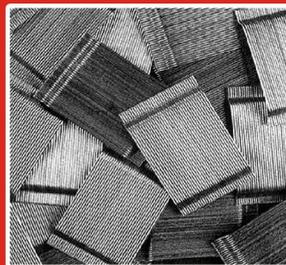




ADFIL
Construction Fibres



ADFIL® SF PAVE

ADFIL® SF FLOOR

Steel Fibre

Paving Systems

for

External & Internal

Applications

This includes Placing, Finishing, Additional reinforcement and Batching instructions



Scan here for additional information

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London, EC2A 2AP.

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Reinforced concrete reinvented

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www.adfil.com

ADFIL® SF86

STEEL FIBRES



Adfil SF86 is a high performance cold drawn hook end steel fibre that has been tested and accepted by the NHBC via third party testing. This product is certified for use in the UK construction market.

Advantages & Benefits

- **Glued for ease of mixing**
- **Reduced installation time**
- **High tensile strength**
- **Proven in SCC concrete**
- **Proven performance**
- **Replacement for structural steel reinforcement**

Tests

Adfil SF86 has been tested in independent accredited laboratories to meet stringent criteria for use in the UK housing market and NHBC accepted. This product has also had extensive BS EN 14651 beam testing carried out to ensure that when used in structural applications, it will achieve the required post crack residual flexural strength.

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www.adfil.com

Engineering

Adfil SF86 steel fibres provide effective replacement of traditional steel bar and fabric in a range of applications.

ADFIL Design Engineers can provide a full PI insured design service for structural applications on request.

General Applications

- **Industrial 'jointless' floors**
- **Pile supported floors**
- **External paving**
- **NHBC accepted house floor structural toppings**
- **Precast element toppings**
- **Suspended Slabs**



Adfil® SF Floor

Flooring System for Internal Applications



Background

Adfil Construction Fibres have a proven system of Steel fibre reinforced concrete for use in internal areas, replacing the need for traditional steel mesh fabric. **Adfil® SF Floor** uses Adfil SF86 steel fibre ready mixed into a designated grade of concrete to ensure consistent and reliable performance for the customer every time.

Application Areas

Adfil® SF Floor can be used in a wide variety of industrial and domestic applications:

- General industrial flooring
- Workshops
- Agricultural buildings
- Domestic floors
- Warehouses



Adfil® SF Floor can be used in a wide variety of Internal Applications



A quality power float finish is easily achieved with the **Adfil® SF Floor** System

The Key Features & Benefits

Adfil® SF Floor will give the following benefits when compared to traditional steel mesh reinforcement construction:

- Ease of construction and reduced construction time
- The risk of reinforcement being placed incorrectly is eliminated as it is contained within the delivered concrete, at the correct dosage to ensure the required performance
- Elimination of significant Health & Safety hazards associated with the handling, cutting and fixing of steel mesh reinforcement
- A significant reduction in embedded carbon (60%) when compared to steel mesh construction
- Can provide an overall cost saving compared to traditional construction methods

Installation

Adfil® SF Floor can be placed using conventional techniques such as direct discharge, skip or pump. There are no specialist handling requirements. To ensure the optimum performance of the end product, best practice compaction, finishing and curing techniques should be observed. It is strongly recommended that a curing membrane be applied to the concrete surface immediately after finishing to control moisture and ensure the concrete reaches its required strength specification.

*use of information see page 58-ENG-Adfil® SF Floor-05/2022UK statement

Adfil® SF Floor

Flooring System for Internal Applications



Cost Savings

Using **Adfil® SF Floor** can result in significant savings on the cost of traditional steel mesh reinforcement in addition to those associated with faster and easier installation.

The following table shows typical savings compared to the use of the common steel mesh types:

Solution	Traditional Steel Mesh Reinforcement Type			
	A142	A193	A252	A393
Adfil® SF Floor 130	5%	7%	12%	20%
Adfil® SF Floor 160	3%	5%	9%	14%
Adfil® SF Floor 190	1%	3%	6%	10%

Table showing indicative cost savings compared to traditional mesh types using 15Kg m³ of Adfil® SF86

Technical Information

Adfil® SF Floor can be specified and installed based upon the following load and construction recommendations, complying with the stated design assumptions noted below:

Solution	Minimum Slab Thickness (mm)	Maximum Point Load (T)	Maximum Fork-lift Capacity (T)	Maximum Wall Load (T)	Maximum Joint Spacing
Adfil® SF Floor 130	130	2	2	2	6
Adfil® SF Floor 160	160	3	3	3	6
Adfil® SF Floor 190	190	4	4	4	6

DESIGN ASSUMPTIONS: Concrete grade C25/30 & 15Kg m³ of Adfil® SF86 Minimum sub-grade CBR = 5%;

Point load applied on base of minimum dimensions 125mm x 125mm

Joint recommendations can be obtained via the full flooring guide

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SB-ENG-Adfil® SF Floor-05/2022UK



Adfil® SF Pave

Paving System for External Applications



Background

Adfil Construction Fibres have a proven system of Steel fibre reinforced concrete for use in internal areas, replacing the need for traditional steel mesh fabric. **Adfil® SF Pave** uses Adfil SF86 steel fibre ready mixed into a designated grade of concrete to ensure consistent and reliable performance for the customer every time.

Application Areas

Adfil® SF Pave can be used in a wide variety of external applications:

- External ground supported slabs for pavements, yards and hard standings
- Farmyards and Agricultural roadways
- Car parks
- Domestic driveways



Direct discharge into formwork will reduce construction time



Large areas can be poured without having to negotiate in-situ steel mesh

The Key Features & Benefits

Adfil® SF Pave will give the following benefits when compared to traditional steel mesh reinforcement construction:

- Ease of construction and reduced construction time
- The risk of reinforcement being placed incorrectly is eliminated as it is contained within the delivered concrete, at the correct dosage to ensure the required performance
- Elimination of significant Health & Safety hazards associated with the handling, cutting and fixing of steel mesh reinforcement
- A significant reduction in embedded carbon (60%) when compared to steel mesh construction.
- Can provide an overall cost saving compared to traditional construction methods.

Installation

Adfil® SF Pave can be placed using conventional techniques such as direct discharge, skip or pump. There are no specialist handling requirements. To ensure the optimum performance of the end product, best practice compaction, finishing and curing techniques should be observed. It is strongly recommended that a curing membrane be applied to the concrete surface immediately after finishing to control moisture and ensure the concrete reaches its required strength specification.

*use of information see page SB-ENG-Adfil® SF Pave-05/2022UK statement

Adfil® SF Pave

Paving System for External Applications



Cost Savings

Adfil® SF Pave can be used in a wide variety of external applications. Using **Adfil® SF Pave** can result in significant savings on the cost of traditional steel mesh reinforcement in addition to those associated with faster and easier installation.

The following table shows typical savings compared to the use of the common steel mesh types:

Solution	Traditional Steel Mesh Reinforcement Type			
	A142	A193	A252	A393
Adfil® SF Pave 130	5%	7%	12%	20%
Adfil® SF Pave 160	3%	5%	9%	14%
Adfil® SF Pave 190	1%	3%	6%	10%

Table showing indicative cost savings compared to traditional mesh types using 15Kg m³ of Adfil® SF86

Technical Information

Adfil® SF Pave can be specified and installed based upon the following load and construction recommendations, complying with the stated design assumptions noted below:

Solution	Minimum Slab Thickness (mm)	Maximum Traffic Loadings	Maximum Joint Spacing (m)
Adfil® SF Pave 130	130	LGV / Car 3.5T 2 Axles	6
Adfil® SF Pave 160	160	HGV 40T 5 Axles	6
Adfil® SF Pave 190	190	HGV / Trailer 44T 6 Axles	6

DESIGN ASSUMPTIONS: Concrete grade C32/40 & 15Kg m³ of Adfil® SF86 Minimum sub-grade CBR = 5%; LGV / HGV data from UK Department of Transport 2003; For loadings outside these parameters contact Adfil for specialist advice

Joint recommendations can be obtained via the full paving guide

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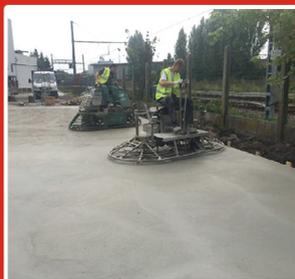
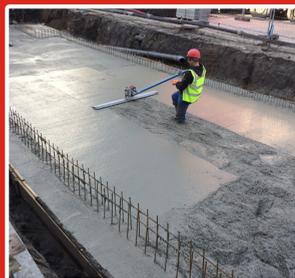
ADFIL
Construction Fibres

Steel Fibre

Finishing & Placing Guide

ADFIL® SF PAVE

ADFIL® SF FLOOR



ADFIL® SF PAVE & SF FLOOR

Finishing & Placing Fibre Concrete



With this document we want to offer the simple guidelines that can lead to a fibre free surface. Exposed fibres are your assurance of a properly distributed three-dimensional reinforcement before the concrete is finished.

Concrete mix

Creating the perfect finish for a fibre reinforced concrete floor starts with optimising the concrete mix design. Concrete mix should be supplied by a certified QSRMC Ready Mix Concrete Supplier, with supporting batch records to demonstrate required compressive strength, minimum cement content, maximum water cement ratio.

By increasing the amount of fine aggregate (0-4mm) in concrete the fibre-concrete matrix will have a better grip on the fibre, more mortar will hold the fibre in place once pushed under the surface. We advise to use a concrete mix design which contains at least 45% of fine aggregate for slump concrete. For concrete which will be power floated we advise a minimum of 47.5% of fine aggregate and a minimum of 350kg of cement. This ensures sufficient fat is available after placement and compaction to ensure fibre suppression below the fresh concrete surface. Typically self-compacting concrete will contain more fines and paste, so the mix design does not need to be changed.

Consistence should be suitable to allow pumping if necessary, generally S3 – S4, confirmed by the concrete supplier. This should be confirmed by appropriate consistence testing by an appointed, qualified Technician, using standard test apparatus, complying to the relevant BS EN Test Standard. If excessive bleed is evident, the mix should be rejected and the concrete supplier notified accordingly. If consistence is not within required tolerance, the mix should also be rejected. Under no circumstances should water be added to the concrete mixer drum under instruction from the Contractor.

Mixing

Adfil SF86 Steel Fibres should be added to the concrete during batching in accordance with recommended mixing guidance. Mix trials should be carried out to ensure the procedure followed results in consistent fibre dispersion without balling, at the specified dosage. Preferably this should be determined from a design provided by ADFIL Engineers.

Installation

Upon discharge, the fresh Adfil SF86 reinforced concrete, should be placed in situ without segregation. This may be via pumping or direct discharge in to formwork. This may result in the propagation of fibres to the concrete surface by capillary action which will lead to surface fibres interfering with power floating operations.

Preferably a laser screed should be used to complete level and compaction, but a portable mechanical screed (magic screed) is also suitable. Full compaction will allow sufficient paste (Fat) to be brought to the surface of the fresh concrete in order to suppress the fibres below the surface and also align fibres in the top area of the concrete to be aligned horizontally below the surface. This is critical if a high quality powerfloat finish is to be achieved.



Readymix Supplier



Adfil SF86 Steel fibre concrete mix



Pouring concrete



Laser screed



ADFIL® SF PAVE & SF FLOOR

Finishing & Placing Fibre Concrete



Timing

Flowing concrete

Flowing concrete should be dappled as soon as it is practically possible. Be careful NOT to use a round skip for this type of concrete as this will push the fibres back up at the end of the skip. Using a flat skip helps to push down the fibres.

Slump concrete

Once the concrete has been poured, the timing of finishing is very important. The concrete needs to have a certain resistance in order to keep a fibre down. The easiest way to check this is to manually push down a fibre and see whether it stays under. If it does, the concrete can be finished.

Ways of finishing

Before finishing, dynamic compaction using appropriate site equipment, like a twin beam compacting screeder or razor back, should be undertaken to ensure full compaction of the slab or topping to full depth, without over compaction which could result in segregation and excessive bleed. Poker vibrators should not be used as this has a tendency to pull fibres vertically out of the surface when pulling the vibrator in and out of the concrete. Hand screed bar, magic screeder can be used as if it were a conventional reinforced concrete.

Skip float

A skip float is to be used to close the surface and to correct any small surface irregularities left by the compacting beam. This should occur soon after compaction when some of the surface moisture has evaporated and the concrete has started to stiffen. Each pass should overlap the previous one by about 50mm. The fibres in the surface will be pushed down due to the skip float movement. This will create a nice fibre free surface.

When a rougher surface need to be applied to provide more friction a brushed finish can be applied. Fibres in the surface will be aligned in the brush direction and will be less visible.

Rollerbug

We advise to use a rollerbug as it will provide a more durable concrete finish as it does not open up the protecting upper concrete paste. The rollerbug will also provide the perfect preparation for powerfloating



**Use a Dapple to finish
SCC**



Vibro Float



Skip Float



Rollerbug

ADFIL® SF PAVE & SF FLOOR

Finishing & Placing Fibre Concrete



Powerfloating

With power floating it is down the quality and skill of the workforce laying the concrete, and the quality of the concrete delivered by your supplier. The only rule we ask the readymixers to adhere to is to ensure there is 45 - 50% fines in the concrete so that there is enough concrete paste (fat) on the top surface.

Also to ensure the correct agitating tool is used for example a concrete poker or magic screeder or vibrating screed bar. Nothing really more that they should use for normal concrete. The correct tools for agitation is to ensure there is around 3mm of fat on top of the area that you are going to power float. So when you initially float it the fibres get pushed down.

The fibres in the surface should be pushed down with a skipfloat or a rollerbug prior to powerfloating the surface. This will avoid fibres sticking out of the surface after powerfloating. Typical site practice is to test the concrete's readiness for power floating by measuring the indentation of the operator's foot: if the indentation is 2mm or less generally the slab is then power floated. It must be noted that the ambient temperature and the concrete mix design may affect power-floating times.

Beware not to set the knives of the powerfloat to deep in the concrete as this might mix the thin upper layer with fibres again. The Contractor should ensure that powerfloat finishing is not carried out prematurely as this will remove the closed surface fat required to ensure a high quality fibre free finished surface.

Powerfloating operations should only be carried out by competent and experienced operatives as appointed under the responsibility of the Contractor. The surface should not be over panned as this could lead to delamination and dusting of the concrete surface when trafficked.

Optionally 3-5kg of quartz sand can be added to every square meter of the surface. It is applied to the concrete when it is at the panning stage prior to powerfloating. This will add a layer of 2mm with hard wearing characteristics and increased impact resistance. It will also help to push any remaining fibre down before powerfloating.

Laser guided screed

No actual extra care needs to be taken into account. When the floor is powerfloated after levelling with the laser, please take the above mentioned advise into account.



Power floating concrete



Laser guided screed



Too wet to pan



Ready to start Panning



ADFIL[®] SF PAVE & SF FLOOR

Finishing & Placing Fibre Concrete



Curing the concrete

All concrete must be cured. Curing is the process of ensuring that there is sufficient water present to allow hydration of the cement throughout its life. For all categories of slabs, it is essential that all normal good curing procedures be strictly followed.

We strongly advise to cure the concrete as soon as is practically possible using a proprietary spray applied membrane forming compound. This will avoid water evaporating out of the concrete surface too quickly.



Curing Concrete

Saw cut joint installation

Saw cut joints should be made within 24hrs of powerfloat finishing, 1/3 of slab / topping depth, or 50mm, whichever is greater. This is critical to ensure uncontrolled cracking does not occur due to shrinkage during final set.



Applying saw cuts within 24 hours

Finishing Trials

Should you be in any doubt about your method of finishing fibre reinforced concrete then we advise that you arrange trial mixes with your readymix supplier. The Adfil technical team will be more than happy attending to offer first hand specialist advice.

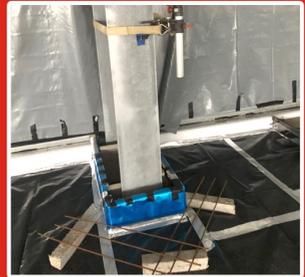
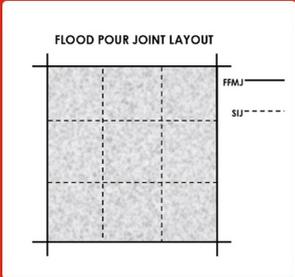
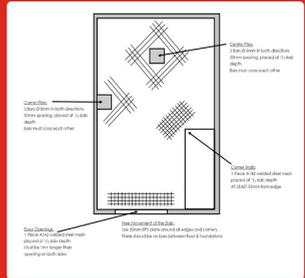


Trail bed being poured



ADFIL
Construction Fibres

Steel Fibre Additional Reinforcement & Recommended Joint details ADFIL® SF PAVE ADFIL® SF FLOOR





ADFIL® SF PAVE & SF FLOOR

Additional Reinforcement & Recommended
Joint details



Guideline for Joint Installation and Supplementary Reinforcement in ADFIL® SF86 Fibre Reinforced Concrete Slabs

Joint Layout Considerations:

In an ideal joint layout plan, the objective is to minimize the risk of cracks occurring, this is achieved by a combination of the following considerations:

- Maintaining bay aspect ratio to a maximum of 1:1.5, preferably having square bays.
- Avoiding re-entrant corners.
- Avoiding bay shapes with acute angles at corners.
- Avoiding restraint to shrinkage with the use of isolation details around fixed piits, such as service access.
- Avoiding point loads at joints.
- Limiting the distance between saw cut joints to a maximum of 6m.
- Limiting dimensions to a maximum of 35m for jointless bays and maximum of 50m for jointed bays, unless using long strip and wide bay construction.

Saw Cut Joints:

- Saw cut joints induce a plane of weakness in the concrete to dictate where cracking
- Saw cut joints are usually 3-4mm wide.
- They should be cut as soon as practicable after placing the concrete, ensuring it is strong enough to avoid any damage during the sawing process.

(Normally 24hrs after placement and finishing)

- They are cut at between 25-30% of slab depth.



ADFIL® SF PAVE & SF FLOOR

Additional Reinforcement & Recommended
Joint details



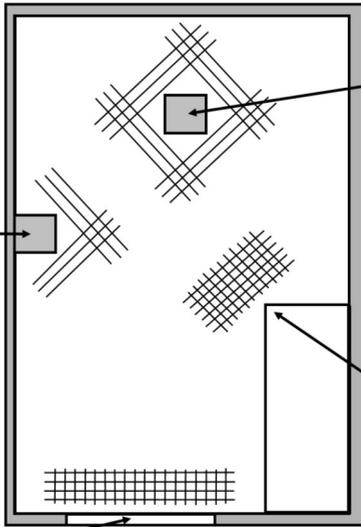
Additional Supplementary Reinforcement

The following is a guide only when using Adfil SF86 Steel Fibre reinforcement in ground bearing slab applications. It is important to ensure the correct measures are taken to avoid defects around services, re-entrants, columns & other details as per best practice.

Columns:

Manholes, Services

3 Bars Ø 8mm in both directions
50mm spacing, placed at 1/3 slab depth
Bars must cross each other



Columns:

Manholes, Services

3 Bars Ø 8mm in both directions
50mm spacing, placed at 1/3 slab depth
Bars must cross each other

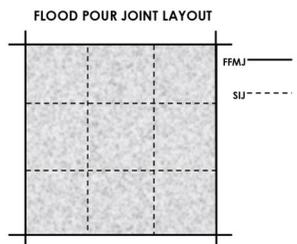
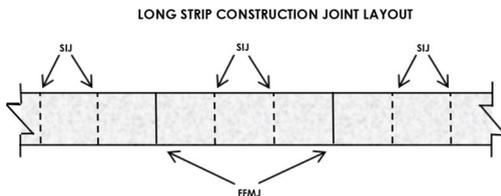
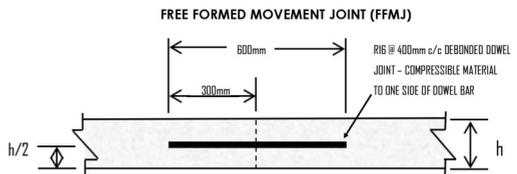
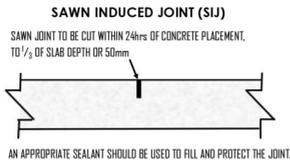
Corner Walls:

1 Piece A142 welded steel mesh
placed at 1/3 slab depth
AT LEAST 35mm from edge

Door Openings:
1 Piece A142 welded steel mesh
placed at 1/3 slab depth
Must be 1m+ longer than
opening on both sides

Free Movement of the Slab:
Use 20mm EPS plate around all edges and corners.
There should be no bars between floor & foundations

Recommended joint details





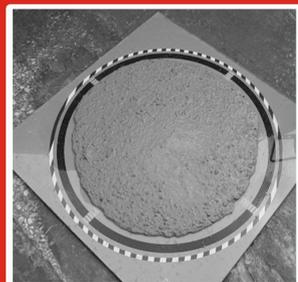
Steel Fibre

Fibre Concrete

Batching Guide

ADFIL® SF PAVE

ADFIL® SF FLOOR





Suggested Mixing Procedure for Adfil® SF86

When adding this fibre into concrete, careful attention must be taken with the batching and mixing procedure.



The suggested procedures below are based upon our own testing. However, experience suggests that different concrete plants, trucks and materials may give varying results and we therefore advise that individual plant trials are carried out prior to supplying a contract.

For Dry Batch Plants:

- Load the truck mixer with all ingredients **excluding the fibres**
- Add **1 bag** of Steel fibres approximately every **30 seconds** (**Not all at once**)
 - i : Either directly into the truck if possible**
 - ii : Or onto a conveyor**
- Mix the truck at **full speed for 4-5 minutes** before you leave for site
- Check your load and leave or carry out any required testing.



Adding Fibre to the back of the truck

For Wet Batch Plants:

- **Add the fibres in the plant mixer with the other concrete ingredients**, Take into account your general safety procedures.
 - i : Either directly into the plant mixer**
 - ii : Or onto the aggregate conveyor**
- Check your load and leave or carry out any required testing.

If the **Fibres cannot** be added to the plant mixer then the **Dry Batch** Plant mixing procedure is suggested.

The **Adfil SF** bags **are not** pulpable paper and **should not** be added to the concrete.

NOTE: If you are adding in micro fibres as well, refer to the micro fibre mixing procedure.



Adding Fibre to the mixer



Final 5 minute mix at full speed

Suggested Mixing Procedure for Adfil® Micro

When adding this fibre into concrete, careful attention must be taken with the batching and mixing procedure.



The suggested procedures below are based upon our own testing. However, experience suggests that different concrete plants, trucks and materials may give varying results and we therefore advise that individual plant trials are

For Dry Batch Plants:

- Add 1/3 of your mixing water to the truck mixer
- Add **1 bag** of Micro fibres approximately every **30 seconds** (**Not all at once**) whilst the barrel is rotating.
- Add in your concrete materials
- Check your load and leave or carry out any required testing.



Adding Fibre to the back of the truck

For Wet Batch Plants:

- **Add the fibres in the plant mixer with approximately 1/3 of your mixing water.** Take into account your general safety procedures.
 - i : **Either directly into the plant mixer**
 - ii : **Or onto the aggregate conveyor**
- **Add** the other concrete ingredients,
- Check your load and leave or carry out any required testing.



Adding Fibre to the mixer

If the Fibres cannot be added to the plant mixer then the **Dry Batch** Plant mixing procedure is suggested.

The **Micro fibre** bags are made of pulpable paper and can be added directly into your concrete.



Final 5 minute mix at full speed

Batching films are available via our website www.adfil.com



UK Technical Sales

Assistance

For any assistance please contact one of the following to get appropriate technical support:

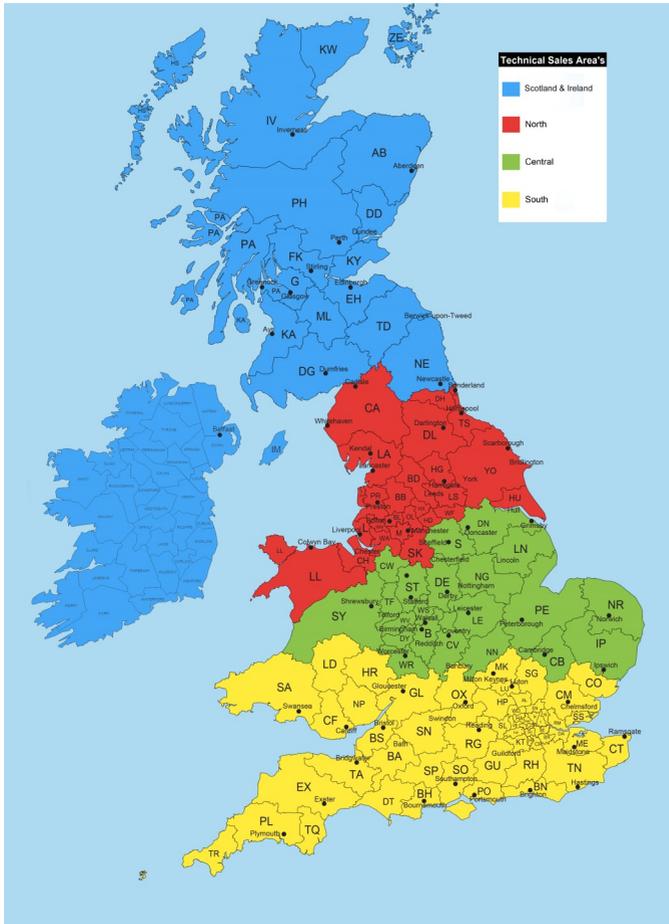
Scotland & Ireland :
+44 (0)7516506016

Northern :
+44 (0)7785616975

Central :
+44 (0)7801300966

Southern :
+44 (0)7824015717

National :
+44 (0)7801595581



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