

Colloidal Graphite 'Aquadag'

AGG303E

'Aquadag' is a dispersion of the purest and finest colloidal graphite in water. It is a concentrate and is generally diluted with distilled or demineralised water before use. The fineness, purity and excellent suspension properties of the graphite particles enable the diluted product to be employed in an extensive range of applications for which lower grade dispersions and graphite powder are unsuitable.

USES

'Aquadag' is used to provide continuous, adherent dry films of colloidal graphite on a variety of materials. Such films are mainly used as lubricants, parting agents or as electrical conductors. Typical uses are:

- Lubrication in the hot drawing of tungsten and molybdenum wire.
- Mould and die coating in the gravity and pressure die casting of light alloys and other metals.
- Pre-treatment and service lubrication of hot metal working tools e.g. extrusion dies and mandrels, forging dies.
- Surface coating of gasket and jointing materials to provide good parting properties and give a good appearance.
- Impregnation of porous materials – e.g. asbestos, paper, wood and textiles to impart some of the properties of graphite such as good lubrication and improved conductivity of heat and electricity.
- Photographic opaque.
- Electrically conducting coatings.

DISPERSION DATA

Dispersed Solid	Graphite
Solids Content	18%
Carrier	Water
Density	1.1kg/litre (11lb/gal.)
Diluents	Distilled, soft or demineralised water
PH value	10 approx.
Shelf life	12 months
Consistency	A light thixotropic paste
Covering power	1lb of product suitably diluted will cover approximately 300 sq.ft of a non-porous surface.

METHODS OF APPLICATION

GENERAL

'Aquadag' is a concentrate and it should normally be diluted before use with distilled or demineralised water.

It is important that dilution be carried out by adding water to the concentrate, not the reverse. Water should be added slowly with constant stirring until a fluid consistency is obtained. The remaining water may then be added more rapidly until the required dilution is reached.

'Aquadag', like certain other suspensions of finely divided solids, is thixotropic, i.e. it gels on standing but the gel structure is easily broken by mild agitation or by simply shaking in the original container. The degree of gelling is no indication of solids content.

Diluted 'Aquadag' may be applied by brushing, swabbing, spraying or dipping. It is an advantage to pre-warm the surface to be coated in order to ensure rapid drying. Surfaces to be treated should be completely degreased. Wetting is improved by the addition of a wetting agent or by preheating of the surface. The maximum addition recommended for most applications is 2% by weight of the diluted product.

FILAMENT WIRE DRAWING

Tungsten and molybdenum wire is coated with 'Aquadag' suitably diluted, and is then heated to bake the graphite on to the wire and raise the wire to the drawing temperature. The graphite coating will lubricate even at red heat, thus preserving the size and finish of the tungsten carbide or diamond dies.

TREATMENT OF EXTRUSION, FORGING AND DIECASTING DIES

Pre-treatment

'Aquadag', diluted with approximately 10 parts of distilled or deionised water should be applied to the clean hot die by brushing, spraying, dipping or swabbing. When dry the coating is buffed with a felt buff until a highly burnished surface is obtained.

Lubrication in service

'Aquadag', diluted with up to 100 parts of water should be applied, preferably by spray. The dilution ratio depends upon the operating temperature of the dies and other factors.

ELECTRICALLY CONDUCTING COATINGS

'Aquadag', the original Acheson conducting coating, is a very useful general purpose material for this group of applications. Coatings formed with 'Aquadag' are suitable for electrostatic screening, as electrodes in many types of electronic and allied equipment such as dose meters, ionisation chambers and Geiger counters and for the prevention of corona discharge at air gaps adjacent to stressed dielectric materials.

The electrical characteristics of the coating vary according to the degree of dilution of the concentrate, the method of application and the heat treatment given to the coating. The following figures are quoted as a guide:

'Aquadag' diluted 1:1 with water and applied by brush	
Air dried coating	approx. 800ohms per square
Heated 200°C	approx. 500ohms per square
Heated 300°C	approx. 20-30ohms per square

The resistance of an applied coating may be reduced up to one third by polishing. The addition of a wetting agent will also noticeably reduce the resistance of the 'Aquadag' coating. The maximum addition recommended is 2% by weight of the diluted product.

Other 'dag' dispersions of graphite and silver are also available for particular electrical and electronic Applications.

PRECAUTIONS

'Aquadag' should be stored in a cool (5-25°C) place and should not be allowed to freeze. Containers should be tightly re-sealed after use in order to prevent loss of ammonia vapour, which added to prevent bacterial growth.