

Services Guide

Insulation Contractors – Cold & Heat

**NOTE 1: This information is pulled from credible sources. This information is a guide. Any information used from this guide must be re-contextualized (no copying and pasting). Re-contextualize information incorporating SEO and business specifics.*

**NOTE 2: For MCP websites, stick to general information and avoid specifics.*

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1. INSULATION CONTRACTORS - COLD & HEAT OVERVIEW

1.1 GENERAL INFORMATION

https://en.wikipedia.org/wiki/Building_insulation

- Building insulation refers broadly to any object in a building used as insulation for any purpose.
- While the majority of insulation in buildings is for thermal purposes, the term also applies to acoustic insulation, fire insulation, and impact insulation (e.g. for vibrations caused by industrial applications). Often an insulation material will be chosen for its ability to perform several of these functions at once.
- Insulation reduces unwanted heat loss or gain and can decrease the energy demands of heating and cooling systems. It does not necessarily deal with issues of adequate ventilation and may or may not affect the level of sound insulation.
- In a narrow sense insulation can just refer to the insulation materials employed to slow heat loss, such as:
 - Cellulose
 - Glass wool
 - Rock wool
 - Polystyrene
 - Urethane foam
 - Vermiculite
 - Perlite
 - Wood fibre
 - Plant fibre (cannabis, flax, cotton, cork, etc.)
 - Recycled cotton denim
 - Plant straw
 - Animal fibre (sheep's wool)
 - Cement
 - Earth or soil
 - Reflective Insulation (also known as Radiant Barrier) but it can also involve a range of designs and techniques to address the main modes of heat transfer - conduction, radiation and convection materials

1.2 SEO

Keywords (First Row – BEST, Last Row – LEAST)

○ HVAC	○ Air conditioner	○ Portable air conditioner	○ Furnace repair
○ Spray foam	○ High efficiency furnace	○ AC unit	○ Insulation
○ Propane furnace	○ Radiant heat	○ Heater	○ Spray foam insulation
○ HVAC system	○ Boiler	○ Heating and cooling	○ Insulation contractors

1.3 TYPES OF INSULATION

<https://www.houselogic.com/organize-maintain/home-maintenance-tips/insulation-types/>

Type	Description	Benefits
Batts and Blankets	<ul style="list-style-type: none">○ This is the most common type of insulation.○ It's especially suitable for do-it-yourself projects, but take care to cut the material to fit around plumbing pipes, wires, and electrical outlets.	<ul style="list-style-type: none">○ It comes in convenient rolls that are easy to transport and carry.
Fibreglass Batts and Blankets	<ul style="list-style-type: none">○ R-value: 3.0-4.0 per inch (R-13 for a 2-by-4-framed wall).○ Disadvantages: Can be itchy to install — you'll need protective clothing. Rolls of fiberglass must be cut by hand to fit spaces. It compresses easily, which causes it to lose insulating properties.○ Environmental issues: Phenol formaldehyde, linked to cancer, is being phased out as a binder. Labels warning of possible cancer risk from inhaled fibers are being phased out because regulators have concluded the fibers break down quickly in lungs. Recycled content can be up to	<ul style="list-style-type: none">○ Advantages: Widely available and familiar, standard widths and thicknesses are designed to fit between studs, joists, and rafters.○ Paper- and foil-faced versions have stapling flanges that make installation easy.

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	<p>60%.</p> <ul style="list-style-type: none"> ○ Best use: Walls, floors, ceilings. 	
Rockwool Batts and Blankets	<ul style="list-style-type: none"> ○ R-value: 4-5 per inch (R-15 for a 2-by-4-framed wall). ○ Disadvantages: Not widely available; retains moisture — if allowed to get damp, it can harbor mould growth. ○ Environmental issues: High recycled content, up to 90% (all pre-consumer). Although the products may contain minute amounts of crystalline silica, a known carcinogen, studies have shown no evidence that inhaled rock wool fibers cause lung disease. ○ Best use: Walls, floors, ceilings. 	<ul style="list-style-type: none"> ○ Advantages: More fire-resistant than fiberglass. Doesn't itch. Springs into shape against studs, so installation is staple-free and quick.
Loose-Fill Fibreglass	<ul style="list-style-type: none"> ○ This insulation consists of fluffy strands of fiber blown into attics and walls with a special machine. It fills nooks and crannies, eliminating cold spots. ○ R-value: 2.2–2.7 per inch. ○ Disadvantages: The product is so fluffy that loose applications may lose up to half their effectiveness at very cold temperatures unless topped by blanket insulation or higher-density loose fill (see cellulose below). ○ Environmental issues: Same as for fiberglass batts and blankets, except that formaldehyde isn't an issue. Up to 60% recycled content. ○ Best use: Ceilings. 	<ul style="list-style-type: none"> ○ Advantages: Lightweight enough for attic applications over ½-inch drywall ceilings with framing every 24 inches.
Loose-Fill Cellulose	<ul style="list-style-type: none"> ○ R-value: 3.2–3.8 per inch. ○ Disadvantages: Too heavy for attic installations; ceiling must have at least 5/8-inch drywall or framing every 16 inches. Over time, it can settle almost 20%, reducing its effectiveness. 	<ul style="list-style-type: none"> ○ Advantages: Effective at all temperatures, and can even perform better as the air gets colder.

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	<ul style="list-style-type: none">○ Environmental issues: Fibers are too big to lodge in lungs; dust is only a nuisance issue. The makeup of cellulose insulation typically is around 85% post-consumer recycled paper, plus 15% fire retardant. That's usually a borate compound, which also helps deter pests.○ Best use: Ceilings, enclosed existing wall or open new wall cavities, unfinished attic floors, other hard to reach places.	
Structural Insulated Panels	<ul style="list-style-type: none">○ Structural insulated panels (SIPs) have superior energy savings of 12% to 14%, but they're also pricier.○ They usually come in 4-by-8-ft. sheets, although some manufacturers make them as large as 8-by-24 feet, used mostly for new construction.○ Some sheets have tongue-and-groove edges to make tight, energy-efficient seams.○ The insulation also is used for basement and crawl space walls.○ When facing a living area, building codes usually require the material to be covered with a layer of drywall.	<ul style="list-style-type: none">○ If you're replacing siding or roofing, or doing an addition, these boards will insulate the entire wall surface, including the framing.
Polystyrene SIPs	<ul style="list-style-type: none">○ This type of SIP comes in two versions: Expanded (EPS) is the least expensive and has the lowest R-value. Extruded (XPS) type is usually blue or pink in color; it's stronger and blocks moisture better than EPS.○ R-value: 3.8 (EPS) to 5 (XPS) per inch.○ Disadvantages: Must be cut to fit around pipes and other wall penetrations, leaving gaps that should be filled with sealing foam. It's not structural — you can't nail	<ul style="list-style-type: none">○ Advantages: Lightweight, easy to install.

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	<p>anything to it. Insects and pests can tunnel through them. Best to treat the panels with insecticide before using. Also, they're so air-tight, a well-built SIP structure might need fresh-air ventilation for safety and to meet building codes.</p> <ul style="list-style-type: none">○ Environmental issues: Panels emit toxic smoke when burned. Although scraps and leftovers can be recycled, they rarely are; instead, they can wind up as plastic bead litter in rivers and oceans.○ Best use: New walls, ceilings, floors, roofs.	
Polyisocyanurate SIPs	<ul style="list-style-type: none">○ R-value: 5.6-7.7 per inch.○ Disadvantages: Because the foil type is a moisture barrier, it shouldn't be used where there already is an interior moisture barrier. Expensive.○ Environmental issues: Panels emit toxic smoke when burned. Although scraps and leftovers can be recycled, they rarely are.○ Best use: New walls, ceilings, floors, roofs.	<ul style="list-style-type: none">○ Advantages: The highest R-value per inch of any insulation with a thickness that ranges from $\frac{1}{2}$ inch to 2 inches. It's often faced with foil, which acts as a moisture barrier. Easy to install.
Spray Foam	<ul style="list-style-type: none">○ This plastic insulation goes on as a liquid and expands to fill the available space, sealing all gaps and cracks and stopping any air leaks. Pros spray the foam insulation mixture into framing cavities; once dry, the excess is cut away, leaving a flat, even surface.	<ul style="list-style-type: none">○ Spray foam insulation costs more than batt insulation, but it has higher R-values. It also forms an air barrier, which can eliminate some other weatherizing tasks, such as caulking.
Open-Cell Polyurethane Spray Foam	<ul style="list-style-type: none">○ R-value: 3.5 to 3.6 per inch.○ Disadvantages: Allows water vapor to pass through, so a moisture barrier is still needed in some situations.○ Requires professional installation.○ Environmental issues: Often called half-pound foam, this insulation contains a modest amount of	<ul style="list-style-type: none">○ Advantages: Stops movement of air.

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	<p>petroleum-based or plant-based plastic. Chemicals and VOCs released during application and while curing can cause asthma and other serious health effects, so wait up to three days to re-enter.</p> <ul style="list-style-type: none">○ Best use: Walls, floors, ceilings.	
Closed-Cell Polyurethane Spray Foam	<ul style="list-style-type: none">○ R-value: 6.0 to 6.5 per inch.○ Disadvantages: Relatively expensive. Requires professional installation.○ Environmental issues: Uses blowing agents that have a high global warming potential. Often called 2-pound foam, it uses significantly more materials than open-cell foam. Exposure issues are similar to open-cell foam. <p>Best use: Walls, floors, ceilings.</p>	<ul style="list-style-type: none">○ Advantages: Stops movement of moisture as well as air.

1.4 WHEN TO INSULATE

<http://yourenergysavings.gov.au/energy/heating-cooling/insulation>

- The best time to install insulation is when you're building or renovating.
- Insulation should be combined with good design—including passive heating and cooling so it can do its job properly keeping you comfortable all year round.
- Many regions have minimum energy efficiency standards for new residential buildings and building extensions. Insulating your new home is one way to meet these minimum requirements.
- Retrofitting insulation is also possible. If you're going to insulate your home at a later stage, the effectiveness and cost will depend on how easy it is to install. For example, it may be more difficult to install insulation in less accessible areas such as existing walls.

1.5 WHAT TO INSULATE

<http://yourenergysavings.gov.au/energy/heating-cooling/insulation>

What	Why
Roofs and Ceilings	<ul style="list-style-type: none">○ If your roof or ceiling isn't insulated, you could lose up to 45% of your heating and cooling energy via the roof.○ Verandah roofs should be insulated in hot climates to reduce heat from the sun, as this not only affects the space below, but also the temperature inside the house.○ Covered verandahs and garages might benefit from insulation if you spend a lot of time in these areas, especially if you're heating or cooling them.
Walls	<ul style="list-style-type: none">○ Wall insulation can save up to an additional 20% of heating and cooling energy.○ Consider added wall insulation as an essential in all climates. Exceptions to this would be homes constructed from straw bale (and to a lesser extent autoclaved aerated concrete—AAC).○ If wall insulation is not already fitted, or if your existing insulation is insufficient, it can be retrofitted.○ Speak to your installer about the correct product for your particular home and location.
Floors	<ul style="list-style-type: none">○ Appropriate floor insulation can save up to 5% of your winter energy costs.○ Carpets are one option to insulate a floor.○ In hot climates floor insulation may interfere with the natural cooling from the ground beneath the house.○ Seek advice about the best option for your home and circumstance.
Water Pipes	<ul style="list-style-type: none">○ Water pipes inside walls can be insulated when building or renovating.○ To avoid further heat being lost from a storage hot water system, insulating externally exposed pipes leading from the water heater to the house as well as the water tank itself is recommended.

2. INSULATION SERVICES

<http://insultwin.com/residential/>

2.1 GENERAL INSULATION SERVICES (RESIDENTIAL & COMMERCIAL)

- Thermal and acoustical fiberglass batts for walls and ceilings
- Pneumatically blown fiberglass insulation
- Spray-applied cellulose insulation
- Spray-applied polyurethane foam insulation
- Spray-applied fiberglass insulation
- Spray-applied Monoglass insulation
- Rigid insulation: expanded, extruded polystyrene and poly-isocyanurates (ISO-board)
- Firestopping
- Backer rod & caulk
- Sprinkler frost protection insulation

Industrial Insulation Services:

<http://www.pcg.com/services/industrial.php>

- Insulation & Lagging for Piping and Ductwork Systems
- Removable Insulation Systems
- Tank Insulation Systems
- Equipment Insulation Systems

2.2 SPRAY FOAM INSULATION BENEFITS

<http://www.greersprayfoam.com/residential-service.html>

- Mould prevention:
 - Because spray foam is so tightly packed, it does not let in moisture. Without moisture, mould is much less likely to grow within the walls of your home.
- Lower energy costs:
 - Spray foam fills all the cracks and holes in your walls to prevent air from escaping. With spray foam, you will notice significantly lower heating and cooling costs as your home's energy efficiency increases. Plus, when you use less electricity, it benefits the environment.

- Decreased outside sounds and particles:
 - Spray foam prevents some outside noises and particles, such as pollutants and allergens, from entering your home. The spray foam seals off any crevices that may provide access for those irritants.
- Increased home value:
 - Your home's value increases when you install spray foam because, in addition to the benefits already mentioned, spray foam lasts longer and results in stronger walls.

3. FIREPROOFING

3.1 TYPES OF FIREPROOFING SERVICES

<https://en.wikipedia.org/wiki/Firestop>

<http://www.rockwool.co.uk/products/fire/firestopping/>

<http://www.alpineinsulation.ca/Fireproofing.html>

<https://en.wikipedia.org/wiki/Fireproofing>

<http://www.ecohome.net/guide/difference-between-air-barriers-vapour-barriers>

Types of Service:

Type	Description
Firestopping	<ul style="list-style-type: none">◦ Various components used to seal openings and joints in fire-resistance rated wall or floor assemblies◦ Fire proof insulation slows the spread of the flames.◦ Includes:<ul style="list-style-type: none">• Penetration void fillers• Pipework and trunking• Sealants and coatings• Linear gaps and seals
Fireproofing	<ul style="list-style-type: none">◦ A spray is applied directly to steel, concrete and other substrates requiring fire protection◦ Spray-applied fireproofing for use over rigid structural substrates such as open web steel joists, beams, columns, floor/ceiling assemblies and exterior or partition wall units.◦ Applying a certification listed fireproofing system to certain structures allows them to have a fire-resistance rating◦ Cementitious fire spray<ul style="list-style-type: none">• The industry considers gypsum-based plasters to be "cementitious"• Endothermic materials have also been used to a large extent and

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	<p>are still in use today, such as gypsum, concrete and other cementitious products</p>
Air and Vapour Seal	<ul style="list-style-type: none">○ Air barriers stop air leakage through individual holes○ Vapour barriers stop diffusion of moisture through solid material○ The rule for vapour barrier installation in cold climates is to have it on the interior with at least 2/3rds of your insulation on the outside of the vapour barrier.○ Air barriers on the other hand can come in the form of house wrap (WRBs), tightly sealed sheathing, insulation that slows airflow, and well-sealed gypsum board (drywall).