

kinvestor

LIQUID ASPHALT

RESEARCH REPORT

presented by
kincommunications

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Summary

Asphalt has stood the test of time since its early use by ancient Egyptians and has been integral in the development of modern roads and infrastructure throughout the world. The majority of liquid asphalt used today is derived from petroleum crude oil. Demand for asphalt binder in North America is currently highest for interstate highways and roofing. Asphalt shingles are cheaper, lighter, and more durable than most other roofing materials – and so are the most widely used roofing material in North America. Asphalt oil can represent up to 25% of a shingle tile.

Currently, the demand for asphalt remains strong, with emerging economies investing heavily in infrastructure. In 2020, worldwide demand for asphalt was estimated to be 143 million metric tonnes. At a forecasted CAGR of 3.6%, demand is expected to reach 174 million metric tonnes by 2025. In Canada, since 2011, the price of asphalt cement has varied from around CAD\$500 – CAD\$900 per tonne, depending on market demand. The sudden drop-off in infrastructure investment and construction in 2020 led to a fall in price that is now starting to recover at a rapid pace. The Canadian asphalt shingles market is expected to reach USD\$1.85 billion by 2027 according to Global Market Insights, with the assumption of a 3.7% CAGR from 2021-2027. This report aims to provide a quick overview of asphalt, its purpose, use, pricing, growth, and demand.

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What is Liquid Asphalt

Liquid asphalt, which is also commonly referred to as 'asphalt cement' and 'asphalt binder' in Europe and Canada, is a black and highly viscous liquid or partially solid state of petroleum. Asphalt can be found in natural deposits, or it may be a refined product. The majority of liquid asphalt used today is derived from petroleum crude oil. Natural deposits of liquid asphalt are mainly found in tar sands and oil sands. Some of the richest supplies of asphalt can be found in Trinidad and Tobago, Venezuela's Lake Bermudez, and the Dead Sea. These deposits are in unconsolidated sandstones.

Liquid asphalt that is derived from a refined product is manufactured in three distinct methods:

- *The blending method* – asphalt is blended with cutback (a solvent from petroleum).
- *The heating method* – takes place in asphalt cement plants. The finished product is asphalt cement which is also known as asphalt binding.
- *The emulsification process* – also known as the water suspension method, where liquid asphalt cement is dispersed in a large volume of water and an emulsifying agent.

Uses of Liquid Asphalt

Refined asphalt came about because of an emerging auto industry in the early 1900's. This refined asphalt is graded using a Performance Graded System (PG) which is used in 49 states in the United States and was implemented by the Strategic Highway Research Program (SHRP). This grading system is based on climate metrics consisting of highest and lowest temperatures. The asphalt must be able to withstand the temperature values for specific uses to ensure a good quality standard. For example, PG64-22 means the pavement requires asphalt that reaches up to 64°C and as low as 22°C. Premium asphalt grades are commonly polymer modified to increase their durability.

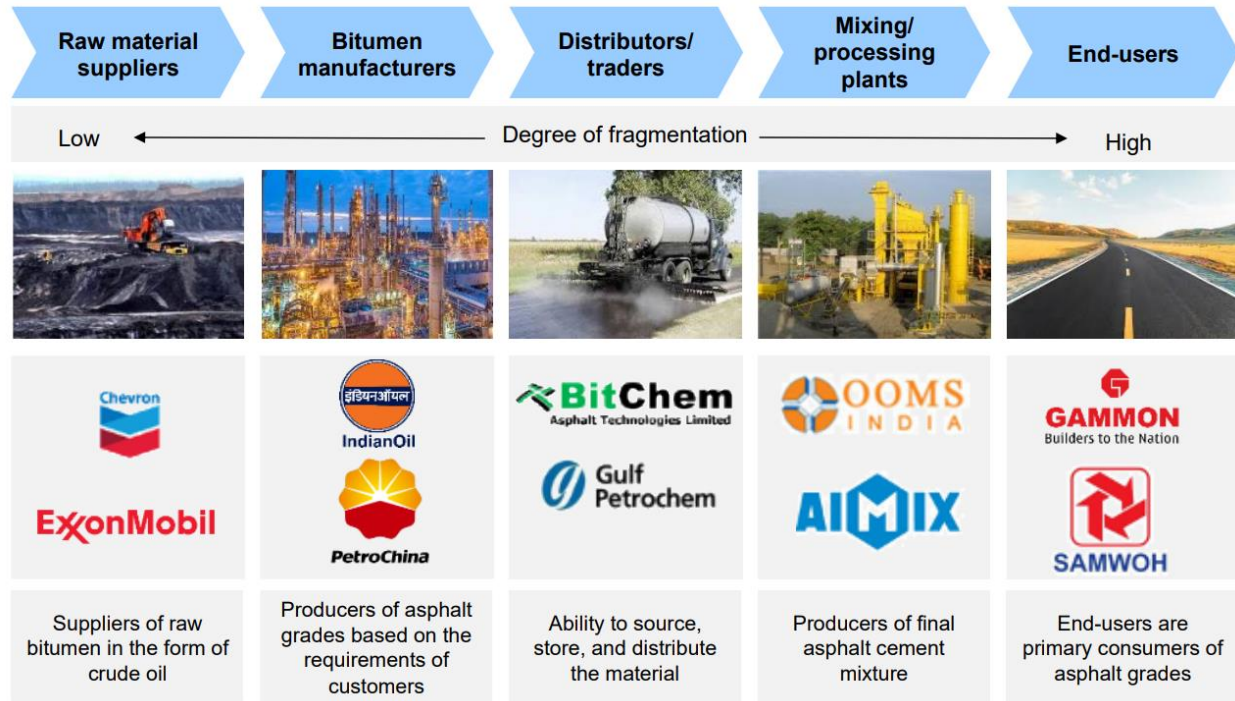
Asphalt has three main areas of use:

- *Municipal* – town or city owned. Can be funnelled down to streets, alleyways, potholes, etc.
- *Residential* – owned by private homeowners – e.g., driveways
- *Commercial* – business owned, used for parking lots, sports courts, etc.

Acquiring asphalt binder for industrial use is a multi-step process. The supply chain begins with raw material suppliers, who provide bitumen to manufacturers. Distributors are responsible for storage and

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selling liquid asphalt to mixing plants, where the final asphalt cement mixture is prepared and sold to end-users. Roughly 88% of asphalt cement acquired by end-users is used for pavement, with the remaining portion utilized for waterproofing, parkways, airports, and other uses.



Source: <https://albertainnovates.ca/wp-content/uploads/2021/04/2020-ADI-AI-Asphalt-Binder-Market-Report-FINAL-Public.pdf>

Pricing History

Since 2011, the price of asphalt cement has varied from around CAD\$500 – CAD\$900 per tonne, depending on market demand. The sudden drop-off in infrastructure investment and construction in 2020 led to a fall in price that is now starting to recover at a rapid pace. The retail price of asphalt cement per tonne as of August 2021 is CAD\$891.00, according to the Ontario Asphalt Pavement Council. This represents a 44% increase year-to-date. In Canada, as of September 2021, the posted prices for Primary Grade A paving grade asphalt cement are C\$670-710 per metric tonne for British Columbia and C\$650-800 per metric tonne for Toronto and Montreal areas, as per Poten & Partners Asphalt Weekly Monitor.

	Posted Prices	Selling Prices
Canada	C\$/MT	C\$/MT
British Columbia	710-720	670-710
Alberta	715	640-690
Sask./Manitoba	660-755	640-720
Toronto, Ontario	700-875	650-775
Montreal, Quebec	740-870	650-800

Primarily Grade A paving grade C\$/MT netback to nearest refiner	Selling Prices		
	This Week	Previous Week	
British Columbia	Vancouver Area	670-710	670-710
	Kamloops Area	670-700	670-700
Alberta	Northern Alberta Area	640-690	640-690
	Southern Alberta Area	640-690	640-690
Saskatchewan & Manitoba	Saskatchewan	640-680	640-680
	Manitoba	690-720	690-720

Primarily PG 58-28 or PG 58S-28* paving grade C\$/MT	Selling Prices	
	This Week	Previous Week
British Columbia	650-800	650-800
Southern Alberta Area	650-775	650-775

*in Montreal, base grade is reported as 58S-28

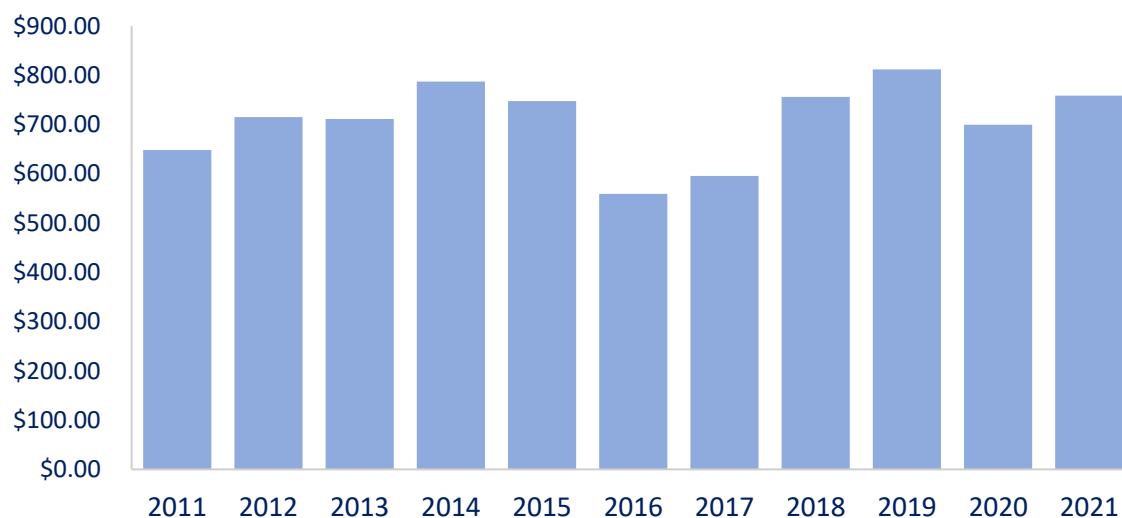
Source: Poten & Partners Asphalt Weekly Monitor (week of Sept 20-24, 2021).

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Jan	\$624.25	\$615.95	\$723.75	\$679.50	\$832.75	\$648.75	\$481.55	\$588.60	\$809.80	\$709.60	\$617.25
Feb	\$624.25	\$615.95	\$723.75	\$679.50	\$832.75	\$648.75	\$481.55	\$588.60	\$809.80	\$709.60	\$617.25
Mar	\$624.25	\$615.95	\$723.75	\$747.00	\$810.00	\$624.40	\$619.70	\$657.00	\$826.40	\$767.25	\$732.00
Apr	\$685.50	\$762.50	\$731.55	\$759.75	\$795.50	\$598.00	\$638.55	\$689.50	\$850.25	\$757.00	\$749.80
May	\$693.13	\$782.50	\$731.25	\$769.60	\$767.60	\$574.05	\$644.15	\$713.75	\$860.00	\$729.00	\$781.50
Jun	\$688.75	\$779.75	\$731.25	\$788.50	\$739.05	\$559.05	\$648.80	\$761.80	\$872.00	\$711.00	\$819.00
Jul	\$679.25	\$753.75	\$707.50	\$811.75	\$732.35	\$555.00	\$636.25	\$828.50	\$864.00	\$705.60	\$862.60
Aug	\$665.95	\$748.75	\$699.50	\$834.20	\$729.90	\$537.80	\$619.70	\$873.60	\$836.60	\$716.25	\$891.00
Sep	\$641.50	\$733.15	\$709.55	\$850.50	\$711.25	\$508.75	\$606.65	\$880.50	\$807.75	\$688.75	
Oct	\$618.15	\$723.75	\$693.15	\$857.40	\$682.80	\$495.65	\$594.05	\$870.00	\$787.00	\$662.40	
Nov	\$615.95	\$723.75	\$679.50	\$832.75	\$648.75	\$481.55	\$588.60	\$809.80	\$709.60	\$617.25	
Dec	\$615.95	\$723.75	\$679.50	\$832.75	\$648.75	\$481.55	\$588.60	\$809.80	\$709.60	\$617.25	

Prices are C\$ per metric tonne. Source: <http://www.onasphalt.org/mtopriceindex/>

The chart below depicts the average price of asphalt cement over the past decade. As of August 2021, asphalt cement is currently at its highest price since August 2008, where it sold at CAD\$932.24. This 13-year high could represent the massive influx of construction that had been delayed due to the pandemic. It can also be representative of long-term sentiment, based on the projected growth of future demand for asphalt cement.

Historical Price - Asphalt Cement (\$CAD)



Source: <http://www.onasphalt.org/mtopriceindex/>

Average Price	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
	\$648.07	\$714.96	\$711.17	\$786.93	\$747.29	\$559.44	\$595.68	\$755.95	\$811.90	\$699.25	\$758.80

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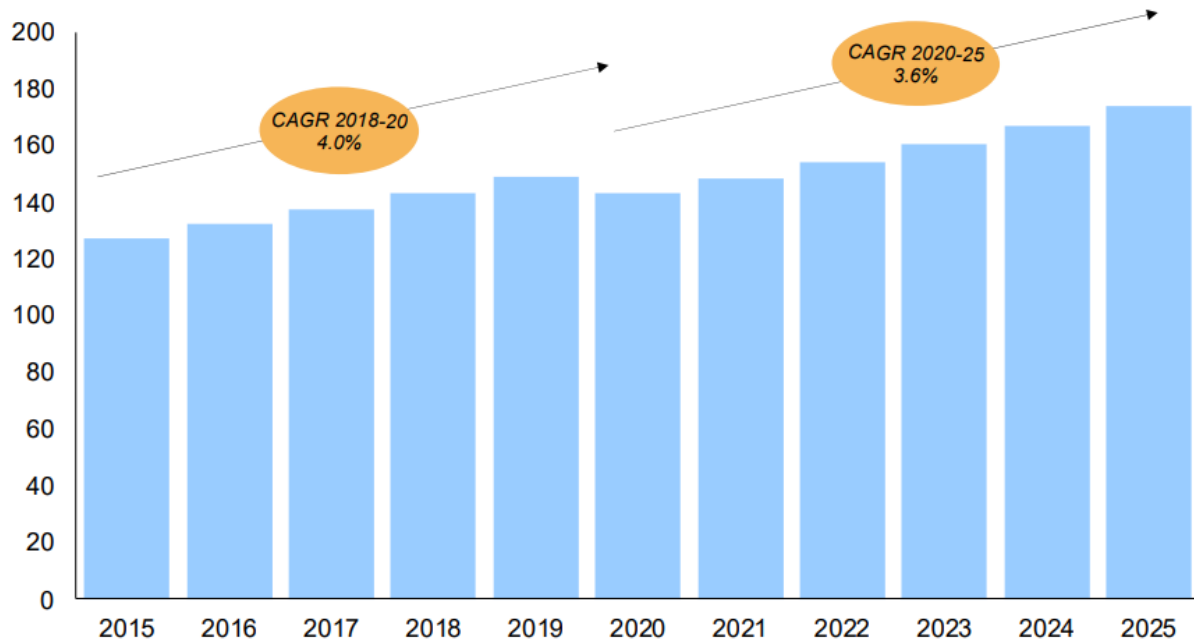
Bitumen, one of the main ingredients of asphalt, is a viscous mixture of hydrocarbon that forms from petroleum distillation. It acts as a binding agent that has been used to “glue” together tools for thousands of years. The chart below depicts the price movement of bitumen. It can be seen that bitumen price has moved in tandem with asphalt concrete throughout the past 5 years.



Source: <https://tradingeconomics.com/commodity/bitumen>

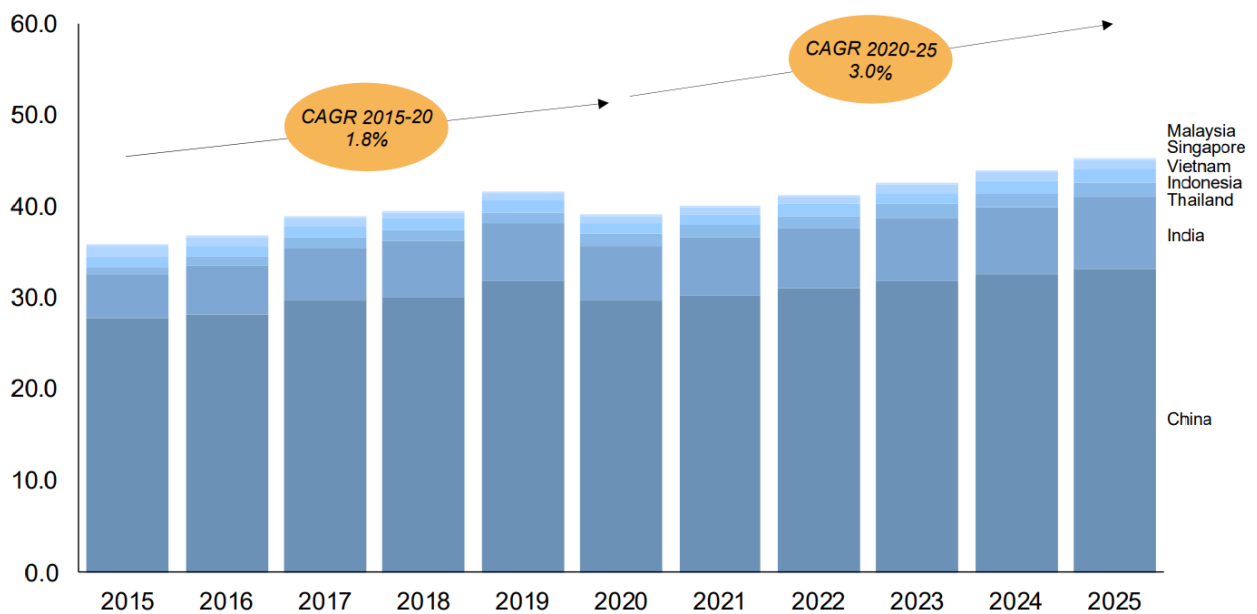
Demand for Liquid Asphalt

In 2020, worldwide demand for asphalt binder was estimated to be 143 million metric tonnes. At a forecasted CAGR of 3.6%, demand is expected to reach 174 million metric tonnes by 2025. Although this growth rate is slightly below the 4.0% CAGR in the past 3 years, it is a conservative estimate based on the variability of demand in nations with lower economic and political stability. The global market is still dominated by North America, Europe, and the Asia-Pacific regions, which make up over 75% of total demand.



Source: <https://albertainnovates.ca/wp-content/uploads/2021/04/2020-ADI-AI-Asphalt-Binder-Market-Report-FINAL-Public.pdf>

North America accounts for 20% of the asphalt binder market, with the United States growing at the fastest rate. Asia constitutes 35% of the market, increasing growth to 3.0% CAGR, up from 1.8% prior to covid. Excluding China, the Asian market is forecasted to grow at 5.3% CAGR until 2025.



Yearly Usage

In Canada, a total of 2.65 million tons of asphalt were used in 2020, down 2% from the previous year's usage of 2.71 million tonnes. It is also worthwhile to note that recently the majority of asphalt imported into the U.S has been provided by Canada. Paving is still the dominant use of asphalt, with only 4 provinces reporting usage of asphalt for non-paving purposes in 2020.

2019 vs. 2020 Asphalt Usage (Canada) – Short Tons									
	PAVING			NON-PAVING			TOTAL		
Province	2019	2020	% Change	2019	2020	% Change	2019	2020	% Change
AB	366,095	355,849	-3%	78,762	59,491	-24%	444,857	415,340	-7%
BC	127,980	144,698	13%	21,689	5,000	-77%	149,669	149,698	0%
MB	45,958	83,779	82%	577	-	-100%	46,535	83,779	80%
NB	70,565	87,626	24%	141	-	-100%	70,706	87,626	24%
NS	119,596	123,135	3%	-	-	n/a	119,596	123,135	3%
NL	26,937	36,048	34%	-	-	n/a	26,937	36,048	34%
ON	797,663	707,230	-11%	158,323	152,943	-3%	955,986	860,173	-10%
PE	2,000	2,000	0%	-	-	n/a	2,000	2,000	0%
QC	628,025	602,374	-4%	175,092	203,612	16%	803,117	805,986	0%
SK	84,200	83,105	-1%	174	-	n/a	84,374	83,105	-2%
YT	2,361	2,992	27%	-	-	n/a	2,361	2,992	27%
Not allocated	1,177	3,987	239%	-	-	n/a	1,177	3,987	239%
Total	2,272,557	2,232,823	-2%	434,758	421,046	-3%	2,707,315	2,653,869	-2%
	84%	84%		16%	16%		100%	100%	

Source: https://www.asphaltinstitute.org/wp-content/uploads/dlm_uploads/FINAL-2020-Asphalt-Usage-Survey.pdf

Relation to Single-Use Asphalt Shingles

Demand for asphalt binder in North America is currently highest for interstate highways and roofing. Shingles made from asphalt serve one purpose which is to be used for the roofing of structures. Because these shingles are petroleum based, they are not eco-friendly and their production wastes energy in addition to exacerbating the emission of greenhouse gases.



Source: <https://albertainnovates.ca/wp-content/uploads/2021/04/2020-ADI-AI-Asphalt-Binder-Market-Report-FINAL-Public.pdf>

Approximately 12 million tons of asphalt shingle waste is generated in the United States each year and approximately 10% of these shingles are re-used or recycled. For the remaining 11 million tons, they are end up in landfills where no further action can be taken with them. Attempts are being made by various organizations to recycle asphalt shingles and this results in increased environmental protection and better disposal standards for asphalt shingles. The asphalt industry is working towards production emission reduction through cleaner technology when recycling. With asphalt being found as completely recyclable and reusable, it has been demonstrated that certain road types being made entirely of reclaimed materials is, in fact, a possibility. If asphalt shingles are kept out of landfills, then there becomes an implied need to ensure that the quality of asphalt produced is kept high to maintain the

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recyclable aspect. With asphalt shingles being kept outside of landfills, this also reduces the associated carbon and environmental footprint over time.

The Canadian asphalt shingles market is expected to reach USD\$1.85 billion by 2027 according to Global Market Insights, with the assumption of a 3.7% CAGR from 2021-2027. This will primarily be due to renovation trends and an increasing number of manufacturing facilities and warehouses for the e-commerce industry in Canada.

Roofing Alternatives

According to Rona, Inc., roughly 75% of all homes in North America have shingle roofs installed. The major reason that asphalt shingles dominate the market is due to their cost-effectiveness. Wood shingles, although relatively longer lasting than asphalt shingles, are not as environmentally friendly, as they cannot be readily recycled. In addition, installation costs are usually double the price of asphalt shingles.

	Asphalt Shingles	Metal	Wood Shingles/Shakes	Clay Tile
Pros	Easy to install and repair	Lightweight	Usually last longer than asphalt shingles	Very durable
	Most cost-effective	Highly durable	Resistant to wind damage	Simple to maintain
	Increase home's energy efficiency	Recyclable	One of the best insulating materials	Aesthetically pleasing
	Resistant to algae growth			
	Not as heavy as other alternatives			
Recyclable				
Cons	Problematic with wind damage	5x-13x cost of asphalt shingles	Not environmentally sustainable 3.5x cost of asphalt shingles	Expensive to install 7x-10x cost of asphalt shingles
	Not as long-lasting as alternatives			

Roof Shingle Types	Cost per Square Ft.	Cost per Square (100 sq.ft.)	Installation Costs
Asphalt 3 Tab	\$1.00	\$100	\$5,000 to \$12,500
Asphalt Architectural	\$1.50	\$150	\$12,450 to \$15,785
Asphalt Fiberglass 3D	\$4.25	\$425	\$8,500 to \$16,500
Metal Shingles	\$5.25 to \$12.50	\$525 to \$1,250	\$5,000 to \$15,000
Aluminum Shingles	\$3.15	\$315	\$15,500 to \$28,000
Copper Roofing	\$14 to \$22	\$1,400 to \$2,200	\$23,000 to \$48,000
Corrugated Steel	\$1.80	\$180	\$10,500 to \$19,500
Standing Seam Metal	\$3.50 to \$6.80	\$350 to \$680	\$23,000 to \$30,000
Steel Shingles	\$3.35	\$335	\$15,000 to \$25,000
Cedar Wood Shake	\$4.50	\$450	\$14,500 to \$25,000
Wood Shingle Roof	\$3.50	\$350	\$10,000 to \$15,645
Clay Tiles	\$7.25 to \$10	\$725 to \$1,000	\$24,000 to \$50,000
Concrete Tile	\$3.25 to \$5.50	\$325 to \$550	\$20,000 to \$42,000
Slate Tiles	\$7.50 to \$15.88	\$750 to \$1,588	\$25,000 to \$50,000
Rubber Shingles	\$4.00 to \$8.25	\$400 to \$825	\$9,200 to \$14,850
Solar Shingles	\$24.25	\$2,425	\$60,000 to \$75,000
TPO - PVC Roofing	\$1.85 to \$5.72	\$185 to \$572	\$11,000 to \$15,000

Source: <https://modernize.com/roof/shingles>

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