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Residential Aluminum wiring systems, six points

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1. **Dates of use**
   Aluminum wiring was used nationwide between 1965 and 1974 in the wiring of new homes. Dates coincide with the Vietnam War, due to an escalation in the price of copper during that period. Aluminum wiring is still widely used today for larger commercial and industrial feeders. Electrical distribution companies use it widely throughout their distribution systems including the supply service cable to most residences.

2. **Risk factor**
   According to a report published by the US Consumer Product Safety Commission (CPSC), homes wired with aluminum wire manufactured before 1972 are 55 times more likely to have one or more connections reach Fire Hazard Conditions than is a home wired with copper. In 1972, manufacturers modified aluminum wire as well as switches and outlets to improve the performance of aluminum wired connections.

3. **Safety**
   Aluminum wiring itself is as electrically safe as copper. The concern with aluminum wiring is the quality of the connections. If proper connections are maintained without damage to the wire, and using approved materials in accordance with the Canadian Electrical Code, an aluminum wiring system can be as safe as that of a copper system.

4. **Concerns**
   Under an electric load electrical cables and connections heat up; the greater the electric load, the greater the heat. When the load is switched off the cables and connections cool down. Under the influence of heat aluminum expands at a rate of three times that of copper. Every time a current is applied to circuit the aluminum connection expands, then contracts once the circuit is switched off. Eventually a gap can be created that exposes the wire to air, causing the aluminum to oxidize. Aluminum oxide is a poor electrical conductor thus creating additional heat at the connection point. Eventually, with continued cycling the electrical connections will become loose creating an arc, which can lead to fire.

5. **Assuring safety through electrical inspection and maintenance**
   To assure the safety of aluminum wiring, the system must be assessed by a qualified electrical contractor, knowledgeable in the special techniques required for inspecting and repairing aluminum wiring. Each circuit must be tested to ensure conductivity is within limits established by the Canadian Electrical Code. All terminations and connections throughout the house must be examined for signs of failure and overheating and reworked using approved processes and materials in accordance with the Canadian Electrical Code. The key to maintaining safe aluminum wiring is regular inspection and maintenance from electrical contractors experienced in aluminum wiring testing and repair.

6. **Inspection frequency**
   Regardless of having completed a PowerCheck Electrical Safety Check-up, the expansion and contraction of the connections, under loading will continue. Accordingly, due to the potential of aluminum joints loosening over time, it is recommended that all aluminum wire systems be inspected every 5 years. Provided maintenance procedures are followed, a residential aluminum wiring system can be as safe as the equivalent copper system.