minute. In very recent experiments on the effect of the thickness of dust layers [illegible] was found that, in the equipment used, the lowest ignition temperatures [illegible] reached with layers $^1/_2$ inch thick. In nearly all cases, 90 per cent or more of [illegible] powder was finer than 74 μ. Selected results are given for metal powders[5] in Table 2, for dusts in the plastics industry[6] in Table 3, and for agricultural and other dusts[14,15] in Table 4. Data for coal dust clouds in air and in oxygen and for layers of coal dusts of various volatile contents[8] are shown in Figure 1.

TABLE 2

Ignition Temperatures of Metal Powders

Powder	Ignition temperature (° C.) Dust cloud	Dust layer	Powder	Ignition temperature (° C.) Dust cloud	Dust layer
Aluminum, atomized	640	750	Manganese	450	450
Aluminum, stamped	550	470	Silicon	775	950
Antimony	415	330	Tin	630	430
Cadmium	570	250	Thorium	270	280
Chromium	900	—	Thorium hydride (ThH_2)[a]	260	320
Copper	700	—	Titanium	330	380
Dowmetal	430	480	Titanium hydride (TiH_2)	440	500
Iron, hydrogen reduced	315	290	Uranium[b]	20	100
Iron, carbon reduced	425	390	Uranium hydride (UH_3)[a,b]	20	120
Iron carbonyl	320	230	Vanadium	500	490
Lead, atomized	710	270	Zinc	600	460
Lead, stamped	580	300	Zirconium[b]	20	100
Magnesium, atomized	600	490	Zirconium hydride (ZrH_2)	350	270
Magnesium, milled	540	475	Ferrosilicon (88% Si)	860	
Magnesium, stamped	520	480	Ferrotitanium, low-carbon	370	400
			Magnesium-aluminum (50-50)	535	460

[a] On exposure in air for several minutes at normal laboratory temperature, layers of [illegible] and UH_3 ignited spontaneously.

[b] During dispersion through furnace at room temperature, dust clouds of U, UH_3, and Zr ignited.

TABLE 3

Ignition Temperatures of Dusts in Plastics Industry

Powder	Ignition temperature of dust cloud (° C.)	Powder	Ignition temperature of dust cloud (° C.)
Resins		Molding compositions	
Shellac, rosin, gum	390	Ethyl cellulose	320
Vinylbutyral	390	Rubber, synthetic	320
Cellulose acetate	370	Cellulose acetate butyrate	370
Pine-rosin base	440	Cellulose acetate	440
Polyethylene	410	Methyl methacrylate	440
Lignin	450	Urea	450
Phenolic	460	Phenolic	490
Cellulose propionate	460	Polystyrene	560
Coal	470	Vinyl chloride–vinyl acetate	690
Polystyrene	490		
Allyl alcohol	500		
Coumarone-indene	520		
Polyvinyl acetate	520		
Chlorinated paraffin	840		
Resin ingredients		Fillers for molding compositions	
Sodium carboxymethyl cellulose	350	Ground alpha pulp	480
Rosin		Ground cotton flock	470
Hexamethylenetetramine	410	Ground wood flour	430
Pentaerythritol	450		
Resin stabilizer	510		
Rennet casein	520		
Phthalic anhydride	650		

[14] I. Hartmann, in L. S. Marks, *Mechanical Engineers' Handbook*, 5th ed., McGraw-Hill, 1951, pp. 795–800.

[15] I. Hartmann, *Ind. Eng. Chem.*, **40**, 752 (1948).

TABLE 3 (*continued*)

TABLE 4

Ignition Temperatures of Agricultural and Other Dusts

Agricultural products	Ignition temperature of dust cloud (° C.)	Miscellaneous dusts	Ignition temperature of dust cloud (° C.)
Alfalfa	460	Aluminum stearate	400
Cellocotton	440	Bark dust, Douglas fir	540
Citrus peel, dehydrated	490	Coal, bituminous[c]	610
Clover seed	470	Cork	470
Cornstarch, ordinary	380	Dinitroorthocresol	440
Cornstarch, modified	460	Gilsonite	560
Corncob, ground, dried	400	Liver protein	520
Garlic, dehydrated	360	Napalm	450
Grain	500	Phenothiazine	540
Onion, dehydrated	410	*p*-Oxybenzaldehyde	380
Pea, dehydrated	560	Rubber, hard-crude	350
Peanut cracklings	520	Soap	430
Rice	440	Sulfur	190
Soybean	520	Thyroid, desiccated	610
Sugar	350		
Wheat kernels	440	Coal-tar pitch[b]	450–540[c]
Wheat, cracked	470	Water gas–tar pitch[b]	550
		Petroleum pitch[b]	430

[a] See Figure 1.

[b] Ignition temperatures for these samples were determined in atmosphere of oxygen; all other values in table determined in air.

[c] Value varies with volatile content.