
PF30-SC

PF-SC Series, 300°C Ovens For Solvents

Most vapor explosions in ovens occur when materials that can absorb large quantities of solvent are being processed; typical examples being coils & similar electrical equipment, fibre board & textiles. Every flammable solvent has a lower & upper flammable limit, & unless the concentration of the solvent VAPOR is within this range it will not explode. The range widens, for most solvents, with increasing temp. Precautions must be taken to ensure that no substantial volume of vapor/air mixture within the range of flammability can occur in the oven. It is not sufficient to permit an explosive mixture to form and attempt to obtain safety by preventing foreseeable means of ignition. The precautions must be directed towards keeping the concentration of solvent VAPOR down and this is achieved by permitting only the minimum Quantity of solvent to enter the oven and by ventilating the oven continuously in use, to dilutes the solvent VAPORs emitted to one quarter of the lower flammable limit. The "flash-point" of a substance is the temperature at which it evolves sufficient VAPOR to form an ignitable mixture with air when tested under standard conditions. Thus, if the flash point of a liquid is below the temperature of the work room it will give off VAPOR until (and beyond) the point where the whole room is full of a flammable mixture, or until all the liquid has evaporated. If the flash point is higher than room temperature, then the liquid will never give off enough VAPOR to form a flammable mixture in the room. Low flash point solvents are thus intrinsically dangerous. However, the choice of a solvent with a high flash point will usually make no difference to the safety of the oven used to evaporate it, since the oven almost Inevitably has a working temperature higher than the flash point. It is still most desirable to choose solvents with the highest possible flash points to reduce danger at the dipping, spraying and other processes prior to the oven.

Pre-Treatment: The first step should be to limit as far as possible the amount of solvent entering the oven at each loading. Particular care is needed with articles which have been dipped in paint or varnish to give a thicker coating than is usually obtained by spraying. As much drying as possible should be carried out before the articles are added Into the oven. Where the process permits, it is a good practice, both for safety and economy of heat, to allow the load to remain for a short time in a semi-enclosure provided with mechanical exhaust ventilation, so that air at room temperature can remove some of the solvent. This arrangement also has the advantage that dripping in the oven is reduced, whereby the accumulation of paint and varnish residues in the oven became less of a problem.

Ventilation: Reliance on natural convection currents up the chimney is not normally an acceptable method of introducing sufficient fresh air into the oven to prevent a solvent/air explosion mixture forming. The oven should be fitted with mechanical exhaust ventilation. It is important that the exhaust draught should be applied at points in the oven where the rate of evaporation is a maximum, and that there are no dead spots in the oven space where there is Tittle air movement, with little dilution of the flammable VAPORs as a result. In order to improve the temperature distribution and to obtain an even flow of air throughout the oven it is normal to have some form of air recirculation. A proportion of the VAPOR and fume laden air should be extracted through a flue fitted with its own separate exhaust fan. Reliance on spillage of sufficient VAPOR and fume laden air through a rotund draught flue from the redirection system tends to be unsatisfactory. An interlock between the heat source and the exhaust ventilation is the normal method of ensuring that sufficient air is Introduced into the oven for safety.

Explosion Relief & Door Fastening: Although an oven may be provided with comprehensive precautions, explosions can still occur due to failure of components, inadequate servicing, or deliberate scotching of safety devices. The probability of fatal or serious injury to work people, or serious damage to the oven, can be reduced substantially if suitable explosion relief is provided, coupled with adequate securing of the doors of the oven to prevent their becoming missiles in the event of an explosion. It is recommended that explosion relief panels are fitted to all solvent evaporating ovens Irrespective of chamber volume. These notes cover the bare essentials of the requirements for solvent evaporating ovens used in stovlng and curing processes.

Model		PF60-SC	PF120-SC	PF200-SC
Max. Temp (°C)		300	300	300
Chamber Dimensions (mm) (H) (W) (D)		400 392 420	500 492 520	750 590 520
Outside Dimensions (mm) (H) (W) (D)		570 765 570	670 865 670	920 965 670
Chamber Capacity (Liters)		66	128	230
Weight (kg)		45	60	75
Shelves Number Supplied Max. Possible Max. Dist load/shelf kg Max load kg		 2 5 10 30	 2 9 10 40	 2 15 10 50
Performance				
Power Rating at 240V (watts)		1500	2000	2700
Holding Power* at Max. temp. (watts)		600	800	1250
Temp. Stability on/off control (°C)		±1.0	±1.0	±1.0
Temp. Stability PID control (°C)		±0.2	±0.2	±0.2
Heat up Times* 100°C (Mins) 200°C 240V 300°C		4.5 12 25	4.5 12 25	5.5 14 30
Recovery Times* 100°C (Mins) 200°C Door Open 60sec 300°C 240V		1 2.5 4	1 2.5 4	1.5 3 5
Air Exchanges vol (l/h) @ 100°C		10,000	10,000	10,000
Air Exchanges (Exchanges/Hour)		153	79	44