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## Tightly built homes jeopardize air quality

### Boost ventilation to clear toxic gas Particleboard now subject of debate

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While building "green" has been gaining momentum over the past few years, indoor air quality has actually taken a back seat.

The level of energy efficiency in new homes has increased, and will continue to increase when the updated Ontario Building Code, requiring better energy efficiency, takes effect next year.

But, unless there is a stronger emphasis on ventilation and an avoidance of building products that release or off-gas toxic chemicals, indoor air quality will continue to erode. And it doesn't matter if you buy a \$300,000 home or a \$2-million home. Toxic building products are used in every home built in Ontario.

In a recent report from Environmental Defence (a charity) called *Polluted Children, Toxic Nation: A Report on Pollution in Canadian Families*, lab tests found that adults in their test group had an average of 32 toxins in their bodies, while children had 23. Although the test group was small, just 13 people from across Canada, it has spurred Health Canada to begin a larger, national program tracking toxic substances next year.

The report revealed three significant findings that cannot be ignored. First, the toxins found are known carcinogens; second, every child tested had at least one toxin at a higher level than the adults; and third, many of the toxins exist in all homes.

Probably the most ubiquitous building product in every new home is particleboard, which can be found in subfloors, cabinet boxes, shelves, closets, interior doors, window bases, moulding and kitchen cabinet doors. Particleboard can take the form of plywood, MDF or oriented strand board.

Particleboard is a composite product made with sawdust and formaldehyde, explains Dan Morris, an engineer who is president of Healthy Building Inc. and teaches a program on sustainable building at Seattle Community College.

"It is used anywhere in a house that used to be wood, and it is one of the worst things we have ever put into housing" he says. "Its half-life is between 10 and 40 years, which means it will off-gas formaldehyde for a long time. MDF has a higher density than plywood, so the formaldehyde comes out a bit slower than in plywood."

Dr. Kapil Khatter, director of health and environment for Pollution Watch and president of Canadian Physicians for the Environment, says formaldehyde is a carcinogen. He suggests particleboard should never be used.

But Renee Bergeron, media relations officer for Health Canada, says formaldehyde is present at low levels in all Canadian buildings. In an email, she explains that most homes tested in Canadian studies have had formaldehyde levels below the Health Canada guideline.

However, she does suggest we can lower our exposure to formaldehyde by increasing the flow of outdoor air to the inside, which means increased ventilation. She also agrees "wood-based products assembled with urea-formaldehyde resins (particleboard or MDF) emit more formaldehyde than those assembled with phenol-formaldehyde resins (such as oriented strand board), and bare products emit more than coated products."

Although Canadian-made particleboards are tested on a regular basis for the Japanese market, and have the best rating going into this market, we import a lot of the particleboard used in our own new homes.

Dale Black, manager of quality management systems for the Canadian Plywood Association, says Canada does not test for formaldehyde for imported plywood or MDF.

Morris, who says the same problem exists in the U.S., attributes it to free trade.

"In the late '80s we had lowered formaldehyde by 70 per cent," he says. "In the late '90s, with free trade, formaldehyde was going up again. The reason is we can't tell any other country what to do or how to make products. So we are importing lots of particleboard from Mexico which has lots of formaldehyde."

Complicating the increase in formaldehyde levels is the tighter, more energy-efficient homes being built, where pollutants build up and are harder to get rid of, says Morris, who believes the biggest problem is inadequate ventilation.

"In houses with poor ventilation, dust can get to be 500,000 particles per cubic foot of air that you breathe. I think there is a conflict between green building and indoor air quality."

Morris's advice to homebuilders is simple: "If in doubt, keep it out" and provide good ventilation in all new homes.

He would like to see heat-recovery ventilation systems in all energy-efficient homes. This would allow fresh air to enter the house through a single intake and then be distributed through ducts to other rooms. Stale, polluted air would be removed through a separate exhaust duct.

Sarah Winterton, executive director for Environmental Defence, says we should be getting rid of known products with toxic chemicals as soon as possible.

"It's a matter of mandating industry to implement pollution plans and implement products with safer materials," she says. "Should products with toxic chemicals be created in the first place?"

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