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(54) **Flash dressing for use in foundry practice.**

(57) This invention relates to flash dressing compositions for use in foundries comprising a mixture of diacetone alcohol and a C_1-C_4 monohydric alcohol. These mixtures have a flash point above 90°F which meets the safety requirements against fire hazards. In spite of this they are not difficult to ignite or burn-off completely from the castings on which they are applied. They are also less expensive than dressings commercially available hitherto.

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FLASH DRESSINGS

The present invention relates to the use of flash dressings in foundry practice.

It is conventional to coat porous moulds and cores with a dressing which serves as a barrier between molten metal and eg the sand in the casting process. By its use, a number of other casting defects are prevented. Where hardened sands are used it is customary to apply a dressing in the form of a water-based coating by brush, swab or spray gun. Such water-based coatings may comprise a base or filler and a liquid vehicle. The filler may be carbonaceous, graphitic, or based on a mineral flour such as zircon. The dressing is normally bonded by a clay-based binder.

In the case of chemically-hardened sands, it is necessary to use dressings in which the vehicle is a volatile liquid which can be "flashed-off' by ignition. Such dressings are referred to as "flash dressings". The volatile liquids for instance may be pure organic solvents or mixtures of organic solvents. Volatile liquids now commercially in use include isopropyl alcohol, and mixtures of ethoxy ethanol with isomeric butanols or white spirit 50:50. Other mixtures used for this purpose include mixtures of ethoxyethanol and liquid hydrocarbons. All these dressings suffer from one or more of the following disadvantages:

1. Isopropyl alcohol when used alone is highly inflammable (flash point below 90°F equivalent to 32°C) which imposes restrictions on its use.

2. Some dressings such as those containing a high proportion

grains, refractory fillers may be used. These fillers may be carbonaceous, graphitic or mineral based. The fillers are similar to those of water-based dressings but in this case the binder may be a resinous material. "Blackings", carbonaceous, graphitic and mineral based fillers are preferred.

In the flash dressings of the present invention suspension agents such as bentonite may be added to prevent the settling out of heavy fillers during use. Other minor components such as iron-oxide may be added to mould coatings to assist in preventing reaction between nitrogen-containing bonding agents and molten ferrous metals. This latter reaction is usually responsible for defects such as "pinholing" under the casting surface. Smoke supressants such as for example ferrocene may also be added to the flash dressing compositions. In some cases addition of a minor proportion, eg up to 20% by volume of the total composition, of a liquid hydrocarbon aids not only to burn off completely the flash dressing applied to the casting but also enhances the luminosity of the flames. This is desirable in some instances to ensure that the flash dressing has in fact been ignited. The amount of liquid hydrocarbon is suitably not more than 15%, preferably not more than 10% by volume of the total composition.

The flash dressings of the present invention may be brushed, sprayed or swabbed onto the mould surface. Where small cores are being dressed, the components may be dipped into the liquid dressing suspension.

After application, the mould is ignited, leaving behind a film on the surface of the sand, and when the casting has been made, the sand core can then be broken away easily leaving a smooth surface on the casting.

The invention is further illustrated with reference to the following tests the results of which are tabulated below. The results in Table 1 are Comparative Tests not according to the invention. The results in Table 2 illustrate the present invention.

1. Smoke Tests

(a) The amount of smoke produced by a dressing was assessed by

of the dressings tested in 1 (a) above.

2. Flash Point Tests

The flash points of various dressings listed in 1 above was measured using the Abel closed cup apparatus according to the Institute of Petroleum Standard Test No IP 170/70.

The results of these tests are also shown in the Tables below:

TABLE 1

(COMPARATIVE TESTS NOT ACCORDING TO THE INVENTION)

Test No	Dressing Misture or Solvent	Flash Point °F	Particulate Smoke Test Rating	Visual Smoke Test Rating
(a)	Methanol	54	White	1
(b)	Ethanol	54	White	1
(c)	Isopropanol	53	Light grey	2
(d)	Sec-butanol	70	Grey	2
(e)	Iso-butanol	77	Light grey	2
(f)	Butyl propionate	101	Black	3
(g)	Amyl acetate	90	Black	3
(h)	Diacetone alcohol	139	White	1
(i)	White spirit	104	Black	4
(j)	Low aromatic white spirit (LAWS)	95	Black	3
(k)	LAWS + Ethoxy ethanol (1:1, v/v)	92	Black	3
(l)	LAWS + Hexylene glycol (2:1,v/v)	109	Black	3
(m)	LAWS + Diacetone alcohol (1:1, v/v)	102	Black	2
(n)	n-Butyl acetate + Diacetone alcohol (1:9, v/v)	115	Grey	2

Material	Parts by weight
Bentone 27	2
Zircon flour	70
Diacetone alochol	10
Isobutanol	15

The dressing may contain in addition 1-2% by weight of a natural or synthetic resin such as a phenol-formaldehyde resin.