

CFRA

Industry Surveys

Building Products

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NEW THEMES



What's Changed: As prices of most raw materials have now dropped from record highs in 2022, we believe headwinds from supply chain and inflationary pressures will slow in 2023. Read more on page 10.



What's Changed: We believe the industry will see a decline from the construction market in 2023 due to rising interest and mortgage rates. Check out page 12 for more.

EXECUTIVE SUMMARY

Companies within the Building Products sub-industry manufacture and sell items used in residential/nonresidential buildings and construction. Examples range from plumbing fixtures and valves to larger heating, ventilation, and air conditioning (HVAC) systems. CFRA has a neutral outlook on the Building Products industry for the next 12 months. Below are the key themes we highlight for 2023.

Building Products May See Relief from Cost Inflation

Building products companies use various raw materials that are exposed to inflationary pressure and supply chain disruptions. These include steel, aluminum, copper, lumber, and resins, all of which saw record high prices in 2022. That said, some of these materials have decreased in price since their peak in 2022, such as copper, aluminum, and lumber. With an expected relief from high raw materials costs, companies will see margin improvement in 2023 after reporting significant compressed margins in 2022. Prices will likely remain low in 2023 given recent drops in homebuilder sentiment due to a significant increase in mortgage rates. We expect companies to see relief from record high raw materials costs in 2023, but we believe a drop in prices translates to lower demand for building products due to decreased construction/home purchasing.

Residential Repair and Remodeling (R&R) Spending to Decrease in 2023

R&R spending continued on an upward trend for majority of 2022, reaching a peak in Q3 2022, but has pulled back amid interest rate hikes and declining home sales. As of October 2022, the Leading Indicator of Remodeling Activity (LIRA) projects R&R spending to decrease from an estimated 16.1% in Q4 2022 to 6.5% by Q3 2023, driven by high interest rates and declining home sales. That said, we have a bullish long-term outlook for R&R spending as 80% of houses in the U.S. are more than 20 years old and over half of the 80% were built before 1980, therefore they are in need of future home improvements and remodeling. For 2023, we believe markets with more exposure to residential R&R, such as plumbing, decking, cabinets, HVAC, roofing and coatings, will see a decrease in demand due to these trends.

Higher Mortgage and Interest Rates Will Pressure New Home Construction, Home Sales, and Nonresidential Construction

With recent interest rate hikes and mortgage rates that have almost doubled since January 2022, we believe residential and nonresidential construction activity will be a headwind for the industry in 2023. We also believe declining home sales will contribute to these headwinds as, according to Fannie Mae, home sales are expected to decrease by 22% in 2023 due to rising mortgage and interest rates. With high rates, buyers are shying away from home purchases and housing starts in the hopes that rates will pull back in 2024. Nonresidential construction is also on the decline with the American Institute of Architects reporting an Architectural Billings Index (ABI) turning negative (under 50) at 47.7 in October 2022 for the first time since January 2021 and we expect this trend to continue in 2023. That said, we think federal spending on infrastructure could be a bright spot for the industry in 2023.

Government Incentives for Clean Energy to be a Bright Spot in 2023

An important positive driver we expect to see in the building products industry in 2023 is government incentives for clean energy in homes and buildings. Major tax credit incentives for home HVAC and rooftop solar were included in the energy and climate-related sections of the Inflation Reduction Act of 2022. The Inflation Reduction Act, coupled with the Bipartisan Infrastructure Law, could incentivize the U.S. to transition to clean energy, benefiting companies with exposure to HVAC and roofing.

BUILDING PRODUCTS

Outlook: Neutral

MARKET CAP BREAKDOWN*

RANK NO.	COMPANY NAME	MARKET CAP (\$ billion)
1	Daikin	51.8
2	Johnson Controls	46.8
3	Trane Technologies	40.1
4	Carrier Global	36.4
5	Saint-Gobain SA	30.3
6	ASSA Abloy AB	26.4
7	Geberit AG	19.0
8	Kingspan Group	11.7
9	Masco Corporation	11.6
10	Allegion	10.0
11	Others†	40.7

Source: CFRA, S&P Global Market Intelligence.

*Data as of January 26, 2023.

†Refer to the "Comparative Company Analysis" section of this survey for the list of companies.

BY THE NUMBERS

+5% Y/Y
Residential construction YTD growth through November 2022

+12% Y/Y
Nonresidential construction YTD growth through November 2022

-35% Y/Y
Total existing home sales average YTD growth through November 2022

-16% Y/Y
Total new housing starts average YTD growth through November 2022

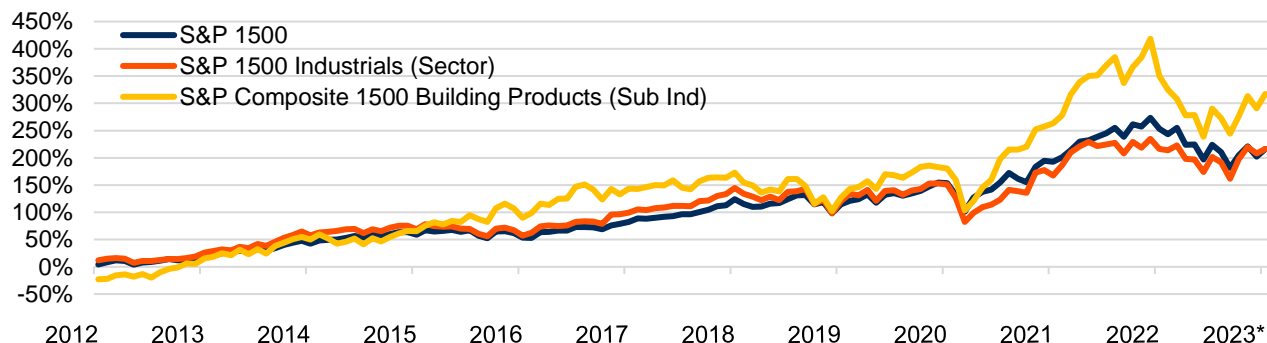
80%
U.S. homes built more than 20 years ago

6.48%
30-year fixed rate mortgage

ETF FOCUS

XLI Industrial Select Sector SPDR	AUM (\$M) 13,517.5	Expense Ratio 0.10
XHB SPDR S&P Homebuilders	AUM (\$M) 773.5	Expense Ratio 0.35
PKB Invesco Dynamic Building & Construction	AUM (\$M) 105.1	Expense Ratio 0.60

HISTORICAL INDEX PERFORMANCE



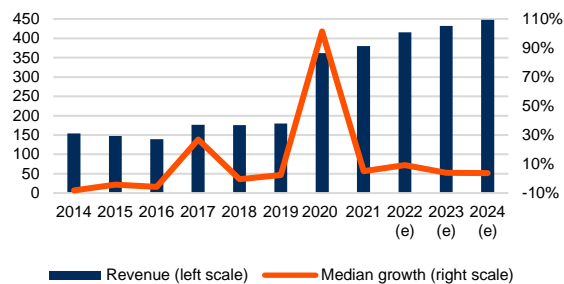
*Data through January 26, 2023.

Source: CFRA, S&P Global Market Intelligence.

FINANCIAL METRICS

Revenue

(in \$, billions)



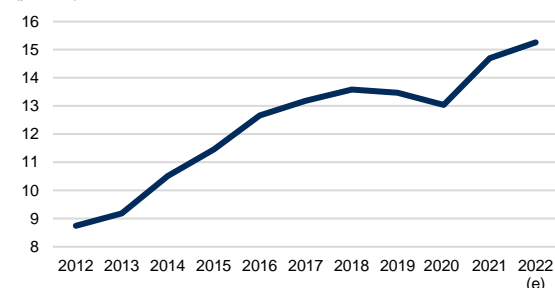
e-Estimate.

Source: CFRA, S&P Global Market Intelligence.

- ◆ Revenue from operations of the building products industry in dollars declined from 2014 to 2016, but in terms of the constituents' reported currency, the median company experienced average annual revenue growth of 12.1% from 2012 to 2021.
- ◆ We project lower median revenue growth of 4.0% in 2023 from 9.3% in 2022, followed by 3.7% growth in 2024. We attribute the lower growth to a drop in homebuilder sentiment due to a significant increase in mortgage rates.

EBIT Margin

(percent)



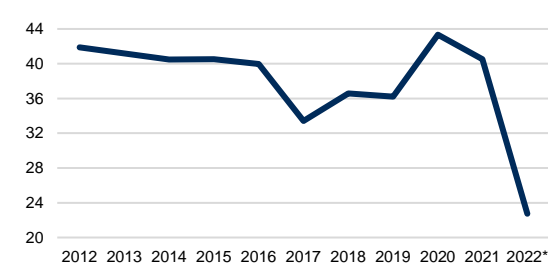
e-Estimate.

Source: CFRA, S&P Global Market Intelligence.

- ◆ EBIT margins of building products companies have increased steadily in the last 10 years, thanks to disciplined cost management.
- ◆ We anticipate EBIT margin will likely stay the same or improve slightly in 2023 from 15.3% in 2022, driven by a decrease in raw material costs, such as steel and copper, despite lower demand for building products due to a decline in construction and home purchasing.

Total Debt-to-Capital

(percent)



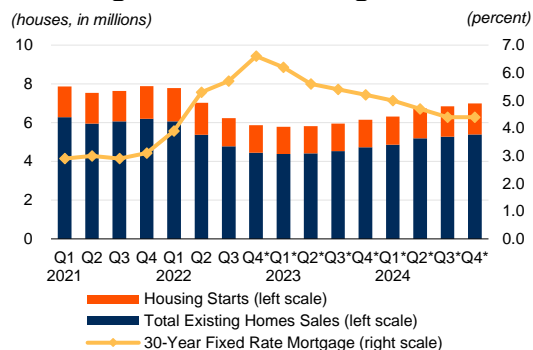
*Data through Q3.

Source: CFRA, S&P Global Market Intelligence.

- ◆ The industry's total debt-to-capital stood at 22.7% as of the third quarter of 2022.
- ◆ We forecast companies' liquidity may be affected in 2023, attributed to reduced borrowing due to rising interest rates.

KEY INDUSTRY DRIVERS

Housing Starts & Existing Home Sales

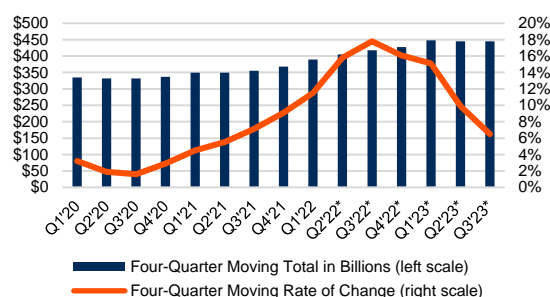


*Estimate.

Source: Mortgage Banking Association.

- ◆ Existing-home sales narrowed in November 2022, declining 7.7% from the prior month and down 35.4% from a year ago, according to the National Association of Realtors.
- ◆ Realtor.com projects home sales will be down 14.1% and prices to rise 5.4% in 2023, propelled by high mortgage rates.

Leading Indicator of Remodeling Activity

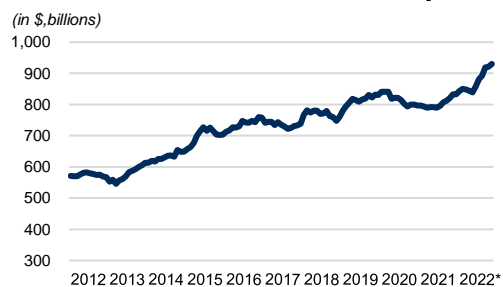


*Estimate.

Source: Joint Center for Housing Studies.

- ◆ Annual expenditures for renovation and repair of the owner-occupied housing stock is forecasted to slow to a 6.5% Y/Y rise in the third quarter of 2023 compared to a 17.8% Y/Y increase in the third quarter of 2022.
- ◆ We forecast remodeling and repair (R&R) activity to weaken in 2023, as homeowners will likely delay R&R due to higher interest rates and high costs of contractor labor.

Nonresidential Construction Spending



*Data through November.

Source: U.S. Census Bureau.

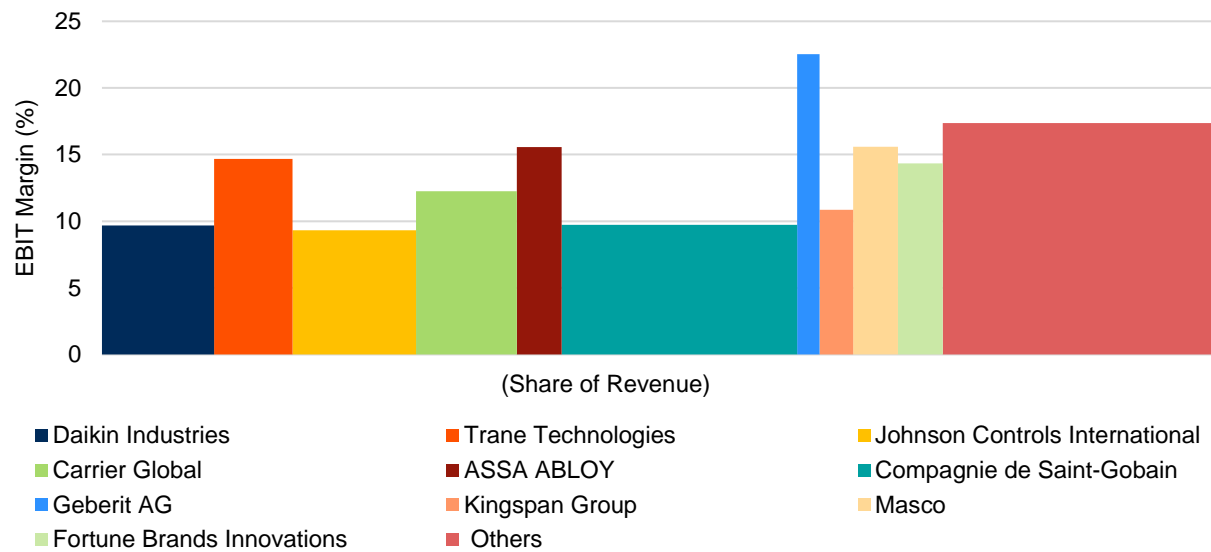
- ◆ Nonresidential construction spending has been gradually improving as of November 2022, with year-to-date growth of 11.7%, compared to the same period in 2021.
- ◆ We foresee a positive longer-term outlook, as increased federal spending on infrastructure could set the stage for higher nonresidential construction spending in 2023.

INDUSTRY TRENDS

Competitive Environment

In the last 12 months, the largest revenue contributors within the Building Products sub-industry are Compagnie de Saint-Gobain at 21.5%, followed by Johnson Controls International at 10.9% and Daikin Industries at 10.7%. Despite its relatively minuscule revenue contribution, Geberit AG had the highest EBIT margin at 22.5%.

REVENUE SHARE – GLOBAL BUILDING PRODUCTS INDUSTRY*

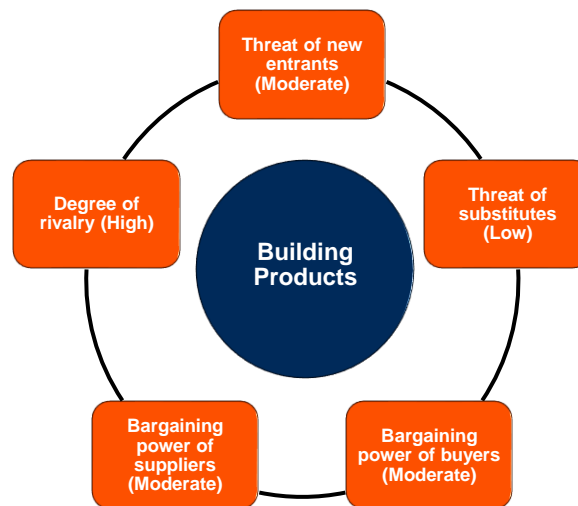


*Last twelve months.

Source: CFRA, S&P Global Market Intelligence.

PORTER'S FIVE FORCES

Below, we use Porter's Five Forces framework to analyze the competitive environment of the Building Products sub-industry.



1) Degree of Rivalry (High)

Competition among U.S. building products firms and foreign providers remains high. We see limited product differentiation among the home improvement and residential building products. As a result, competition for these products can often come down to price. We note that larger commercial systems (HVAC, security products) compete; however, regulations and technology adoption can drive product refreshment and differentiation.

2) Bargaining Power of Buyers (Moderate)

As we already noted, competition among U.S. building products firms and foreign providers is high, implying that buyers have many choices in the building products market. Some home improvement and residential building products sales are concentrated with large home center retailers, which could significantly impact prices. We also note that changes in housing turnover, new home construction, and consumer confidence could have material impacts on discretionary building products. However, we acknowledge that some building products have more resilient, nondiscretionary features (roof and systems replacements are examples).

3) Bargaining Power of Suppliers (Moderate)

Many U.S. building products firms are dependent on third-party suppliers located in foreign countries and are susceptible to tariffs that would move costs higher. Given that some building products companies use a small number of suppliers, we think interruptions in the supply chain would drive delays and increase costs.

4) Threat of Substitutes (Low)

We do not see any technologies developing in the near term that would disrupt the basic need for residential or commercial building products (kitchen, bath, windows, doors, HVAC). Disruptive technologies, including smart products and touchless solutions, are consistently being developed within the industry.

5) Threat of New Entrants (Moderate)

Threat of new entrants varies across the building products sub-industry. Despite some building products firms being more capital intensive than others, we note that the sub-industry at large is not as capital intensive as other sub-industries within the Industrials sector, which poses a risk for building products constituents. However, some building products firms require retail dealer networks and distribution channels as well as carry strong brand names, all of which help establish stable positioning within the sub-industry.

Operating Environment

Headwinds from Supply Chain and Inflationary Challenges May Slow in 2023

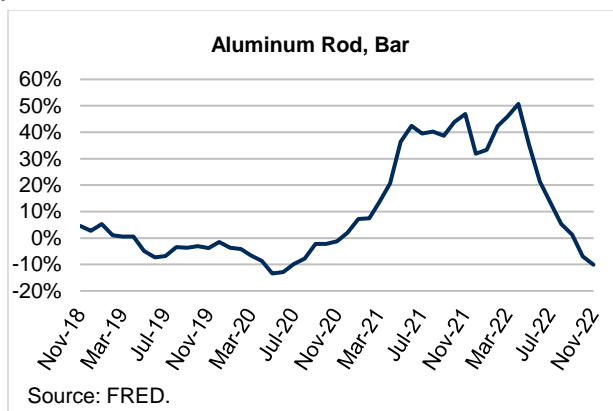
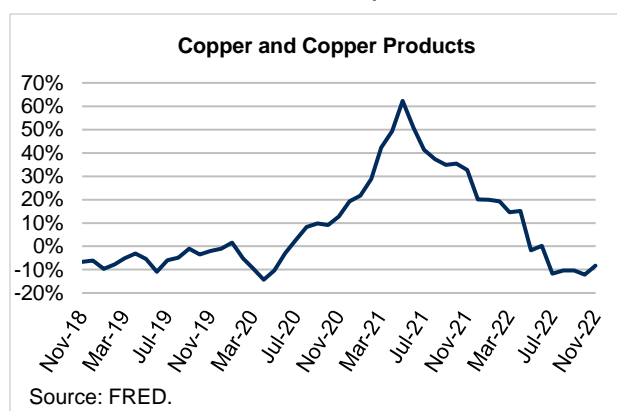
Like many industries, building products companies use various raw materials that are exposed to inflationary pressure and supply chain disruptions. These include steel, copper, aluminum, lumber, and resins, all of which saw prices accelerate in 2021 and reach record highs in 2022. These headwinds are likely to slow in 2023 given that prices of most raw materials have dropped, with steel decreasing 13% and lumber decreasing 68% from early January 2022 to early January 2023. We list some of the key markets and their raw materials below.

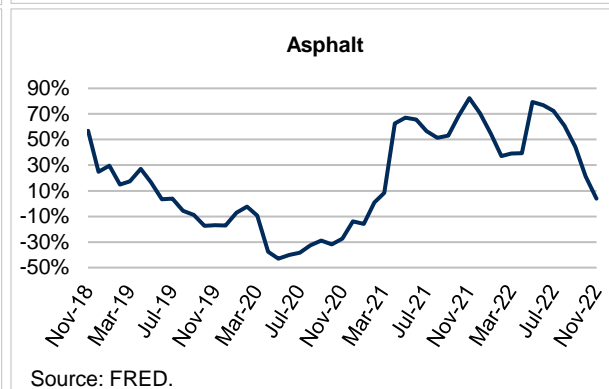
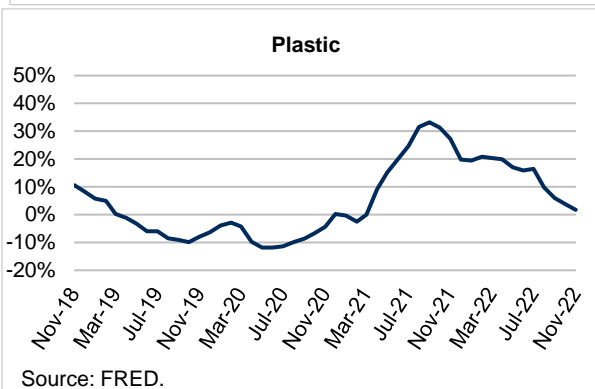
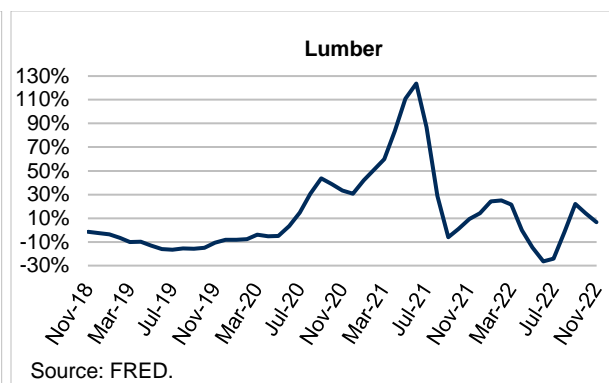
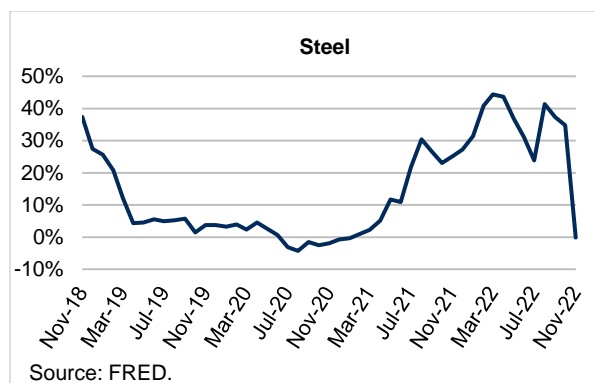
MARKETS AND RAW MATERIALS

MARKET	RAW MATERIALS
Plumbing	Copper, Zinc, Stainless Steel
Decking	Reclaimed Wood, Plastic
Cabinets	Hardwood Lumber, Plywood
Insulation	Fiberglass
Roofing	Asphalt
Coatings	Acrylic Resins, Titanium Dioxide
HVAC	Steel, Copper, Aluminum

Source: CFRA, company filings.

RAW MATERIAL INFLATION (Y/Y CHANGE IN PPI)



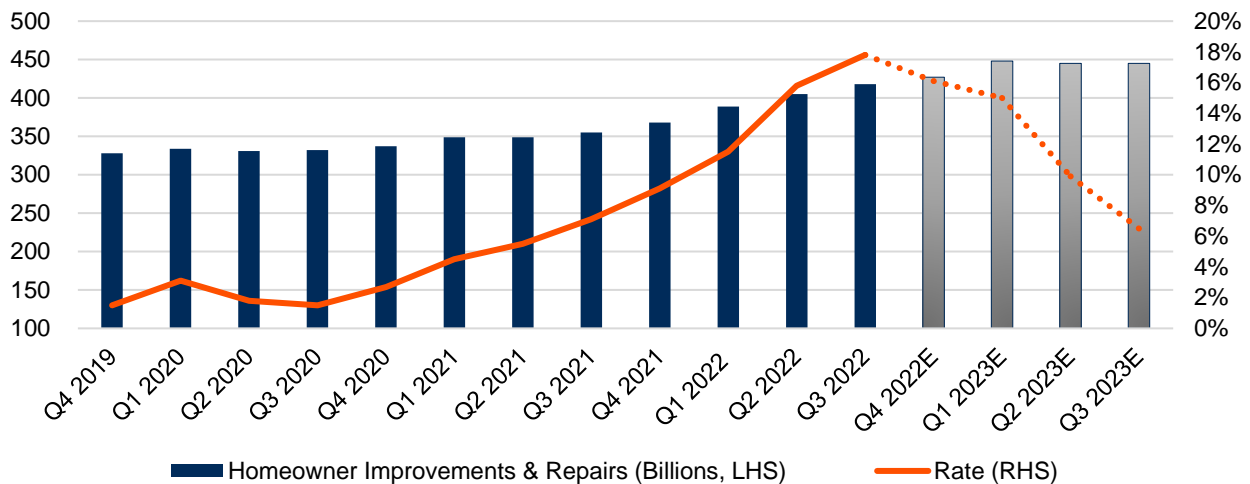


Industry constituents continued to take pricing actions in 2022 to offset higher material costs and maintain price/cost neutrality. When looking across different building products markets, we are mostly positive on companies' abilities to successfully price out inflation. However, we think companies in certain markets could be more effective than others. Going forward, we expect pricing actions to slow and margins to recover slightly in 2023 given lower raw material costs. However, given a looming recession in a rising rate environment, coupled with an estimated 22% decrease in 2023 home sales, adverse impacts on demand may arise, especially for discretionary replacement items.

Residential Repair and Remodeling (R&R) to Weaken in 2023

The underlying drivers for residential building products include R&R spending and new home construction; however, we note that the industry leans favorably toward the former. The Leading Indicator of Remodeling Activity (LIRA), provided by the Joint Center for Housing Studies (JCHS) of Harvard University and reflected in the chart below, projects the year-over-year change in homeowner improvements and repairs on a four-quarter moving basis. We can see that the growth rate of spending kept on an upward trend until Q3 2022 after being initiated by the pandemic where do-it-yourself (DIY) projects around the home became a popular activity for homeowners forced indoors due to government-mandated lockdowns. That said, as of October 2022, LIRA projections estimate R&R spending to decrease from 16.1% in Q4 2022 to 6.5% by Q3 2023 given rising interest rates and declining home sales. Despite the drastic rise in home prices, which allows homeowners more access to capital through home equity loans and lines of credit, we believe homeowners will delay R&R in 2023 due to higher interest rates and high costs of contractor labor.

LEADING INDICATOR OF REMODELING ACTIVITY (LIRA)



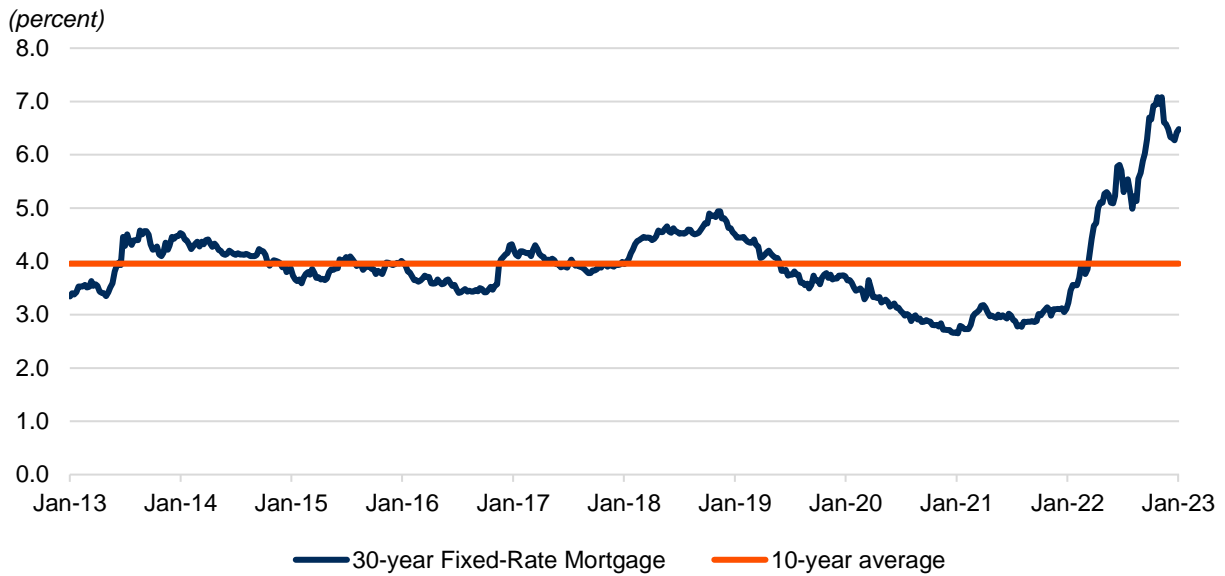
Source: Joint Center for Housing Studies of Harvard University.

That said, we have a bullish long-term view on R&R activity since, according to the JCHS, 80% of the homes in the U.S. are more than 20 years old and over half of this 80% were built prior to 1980, therefore they require updates and remodeling in the near future. There is also a shortage of new and existing housing throughout most of the country. At the peak in 2008, there were 12 million existing homes for sale, compared to only 4.09 million in November 2022. So, many homeowners living in their existing homes are most likely thinking about improving the appearance of an aging house, but we believe will wait until at least 2024 given the hope that rates will pull back and the cost of contractor labor will be lower.

Higher Rates Will Pressure New Home/Nonresidential Construction and Existing Home Sales

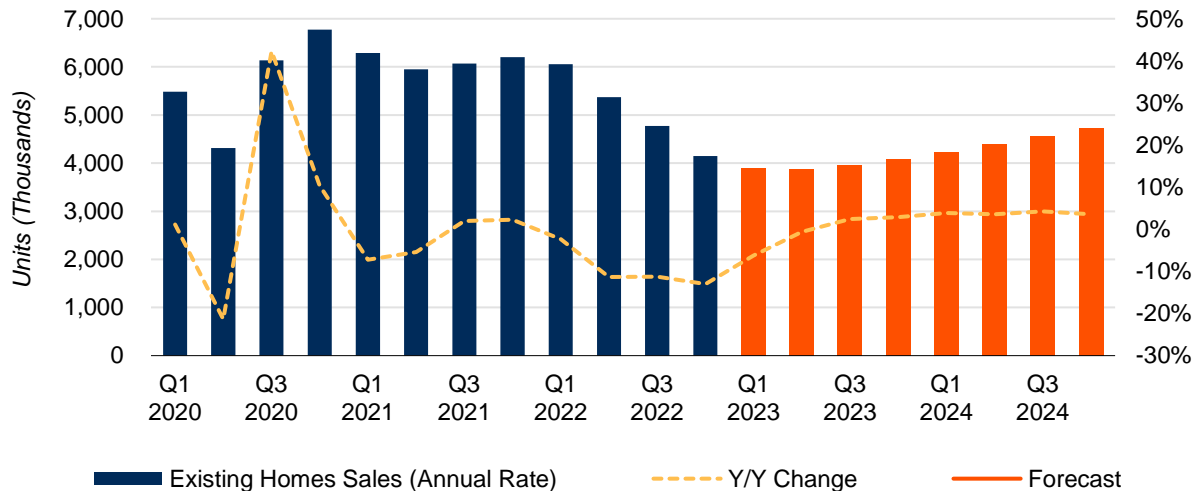
We believe the industry will see a decline from the construction market in 2023 due to rising interest and mortgage rates. The average monthly 30-year fixed mortgage rate has almost doubled in 2022 from 3.45% in January to 6.36% in December, and mortgage rates are expected to increase in 2023. As of November 2022, the Federal Reserve projects its fund rate to be at 3.9% to 4.9% by mid 2023, currently at 4.25% to 4.5%. According to Fannie Mae, home sales are expected to decline 22% in 2023 due to rising mortgage and interest rates, and real GDP is expected to decrease 0.6%. In addition, housing starts have decreased by 21% from their peak in April 2022 to November 2022 and residential construction spending has decreased 8% from an all-time high in May 2022 to November 2022. With higher mortgage and interest rates, buyers are shying away from home purchases and housing starts in the hopes that rates will pull back in 2024.

30-YEAR FIXED-RATE MORTGAGE VERSUS 10-YEAR AVERAGE



Source: CFRA, Freddie Mac.

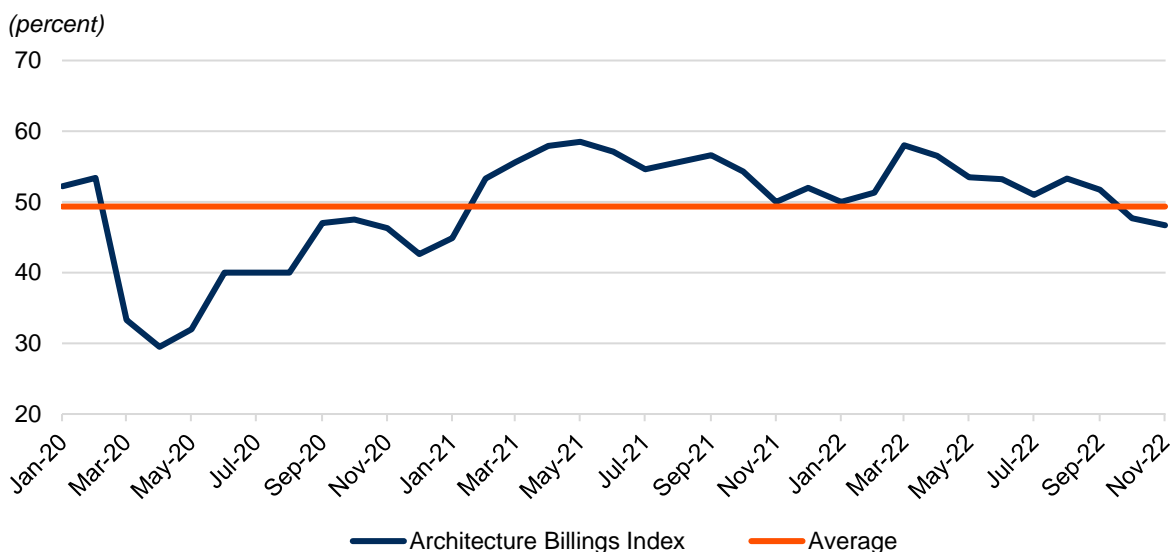
EXISTING HOME SALES (UNITS, ANNUAL RATE) AND PERCENTAGE CHANGE, ACTUAL AND FORECAST



Source: CFRA, Mortgage Bank Associations.

We also expect nonresidential construction activity to see a decline in 2023 due to the rise in interest rates as key indicators look to be on a downward trend since the fall. According to the American Institute of Architects, the Architectural Billings Index (ABI), the leading economic indicator for nonresidential construction activity, was negative (under 50) at 47.7 in October 2022 for the first time since January 2021. In November, ABI fell an additional 2.3% from October 2022 and declined 20% from 2022's high in March. Looking at the graph below, we can see the start of this downward trend, which we expect to last until at least the end of 2023. Design contracts have also followed this same trend with a score of 48.6 in October 2022 and a further decline of 3.5% in November 2022. That said, we think government infrastructure spending could be a bright spot for nonresidential construction in 2023.

ARCHITECTURE BILLINGS INDEX (ABI)*



*Latest available data.

Source: CFRA, American Institute of Architects.

Overall, we have a bullish long-term outlook on homebuilding and home sales as inventory remains historically low relative to demand, but believe the short-term outlook is negative amid the Fed's rate hiking spurt. We also have a bullish long-term outlook on nonresidential spending, but our short-term outlook is neutral amid rising interest rates, recent ABI results, and expected government infrastructure spending.

SALES GROWTH FOR COMPANIES WITH NONRESIDENTIAL EXPOSURE

COMPANY	PRODUCT FOCUS	2021	2022E	2023E
Allegion	Security Products, Locks	5%	14%	8%
Armstrong Worldwide	Ceilings	18%	11%	6%
Johnson Controls	HVAC, Building Solutions	6%	7%	7%
Average	Total	10%	11%	7%

Source: CFRA, S&P Global Market Intelligence as of January 2023.

The table below highlights sales trends among popular residential building products in 2021, 2022, and consensus estimates for 2023. We note that every company's product focus is expected to have negative sales growth in 2023. This is in line with our expectations that residential and nonresidential construction activity will see a decrease in 2023.

SALES GROWTH FOR HOMEOWNER IMPROVEMENT COMPANIES

COMPANY	PRODUCT FOCUS	2021	2022E	2023E
Fortune Brands	Cabinets, Plumbing, Security	26%	-38%	-5%
Masco	Decorative, Plumbing	17%	4%	-5%
Lennox	Residential HVAC	15%	13%	-1%
Masonite International	Residential Doors	15%	10%	-1%
Owens Corning	Roofing	20%	15%	-5%
Trex Company	Residential Decking	36%	-8%	-3%
Average	Total	22%	-1%	-3%

Source: CFRA, S&P Global Market Intelligence; as of January 2023.

Government Incentives for Clean Energy

The Inflation Reduction Act, coupled with the Bipartisan Infrastructure Framework, will produce incentives to adopt clean energy, which we think will bode well for companies in this space. Major tax credit incentives for home HVAC and rooftop solar were included in the energy and climate-related sections of the Inflation Reduction Act of 2022. There are billions in incentives for commercial building energy and HVAC systems to be decarbonized and we believe this will benefit companies that are dedicated to increasing the world's green footprint with innovative products that are focused on clean energy. Additionally, the Bipartisan Infrastructure bill initiated a new program called Energy Efficiency Revolving Loan Fund Capitalization, where \$250 million has been allotted to provide grants and loans for commercial and residential energy efficiency, leading to positive implications for HVAC and insulation. In November 2022, the U.S Department of Energy announced the opening of applications for the program to all 50 states with a deadline of April 21, 2023, with the objective to promote energy efficiency audits, upgrades, and retrofits to enhance energy efficiency and comfort of buildings.

HOW THE INDUSTRY OPERATES

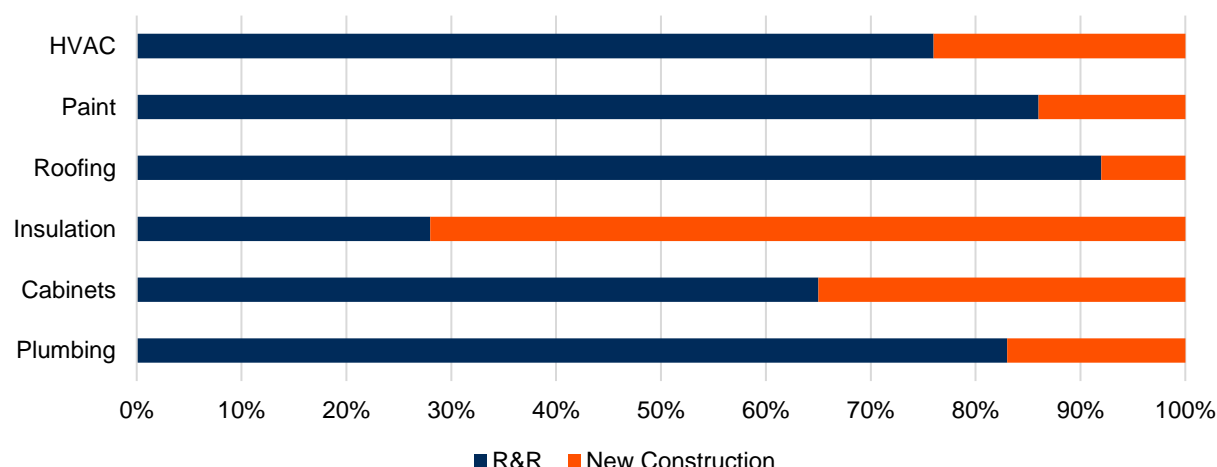
The Building Products sub-industry should not be confused with Building Materials. The former (subject of this Industry Survey) includes building components and home improvement products, while the latter consists of cement, concrete, and bricks. (For more information on homebuilders, CFRA recommends our “Household Durables” Industry Survey, which also includes information on the consumer electronics, home furnishings, household appliances, and housewares & specialties sub-industries.)

When looking at how the Building Products sub-industry operates, we focus on whether companies are more tilted toward residential or commercial markets and how sales are broken down between new construction or repair & remodel spending.

Residential

Demand within residential building products is primarily driven by repair & remodel (R&R) investments and new home construction spending. The industry leans favorably toward R&R, with insulation being the exception.

REVENUE SHARE (%) BETWEEN R&R AND NEW HOME CONSTRUCTION BY MARKET



Source: CFRA Estimates, Company Filings: MAS, FBHS, OC, SHW, LII.

Discretionary projects, including kitchen remodels, bath remodels, room additions, and outside attachments generally follow seasonal home improvement trends and consumer confidence. Nondiscretionary projects (replacements), which include windows, siding, roofing, and HVAC, are mainly driven by unforeseen events (roofing damage from major storms). Companies with exposure to nondiscretionary projects are generally more resilient during economic downturns. However, we note that the fundamentals that drive R&R spending and new home construction activity are similar. We list some of the fundamentals below:

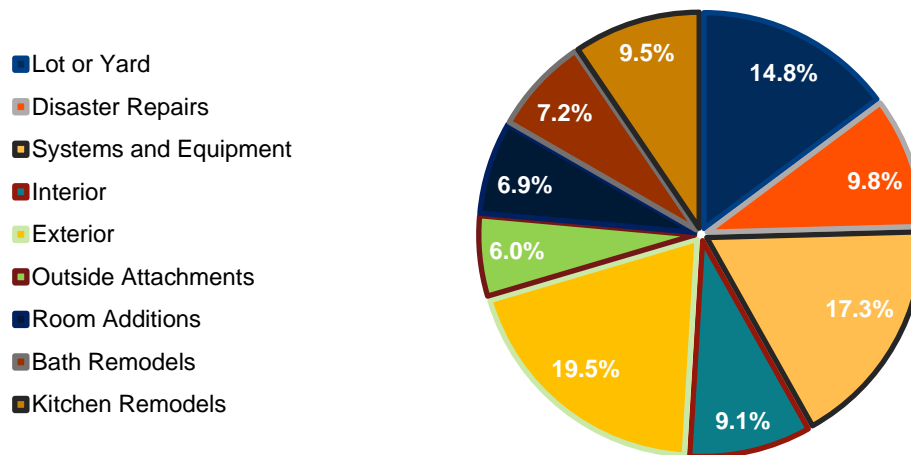
- **Home Price Appreciation** is a key driver for R&R spending, because as home prices rise, home equity also increases, which can serve as an incentive or as support to undergo large projects.
- **Housing Turnover** is the number of transactions involving the transfer of ownership relative to the stock of housing. It is also a key driver for R&R spending, as people generally make home improvements to increase the value of their homes before selling. Additionally, when consumers move into a new home, they tend to make small ticket adjustments.

- **Consumer Confidence.** When consumers feel confident about future economic conditions, they are more likely to spend on R&R and discretionary projects.
- **Financing Availability (Home Equity Loans)** highly depends on the state of the economy. When the economy is good and people have higher incomes and better credit scores, banks are more likely to approve home loans.
- **Housing Design Trends** are continuously evolving and drive consumers' spending on home improvement projects as well as new home construction activity.
- **Natural Disasters** are becoming a more routine part of life in the U.S., and subsequently, so are home improvement projects geared towards weather damage repairs and prevention.

Do-It-Yourself (DIY) projects are forms of home improvement that are generally less expensive for homeowners to do on their own rather than hiring a professional. Popular DIY projects include lawn maintenance, landscaping, painting and staining, decking, and tile-setting. A key driver for the U.S. DIY market is the age of the average homeowner, as younger households are more likely to partake in DIY projects than older ones. DIY spending as a percentage of improvement spending steadily declined from 21% in 2009 to 17% in 2019 (latest available), which can be attributed to a larger share of older homeowners (the share of homeowners age 55 and over increased to 55% in 2019 from 41% in 1999). CFRA expects medium-term trends in Millennial homebuying to improve DIY spending.

As we can see from the chart below, nondiscretionary projects, illustrated by interior, exterior, and systems, make up roughly 50% of homeowner improvement expenditures. This is different than in 2007, before the Great Recession, when it was approximately 40%.

SHARE OF HOME IMPROVEMENT SPENDING (%) IN 2019*



*Latest available data.

Source: CFRA, Joint Center for Housing Studies of Harvard University.

Manufacturing and Distribution

The production of residential building products is capital intensive and generally reliant on flexible supply chains, with the ability to manufacture and source raw materials from several locations. Volatility in energy and raw material prices can impact manufacturing costs. Depending on customer arrangements, the impact of higher inputs can often be mitigated by passing costs through to customers; however, this can often lag and result in margin compression. We think building products companies will continue to modernize and invest in automation initiatives to streamline manufacturing processes.

Building products with more residential exposure generally sell through to large home centers, retailers, and distributors. It is not uncommon for residential building products companies to provide customer programs and incentives, including price discounts, cooperative advertising, and promotions, to obtain favorable product placement and maintain competitive pricing. E-commerce is becoming an increasingly popular distribution channel as consumers shift their purchasing practices toward the web.

Due to the competitive landscape, it is not unusual for residential building products companies to invest in brand reputation through product refreshment and brand awareness. As mentioned in Porters, there is a high degree of rivalry among these companies, including foreign and domestic manufacturers as well as private label brands sold by customers.

Building products companies with a residential tilt include Azek Company, Fortune Brands, Jeld-Wen, Masco, Masonite International, Owens Corning, and Trex Company.

Nonresidential

Demand within nonresidential building products mostly depends on commercial renovation and new construction spending. We acknowledge that there are various categories within building products sub-industry that are relevant to both residential and nonresidential buildings, including ceilings, flooring, roofing, insulation, doors and windows, plumbing supplies and fixtures, security products, and heating, ventilation, and air conditioning (HVAC). However, we note that companies with a tilt to nonresidential building products manufacture and sell items such as security systems, fire-suppression solutions and commercial HVAC equipment. Lastly, we note that the fundamentals that drive commercial renovation spending and nonresidential construction activity are similar.

- **Gross Domestic Product.** The cyclical nature of commercial renovation and new construction spending tends to be influenced by prevailing economic conditions. However, the trend of remote work is weakening this relationship.
- **State and Local Government Spend** substantial amounts on construction of roads, schools and other public infrastructure every year.
- **Building Codes.** Many building products must comply with local building codes and ordinances, which are subject to future government review and interpretation.
- **Technology Adoption.** Nonresidential construction is increasingly adopting technology such as energy efficiency measures, including efficient lighting, building insulation, heating system replacement, and optimization of heating system operations.

Manufacturing and Distribution

Like residential building productions, nonresidential building products companies often manufacture products on a global scale, where cost increases for raw materials could have a material impact on manufacturing costs. An exception is Allegion, which has broad geographic exposure, and whose strategy is to produce in the region of use. Building products with more commercial and institutional exposure generally sell through a variety of distribution channels. This includes resale distributors, wholesalers, retailers, and e-commerce. Products used in building construction can also be sold to building materials distributors, who then re-sell to architecture firms or building contractors.

Heating, Ventilation, and Air Conditioning (HVAC)

HVAC systems are used in homes and buildings to control indoor climate and ventilation. The main purpose of these systems is to provide consumers with clean and comfortable indoor air through filtration, temperature control, and optimal humidity. Residential HVAC systems include air conditioning units, heat pumps, furnaces, and packaged heating and air units. Residential HVAC life expectancy averages between 10 and 15 years. Residential HVAC companies typically sell through distributors who sell to dealer contractors. However, some companies own most of their own distribution and sell directly to dealers. Lastly, residential HVAC manufacturers generate revenue through HVAC new equipment or repair and replacement parts, as services are mostly done through third-party.

Commercial HVAC systems also vary. Light commercial units, which are more suitable for small commercial buildings or individual spaces (restaurants, retail shops), are relatively simplistic and can lose service revenue to third-party companies. These include single split systems and smaller packaged systems. Applied systems, which are more complex and are used for larger nonresidential buildings and institutions, generally retain service revenue for HVAC companies. Commercial HVAC life expectancy is roughly 15 years. CFRA thinks HVAC equipment opportunities in the medium-term are plentiful, as HVAC is a major area of energy consumption in commercial buildings (estimated between 40% and 60%) and global decarbonization efforts will likely drive product refreshments.

HOW TO ANALYZE A COMPANY IN THIS INDUSTRY

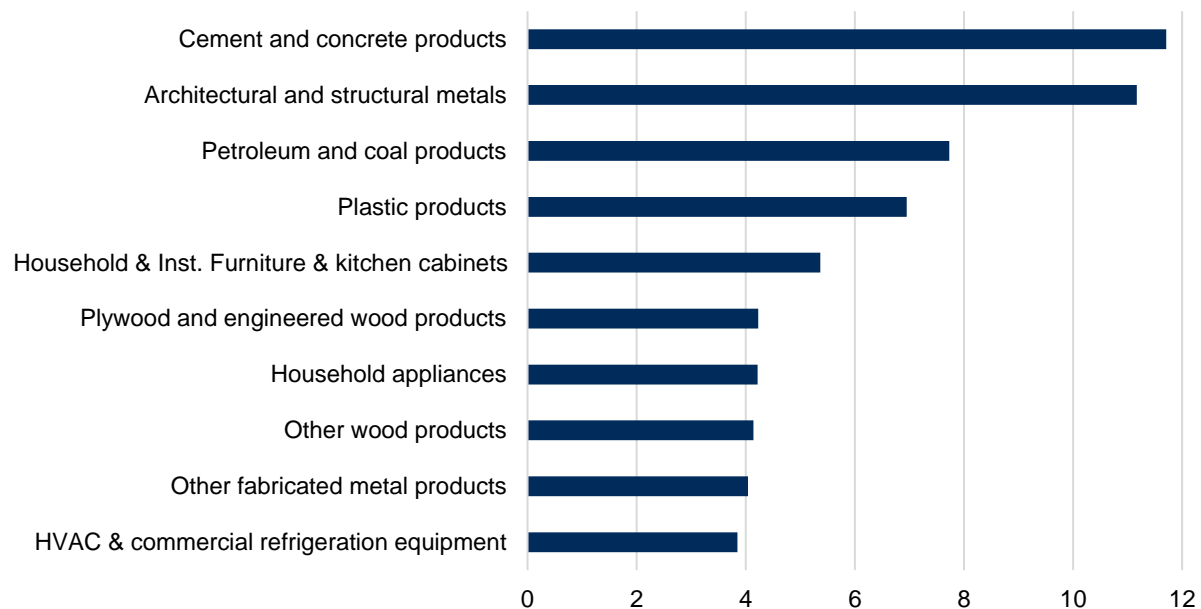
When analyzing a company in the building products sub-industry, one should consider relevant macroeconomic factors and industry drivers, some of which we outline on page 7.

Industry Drivers

Housing Starts. One of the primary drivers of the building products industry is housing starts. In the below chart, we show the 10 products that were used the most in new residential construction based on dollar value. Excluding cement and concrete products (which we consider as building materials), architectural and structural metals are at the top of the list with \$11.17 billion. This category includes metal-framed windows and metal doors, sheet metal work, and metal railings, fences, and moldings.

Following that, new residential construction used \$7.73 billion of petroleum and coal products and \$6.95 billion of plastic products. Petroleum and coal products include asphalt and tar paving mixtures, as well as any petroleum-based fuels and lubricating products. Plastic products include plastic pipes, plumbing fixtures (such as bathtubs and shower stalls), floor coverings, and sidings.

TOP 10 BUILDING PRODUCTS USED IN NEW RESIDENTIAL CONSTRUCTION: 2019*



*Latest available data.

Source: NAHB estimates based on data by the U.S. Bureau of Economic Analysis.

Homeownership Rate. People are much more likely to spend on repair and remodeling on houses that they own instead of houses that they rent. As such, higher homeownership rates lead to higher R&R spending. Common R&R products include cabinets, doors & security, plumbing, HVAC, DIY paint, roofing, and decking.

Aging Housing Stock. A higher number of older homes are in the market today due partly to sluggish new home construction that has not fully recovered since the last recession. As stated earlier, close to 80% of the U.S.'s housing stock is at least 20 years old, and, of those, 38% are at least 50 years old, which will drive R&R spending.

Nonresidential Construction spending is tied to private and public capital spending trends, interest rates, government funding, and consumer demand. Companies with a tilt to nonresidential building products mainly manufacture and sell ceiling products, security products, and HVAC.

Building Codes. Changes in building codes could increase the cost of and/or lower the demand for some products but generally serve as a catalyst for more innovative building products.

Financial Analysis

To analyze the financial health and investment prospects of a firm within the building products sub-industry, a good place to start is the company's financial statements – the income statement, the balance sheet, and the statement of cash flow.

Income Statement

◆ **Revenue Growth.** It is important to identify the factors driving revenue expansion. Are revenues rising on sales volume growth from operations, or from one-time boosts related to acquisitions? If revenue growth is being driven by acquisitions, will the acquisitions enable cost reductions, and if so, will they justify the purchase price of the acquired company? Is growth in sales volume benefiting from favorable market fundamentals and management acumen, or from large price discounts?

◆ **Gross Margin.** The gross profit margin is a measure of a manufacturing operation's efficiency and profitability. Gross margin is calculated by taking gross profit (sales less cost of goods sold) divided by sales. Well-run and profitable companies can sell their goods well above the cost of production if pricing remains stable. It is important to observe whether margins are widening, narrowing, or holding steady, and to discern the reasons behind those trends.



Watch Out! Costs for bad debts and other provisions are estimated by management and recorded as either expenses or offsets to revenue (depending upon the provision). Management has discretion in calculating these estimates, and therefore has the ability to manipulate earnings, and sometimes revenues. By under-provisioning or reversing previous provisions, management can generate artificial, and therefore unsustainable, earnings.

◆ **Operating Margin.** Operating margins help illustrate a company's efficiency and profitability, although on a broader scope. The operating margin reflects the efficiency and profitability of an entire enterprise—not just manufacturing, but corporate, selling, and distribution operations as well. For example, a company with lean management, lower fixed costs, and well-run distribution centers will likely report wider operating margins than one with a bloated bureaucracy and duplicative distribution centers.



Watch Out! An investor should be aware that some companies might hide normal operating expenses or disguise poor decisions as write-offs, thus boosting the reported operating margin. If significant "special items" such as asset impairment charges or goodwill write-downs crop up every year, it is a red flag. In such cases, the investor may want to add special items back to operating expenses. What this essentially does is reduce the reported operating margin to something more useful and realistic, so that comparisons can be made with the company's past results and with those of its peers.



Watch Out! Companies in the Building Products industry are fixed asset intensive, making depreciation a significant expense for most of these companies. Since depreciation is based on estimates of asset lives, management can manipulate these estimates to manage earnings. Specifically, extending the depreciable life of an asset will boost a company's earnings while shortening depreciable lives will decrease earnings. Therefore, it is important to refer to the notes to the financial statements to ensure that a change in depreciable life has not occurred.

Balance Sheet

Investors should look at a company's balance sheet to determine its financial strength or potential liquidity or solvency problems.

◆ **Current ratio.** This commonly used ratio helps in assessing a company's ability to service its short-term financial obligations; it is one indicator to show whether business has a potential liquidity problem. The current ratio is derived by dividing current assets by current liabilities. Current assets are those that can be readily converted into cash or used up in the course of a firm's operating cycle (typically one year). Current liabilities generally encompass short-term debt, accounts payable, and other short-term obligations.

A ratio above 1.0 is viewed as a positive; the higher the current ratio, the better the company is able to service its short-term obligations. A good practice is to compare a company's present current ratio with its historic ratio, to make sure that the present ratio is not abnormally low.



Watch Out! Inventory represents one of the most substantial assets on the balance sheets of building product companies and can be a leading indicator of financial condition. Therefore, a company's choices with respect to inventory accounting can have a significant impact on its results. Analysts should assess whether or not a company has changed its inventory costing methodology, as this can impact comparability (and potentially flatter results) versus prior periods. Similarly, when analyzing a company relative to its peers, it is important to identify any differences in inventory costing policies between the companies.

◆ **Debt-to-equity ratio.** This ratio, used to assess a company's financial strength and flexibility, is based on the level of debt relative to total equity. The ratio is calculated by dividing total debt (including lease obligations) by total equity. A high debt-to-equity ratio would indicate that a company is highly leveraged and thus generally more vulnerable to economic downturns when interest and debt payments might take up a significant portion of income.

Statement of Cash Flow

◆ **Analysis of free cash flow.** Free cash flow represents actual cash generated by operations less capital expenditures, or costs needed to maintain the company's business operations, which are excluded from this measure. While reported earnings are accounted for through an accrual method that seeks to match expenses with the revenues they generate, cash flow is reported as it occurs and thus tends to be more variable than reported earnings.

Free cash flow can be used to grow the business, make acquisitions, pay down debt, repurchase shares and/or pay dividends—activities that shareholders generally like to see. Rapidly growing businesses sometimes have low or even negative cash flow, as heavy investments are made in inventory, plant and equipment, and other cash outlays necessary to grow the business. At some point, however, these businesses must begin generating significant positive cash flow, if they are to provide decent returns for investors.

CFRA also uses free cash flow generation as a check on the quality of earnings, which are highly susceptible to changes in management estimates. Industry investors tend to pay close attention to the old street adage that “Earnings are an opinion. Cash is fact.” As such, we monitor the degree to which net income is converted into free cash flow over several quarters.

Valuation

Given the competitive nature and limited product differentiation within the building products sub-industry, we recommend using comparable company analysis. This consists of comparing the trading multiples of a company of interest with the trading multiples of its peers to determine whether a stock is attractively priced or expensive. Some of the most common trading multiples include:

Price-to-Earnings (P/E) ratio. This is one of the most common and simple ways to value equities. To calculate, take a company’s share price and divide it by earnings per share (EPS), for either the past 12-months (trailing) or by the projected EPS for a specified future period.

Enterprise Value-to-EBITDA (EV/EBITDA) ratio. This is another common multiple used to value equities. Unlike P/E, EV/EBITDA strips out interest (cost of debt), taxes, and non-cash charges like depreciation and amortization. Investors apply a multiple to a company’s earnings before interest, taxes, depreciation, and amortization (EBITDA) to calculate Enterprise Value, which is the market value of equity (market capitalization) plus net debt (total debt less cash). When two companies have different capital structures, it is best to use EV/EBITDA.

However, caution must be exercised in the interpretation of these metrics. A company that appears cheap relative to its peers may be at a certain competitive disadvantage that could prevent investors from buying the stock. Examples include certain end-market or geographic exposure, unfavorable outlook on management, supply chain risks, or lack of product refreshments, to name a few.

GLOSSARY

Carbon footprint—The total greenhouse gas emissions caused by an individual, event, organization, service, or product, expressed as carbon dioxide equivalent.

Climate change—Includes both the global warming driven by human emissions of greenhouse gases, and the resulting large-scale shifts in weather patterns.

Decking—The material of a timber platform or terrace attached to a house or other building.

Heating, ventilation, and air conditioning (HVAC)—The technology of indoor and vehicular environmental comfort. Its goal is to provide thermal comfort and acceptable indoor air quality.

Housing starts—New residential construction projects that begin during any particular month and are considered a key economic indicator. A housing start is counted when construction begins on the footings or foundations of a residential structure.

Refrigerant—A substance or mixture, usually a fluid, used in a heat pump and refrigeration cycle.

Retrofit—To furnish (something, such as a computer, airplane, or building) with new or modified parts or equipment not available or considered necessary at the time of manufacture.

Siding—The protective material attached to the exterior side of a wall of a house or other building.

Split-System Air Conditioning—A split system replacement refers to a special type of air conditioner, which has a condensing unit that sits separately from an evaporative coil unit. The two parts are connected by a copper tube that carries the refrigerant between the units.

INDUSTRY REFERENCES

TRADE ASSOCIATIONS

Air-Conditioning, Heating, and Refrigeration Institute

ahrinet.org

Trade association representing manufacturers of HVACR and water heating equipment within the global industry.

American Institute of Architects

aia.org

Professional organization for architects in the U.S.

American Society of Heating, Refrigerating and Air-Conditioning Engineers

ashrae.org

Professional association seeking to advance heating, ventilation, air conditioning, and refrigeration systems design and construction.

Home Improvement Research Institute

hiri.org

Nonprofit organization dedicated to home improvement research.

Mortgage Bankers Association

mba.org

National association representing all facets of the real estate finance industry.

National Association of Home Builders

nahb.org

Trade association representing the interests of home builders, developers, contractors, and associated businesses.

National Association of Realtors

nar.realtor

America's largest trade association, representing 1.4 million members, including NAR's institutes, societies, and councils, involved in all aspects of the residential and commercial real estate industries.

EDUCATIONAL INSTITUTION

Joint Center for Housing Studies

jchs.harvard.edu

A center that advances understanding of housing issues and informs policy.

GOVERNMENT AGENCIES

Freddie Mac

freddiemac.com

Public government-sponsored enterprise that provides mortgage loans.

U.S. Census Bureau

census.gov

Principal agency of the U.S. Federal Statistical System, responsible for producing data about the American people and economy.

MARKET RESEARCH FIRMS

The Farnsworth Group

thefarnsworthgroup.com

Provides custom market research and industry insight for the building products, home improvement, hardware, lawn and garden, and building supply industries.

ONLINE RESOURCES

Construction.com

Dodge Data & Analytics is North America's leading provider of analytics and software-based workflow integration solutions for the construction industry.

Realtor.com

Real estate listings website.

COMPARATIVE COMPANY ANALYSIS

		Operating Revenues																
Ticker	Company	Yr. End	Million \$							CAGR (%)			Index Basis (2013=100)					
			2021	2020	2019	2018	2017	2016	2015	10-Yr.	5-Yr.	1-Yr.	2021	2020	2019	2018	2017	2016
BUILDING PRODUCTS																		
AOS	A. O. SMITH CORPORATION	DEC	3,538.9	2,895.3	2,992.7	3,187.9	2,996.7	2,685.9	2,536.5	7.5	5.7	22.2	140	114	118	126	118	106
WMS	ADVANCED DRAINAGE SYSTEMS, INC.	# MAR	2,769.3	1,982.8	1,673.8	1,384.7	1,330.4	1,257.3	1,290.7	8.7	9.0	18.5	215	154	130	107	103	97
ALLE	ALLEGION PLC	DEC	2,867.4	2,719.9	2,854.0	2,731.7	2,408.2	2,238.0	2,068.1	3.6	5.1	5.4	139	132	138	132	116	108
AWI	ARMSTRONG WORLD INDUSTRIES, INC.	DEC	1,106.6	936.9	1,038.1	975.3	893.6	837.3	805.1	-8.6	5.7	18.1	137	116	129	121	111	104
ASSA B	ASSA ABLOY AB (PUBL)	DEC	10,507.1	10,672.3	10,065.3	9,457.6	9,301.3	7,854.1	8,067.1	8.6	5.9	8.4	130	132	125	117	115	97
CARR	CARRIER GLOBAL CORPORATION	DEC	20,613.0	17,456.0	18,608.0	0.0	17,814.0	17,814.0	0.0	NA	NA	18.1	NA	NA	NA	NA	NA	NA
SGO	COMPAGNIE DE SAINT-GOBAIN S.A.	DEC	50,221.8	46,639.8	47,775.8	47,829.2	49,003.4	41,267.8	43,033.4	0.5	2.5	15.8	117	108	111	111	114	96
FHI	DAIKIN INDUSTRIES,LTD.	# MAR	25,603.3	22,544.4	23,701.3	22,390.7	21,567.3	18,331.6	18,188.8	7.9	4.1	-2.2	141	124	130	123	119	101
FBHS	FORTUNE BRANDS HOME & SECURITY, INC.	DEC	7,656.1	6,090.3	5,764.6	5,485.1	5,283.3	4,984.9	4,579.4	8.7	9.0	25.7	167	133	126	120	115	109
GEBN	GEBERIT AG	DEC	3,796.0	3,375.1	3,183.2	3,130.7	2,984.2	2,765.4	2,590.6	6.4	4.3	15.9	147	130	123	121	115	107
JELD	JELD-WEN HOLDING, INC.	DEC	4,771.7	4,235.7	4,289.8	4,346.8	3,763.7	3,666.9	3,381.1	NA	5.4	12.7	141	125	127	129	111	108
JCI	JOHNSON CONTROLS INTERNATIONAL PLC	SEP	23,668.0	22,317.0	23,968.0	23,400.0	22,835.0	20,837.0	17,100.0	-5.3	2.6	6.1	138	131	140	137	134	122
KRX	KINGSPAN GROUP PLC	DEC	7,388.8	5,597.6	5,228.5	5,006.3	4,404.5	3,281.4	3,013.1	15.4	15.9	42.0	245	186	174	166	146	109
LII	LENNOX INTERNATIONAL INC.	DEC	4,194.1	3,634.1	3,807.2	3,883.9	3,839.6	3,641.6	3,467.4	4.0	2.9	15.4	121	105	110	112	111	105
MAS	MASCO CORPORATION	DEC	8,375.0	7,188.0	6,707.0	6,654.0	6,014.0	7,361.0	7,142.0	1.6	2.6	16.5	117	101	94	93	84	103
DOOR	MASONITE INTERNATIONAL CORPORATION	# JAN	0.0	2,596.9	2,176.7	2,170.1	2,032.9	2,032.9	1,974.0	5.7	5.6	15.1	0	132	110	110	103	103
OC	OWENS CORNING	DEC	8,498.0	7,055.0	7,160.0	7,057.0	6,384.0	5,677.0	5,350.0	4.8	8.4	20.5	159	132	134	132	119	106
AZEK	THE AZEK COMPANY INC.	SEP	1,179.0	899.3	794.2	681.8	681.8	0.0	0.0	NA	NA	31.1	NA	NA	NA	NA	NA	NA
TT	TRANE TECHNOLOGIES PLC	DEC	14,136.4	12,454.7	13,075.9	12,343.8	14,197.6	13,508.9	13,300.7	1.0	0.9	13.5	106	94	98	93	107	102
TREX	TREX COMPANY, INC.	DEC	1,197.0	880.8	745.3	684.3	565.2	479.6	440.8	16.2	20.1	35.9	272	200	169	155	128	109

Note: Data as originally reported. CAGR-Compound annual growth rate.

□Company included in the S&P 500. †Company included in the S&P MidCap 400. \$Company included in the S&P SmallCap 600. #Of the following calendar year.

Source: S&P Capital IQ.

Net Income

			Million \$							CAGR (%)			Index Basis (2013=100)					
Ticker	Company	Yr. End	2021	2020	2019	2018	2017	2016	2015	10-Yr.	5-Yr.	1-Yr.	2021	2020	2019	2018	2017	2016
BUILDING PRODUCTS																		
AOS	▣ A. O. SMITH CORPORATION	DEC	487.1	344.9	370.0	444.2	296.5	326.5	282.9	4.8	8.3	41.2	172	122	131	157	105	115
WMS	ADVANCED DRAINAGE SYSTEMS, INC.	# MAR	271.3	224.2	-193.2	77.8	62.0	33.0	25.1	43.6	55.0	NM	1083	895	-771	310	248	132
ALLE	▣ ALLEGION PLC	DEC	483.0	314.3	401.8	434.9	273.3	229.1	153.9	8.3	16.1	53.7	314	204	261	283	178	149
AWI	ARMSTRONG WORLD INDUSTRIES, INC.	DEC	183.2	-99.1	214.5	185.9	119.6	104.7	94.2	5.0	11.8	NM	194	-105	228	197	127	111
ASSA B	ASSA ABLOY AB (PUBL)	DEC	1205.5	1116.7	1069.7	309.8	1054.7	732.7	911.3	11.0	10.4	18.9	132	123	117	34	116	80
CARR	0 CARRIER GLOBAL CORPORATION	DEC	1664.0	1982.0	2116.0	2734.0	1227.0	1227.0	0.0	NA	NA	-16.0	NA	NA	NA	NA	NA	NA
SGO	COMPAGNIE DE SAINT-GOBAIN S.A.	DEC	2867.1	557.8	1577.8	454.5	1880.4	1383.9	1406.5	7.0	14.0	452.9	204	40	112	32	134	98
FHI	† DAIKIN INDUSTRIES,LTD.	# MAR	1792.8	1412.8	1586.7	1706.1	1780.1	1380.6	1219.2	22.9	2.7	-8.5	147	116	130	140	146	113
FBHS	▣ FORTUNE BRANDS HOME & SECURITY, INC.	DEC	772.4	553.1	431.9	389.6	472.6	413.2	315.0	NA	13.3	39.6	245	176	137	124	150	131
GEBN	GEBERIT AG	DEC	829.0	726.0	667.9	606.9	541.2	539.7	421.9	7.0	6.6	17.7	196	172	158	144	128	128
JELD	JELD-WEN HOLDING, INC.	DEC	168.8	91.6	63.0	141.9	8.1	377.2	90.9	NA	-14.9	84.3	186	101	69	156	9	415
JCI	▣ JOHNSON CONTROLS INTERNATIONAL PLC	SEP	1637.0	631.0	5674.0	2162.0	1611.0	-868.0	1563.0	1.5	NM	159.4	105	40	363	138	103	-56
KRX	KINGSPAN GROUP PLC	DEC	630.2	457.0	414.5	378.9	341.4	269.6	204.3	24.5	16.8	48.3	308	224	203	185	167	132
LII	† LENNOX INTERNATIONAL INC.	DEC	464.0	356.3	408.7	359.0	305.7	277.8	186.6	18.0	10.8	30.2	249	191	219	192	164	149
MAS	▣ MASCO CORPORATION	DEC	410.0	1224.0	935.0	734.0	533.0	493.0	355.0	NA	-3.6	-66.5	115	345	263	207	150	139
DOOR	MASONITE INTERNATIONAL CORPORATION	# JAN	0.0	94.5	44.6	92.7	151.7	151.7	98.6	NA	-0.9	36.9	0	96	45	94	154	154
OC	0 OWENS CORNING	DEC	995.0	-383.0	405.0	545.0	289.0	393.0	330.0	13.7	20.4	NM	302	-116	123	165	88	119
AZEK	THE AZEK COMPANY INC.	SEP	93.2	-122.2	-20.2	6.7	6.7	0.0	0.0	NA	NA	NM	NA	NA	NA	NA	NA	NA
TT	▣ TRANE TECHNOLOGIES PLC	DEC	1423.4	854.9	1410.9	1337.6	1302.6	1476.2	664.6	15.3	-0.7	66.5	214	129	212	201	196	222
TREX	† TREX COMPANY, INC.	DEC	208.7	175.6	144.7	134.6	95.1	67.8	48.1	NA	25.2	18.8	434	365	301	280	198	141

Note: Data as originally reported. CAGR-Compound annual growth rate.

□Company included in the S&P 500. †Company included in the S&P MidCap 400. §Company included in the S&P SmallCap 600. #Of the following calendar year.

Source: S&P Capital IQ.

			Return on Revenues (%)						Return on Assets (%)						Return on Equity (%)					
Ticker	Company	Yr. End	2021	2020	2019	2018	2017	2016	2021	2020	2019	2018	2017	2016	2021	2020	2019	2018	2017	2016
BUILDING PRODUCTS																				
AOS	▣ A. O. SMITH CORPORATION	DEC	13.8	11.9	12.4	13.9	9.9	12.2	14.0	10.9	12.1	14.5	9.3	11.3	26.5	19.6	21.9	26.4	18.8	22.1
WMS	▣ ADVANCED DRAINAGE SYSTEMS, INC.	# MAR	9.8	11.3	NM	5.6	4.7	2.6	10.2	9.3	NM	7.5	5.9	3.1	25.2	24.0	NM	12.5	11.1	6.7
ALLE	▣ ALLEGION PLC	DEC	16.8	11.6	14.1	15.9	11.3	10.2	15.8	10.2	13.5	15.5	10.8	10.2	60.6	39.5	56.9	82.2	106.0	316.5
AWI	ARMSTRONG WORLD INDUSTRIES, INC.	DEC	16.6	NM	20.7	19.1	13.4	12.5	10.7	NM	14.4	10.1	6.4	6.0	38.2	NM	82.0	58.8	64.3	19.2
ASSA B	ASSA ABLOY AB (PUBL)	DEC	11.5	10.5	10.6	3.3	11.3	9.3	8.4	7.8	8.5	2.6	8.7	7.0	17.0	15.5	18.0	5.4	17.6	14.9
CARR	0 CARRIER GLOBAL CORPORATION	DEC	8.1	11.4	11.4	14.5	6.9	0.0	6.4	7.9	9.4	12.6	5.6	NA	24.9	19.1	15.0	19.1	0.0	0.0
SGO	COMPAGNIE DE SAINT-GOBAIN S.A.	DEC	5.7	1.2	3.3	1.0	3.8	3.4	4.9	0.9	2.8	0.8	3.6	3.0	13.3	2.6	7.7	2.6	8.6	7.0
FHI	↑ DAIKIN INDUSTRIES,LTD.	# MAR	7.0	6.3	6.7	7.6	8.3	7.5	5.7	4.8	6.4	7.0	7.6	6.5	12.2	10.3	12.2	14.1	15.8	14.7
FBHS	▣ FORTUNE BRANDS HOME & SECURITY, INC.	DEC	10.1	9.1	7.5	7.1	8.9	8.3	9.7	7.5	6.9	6.5	8.6	8.1	26.5	21.3	18.7	16.3	19.1	17.1
GEBN	GEBERIT AG	DEC	21.8	21.5	21.0	19.4	18.1	19.5	20.0	17.1	17.4	17.1	14.1	15.2	38.7	33.6	35.5	33.3	30.4	35.2
JELD	JELD-WEN HOLDING, INC.	DEC	3.5	2.2	1.5	3.3	0.2	10.3	4.5	2.3	1.9	4.7	0.3	14.9	18.3	10.1	8.0	18.3	1.6	164.5
JCI	▣ JOHNSON CONTROLS INTERNATIONAL PLC	SEP	6.9	2.8	23.7	9.2	7.1	NM	3.9	1.5	13.4	4.4	3.1	NM	9.4	4.0	6.0	6.1	3.5	4.8
KRX	KINGSPAN GROUP PLC	DEC	8.5	8.2	7.9	7.6	7.8	8.2	8.7	7.0	8.6	8.2	8.8	8.5	21.3	17.0	19.3	20.0	18.8	18.5
LII	↑ LENNOX INTERNATIONAL INC.	DEC	11.1	9.8	10.7	9.2	8.0	7.6	21.4	17.5	20.1	19.8	16.2	15.8	NM	NM	NM	NM	697.2	399.1
MAS	▣ MASCO CORPORATION	DEC	4.9	17.0	13.9	11.0	8.9	6.7	7.4	21.2	18.6	13.6	9.6	9.6	191.6	472.3	10523.1	544.4	1182.5	NM
DOOR	MASONITE INTERNATIONAL CORPORATION	# JAN	0.0	3.6	3.1	2.0	4.3	7.5	NA	4.2	3.2	2.3	5.2	9.0	0.0	14.2	11.1	7.8	14.2	22.5
OC	0 OWENS CORNING	DEC	11.7	NM	5.7	7.7	4.5	6.9	9.9	NM	4.0	5.6	3.3	5.1	24.0	NM	9.0	12.8	7.2	10.4
AZEK	THE AZEK COMPANY INC.	SEP	7.9	NM	NM	1.0	0.0	0.0	4.3	NM	NM	0.4	NA	NA	6.8	NM	NM	0.0	0.0	0.0
TT	▣ TRANE TECHNOLOGIES PLC	DEC	10.1	6.9	10.8	10.8	9.2	10.9	7.9	4.7	6.9	7.5	7.2	8.5	22.9	14.4	16.1	14.3	19.2	23.2
TREX	↑ TREX COMPANY, INC.	DEC	17.4	19.9	19.4	19.7	16.8	14.1	22.7	22.8	24.4	28.9	29.2	30.6	31.8	33.8	36.5	46.9	52.1	54.1

Note: Data as originally reported. CAGR-Compound annual growth rate.

[]Company included in the S&P 500. †Company included in the S&P MidCap 400. §Company included in the S&P SmallCap 600. #Of the following calendar year.

Source: S&P Capital IQ.

Ticker	Company	Yr. End	Current Ratio						Debt/Capital Ratio (%)						Debt as a % of Net Working Capital						
			2021	2020	2019	2018	2017	2016	2021	2020	2019	2018	2017	2016	2021	2020	2019	2018	2017	2016	
BUILDING PRODUCTS																					
AOS	A. O. SMITH CORPORATION	#	DEC	1.6	1.8	2.0	2.1	2.2	2.0	2.1	1.7	1.8	2.1	2.0	3.4	30.0	14.5	37.8	25.9	41.4	39.7
WMS	ADVANCED DRAINAGE SYSTEMS, INC.		MAR	2.2	2.3	2.8	2.3	2.1	1.7	2.6	2.5	2.4	2.4	2.2	2.1	189.1	184.2	254.5	80.2	114.2	168.2
ALLE	ALLEGION PLC		DEC	1.9	2.2	2.0	1.8	2.2	1.9	1.4	1.3	1.2	1.2	1.1	1.2	276.8	229.3	288.5	343.1	252.2	354.3
AWI	ARMSTRONG WORLD INDUSTRIES, INC.		DEC	1.5	1.8	1.6	1.3	2.4	1.8	2.7	1.9	1.8	2.1	5.0	1.5	552.9	515.3	695.2	458.6	215.8	466.3
ASSA B	ASSA ABLOY AB (PUBL)		DEC	1.3	1.2	1.1	1.0	1.1	1.2	5.2	4.6	3.8	4.0	3.5	2.8	315.8	480.9	700.2	2260.6	1393.7	532.3
CARR	CARRIER GLOBAL CORPORATION		DEC	1.7	1.7	1.3	1.4	1.4	0.0	1.7	3.4	2.2	2.5	2.3	1.6	199.0	294.0	5.1	8.3	7.7	NA
SGO	COMPAGNIE DE SAINT-GOBAIN S.A.		DEC	1.4	1.5	1.4	1.2	1.3	1.3	4.6	11.0	7.9	9.5	6.9	7.1	180.8	169.6	225.5	300.5	200.4	185.9
FHI	DAIKIN INDUSTRIES,LTD.	#	MAR	1.7	2.3	1.9	1.7	2.0	1.9	8.2	10.5	8.2	6.6	3.9	3.6	41.6	60.9	61.0	87.8	76.9	97.7
FBHS	FORTUNE BRANDS HOME & SECURITY, INC.		DEC	1.4	1.6	1.3	1.1	1.8	1.7	50.4	48.1	42.4	45.3	36.7	37.7	350.4	297.9	365.0	932.5	217.0	237.6
GEBN	GEBERIT AG		DEC	1.3	1.9	1.9	1.3	1.8	2.0	17.4	27.2	28.8	28.3	32.8	37.3	180.2	142.7	153.7	298.1	187.1	182.2
JELD	JELD-WEN HOLDING, INC.		DEC	2.0	2.0	1.6	1.7	2.0	1.7	66.4	62.8	64.1	64.7	61.5	88.3	195.5	190.2	305.3	294.5	222.8	440.3
JCI	JOHNSON CONTROLS INTERNATIONAL PLC		SEP	1.1	1.2	1.4	1.1	1.0	1.0	28.6	29.0	24.4	34.1	39.3	33.3	834.9	418.7	202.2	1907.3	3008.7	1559.3
KRX	KINGSPAN GROUP PLC		DEC	1.8	2.2	1.7	1.6	1.7	1.6	30.8	36.4	28.5	35.0	29.6	30.8	98.4	94.6	137.8	160.7	128.1	151.6
LII	LENNOX INTERNATIONAL INC.		DEC	1.4	1.6	1.1	1.1	1.7	1.1	129.0	101.9	126.1	126.0	95.1	102.3	343.8	243.7	696.6	895.9	198.7	556.8
MAS	MASCO CORPORATION		DEC	1.8	1.8	1.8	1.6	2.0	2.0	97.4	86.8	102.1	97.7	94.2	103.6	197.3	177.9	235.9	274.6	186.0	203.2
DOOR	MASONITE INTERNATIONAL CORPORATION	#	JAN	0.0	2.9	2.5	2.7	2.8	3.2	NA	55.3	53.3	55.4	56.1	45.9	NA	115.5	135.6	169.6	176.5	125.1
OC	OWENS CORNING		DEC	1.8	1.8	1.6	1.6	1.5	1.6	40.0	43.8	39.1	43.8	36.1	35.1	206.1	263.0	408.1	452.0	337.8	336.9
AZEK	THE AZEK COMPANY INC.		SEP	3.1	3.4	2.1	2.3	0.0	0.0	24.6	26.2	69.2	68.7	NA	NA	128.4	154.0	732.6	799.7	NA	NA
TT	TRANE TECHNOLOGIES PLC		DEC	1.4	1.6	1.8	1.3	1.3	1.6	41.7	41.2	40.2	34.6	29.2	35.7	261.4	175.2	121.4	264.1	229.5	187.0
TREX	TREX COMPANY, INC.		DEC	4.5	3.0	3.9	2.9	2.4	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Note: Data as originally reported. CAGR-Compound annual growth rate.

□Company included in the S&P 500. †Company included in the S&P MidCap 400. \$Company included in the S&P SmallCap 600. #Of the following calendar year.

Source: S&P Capital IQ.

Ticker	Company	Yr. End	Price/Earnings Ratio (High-Low)						Dividend Payout Ratio (%)						Dividend Yield (High-Low, %)					
			2021	2020	2019	2018	2017	2016	2021	2020	2019	2018	2017	2016	2021	2020	2019	2018	2017	2016
BUILDING PRODUCTS																				
AOS	A. O. SMITH CORPORATION	DEC	28 - 17	27 - 16	25 - 18	26 - 16	37 - 27	28 - 17	34.9	46.0	40.3	29.3	32.7	25.8	2.1 - 1.3	2.0 - 1.4	2.8 - 1.7	2.2 - 1.6	2.1 - 0.8	1.2 - 0.9
WMS	ADVANCED DRAINAGE SYSTEMS, INC.	MAR	43 - 10	NM - NM	27 - 19	27 - 18	55 - 37	83 - 46	14.2	14.3	NM	33.6	29.8	44.7	0.4 - 0.3	1.5 - 0.3	1.3 - 0.7	1.4 - 1.0	1.5 - 1.0	1.3 - 0.8
ALLE	ALLEGION PLC	DEC	28 - 20	41 - 23	29 - 18	20 - 16	31 - 22	30 - 22	26.7	37.3	25.0	18.3	22.3	20.1	1.7 - 1.1	1.3 - 1.0	1.6 - 0.8	1.2 - 0.9	1.1 - 0.7	1.0 - 0.7
AWI	ARMSTRONG WORLD INDUSTRIES, INC.	DEC	31 - 19	NM - NM	23 - 13	20 - 15	27 - 17	26 - 19	22.6	NM	16.6	4.6	0.0	0.0	1.3 - 0.8	1.2 - 0.7	1.4 - 0.7	1.3 - 0.7	1.1 - 1.0	0.0 - 0.0
ASSA B	ASSA ABLOY AB (PUBL)	DEC	29 - 20	30 - 19	26 - 17	78 - 63	25 - 21	32 - 25	39.7	46.6	38.9	133.2	38.6	44.3	2.0 - 1.4	1.9 - 1.4	2.4 - 1.5	2.1 - 1.5	2.0 - 1.6	1.8 - 1.5
CARR	CARRIER GLOBAL CORPORATION	DEC	30 - 19	18 - 5	NA - NA	NA - NA			25.1	7.0	0.0	0.0	0.0	0.0	1.7 - 0.8	1.4 - 0.8	1.5 - 0.8	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0
SGO	COMPAGNIE DE SAINT-GOBAIN S.A.	DEC	13 - 8	48 - 21	15 - 11	67 - 39	18 - 15	18 - 14	27.6	0.0	51.8	178.1	45.0	51.9	3.9 - 2.0	3.1 - 2.1	3.9 - 0.0	4.6 - 3.5	4.2 - 2.6	3.1 - 2.4
FHI	DAIKIN INDUSTRIES,LTD.	MAR	46 - 23	28 - 20	24 - 17	22 - 16	22 - 15	21 - 14	22.8	29.9	29.1	22.4	20.9	23.7	0.9 - 0.6	1.4 - 0.7	1.2 - 1.0	1.3 - 0.9	1.2 - 0.9	1.5 - 1.0
FBHS	FORTUNE BRANDS HOME & SECURITY, INC.	DEC	20 - 15	23 - 9	21 - 12	27 - 13	22 - 17	24 - 17	18.5	24.1	28.5	29.6	23.3	23.8	1.9 - 1.0	1.3 - 0.9	2.8 - 1.1	2.4 - 1.4	1.9 - 1.0	1.3 - 1.1
GEBN	GEBERT AG	DEC	36 - 25	32 - 22	31 - 20	28 - 23	34 - 28	29 - 21	53.5	62.9	60.1	63.8	69.9	56.4	2.8 - 1.5	2.2 - 1.5	2.9 - 2.0	2.9 - 2.0	2.8 - 2.1	2.4 - 1.9
JELD	JELD-WEN HOLDING, INC.	DEC	18 - 13	29 - 8	39 - 23	31 - 10	NM - NM	NA - NA	0.0	0.0	0.0	0.0	0.0	87.6	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0
JCI	JOHNSON CONTROLS INTERNATIONAL PLC	SEP	33 - 18	53 - 28	7 - 4	18 - 14	27 - 21	NM - NM	46.5	125.2	16.2	44.1	43.6	NM	3.0 - 1.3	2.6 - 1.4	4.4 - 2.3	3.6 - 2.4	3.1 - 2.4	2.9 - 1.8
KRX	KINGSPAN GROUP PLC	DEC	34 - 17	40 - 19	27 - 17	24 - 18	23 - 16	18 - 13	13.3	0.0	21.0	20.6	21.7	18.8	0.9 - 0.4	0.5 - 0.0	1.0 - 0.0	1.1 - 0.8	1.1 - 0.8	1.2 - 0.8
LI	LENNOX INTERNATIONAL INC.	DEC	28 - 22	33 - 18	28 - 20	26 - 21	29 - 21	25 - 18	27.3	33.1	27.0	26.2	26.1	24.8	2.3 - 1.1	1.3 - 0.9	1.8 - 1.0	1.3 - 0.9	1.3 - 0.9	1.3 - 1.0
MAS	MASCO CORPORATION	DEC	43 - 32	13 - 6	15 - 9	19 - 12	26 - 19	25 - 16	51.5	11.8	15.4	18.3	24.2	26.0	2.4 - 1.3	1.7 - 0.8	2.0 - 0.9	1.7 - 1.1	1.7 - 0.9	1.3 - 1.0
DOOR	MASONITE INTERNATIONAL CORPORATION	JAN	28 - 9	28 - 17	41 - 25	25 - 17	14 - 9	22 - 17	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0
OC	OWENS CORNING	DEC	11 - 8	NM - NM	18 - 12	20 - 8	35 - 20	16 - 12	10.9	NM	23.5	16.9	30.8	20.6	1.9 - 1.2	1.4 - 1.0	3.1 - 1.3	2.1 - 1.3	2.0 - 0.9	1.6 - 0.9
AZEK	THE AZEK COMPANY INC.	SEP	84 - 55	NM - NM	NA - NA	NA - NA			0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0
TT	TRANE TECHNOLOGIES PLC	DEC	35 - 23	43 - 20	23 - 15	20 - 15	19 - 15	14 - 9	39.4	59.3	36.2	35.8	33.0	23.6	2.2 - 1.2	1.6 - 1.1	3.0 - 1.4	2.5 - 1.6	2.4 - 1.9	2.2 - 1.7
TREX	TREX COMPANY, INC.	DEC	78 - 46	57 - 21	37 - 23	39 - 23	36 - 19	31 - 14	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0

Note: Data as originally reported. CAGR-Compound annual growth rate.

[Company included in the S&P 500. †Company included in the S&P MidCap 400. §Company included in the S&P SmallCap 600. #Of the following calendar year.

Source: S&P Capital IQ.

Ticker	Company	Yr. End	Earnings per Share (\$)						Tangible Book Value per Share (\$)						Share Price (High-Low, \$)					
			2021	2020	2019	2018	2017	2016	2021	2020	2019	2018	2017	2016	2021	2020	2019	2018	2017	2016
BUILDING PRODUCTS																				
AOS	A. O. SMITH CORPORATION	DEC	3.0	2.1	2.2	2.6	1.7	1.9	5.3	6.0	4.8	5.4	4.8	4.1	86.7 - 52.1	58.7 - 33.8	56.7 - 40.4	68.4 - 40.3	63.7 - 46.4	51.5 - 30.2
WMS	ADVANCED DRAINAGE SYSTEMS, INC.	# MAR	3.2	2.6	(3.2)	1.2	1.0	0.5	-2.1	-3.7	-9.2	4.0	2.7	1.1	138.0 - 80.4	84.4 - 22.1	40.2 - 23.8	33.5 - 21.7	26.3 - 17.9	28.5 - 17.7
ALLE	ALLEGION PLC	DEC	5.3	3.4	4.3	4.5	2.9	2.4	-5.6	-5.2	-6.8	-8.2	-7.9	-10.1	148.7 - 106.5	139.2 - 77.4	125.8 - 78.3	94.3 - 73.9	89.8 - 63.8	73.5 - 53.0
AWI	ARMSTRONG WORLD INDUSTRIES, INC.	DEC	3.8	(2.1)	4.3	3.6	2.2	1.9	-1.5	-3.5	-2.1	-4.4	-0.4	-3.0	118.1 - 70.8	111.5 - 58.0	104.5 - 57.4	73.5 - 54.3	61.5 - 38.5	48.7 - 35.9
ASSA B	ASSA ABLOY AB (PUBL)	DEC	1.1	1.0	1.0	0.3	0.9	0.7	-0.7	-1.5	-1.1	-1.3	-1.2	-1.0	32.1 - 22.1	30.3 - 19.3	24.9 - 16.5	21.9 - 17.5	24.2 - 19.5	21.0 - 16.3
CARR	CARRIER GLOBAL CORPORATION	DEC	1.9	2.3	2.4	3.2	0.0	0.0	-3.6	-5.7	3.6	0.0	0.0	0.0	58.9 - 34.2	41.5 - 11.5	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0
SGO	COMPAGNIE DE SAINT-GOBAIN S.A.	DEC	5.4	1.0	2.9	0.8	3.4	2.5	14.9	12.4	13.8	10.9	11.6	10.4	73.8 - 43.0	49.9 - 20.1	44.4 - 31.7	55.6 - 32.0	62.9 - 52.1	46.7 - 33.2
FHI	DAIKIN INDUSTRIES,LTD.	# MAR	6.1	4.8	5.4	5.8	6.1	4.7	39.2	34.8	28.4	24.7	25.2	17.7	257.0 - 172.9	236.8 - 109.6	149.8 - 102.0	142.8 - 99.3	121.3 - 92.2	93.7 - 58.4
FBHS	FORTUNE BRANDS HOME & SECURITY, INC.	DEC	5.5	3.9	3.1	2.7	3.0	2.6	-5.8	-7.5	-6.0	-8.2	-3.1	-3.8	114.0 - 80.4	92.6 - 33.9	66.2 - 37.2	73.6 - 35.3	69.8 - 53.2	64.5 - 44.2
GEBN	GEBERT AG	DEC	23.2	20.2	18.5	16.7	14.7	14.6	15.9	11.6	8.7	2.6	2.5	-1.2	855.6 - 579.9	651.5 - 408.5	568.7 - 364.7	476.7 - 373.6	499.6 - 414.8	427.4 - 309.8
JELD	JELD-WEN HOLDING, INC.	DEC	1.7	0.9	0.6	1.3	(0.0)	(1.1)	0.8	1.2	-0.4	-0.5	0.7	-29.9	31.5 - 22.9	27.3 - 6.1	24.6 - 13.9	42.3 - 13.3	40.3 - 25.0	0.0 - 0.0
JCI	JOHNSON CONTROLS INTERNATIONAL PLC	SEP	2.3	0.8	6.5	2.3	1.7	(1.3)	-8.9	-8.0	-5.2	-3.7	-6.4	-4.8	81.8 - 45.9	47.6 - 22.8	44.8 - 29.2	41.5 - 28.3	44.7 - 34.5	49.0 - 33.6
KRX	KINGSPAN GROUP PLC	DEC	3.4	2.5	2.3	2.1	1.9	1.5	5.6	5.3	2.9	1.6	2.3	2.2	121.3 - 58.5	103.4 - 45.8	62.0 - 40.1	50.7 - 36.7	44.8 - 31.0	27.7 - 18.4
LI	LENNOX INTERNATIONAL INC.	DEC	12.4	9.2	10.4	8.7	7.1	6.3	-12.4	-5.3	-9.2	-8.4	-3.6	-3.9	356.4 - 266.8	319.8 - 163.4	298.5 - 210.4	230.7 - 177.4	213.8 - 147.5	164.6 - 105.7
MAS	MASCO CORPORATION	DEC	1.6	4.6	3.2	2.4	1.7	1.5	-4.7	-2.8	-3.6	-3.1	-3.5	-4.0	70.8 - 52.0	60.2 - 27.0	48.4 - 28.6	46.4 - 27.0	44.4 - 31.3	37.4 - 23.1
DOOR	MASONITE INTERNATIONAL CORPORATION	# JAN	0.0	3.9	2.8	1.8	3.3	5.1	0.0	19.5	15.4	10.3	8.4	14.2	132.2 - 92.8	109.8 - 34.9	74.5 - 44.3	75.3 - 43.8	85.3 - 50.4	72.8 - 45.1
OC	OWENS CORNING	DEC	9.5	(3.5)	3.7	4.9	2.6	3.4	16.8	11.8	9.0	5.1	11.6	12.2	109.9 - 72.8	79.0 - 28.6	68.7 - 42.8	96.5 - 40.6	92.9 - 50.8	58.7 - 39.0
AZEK	THE AZEK COMPANY INC.	SEP	0.6	(1.0)	(0.2)	0.1	0.0	0.0	1.5	0.4	0.0	0.0	0.0	0.0	51.3 - 33.7	42.2 - 26.3	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0
TT	TRANE TECHNOLOGIES PLC	DEC	5.9	3.5	5.8	5.3	5.0	5.6	-10.9	-9.3	-5.0	-10.6	-10.2	-10.8	207.1 - 138.0	153.7 - 70.0	138.3 - 89.1	107.1 - 79.6	96.2 - 74.4	79.2 - 47.1
TREX	TREX COMPANY, INC.	DEC	1.8	1.5	1.2	1.1	0.8	0.6	6.1	4.4	3.2	2.3	1.4	1.1	141.0 - 81.7	87.9 - 28.1	46.8 - 28.8	45.4 - 25.4	29.7 - 15.4	18.1 - 7.8

Note: Data as originally reported. CAGR-Compound annual growth rate.

[Company included in the S&P 500. †Company included in the S&P MidCap 400. §Company included in the S&P SmallCap 600. #Of the following calendar year.

Source: S&P Capital IQ.

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