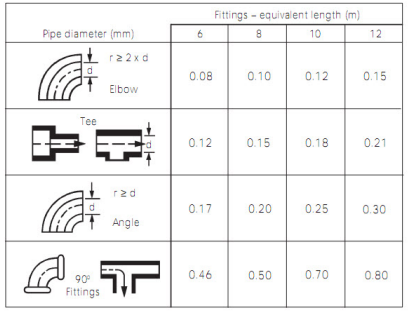
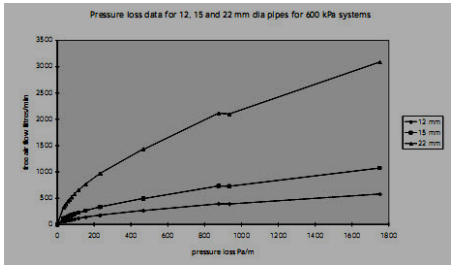
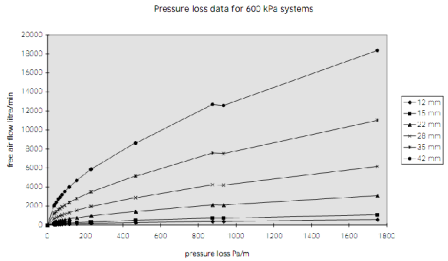
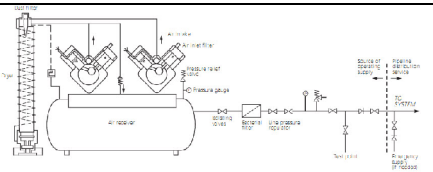
Medical

Kategori	Lokasi	Perkara yang Perlu Ada	Spesifikasi	Gambarajah
Dental Air	Dental room	- Effluent discharge .	• All gravity drainage from spittoons etc should discharge into the foul drain via a tun-dish and full depth trap. • Discharge from separators should similarly be taken to a full-depth S-trap connected to the foul drain.	Rujuk Rajah.
		- Pipeline materials	- The pipeline system can be of either copper in accordance with HTM 2022 'Design considerations' or nylon such as Tecalon. For larger installations, that is, more than 2/3 dental chairs, copper is preferred. The copper pipelines should be installed in accordance with the installations guidance given in HTM 2022 'Design considerations'. - If nylon pipes are used, care must be taken to ensure that fire safety is not compromised. - Where dental compressed air is installed with medical gas pipeline systems, the validation and verification procedures as set out in HTM 2022 'Validation and verification' should be followed. - Where work is to be carried out on an existing dental system, the permit-to-work should be followed as set out in HTM 2022 'Operational management'; the parts which do not apply should be clearly marked "not applicable".	

	Dental Plant Room	Compressor systems	- In order to achieve the quality specification set out in Table 1, it will be necessary for a dryer system to be incorporated into the plant as well as appropriate filtration. The major components of a dental air system are shown in Figure 2.	
		Siting	- The plant should have all-round access for maintenance purposes, and allowance should be made for changing major components. - Air inlet filters should be fitted immediately upstream of the compressor. In exceptional circumstances additional screens, filters and silencers may be required. - The air filters should comply with BS7226:1989 and be either medium filters or grade CA paper element filters. - The compressor and drier plant should ideally be installed in a dust-free, dry, cool room. The room should be well ventilated as shown in Figure 3. - The optimum temperature range is 10–15°C; additional forced ventilation will be required if the ambient temperature exceeds 35°C. - An air compressor gives off approximately 70% of its generated power as heat energy; a compressor system designed to develop 500 litres/minute at 5 bar generates approximately 3 kW. This will need to be taken into account when considering the	  

<table>
<tr><td></td><td></td><td></td><td>room ventilation.

- The performance of the compressor and dryer is seriously impaired if the ambient temperature rises above 35°C; the temperature must not fall below +5°C to prevent condensation forming and the control mechanism and the dryer system freezing.</td><td></td></tr>
<tr><td></td><td></td><td>Noise</td><td>- The noise level of the system will obviously increase with the capacity of the supply systems. The maximum free field noise level at 1 m distance for unsilenced compressed air plant varies with the type and power of the plant. Typical noise levels are given in Table 2.</td><td>Table 2 Compressor plant noise levels
<table><tr><th>Power (kW)</th><th>Maximum free field noise level at 1 m – unsilenced plant (dBA)</th><th>Maximum free field noise level at 1 m – silenced plant or in acoustic cabinet (dBA)</th></tr><tr><td>1.5</td><td>67.5</td><td>58</td></tr><tr><td>1.8</td><td>73.5</td><td>59</td></tr><tr><td>2 × 1.5</td><td>75</td><td></td></tr><tr><td>2 × 2.2</td><td>80</td><td></td></tr></table></td></tr>
<tr><td></td><td></td><td>Air intake</td><td>- The air intake for the compressor plant should be located to minimise contamination from internal combustion engine exhausts and the discharge from vacuum systems, anaesthetic gas scavenging systems and ventilation systems or other potential sources of contamination.</td><td>  </td></tr>
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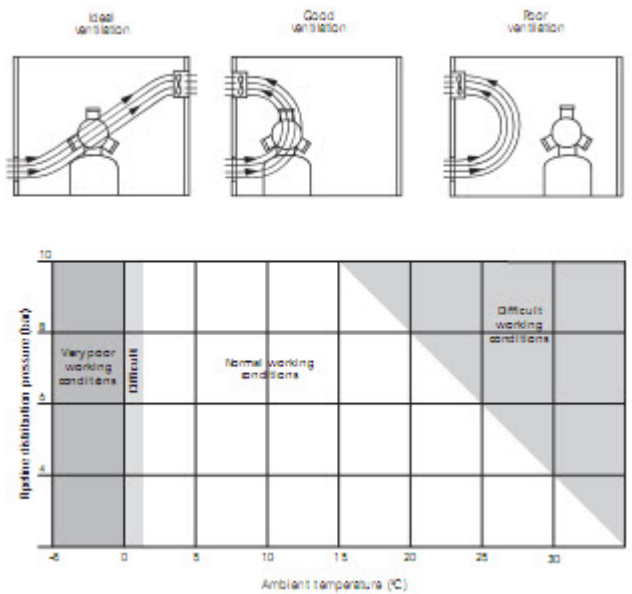
		Plant Ventilation	- A duplex dryer system would not normally be required for dental surgeries, although it would be considered for a dental school or large department where downtime for maintenance would cause unacceptable disruption.	
Dental Vacuum		Vacuum pipeline materials	- The pipelines are only clean between the vacuum plant and the separators. The maximum vacuum is –0.25 bar (approx. –190 mm Hg). - The choice of material is governed by: a. the requirement that the material must withstand –0.25 bar (approx - –190 mm Hg); b. fire safety; c. cost. - The vacuum and exhaust lines can be either copper – as medical vacuum lines, see HTM 2022 'Design considerations' – or polythene and polypropylene or uPVC. - Where non-metallic pipelines pass through fire compartmental walls/barriers they should be suitably sleeved.	

			- Pipes made from ABS/ASA material are not suitable for use with the medications and solutions used in dental systems.	
		Dental vacuum plant exhaust	- The exhaust pipe from the vacuum system must be sited outside at roof level away from air intakes, opening windows etc. It should be clearly labelled "Dental vacuum discharge point – do not obstruct". - The exhaust pipe should turn down to prevent influx of rainwater and have a mesh to protect against ingress of insects, vermin, birds etc. - The exhaust pipe should be provided with a drain valve at its lowest point. - Noise from the exhaust should be considered and a silencer fitted if required. - The exhaust from a duplex (or triplex) system may be manifolded together to one external exhaust. - The vacuum pumps should be sized to take into account the back-pressure of the exhaust system and the resistance of the bacterial filter.	
		Condensate water separator	- In order to avoid considerable water condensation due to large temperature differences, it is advisable not to install the vacuum lines close to outside walls. - All vacuum lines should be provided with a condensation water separator. - This should be installed as close as possible to the vacuum plant and at the lowest point of the vacuum line. - The separator should be easily accessible and preferably fitted with an automatic drain.	

			- The pressure loss caused by the water separator should not exceed 1.5 mm Hg under maximum flow conditions.	
Electricity		Earthing	- Pipelines should be bonded to the consumer's earth terminal as required by Regulation 413-2 of the IEE Regulations. This bonding should be made as near as possible to the point at which the pipeline enters the building from the plant. The size of the bonding conductor should be in accordance with Table 54f of the Regulations. The pipelines should not themselves be used for earthing the electrical equipment. - Flexible pipeline connections between the compressors or vacuum pumping plant and the fixed pipelines should be bonded across to comply with this requirement. Flexible connections in the fixed pipelines should not normally be used, but if they are specially approved they should be similarly bonded across.	