

DNA Analysis of Building

DNA Mould Test



Address Garðaskóli, Vífilstaðavegi, 210 Garðbæ

Case nr. 3.161.348

Requester Mannvit hf, Alma Dagbjört

Lab nr. 2023001511

Test ID 8060, 8061, 8062 og 8063

Sample date 05.06.2023 Receipt date 08.06.2023 Analysis date 15.06.2023

DNA tests may reveal whether there are microorganisms (mould) in dust originating from moisture damaged building materials or concealed water damages. Microbiologic material from concealed constructions may over time be released to the residential zone, where it will sediment with the dust. The result of the DNA analysis is an indication of the extent of which the room is affected by microbiologic material.

CONCLUSION

Based on the analysis results for the test made from kjallari, sýni tekið í loftræsti kerfi, Garðaskóli, Vífilstaðavegi, 210 Garðbæ, our evaluation is that the rate of mould in the building is somehow above the normal, expected level for dry, clean and undamaged buildings. The presence of *Aspergillus* and *Penicillium* often observed in buildings with moisture and water damages is far above normal level. There is an increased level of *Aspergillus versicolor* in the test.

Note there is a very low total amount, and therefor a risk for not valid test results

As a whole our evaluation is that the zone is affected by atypical levels of microbiologic material.

However, we would like to point out that the evaluation is merely based on the analysis results. As the results only form part of our evaluation basis, these results should always be compared to observations and moisture measurings on site, before drawing a final conclusion. We therefore recommend further testing in order to identify extent and cause of the observed occurrence of mould and moisture problems in the inspected areas.



The results for the individual species/groups are given as DNA units per cm². The division into classes A-F is based on internal references and is an expression of the probability that the building is affected by atypical occurrences of mould.

A-B	The species composition and concentration of DNA-units is at the level normally expected for dry, clean and not damp-damaged buildings
C-D	The species composition and concentration of DNA-units is at a slightly elevated to elevated level for dry, clean and not moisture-damaged buildings
E-F	The species composition and concentration of DNA-units is at a higher than expected level for dry, clean and not damp-damaged buildings.

RESULT

The amount of organisms per. cm²

<i>Total antal skimmelsvamp</i>	1111	100,00%
<i>Wallemia sebi</i>	0	0,00%
<i>Cladosporium cladosporioides</i>	39	3,53%
<i>Cladosporium herbarum</i>	28	2,54%
<i>Cladosporium sphaerospermum</i>	0	0,00%
<i>Mucor/Rhizopus grp.</i>	0	0,00%
<i>Rhizopus stolonifer</i>	0	0,00%
<i>Acremonium strictum</i>	0	0,00%
<i>Aspergillus og Penicillium arter</i>	946	85,11%
<i>Aspergillus fumigatus</i>	0	0,00%
<i>Penicillium chrysogenum</i>	0	0,00%
<i>Tricoderma viride</i>	0	0,00%
<i>Aspergillus glaucus</i>	0	0,00%
<i>Aspergillus niger</i>	0	0,00%
<i>Aspergillus versicolor</i>	145	13,05%
<i>Alternaria alternata</i>	0	0,00%
<i>Ulocladium chartarum</i>	0	0,00%
<i>Stachybotrys chartarum</i>	0	0,00%
<i>Chaetomium globosum</i>	0	0,00%
<i>Streptomyces</i>	0	0,00%

The evaluation is based on the assumption that the test has been made correctly according to OBH's guide lines.

**8061 Garðaskóli, Vífilstaðavegi, 210 Garðbæ
kjallari, tekið við hiðina á stiga ofan af hurðakarmi, 352**

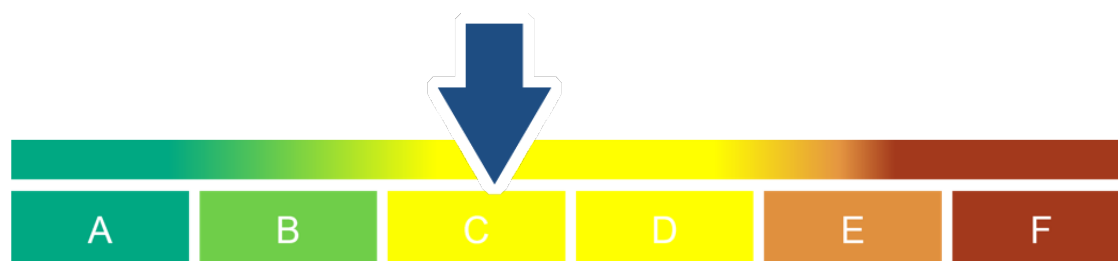
DNA tests may reveal whether there are microorganisms (mould) in dust originating from moisture damaged building materials or concealed water damages. Microbiologic material from concealed constructions may over time be released to the residential zone, where it will sediment with the dust. The result of the DNA analysis is an indication of the extent of which the room is affected by microbiologic material.

CONCLUSION

Based on the analysis results for the test made from kjallari, tekið við hiðina á stiga ofan af hurðakarmi, Garðaskóli, Vífilstaðavegi, 210 Garðbæ, our evaluation is that the rate of mould in the building is somehow above the normal, expected level for dry, clean and undamaged buildings. When looking at the composition of mould species there is no sign of a severe or long-lasting moisture damage. However, there is an increased level of *Penicillium* and *Aspergillus*, which may originate from a small moisture damage with low moisture levels, as e.g. condensation on a thermal bridge.

We recommend to dry off horizontal surfaces and to vacuum with a HEPA filter.

However, we would like to point out that the evaluation is merely based on the analysis results. As the results only form part of our evaluation basis, these results should always be compared to observations and moisture measurements on site, before drawing a final conclusion.



The results for the individual species/groups are given as DNA units per cm². The division into classes A-F is based on internal references and is an expression of the probability that the building is affected by atypical occurrences of mould.

A-B	The species composition and concentration of DNA-units is at the level normally expected for dry, clean and not damp-damaged buildings
C-D	The species composition and concentration of DNA-units is at a slightly elevated to elevated level for dry, clean and not moisture-damaged buildings
E-F	The species composition and concentration of DNA-units is at a higher than expected level for dry, clean and not damp-damaged buildings.

RESULT

The amount of organisms per. cm²

<i>Total antal skimmelsvamp</i>	24261	100,00%
<i>Wallemia sebi</i>	0	0,00%
<i>Cladosporium cladosporioides</i>	0	0,00%
<i>Cladosporium herbarum</i>	22	0,09%
<i>Cladosporium sphaerospermum</i>	12	0,05%
<i>Mucor/Rhizopus grp.</i>	0	0,00%
<i>Rhizopus stolonifer</i>	0	0,00%
<i>Acremonium strictum</i>	0	0,00%
<i>Aspergillus og Penicillium arter</i>	7111	29,31%
<i>Aspergillus fumigatus</i>	0	0,00%
<i>Penicillium chrysogenum</i>	0	0,00%
<i>Tricoderma viride</i>	29	0,12%
<i>Aspergillus glaucus</i>	0	0,00%
<i>Aspergillus niger</i>	0	0,00%
<i>Aspergillus versicolor</i>	217	0,90%
<i>Alternaria alternata</i>	0	0,00%
<i>Ulocladium chartarum</i>	0	0,00%
<i>Stachybotrys chartarum</i>	0	0,00%
<i>Chaetomium globosum</i>	0	0,00%
<i>Streptomyces</i>	0	0,00%

The evaluation is based on the assumption that the test has been made correctly according to OBH's guide lines.

**8062 Garðaskóli, Vífilstaðavegi, 210 Garðbæ
uppá lofti (steyppt plata), endi að Ásgarði, Garðaskóli, 808**

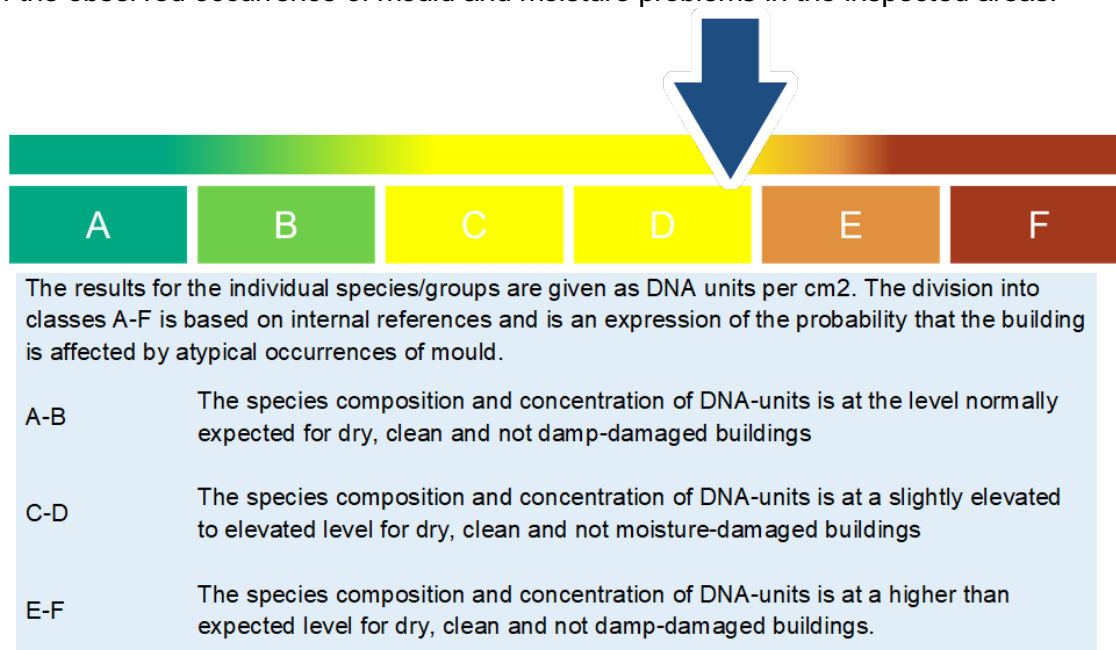
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CONCLUSION

Based on the analysis results for the test made from uppá lofti (steyppt plata), endi að Ásgarði, Garðaskóli, Garðaskóli, Vífilstaðavegi, 210 Garðbæ, our evaluation is that the rate of mould in the building is somehow above the normal, expected level for dry, clean and undamaged buildings. The presence of *Aspergillus* and *Penicillium* often observed in buildings with moisture and water damages is far above normal level. There is an increased level of a.o. *Aspergillus fumigatus* in the test.

As a whole our evaluation is that the zone is affected by atypical levels of microbiologic material.

However, we would like to point out that the evaluation is merely based on the analysis results. As the results only form part of our evaluation basis, these results should always be compared to observations and moisture measurements on site, before drawing a final conclusion. We therefore recommend further testing in order to identify extent and cause of the observed occurrence of mould and moisture problems in the inspected areas.



RESULT

The amount of organisms per. cm²

<i>Total antal skimmelsvamp</i>	9363	100,00%
<i>Wallemia sebi</i>	0	0,00%
<i>Cladosporium cladosporioides</i>	178	1,90%
<i>Cladosporium herbarum</i>	331	3,54%
<i>Cladosporium sphaerospermum</i>	71	0,76%
<i>Mucor/Rhizopus grp.</i>	0	0,00%
<i>Rhizopus stolonifer</i>	0	0,00%
<i>Acremonium strictum</i>	0	0,00%
<i>Aspergillus og Penicillium arter</i>	4959	52,96%
<i>Aspergillus fumigatus</i>	14	0,15%
<i>Penicillium chrysogenum</i>	0	0,00%
<i>Tricoderma viride</i>	25	0,27%
<i>Aspergillus glaucus</i>	0	0,00%
<i>Aspergillus niger</i>	0	0,00%
<i>Aspergillus versicolor</i>	204	2,18%
<i>Alternaria alternata</i>	0	0,00%
<i>Ulocladium chartarum</i>	0	0,00%
<i>Stachybotrys chartarum</i>	12	0,13%
<i>Chaetomium globosum</i>	0	0,00%
<i>Streptomyces</i>	0	0,00%

The evaluation is based on the assumption that the test has been made correctly according to OBH's guide lines.

**8063 Garðaskóli, Vífilstaðavegi, 210 Garðbæ
sama rými uppá lofti í hinn endan, steypt plata, Garðaskóli, 786**

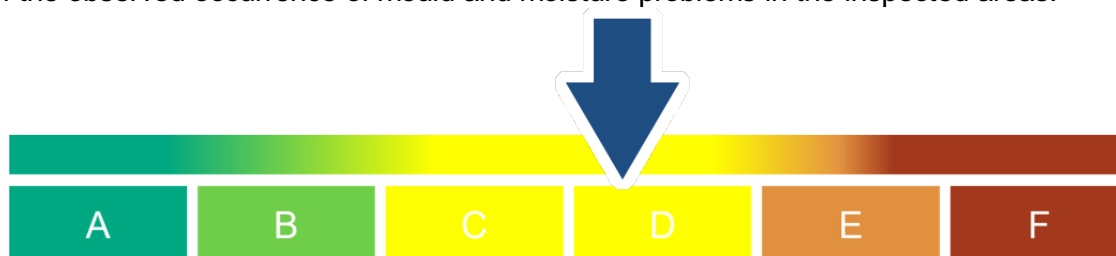
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CONCLUSION

Based on the analysis results for the test made from sama rými uppá lofti í hinn endan, steypt plata, Garðaskóli, Garðaskóli, Vífilstaðavegi, 210 Garðbæ, our evaluation is that the rate of mould in the building is somehow above the normal, expected level for dry, clean and undamaged buildings. The presence of *Aspergillus* and *Penicillium* often observed in buildings with moisture and water damages is far above normal level.

As a whole our evaluation is that the zone is affected by atypical levels of microbiologic material.

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E-F	The species composition and concentration of DNA-units is at a higher than expected level for dry, clean and not damp-damaged buildings.

RESULT

The amount of organisms per. cm²

Total antal skimmelsvamp	10761	100,00%
<i>Wallemia sebi</i>	127	1,18%
<i>Cladosporium cladosporioides</i>	1585	14,73%
<i>Cladosporium herbarum</i>	274	2,55%
<i>Cladosporium sphaerospermum</i>	66	0,62%
<i>Mucor/Rhizopus grp.</i>	0	0,00%
<i>Rhizopus stolonifer</i>	0	0,00%
<i>Acremonium strictum</i>	0	0,00%
<i>Aspergillus og Penicillium arter</i>	3547	32,96%
<i>Aspergillus fumigatus</i>	6	0,05%
<i>Penicillium chrysogenum</i>	0	0,00%
<i>Trichoderma viride</i>	0	0,00%
<i>Aspergillus glaucus</i>	0	0,00%
<i>Aspergillus niger</i>	1	0,01%
<i>Aspergillus versicolor</i>	114	1,06%
<i>Alternaria alternata</i>	0	0,00%
<i>Ulocladium chartarum</i>	0	0,00%
<i>Stachybotrys chartarum</i>	0	0,00%
<i>Chaetomium globosum</i>	0	0,00%
<i>Streptomyces</i>	0	0,00%

The evaluation is based on the assumption that the test has been made correctly according to OBH's guide lines.

Contact the undersigned regarding questions to the report

Med venlig hilsen

Tina Eckardt

Tina Eckardt
Laborant
OBH Rådgivende Ingeniører
Environment and Health

ANALYSIS METHOD

The analysis was developed by EPA, USA's Environmental Protection Agency (pat 6 387 652). The organisms are washed out of the test, and the DNA is extracted. Accordingly, the DNA is amplified in a sequential PCR process, until the light from an attached fluorescence molecule can be seen in the detector. The number of sequences are calculated and compared to a synthetic standard DNA, after which the number of original DNA sequences are calculated. As the DNA is unique for any organism the species and quantity of specific organisms can be determined. By this precise method you will rapidly be informed how much mould, respective indicator organisms which the test contains per square unit.

ANALYSIS EXPLANATION

The above evaluation applies for the test made, and not for the building as such. The analysis response should always be included as part of a total evaluation of the conditions on site together with other observations and measurements. The responsibility for correct testing always lies with the tester. Evaluations and good advice given here or in connection with interpretation of these results apply for the normal cases and are based on the assumption that the test is representative and made according to OBH's guide lines.

TAKING A DUST TEST

The purpose of the test is to evaluate whether in the indoor air there are microorganisms to indicate moisture damaged building parts. Mould releases particles, spores, cells, and other fungus components containing DNA, to the air. These microparticles float in the air and are sedimented with dust in the living area. Collecting dust is thus an expression of whether the air of the room has been effected by particles from mould over an extended period of time.

INDICATION OF QUANTITY

The DNA analysis distinguishes between 20 groups/species.

The test result states the number of DNA sequences for respective species and groups per cm².

Any colour markup states the level of each species or group, deviating according to the levels of dry, clean and undamaged buildings.

Yellow	Above normal
Orange	Far above normal
Red	Very far above normal

HEALTH

Mould in our indoor environment may affect our health, most commonly with respiratory irritation. Further symptoms are irritation of eyes, nose and upper respiratory tract, headache, fatigue, coughing, and rashing. These symptoms will be more severe for persons with hay fever and asthma. Asthmatic symptoms may occur in connection with a long-term stay in an indoor environment with massive mould problems. The DNA result does not reveal anything about the health risk of residing in the building.

THE HEALTH DAMAGING EFFECT

In order to evaluate the health risk of residing in a building, a construction technical and healthcare evaluation must be made. According to the Danish National Board of Health the health risk is among others characterized by the unhealthy circumstances as well as the moisture and mould conditioned health problems of the residents/users.

READ MORE

www.obh-gruppen.dk

www.sst.dk

www.astma-allergi.dk

www.indeklimaportalen.dk