey/Brown	9.0 (PSV 66-68)
0.8 – 1.7mm Emery	Angular	Dark Grey/Brown	9.0 (PSV 66-68)
1.0 – 2.0mm Emery	Angular	Dark Grey/Brown	9.0 (PSV 66-68)



# Addagrip 1000 System

## Addagrip 1000 System Testing

Various independent tests confirming the suitability of the Addagrip 1000 System Resin for the treatment of damaged concrete pavements have provided the following results:

### General description

The Addagrip 1000 System is a concrete repair system that consists of a specific resin and aggregate. The purpose of the aggregate is to increase roughness of the pavement. The system has been developed to treat top layer as well as deep damage and to seal small cracks and spalled surfaces on concrete airfield pavements. Applying the Addagrip 1000 System Resin onto the damaged or spalled surfaces of concrete will prevent further deterioration prolonging the life of the concrete.

### Testing

Laboratory tests were performed to determine the hydrophobic and physical properties of the system using 10 x 10 x 10cm blocks of B35 Concrete.

### Evaluation of roughness using a 1mm aggregate

Concrete roughness ratio (without treatment)	0.69	Roughness factor after application of the system	0.75
Coefficient of variation	1.9%	Coefficient of variation	2.26%

### Protection against absorption of water and aviation fuel

Absorption of samples in water (without treatment)	4.19%	Absorption of samples in aviation fuel without treatment	5.26%
Absorption of samples with surface treatment	0.19%	Absorption of samples with surface treatment	1.31%
Reduction of absorption	95.4%	Reduction of absorption	75.2%



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## Freeze resistance

Freeze and de-icer tests have been conducted. The tests consisted of over 200 cycles of freezing and defrosting 10 x 10 x 10cm B35 concrete cubes treated with the system. Results are as follows:

During the tests the top layer condition and any increase of absorption was checked.

Strength reduction after freeze resistance cycle completed	11.2%
Mass decrement of samples	not evident
De-icer resistance	Good
Absorption of samples after freeze resistance test	0.45%

## Adherence to the concrete

Tear of resistance tests were carried out using a SP-1 Hydraulic Device. Results as follows: Mean value 2.7MPa Minimum value 1.9MPa

The tear off occurred within the concrete layer.

## High temperature resistance

Temperature resistance consisted of 20 test cycles. In each cycle the samples covered in the system were dried in temperatures of 110 °C and then checked for absorption in water at a temperature of 18 °C – 20 °C. No macroscopic changes and mass losses have been evident during the test. Reaction to Fire classification Bfl-s1.

## Capability of applying line marking paints onto treated areas

Application of chlorinated rubber paint, acrylic paint and epoxy paints have proved easy and successful.



## Addagrip 1000 System Concrete Pavement Protection



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