

## Assessment Schedule - TS.7

The Assessor shall determine the business's commitment and support to good and safe working practices; also that it has a positive culture in all aspects of its work. In particular, the Assessor shall check that the business's health, safety and environmental arrangements are followed while the work is carried. The details that the assessor will expect to find in use, are given in the BESCA standard BS.5 and BS.6. The level of assessment will be appropriate for, the size and the complexity of the business.

<b>Ductwork systems technical standards</b>			
BESCA standard	Scheme Requirement	Typical evidence required	
		Work done in domestic premises	Work done in non-domestic premises
TS.7.1	<p><b>Sheet metal ductwork systems</b></p> <p><i>Note: There are no major differences in the basic installation of pre-made rectangular, circular and flat oval duct and fittings.</i></p> <p><b>Technical standards that apply to this work:</b>  <i>The Building Regulations            Approved Documents            Compliance guides            BESA standards</i></p>	<ul style="list-style-type: none"> <li>• Only Competent individuals, who have the necessary skills, knowledge and experience, as set out in BESCA standard BS.9, shall undertake the work so that it meets the standards set by BESCA. The business's training and/or subcontract records shall identify these people, as set out in BESCA standards BS.9 and/or BS.10.</li> <li>• Only approved sealants, gaskets and/or tapes shall be used. Sealants shall be used in accordance with the manufacturer's instructions and the COSHH assessment for the product.</li> <li>• Ductwork sections shall be unloaded and stored on site in a way that avoids damage and contamination.</li> <li>• During assembly, spirally wound and straight seamed cross-joints shall be sealed and fixed with fastenings set at the required spacing, as specified in DW/144 and/or DW172. Self-piercing screws shall be not used. Incomplete ductwork shall be temporarily sealed off and supported safely to avoid undue stress on fixings, hangers and joints.</li> <li>• Hangers for horizontal ductwork shall be made from galvanised steel rod or studding, angle iron, flat strap or from stranded wire and shall be fixed so that they are capable of supporting the ductwork and without causing it to twist. Drop rods used to support ducting do not project too far below the supporting bracket. External ductwork shall be adequately supported and braced to withstand the elements, and in accordance with the designer's requirements</li> <li>• Vertical ducts shall be adequately supported from the stiffening angle or the angle frame, or by separate supporting angles fixed to the duct. Supports must take into account any additional load caused by equipment attached to or built-in to the vertical ductwork.</li> <li>• Control, fire and smoke dampers shall be installed. Access panels shall be provided to give access to these for inspection and servicing. Panels/covers shall be positioned so that there are no external obstructions to preventing them from being removed and used. Sleeves shall be used where the ducts passes through walls and shall be sealed to prevent the spread of noise, fire and smoke, as set out in BESCA Standard TS.4.1. The installation of recessed air terminals in ceilings and the maintenance of breaches to fire barriers must be carried out in compliance with Approved Document B (Fire Safety), as set out in BESCA standard TS.4.1.</li> <li>• Any flexible metal or fabric ducts used shall be supported so that there is no excessive sagging and kinking. They shall be fastened at each end, without damage being caused to them, to maintain the air tightness of the system.</li> <li>• Flexible joint connections shall be used at building expansion joints, at fan inlet and/or outlets and other points where the transmission of vibration needs to be avoided. These shall be between 50mm and 250mm wide, shall be aligned correctly so that they are not distorted and shall not be too taut. Ductwork connections to building openings shall be fixed to the building with a flange. This shall be sealed with a gasket strip or a sealer applied between the flange and the opening in the building.</li> <li>• Fans and air handling units, heating and cooling batteries, etc shall be included into the ductwork system in accordance with the manufacturer's instructions and as detailed in BESCA standard TS.8.1.</li> <li>• Air leakage testing shall be carried out where required when the system is complete, or where sections of the system may be inaccessible later. Testing shall always be carried out on high-pressure ductwork systems. Leakage tests shall be carried out as detailed in BESCA standard TS.7.4.</li> <li>• Ductwork carrying heated or conditioned air shall be insulated to prevent heat loss or gain. All ducts shall be identified using a triangular symbol that shows the direction of airflow and the type of service. Thermal insulation shall be installed to BESCA standard TS.7.5.</li> <li>• On completion, notes shall be made or a drawing of the ductwork is marked to show any deviations from the routes originally specified or envisaged. This information shall be passed back to the office to use when the final record drawings are produced.</li> </ul>	

## Assessment Schedule - TS.7

<p>TS.7.2</p>	<p><b>Plastic and glass fibre ductwork systems</b></p> <p><i>Note: There are no major differences in the basic installation of pre-made rectangular and circular plastic ducts and fittings</i></p> <p><b>Technical standards that apply to this work:</b>  <i>The Building Regulations  Approved Documents  Compliance guides  BESA standards</i></p>	<ul style="list-style-type: none"> <li>• Only Competent individuals, who have the necessary skills, knowledge and experience, as set out in BESCA standard BS.9, shall undertake the work so that it meets the standards set by BESCA. The business's training and/or subcontract records shall identify these people, as set out in BESCA standards BS.9 and/or BS.10.</li> <li>• Only approved sealants, gaskets and/or tapes shall be used. Sealants shall be used in accordance with the manufacturer's instructions and the COSHH assessment for the product.</li> <li>• Ductwork sections shall be unloaded and stored on site in a way that avoids damage and contamination.</li> <li>• During assembly flanged cross-joints on UPVC, PP or fibre glass duct sections shall be sealed with an approved sealant or gasket, as specified in DW/154 and/or DW191. Continuous hot air welding shall be used to seal rectangular UPVC and PP socket and spigot cross-joints. Incomplete ductwork shall be temporarily sealed off and supported safely to avoid undue stress on fixings, hangers and joints.</li> <li>• Hangers for horizontal ductwork shall be made from galvanised steel rod or studding, angle iron, flat strap or from stranded wire and shall be fixed so that they shall be capable of supporting the ductwork and without causing it to twist. Drop rods used to support ducting do not project too far below the supporting bracket. External ductwork shall be adequately supported and braced to withstand the elements, and in accordance with the designers requirements</li> <li>• Vertical ducts shall be adequately supported at least every 4 metres, or at each floor level, from the stiffening angle or the angle frame, or by separate supporting angles fixed to the duct. Supports must take into account any additional load caused by equipment attached to or built-in to the vertical ductwork.</li> <li>• Control and fire dampers and intumescent sleeves shall be installed. Access panels shall be provided to give access to the dampers for inspection and servicing. Panels/covers shall be positioned so that there shall be no external obstructions to preventing them from being removed. Sleeves shall be used where the duct passes through walls and shall be sealed to prevent the spread of noise, fire and smoke, as set out in BESCA Standard TS.4.1. The installation of recessed air terminals in ceilings and maintenance of breaches to fire barriers must be carried out in compliance with Approved Document B (Fire Safety), as set out in BESCA standard TS.4.1.</li> <li>• Flexible joint connections used at building expansion joints, at fan inlet and/or outlets and other points where the transmission of vibration needs to be avoided. These shall be between 50mm and 250mm wide, shall be aligned correctly so that they are not distorted, and shall not be too taut. Ductwork connections shall be fixed to the building with a flange. This shall be sealed with a gasket strip or a sealer applied between the flange and the opening in the building.</li> <li>• Fans and air handling units, heating and cooling batteries, etc shall be included into the ductwork system in accordance with the manufacturer's instructions and as detail in BESCA standard TS.8.1.</li> <li>• Air leakage testing shall be carried out where required when the system shall be completed, or where sections of the system may be inaccessible later. Testing shall always be carried out on high-pressure ductwork systems. Leakage tests shall be carried out as detailed in BESCA standard TS.7.4.</li> <li>• Ductwork carrying heated or conditioned air shall be insulated to prevent heat loss or gain. All ducts shall be identified using a triangular symbol that shows the direction of airflow and the type of service. Thermal insulation shall be installed to BESCA standard TS.7.5.</li> <li>• On completion, notes shall be made or a drawing of the ductwork is marked to show any deviations from the routes originally specified or envisaged. This information shall be is passed back to the office to use when the final record drawings are produced.</li> </ul>
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## Assessment Schedule - TS.7

<p>TS.7.3</p>	<p><b>Local exhaust ventilation systems (LEV)</b></p>	<ul style="list-style-type: none"> <li>• Only Competent individuals, who have the necessary skills, knowledge and experience, as set out in BESCA standard BS.9, shall undertake the work so that it meets the standards set by BESCA. In particular, the persons carrying out the design and commissioning shall be trained to the recommendations made by the British Occupational Hygiene Society. The business's training and/or subcontract records shall identify these people, as set out in BESCA standards BS.9 and/or BS.10.</li> <li>• The LEV design and installation shall comply with the technical requirements of the HSE's publication HSG 258. Depending on the application and contaminant to be contained, the ductwork may be sheet metal, plastic or fibre glass as set out in sections TS.7.1 or .2. Fans, special filters, etc shall be included into the exhaust system in accordance with the manufacturer's instructions and as detailed in BESCA standard TS.8.1.</li> <li>• Where required, instrument and test points, with easy and safe access, shall be provided in appropriate places; and the exhaust system shall be electrically interlocked with the equipment that it serves, and any necessary make-up supply air system.</li> <li>• New installations shall be provided with an LEV User Manual and Log Book, which shall also be used to record any later modifications that are made to the system.</li> <li>• Leakage and performance tests shall be carried out as detailed in BESCA standard TS.7.4.</li> <li>• Persons carrying out the initial commissioning, and any subsequent re-commissioning, shall be trained to the requirements of the British Occupational Hygiene Society, so that they are qualified and competent to do so.</li> </ul>
<p>TS.7.4</p>	<p><b>Testing ductwork systems</b></p> <p><b>Technical standards that apply to this work:</b>  <i>The Building Regulations</i>  <i>Approved Documents</i>  <i>Compliance guides</i>  <i>BESA standards</i></p>	<ul style="list-style-type: none"> <li>• Only Competent individuals, who have the necessary skills, knowledge and experience, as set out in BESCA standard BS.9, shall undertake the work so that it meets the standards set by BESCA. The business's training and/or subcontract records shall identify these people, as set out in BESCA standards BS.9 and/or BS.10.</li> <li>• Testing is not required for low or medium pressure ductwork unless specified by the customer or the designer. However, air leakage testing shall be mandatory for high-pressure ductwork.</li> <li>• Where a test is required, it shall be carried out when the system is completed, or when sections of the system may be inaccessible later. Testing shall be done before the thermal insulation is applied to the ductwork. Items of in-line plant are not normally included in the air leakage test.</li> <li>• The open ends of ductwork to be tested shall be sealed and made airtight with a suitable material, such as heavy gauge polythene sheeting and tape. Where necessary, long lengths of ductwork shall be split into smaller sections for testing. This shall be achieved by inserting a suitable material, such as heavy gauge polythene sheeting at flanged, or other accessible joints. One opening shall be adapted to accept the air leakage test fan.</li> <li>• The test shall normally be carried out in accordance with the B&amp;ES (HVCA) standard DW/143 "A Practical Guide to Ductwork Leakage Testing". The ductwork, joints and hood associated with local exhaust ventilation (LEV) system shall be leak tested with a smoke generator to verify the commissioned system will control the containment cloud.</li> <li>• Testing results shall be recorded and certified by the installer.</li> <li>• After the test is complete, all materials used to seal the ductwork shall be removed, paying particular attention to all of the diaphragms that were used to split ductwork into shorter sections for testing.</li> </ul>

## Assessment Schedule - TS.7

<p>TS.7.5</p>	<p><b>Ductwork insulation</b></p> <p><b>Technical standards that apply to this work:</b>  <i>The Building Regulations</i>  <i>Approved Documents</i>  <i>Compliance guides</i>  <i>BESA standards</i></p>	<ul style="list-style-type: none"> <li>• Only Competent individuals, who have the necessary skills, knowledge and experience, as set out in BESCA standard BS.9, shall undertake the work so that it meets the standards set by BESCA. The business's training and/or subcontract records shall identify these people, as set out in BESCA standards BS.9 and/or BS.10.</li> <li>• Ductwork systems that carry heated or cooled air shall be adequately insulated so as to conserve energy and to prevent heat loss or gain.</li> <li>• The joints on thermal insulation mattresses and rigid slabs shall be staggered and the sections shall be securely fixed by means of adhesive, studs, skewers, etc. Where insulation is required on flanges, dampers, etc, it shall be equal in thickness to that on the associated ductwork.</li> <li>• Where the temperature of the air in the ductwork is low enough for condensation to occur on the ductwork, or where specified by the designer, the ductwork and the associated hangers shall be vapour sealed.</li> <li>• Where metal cladding is used in an area that is designated as hazardous, there shall be electrical earth bonding between the sections of metal cladding.</li> <li>• Insulated external ductwork shall be weatherproofed using a covering that has lapped and sealed joints and which continues over flanges, dampers, etc so as to prevent the ingress of water.</li> <li>• The ductwork insulation systems shall be identified using a triangular symbol that shows the direction of airflow and the type of service.</li> </ul>
<p>TS.7.6</p>	<p><b>Ductwork hygiene</b></p> <p><b>Technical standards that apply to this work</b>  <i>The Building Regulations</i>  <i>Approved Documents</i>  <i>Compliance guides</i>  <i>BESA standards</i></p>	<ul style="list-style-type: none"> <li>• Only Competent individuals, who have the necessary skills, knowledge and experience, as set out in BESCA standard BS.9, shall undertake the work so that it meets the standards set by BESCA. The business's training and/or subcontract records shall identify these people, as set out in BESCA standards BS.9 and/or BS.10</li> <li>• Unless specified otherwise, the work shall be carried out as set out in the B&amp;ES (HVCA) publication TR19 – “Guide to Good Practice - Internal Cleanliness of Ventilation Systems”.</li> <li>• A visual inspection and condition survey of the ductwork system and the associated plant, terminals and air inlets/outlets shall be carried out.</li> <li>• Where necessary, a surface condition or deposit thickness test shall be carried out. Samples taken from the ductwork shall be laboratory tested for microorganisms.</li> <li>• There shall be a risk assessment for the work, and a method statement that explains the cleaning technique. Appropriate PPE shall be available and shall be used during the cleaning work. There shall be sufficient access panels of an adequate size to allow the work to be done.</li> <li>• Any sensors fitted to or installed in the ductwork shall be removed or protected prior to cleaning. Equipment, furnishings and surfaces in the area shall be protected from contamination and/or damage. Care shall be taken to make sure that there is no recontamination of a previously cleaned area.</li> <li>• The cleaning work shall be carried out in a systematic manner using vacuum extraction equipment fitted with approved filters. During the work, control dampers shall be marked "as found" so that they can be returned to their original setting.</li> <li>• Surfaces that have been cleaned shall be, where required, treated with a biocide.</li> <li>• Once the cleaning is finished, a visual check shall be performed to make sure that the required standard has been met. If it is specified, a vacuum test shall be carried out.</li> <li>• After the cleaning is complete, the waste shall be bagged-up for disposal and suitably marked to identify what it is. A completion report shall be prepared and handed to the customer. This shall confirm that work has been successfully completed and identify any problems that have been found in the system that might affect the energy efficiency requirements of the dwelling or building.</li> </ul>