

Indoor air quality at home

Consultation on draft guideline – deadline for comments 5pm on 09/08/19 email: IndoorAir@nice.org.uk

	<p>Please read the checklist for submitting comments at the end of this form. We cannot accept forms that are not filled in correctly.</p> <p>We would like to hear your views on the draft recommendations presented in the guideline, and any comments you may have on the rationale and impact sections in the guideline and the evidence presented in the evidence reviews documents. We would also welcome views on the Equality Impact Assessment.</p> <p>In addition to your comments below on our guideline documents, we would like to hear your views on these questions:</p> <ol style="list-style-type: none">1. Which areas will have the biggest impact on practice and be challenging to implement? Please say for whom and why.2. Would implementation of any of the draft recommendations have significant cost implications?3. What would help users overcome any challenges? (For example, existing practical resources or national initiatives, or examples of good practice.) <p>See section 3.9 of Developing NICE guidance: how to get involved for suggestions of general points to think about when commenting.</p>
Organisation name – Stakeholder or respondent (if you are responding as an individual rather than a registered stakeholder please leave blank):	Chartered Institution of Building Services Engineers (CIBSE)
Disclosure Please disclose any past or current, direct or indirect links to, or funding from, the tobacco industry.	None

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Name of commentator person completing form:		Dr Julie Godefroy		
Type		[office use only]		
Comment number	Document [guideline, evidence review A, B, C etc., methods or other (please specify which)]	Page number Or 'general' for comments on whole document	Line number Or 'general' for comments on whole document	Comments Insert each comment in a new row. Do not paste other tables into this table, because your comments could get lost – type directly into this table.
1	Guideline	1	General	We support the production of this guideline, which is much needed. We agree with the emphasis on source control, ventilation, maintenance, and awareness of occupants. Due to the complex mixture of pollutants that occupants are exposed to in homes, there is a need to prioritize, and we agree with the current emphasis on PM and formaldehyde (as well as consideration of VOCs more generally). We have highlighted in our comments where we think there should be more focus on carbon monoxide. At the next iteration, there could be a review on the need to include other pollutants (e.g. NOx), depending on evidence of exposure and on technological developments (e.g. this may not be needed if transport measures have reduced exposure; on the other hand, gas filters may have become more widely available). We have included possible references in comment #39 which cover research and guidance on prioritization.
2	Guideline	4	2-3	We wonder whether the provision of gas heating systems and appliances (e.g. cookers) should be added to the list of key risk factors, as this increases risks of carbon monoxide as well as combustion pollutants. This would seem more consistent with the emphasis on it in the rest of the guideline. See also possible additional references for the evidence review in comment #39
3	Guideline	5	General	We agree with the recommendations on this page as local authorities have a significant role to play to improve indoor air quality, through various levers (environmental health, planning, links with health departments and other local organisations etc). However, these guidelines will only be effectively implemented with appropriate training

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				and resources to local authorities. We recommend explicitly adding a recommendation to central government for training and resources to be provided. See also comment #11
4	Guideline	5	9-11	We agree with this. It may be useful also to make the link with overheating: overheating risk will often be increased by similar factors as poor indoor air quality i.e. location near busy / noisy roads which increase noise and outdoor air pollution, and inadequate ventilation, and is likely to have a greater adverse impact on those with respiratory problems, so the connection between overheating and indoor air quality will exacerbate the impact of the two phenomena.
5	Guideline	5	12-14	We agree with this. It may be useful to list examples of departments that should be involved in this joint working, as individuals may not be aware of their potential to contribute e.g. environmental health, building control, planning, housing (if any council housing), transport, trees & green spaces. Joint working is also relevant in the context of the post Grenfell discussions about a new Building Safety Regulator. Whilst there is a considerable focus on fire safety, current research and evidence suggest that air quality and overheating will pose a serious health risk in homes, and this needs to be on the agenda for the Building Safety Regulator from the earliest stages.
6	Guideline	5	15-18	We agree with this, and think it would benefit from adding guidance and references on local inspection protocols e.g. reference documents, examples of good practice, case studies. see also possible references in comment #39
7	Guideline	5	19-22	Yes, we support this
8	Guideline	5	23-24	We agree with this. It may be useful to list examples of external organisations that could be approached for joint working, to ensure the advice is adequate and not biased by commercial interests. Professional institutions are a good place to start, and CIBSE would be happy to be listed. We would also recommend CIEH (which environmental health officers will often already have good links to), the RIBA and CIAT for architectural issues including ventilation and materials selection, and the RTPPI for planning issues.
9	Guideline	5	25-27	We agree with this and support the use of audit data. In addition to audits to identify properties most at risk, we think that in order to monitor progress against the goals of the strategy, the recommendation should include monitoring the effect of interventions i.e. post-intervention audits. It is essential that the evidence and lessons learned are shared among local authorities and with the wider industry.
10	Guideline	6	15-18	We agree with this. It would be useful to add a bullet point that would explicitly include awareness on how to avoid and remediate poor indoor air quality
11	Guideline	7	1	The paths to professional development may be the existing ones, but resources should be increased and new opportunities created; CIBSE would be happy to discuss how they could support training programmes. See also comment #1
12	Guideline	7	18-25	We would add to the list of measures: fabric repairs and improvements to insulation levels to reduce cold surfaces, with care to avoid thermal bridging. CIBSE are recommending that the guidance in the Approved Documents which support Parts L (energy efficiency) and F (ventilation) of the Building Regulations, currently under review, should be revised to emphasise the importance of these aspects of renovation in relation to indoor air quality; there may be scope here for NICE to make similar recommendations.

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13	Guideline	7	26	We would recommend the following rewording: “advise people <u>on what trickle vents are for and look like, and to keep them open and unblocked</u> ”. As per comment #12, this would be a useful area for NICE to be engaged in the discussions around the review of Parts L and F.
14	Guideline	8	10-13	We would recommend the following addition to the existing wording: “fans in the kitchen or bathroom are not working <u>or if excessive noise levels from the fans discourage operation</u> ”. This is a known common cause for occupants switching off or even disabling extract fans (see for example several studies by Mawditt I., Gupta R. & Sharpe T.)
15	Guideline	8	14-15	We would recommend the following addition to the existing wording: “repairs are needed, including <u>fabric repairs and improvements to heating, insulation levels or ...</u> ”
16	Guideline	8	23-25	It may be useful to give more guidance on what is meant by “low emission materials”, for example a list of possible labels. The current proliferation of labels may be confusing to consumers
17	Guideline	8	26-27	We would recommend adding any new combustion appliance to this section, including indoor fires, and recommend closed fires rather than open ones
18	Guideline	9	general	As part of the guidance to home occupiers, it may be useful to include more general points that affect indoor air quality and which are related to lifestyles and behaviours, for example the effect of pets, removing shoes when indoors, vacuum cleaning etc.
19	Guideline	10	25-26	This is a significant recommendation, which we very much support – see for example our 2018 briefing on Part F (https://www.cibse.org/getmedia/4a601f5c-a866-41a2-8cf7-1bab17f4f57e/Position-Paper-on-Building-Regulations-Part-L-F.pdf.aspx) . As this section is aimed at regulators and building control teams, we assume that “standards” includes building regulations – if so (we would support this), this should be made explicit.
20	Guideline	11	1-2	We support the reference to WHO 2006 (pollutants) and 2009 (mould); this is the basis of our recommended indoor air guidelines in the upcoming revised CIBSE TM40 Health and Wellbeing in Building Services (https://www.cibse.org/Knowledge/CIBSE-TM/TM40-2019-Health-Issues-and-Wellbeing-in-Building-Services)
21	Guideline	11	3-7	We agree with the recommendation, but note that building regulations currently do not comprehensively deal with indoor air quality. This may change with the update to Part F as part of the Building Regulations 2019/20 review. This is another reason for NICE to consider participating in that review and approaching MHCLG to that end. We are aware of poor enforcement of the requirements of Part F and its guidance; we would recommend being more explicit about the essential provisions recommended in Part F and its Approved Document, including the guideline levels of pollutants, and commissioning of ventilation systems. Evidence from our members is overwhelming that such provisions are rarely queried by Building Control Bodies. In line with this, we would recommend the following addition to the current text: “ensure enforcement takes place within the specified timelines and according to the recommended standards”. The guidance should then be updated, ideally with training provided, following the expected 2019/20 update to Part F. Whilst there is now a post Grenfell focus on better enforcement, there is a natural tendency to focus on obvious and immediate safety matters – fire and structure – at the expense of longer term risks such as air quality and overheating. This will only change when Building Control are firmly guided to address the longer term hazards

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				more seriously. This also requires NICE to engage with the proposed Building Safety Regulator to ensure that Building Safety is seen in this much wider framework, and not as a synonym for fire safety.
22	Guideline	11	3-7	“Existing building regulation enforcement activities”: due to changes proposed under the Building Safety reforms we anticipate changes that would build better links to the operational stage of buildings. As this is a new and significant change, we think it could be beneficial to make reference to it here, as some local authorities bodies will not yet be familiar with the changes and the obligations and opportunities they will bring.
23	Guideline	11	9-15	A very important part of avoiding sources of pollutants is the location of sensitive uses (e.g. dwellings, care homes etc), rooms (e.g. bedrooms) and air inlets in relation to external sources of pollution. Single-aspect dwellings should also be avoided as much as possible (except for the small ones where it cannot reasonably be expected), to allow cross-ventilation. We strongly recommend that this should be added to this section, as one of the key measures that designers can take at an early stage through site configuration, building layout, and ventilation design. This could also have other benefits for health and wellbeing, such as reducing noise and overheating risk (by reducing nuisance through open windows, and therefore increasing the likelihood that occupants will open them). CIBSE publications, including the upcoming revised TM40, provide guidance on this if a reference is needed.
24	Guideline	11	10-13	“Consider specifying building materials and products that only emit a low level of formaldehyde and VOCs”: we would recommend strengthening this, at least for the main building materials and finishes as low-emission options are already reasonably widely available for these. We would also clarify what is meant by “low emissions”, for example by listing preferred and reliable labels. It may also be useful to refer to guideline levels in Approved Document F, as awareness of such guidelines is not widespread among industry and may raise the importance of the issue.
25	Guideline	11	14-15	This statement refers to minimising exposure to particulate matters; as these guidelines cover indoor air quality, we assume this refers to internal exposure, and therefore heating systems such as indoor fires which could increase indoor exposure? It may be worth clarifying this. We would also recommend adding a more general recommendation for low-emission heating systems, to reduce external pollution, in terms of particulate matters but also NOx (as this will in turn help improve indoor quality).
26	Guideline		22	We would recommend the following addition to the existing wording: “specifying kitchen extractor or cooker hoods that extract to the outside <u>and which are easily accessible for cleaning or maintenance, with simple instructions for occupants</u> ”. This is important to avoid increasing the risk of fire, and avoid excessive noise which could prevent occupants from using the hood.
27	Guideline		23	We would recommend modifying the current wording (“specifying that windows must open where possible and safe to do so”) to the following: “specifying that windows or openings in every room must at the very least meet the provisions of Part F purge requirements, and that all habitable rooms should be provided with windows that are openable in a safe and secure manner”. The current wording could be read as if providing rooms without openable windows is acceptable in dwellings; we would strongly discourage this. This would also help reduce the risk of overheating, with associated health and wellbeing benefits.

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28	Guideline	12	3-4	We would recommend merging this point with broader considerations of site layout, building layout and air inlets (not only “windows that open”), as per comment #23
29	Guideline	12	5-6	We think it would be useful to explain what “filtration” is intended; filters against particulate matters are commonly available for residential systems, with a well established system of standards to gauge their performance. Gaseous filters which could tackle NOx, however, are expensive and still expensive and uncommon. In any case, would recommend adding that, where mechanical ventilation systems are provided, there should be sample operation and maintenance guidance to occupants, including on filter replacement if filters are provided. The units should be easily accessible (e.g. if at all possible, not in a loft accessible by hatch, as the inconvenience will be a strong deterrent to regular maintenance). There is ample evidence and guidance on this, for example from the Good Homes Alliance (https://goodhomes.org.uk/wp-content/uploads/2017/08/VIAQ-final-120220.pdf), Zero Carbon Hub (http://www.zerocarbonhub.org/resources/reports/ventilation-new-homes), Passivhaus Trust (http://www.passivhaustrust.org.uk/UserFiles/File/Technical%20Papers/2018%20MVHR%20Good%20Practice%20Guide%20rev%201.1.pdf) and CIBSE TM60 Good Practice in the Design of Homes.
30	Guideline	12	7-8	“to improve heating efficiency”: this could be read as relating to heating systems only, while we assume the intent of this sentence could include insulation and airtightness improvements, during which ventilation provision must be considered. The wording is ambiguous and we would recommend amending. A useful reference in the context of refurbishment would be the recently released BSI guidance PAS 2035 & 2030:2019 (https://shop.bsigroup.com/ProductDetail/?pid=000000000030390699), which promotes a whole-house approach including consideration of inter-relations between energy efficiency, ventilation, indoor air quality and overheating
31	Guideline	12	9-23	We are unsure that this section should be separate from the one addressed to designers: many homes are built by housebuilders which act as designers, builders, and developers; furthermore, under many contracts designers will be responsible to checking installation, departure from specifications etc. We think it may be better to merge this section with the previous one, allowing some of the paragraphs to be removed and others to be merged and expanded: for example, the point on materials specifications (p11, lines 10-13) could be merged with that requiring follow-through during construction and attention to product substitutions (p12, lines 15-17).
32	Guideline	12	18-20	We would add a point on the requirement for flues to be accessible for maintenance, and carbon monoxide alarms to be installed. These are legal requirements in many situations and this should be emphasised. Shared flues should also be required in contract documents to be tested under witnessed conditions to demonstrate that they do not leak and that they do not allow flow of combustion products from one apartment to another under any circumstances.
33	Guideline	13-14	genera l	This section is addressed to local authorities (line 2), as they will be in charge of enforcing regulations on rental properties. We think it would be useful to re-word and expand it so it is also addressed to landlords, to highlight their obligations. Enforcement and awareness-raising by local authorities can complement this. For example, sections 1.9.2, 1.9.3 and 1.9.5 could be presented as requirements and guidance for landlords AND points that need to be raised by local authorities if their application is poor.

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				In the recommendations to landlords, we would also add the opportunity for works that improve air quality to be carried out as part of other works such as those to bring properties to the minimum Energy Performance Certificate (EPC) ratings (or better) required under Minimum Energy Efficiency Standards (MEES). MHCLG are currently reviewing and revising the national housing safety rating scheme, and should be consulted about strengthening the aspects that relate to this topic.
34	Guideline	13	14-18	We would add an explicit point stating that heating systems should be maintained as appropriate, and emphasising that annual safety inspections are required for gas appliances in rented properties. Under the current legislation for landlords to end tenancies under section 21 of the Housing Act, such a notice to terminate CANNOT legally be served if the gas safety certificates are not up to date. This should be a powerful incentive to landlords to keep them up to date, and it is worth advertising this to landlords.
35	Guideline	13	13-26	We would add a point referring to legal obligations for carbon monoxide alarms to be installed, and list those in the items to be inspected and maintained
36	Guideline	15	25-27	We support the identification of air exchange rates as a priority for research, particularly in the context of the UK's carbon reduction targets. One option to explore could be to do this for different categories of buildings, as in the approach of BS EN 16798-1:2019 (i.e. buildings with low / medium / high internal emissions) and potentially adding consideration of external pollution to assess the best compromise point.
37	Guideline	16	14-18	As a recommendation for research, we would add “how is occurrence avoided”, particularly in the case of retrofit. While knowledge is growing on this (including thanks to the work of the Centre for Moisture in Buildings), it needs to grow further and be widely disseminated to practitioners. This is crucial as retrofit works are expected to increase significantly to meet the UK's carbon targets; this will lead to fabric interventions and the application of insulation and airtightness improvements to a very varied building stock, including traditional buildings which require different approaches to moisture management.
38	Guideline	16	13	<p>Under “other recommendations for research”, we would add research into the effects of combined exposure to multiple stressors (e.g. to heat and air pollution, to noise and air pollution), as is very common in practice. This could help better assess priorities for regulation and interventions.</p> <p>We would also recommend reviewing research on semi-volatile organic compounds (SVOCs) and whether they should be the subject of more guidelines. Below is further information provided by a member of our indoor air quality group and of UK-IEG.</p> <p><u>SVOCs</u>: People are exposed to SVOCs via multiple routes. They inhale air containing gaseous SVOCs or SVOCs adsorbed on airborne particles, they touch SVOC coated surfaces, they ingest dust containing SVOCs (a particularly important exposure route for infants), and the foods they eat contain SVOCs. Also, it has recently been recognized that airborne SVOCs can adsorb directly on the skin and then move into the body. SVOCs are different from VOCs because they tend to stay in the home for longer periods and could not be removed simply through ventilation strategies. As SVOCs deposit on surfaces, they might stick to dust particles and cleaning is required to remove them in addition to robust ventilation. It has been calculated that many SVOCs have long persistence indoors. Even if the original sources are removed, SVOCs will persist indoors for weeks or years because all indoor surfaces have become coated with SVOCs. SVOCs that may be found</p>

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				<p>in homes and other buildings, and also as detectable body burdens of occupants, include pesticides, plasticizers, and flame retardants. Calculations also indicate that human uptake of SVOCs by absorption on the skin can be much larger than previously thought, potentially equal to or in some cases exceeding intake through inhalation. References: Weschler and Nazaroff, 2012 Damalas and Koutroubas, 2016 Shi et al., 2018 Lucatinni et al., 2018 [Fire%20retardants%20are%20particularly%20essential%20SVOC%20to%20be%20considered%20in%20the%20built%20environment.]House of Common, Environmental Audit Committee, Toxic Chemicals in Everyday Life, 2019 Shaw, 2010”</p>
39	Evidence review	General	General	<p>Possible additional references:</p> <p><u>Prioritization of pollutants:</u> Method based on harm and likelihood, adopted by the International Energy Agency’s Air Infiltration and Ventilation Centre:</p> <ul style="list-style-type: none"> Logue JM, Price PN, Sherman MH, Singer BC. A Method to Estimate the Chronic Health Impact of Air Pollutants in U.S. Residences. Environmental Health Perspectives. 2011;120(2):216-22. Borsboom W, De Gids W, Logue JM, Sherman MH, Wargocki P. TN 68: Residential Ventilation and Health. Air Infiltration and Ventilation Centre, Brussels, Belgium; 2016. <p><u>Audits and monitoring</u></p> <ul style="list-style-type: none"> Jones BM, Phillips G, O’Leary C, Molina C, Hall IP, Sherman MH, editors. Diagnostic barriers to using PM2.5 concentrations as metrics of indoor air quality. AIVC 2018 Smart Ventilation for Buildings; 2018; Juan-Les-Pins, France. Jones BM. What’s Cooking? CIBSE Journal 2018:67. <p><u>Cooking and air quality:</u></p> <ul style="list-style-type: none"> NHBC research: https://www.nhbcfoundation.org/publication/assessment-of-mvhr-systems/ O’Leary C, de Kluizenaar Y, Jacobs P, Borsboom W, Hall I, Jones B. Investigating measurements of fine particle (PM2.5) emissions from the cooking of meals and mitigating exposure using a cooker hood. Indoor Air. 2019;29(3):423-38. Abdullahi KL, Delgado-Saborit JM, Harrison RM. Emissions and indoor concentrations of particulate matter and its specific chemical components from cooking: A review. Atmospheric Environment. 2013;71:260-94. ASTM. E3087 – 18: Measuring capture efficiency of domestic range hoods. American Society for Testing and Materials; 2018.

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Insert extra rows as needed

Checklist for submitting comments

- Use this comment form and submit it as a **Word document (not a PDF)**.
- Complete the disclosure about links with, or funding from, the tobacco industry.
- Include **page and line number (not section number)** of the text each comment is about.
- Combine all comments from your organisation into 1 response. **We cannot accept more than 1 response from each organisation.**
- Do not paste other tables into this table – type directly into the table.
- **Mark any confidential information or other material that you do not wish to be made public. Also, ensure you state in your email to NICE that your submission includes confidential comments.**
- Do not include medical information about yourself or another person from which you or the person could be identified.
- Spell out any abbreviations you use
- For copyright reasons, comment forms **do not include attachments** such as research articles, letters or leaflets (for copyright reasons). We return comments forms that have attachments without reading them. The stakeholder may resubmit the form without attachments, but it must be received by the deadline.
- **We do not accept comments submitted after the deadline stated for close of consultation.**

You can see any guidance that we have produced on topics related to this guideline by checking [NICE Pathways](#).

Note: We reserve the right to summarise and edit comments received during consultations, or not to publish them at all, if we consider the comments are too long, or publication would be unlawful or otherwise inappropriate.

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