

## Sales Decline -2.3% to Start 2023 January Backlog Declines Slightly

### Regional Performance:

World sales declined -2.3% YTD in January, with Europe achieving the highest growth at +10.7%.

Worldwide, orders were down -20.3% YTD. China had the worst performance at -33.6%.

### 2023 Historical Outlook:

With uncertain economic conditions, Bishop's 2023 sales forecast remains at \$85,700 million, up +1.9% over 2022 sales.

Using a historical analysis of industry sales, the full year forecast could range from \$90,000 million with 8.2% growth to \$80,763 million with -4.0% growth.

### Industry Backlog:

January's backlog was \$22,725 million.

### 2022 Currency Impact:

The industry declined -2.3% YTD in January in USD and -6.1% in local currencies.

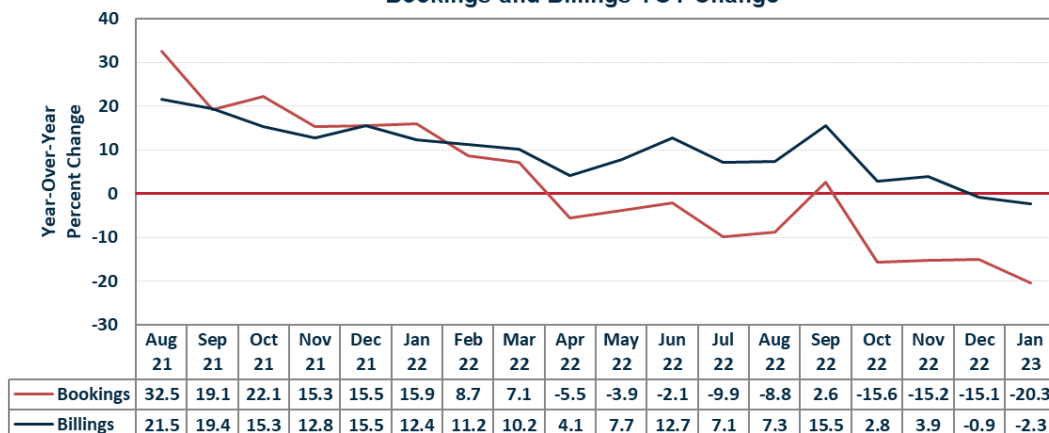
### Merger and Acquisition Services

#### Buy & Sell-Side

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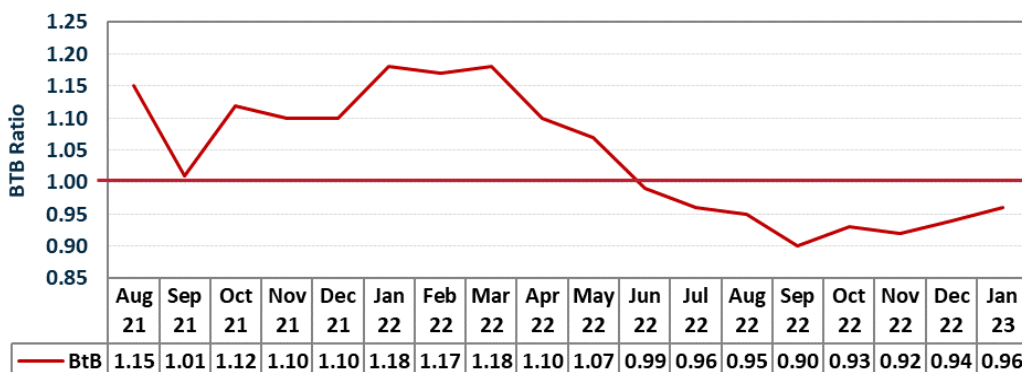
January bookings were down -20.3%, the largest decline in over a year. Billings were down -2.3%, the largest decline in sales since August 2021. The backlog in January contracted slightly to \$22,725 million or 14.1 weeks.

Bookings and Billings YOY Change



The book-to-bill ratio in January was 0.96.

Connector Industry Book-to-Bill

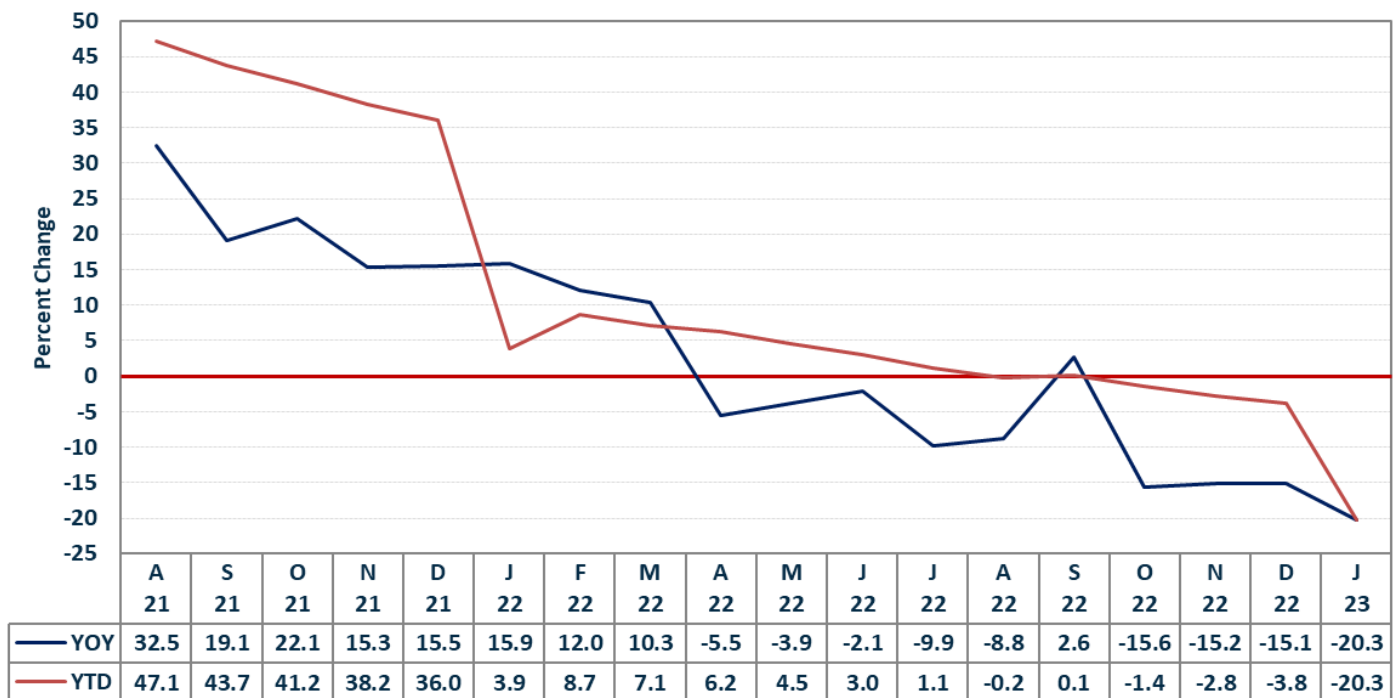


## Booking Highlights and Conclusions

### Sequential, Year-Over-Year, and Year-To-Date Bookings Percentage Change – 2021/2022/2023

Month	Sequential			Year-Over-Year			Year-To-Date		
	2021	2022	2023	2021	2022	2023	2021	2022	2023
Jan	2.3%	2.6%	-3.7%	24.7%	15.9%	-20.3%	24.7%	15.9%	-20.3%
Feb	17.7%	10.4%		38.9%	8.7%		32.0%	12.0%	
Mar	-3.5%	-5.3%		34.5%	7.1%		32.8%	10.3%	
Apr	3.2%	-8.5%		81.9%	-5.5%		42.9%	6.2%	
May	5.1%	7.0%		86.4%	-3.9%		50.5%	4.5%	
Jun	-8.3%	-6.7%		59.7%	-2.1%		51.9%	3.0%	
Jul	-1.9%	-9.6%		36.4%	-9.9%		49.6%	1.1%	
Aug	6.6%	8.0%		32.5%	-8.8%		47.1%	-0.2%	
Sep	-11.9%	-1.0%		19.1%	2.6%		43.7%	0.1%	
Oct	6.8%	-12.1%		22.1%	-15.6%		41.2%	-1.4%	
Nov	9.3%	9.8%		15.3%	-15.2%		38.2%	-2.8%	
Dec	-7.0%	-6.8%		15.5%	-15.1%		36.0%	-3.8%	

### Bookings - YOY and YTD



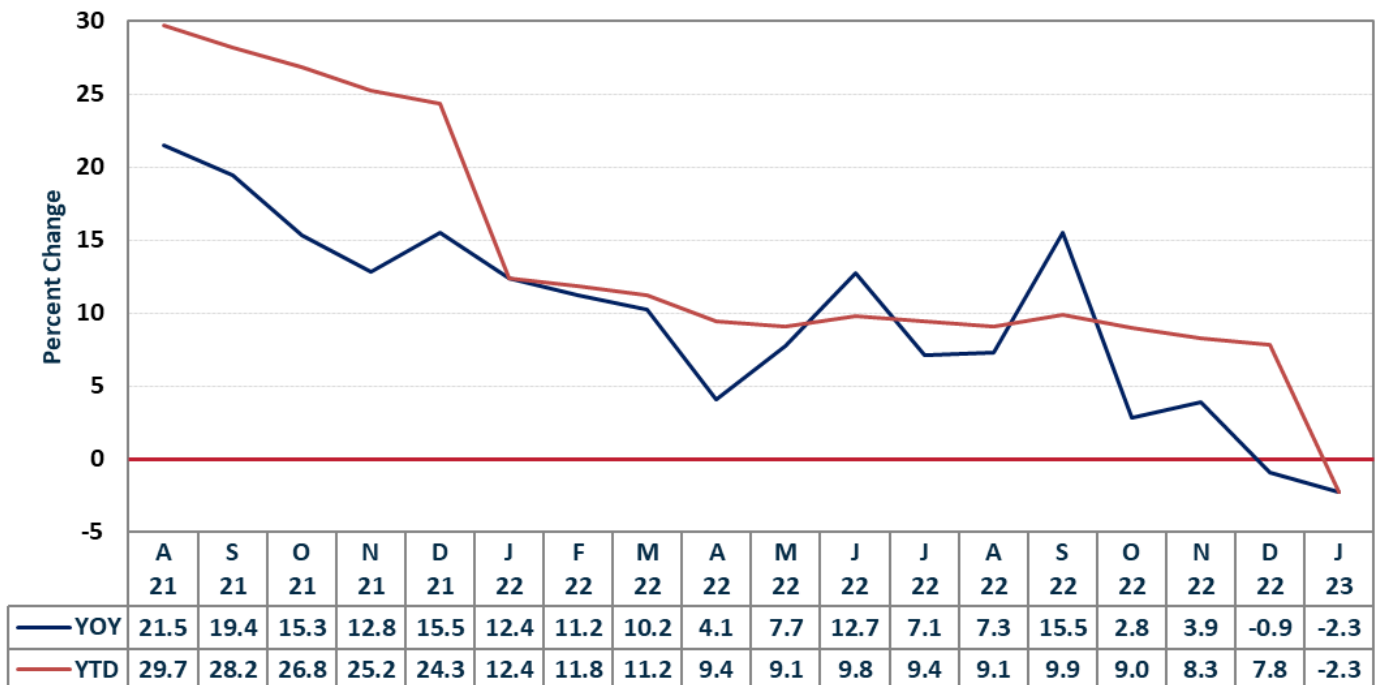
- January bookings decreased -20.3% YOY.
- Orders decreased -3.7% sequentially.
- The book-to-bill ratio for January was 0.96.

## Billing Highlights and Conclusions

### Sequential, Year-Over-Year, and Year-To-Date Billings Percentage Change – 2021/2022/2023

Month	Sequential			Year-Over-Year			Year-To-Date		
	2021	2022	2023	2021	2022	2023	2021	2022	2023
Jan	-1.6%	-4.3%	-5.6%	19.0%	12.4%	-2.3%	19.0%	12.4%	-2.3%
Feb	12.6%	11.4%		26.7%	11.2%		22.9%	11.8%	
Mar	-1.1%	-2.0%		25.5%	10.2%		23.8%	11.2%	
Apr	-1.2%	-6.6%		49.5%	4.1%		29.4%	9.4%	
May	7.0%	10.7%		47.1%	7.7%		32.8%	9.1%	
Jun	-3.8%	0.7%		33.5%	12.7%		33.0%	9.8%	
Jul	-2.0%	-7.1%		20.6%	7.1%		31.0%	9.4%	
Aug	8.7%	8.9%		21.5%	7.3%		29.7%	9.1%	
Sep	-2.3%	5.1%		19.4%	15.5%		28.2%	9.9%	
Oct	-3.4%	-14.0%		15.3%	2.8%		26.8%	9.1%	
Nov	9.4%	10.6%		12.8%	3.9%		25.2%	8.6%	
Dec	-5.6%	-10.0%		15.5%	-0.9%		24.3%	7.8%	

### Billings - YOY and YTD

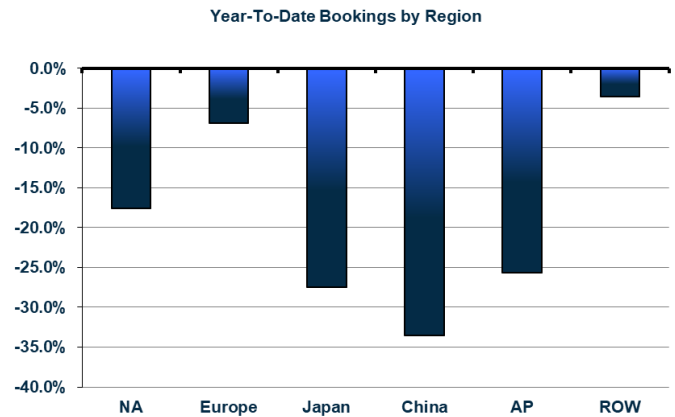


- January billings decreased -2.3% YOY.
- Sequentially, billings decreased -5.6% in January.

## Regional Performance: BOOKINGS

### January 2023 Bookings

Region	Sequential	YOY	YTD
NA	-7.8%	-17.6%	-17.6%
Europe	4.8%	-6.9%	-6.9%
Japan	-11.1%	-27.5%	-27.5%
China	-11.5%	-33.6%	-33.6%
AP	2.2%	-25.7%	-25.7%
ROW	13.7%	-3.5%	-3.5%
Total	-3.7%	-20.3%	-20.3%

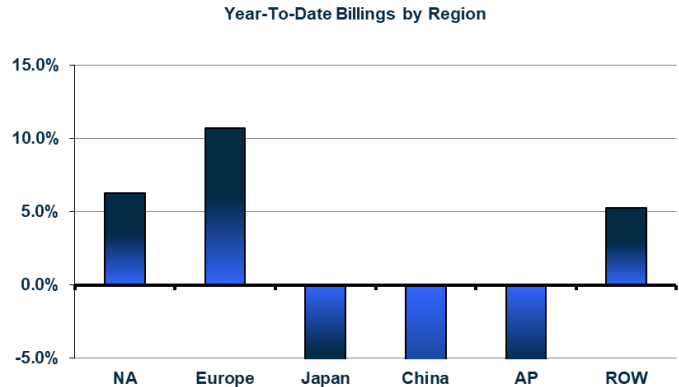


- January bookings decreased -20.3% YOY.
- Orders declined in all regions.
- China's YOY bookings decreased the most at -33.6%.
- The book-to-bill ratio was 0.96, the eighth consecutive month below 1.00.

## Regional Performance: BILLINGS

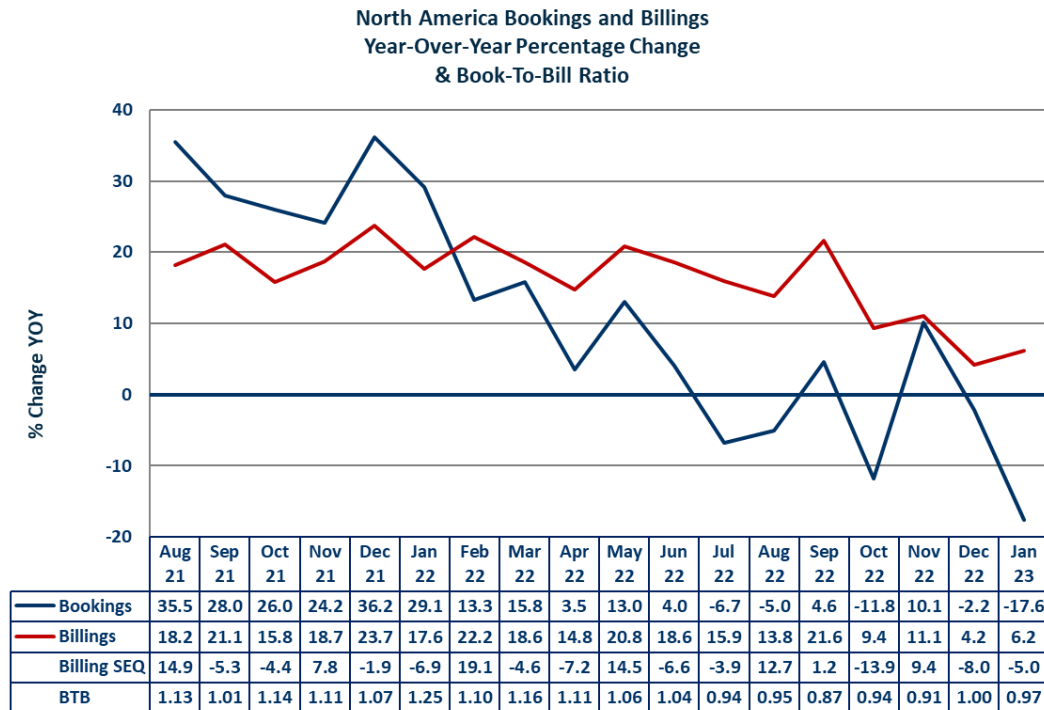
### January 2023 Billings

Region	Sequential	YOY	YTD
NA	-5.0%	6.2%	6.2%
Europe	5.6%	10.7%	10.7%
Japan	-5.1%	-8.1%	-8.1%
China	-14.9%	-18.1%	-18.1%
AP	-11.5%	-9.5%	-9.5%
ROW	-5.1%	5.3%	5.3%
Total	-5.6%	-2.3%	-2.3%



- January connector sales decreased -2.3% YOY.
- All regions, except Europe, contracted sequentially.
- North America, Europe and ROW were the only regions to grow YOY.
- Industry growth is -2.3% year-to-date in US dollars and -6.1% in local currencies (see page 16).

**North America:** The following chart displays the year-over-year percentage change in bookings and billings for the last 18 months. The monthly book-to-bill (BTB) ratio is also displayed.



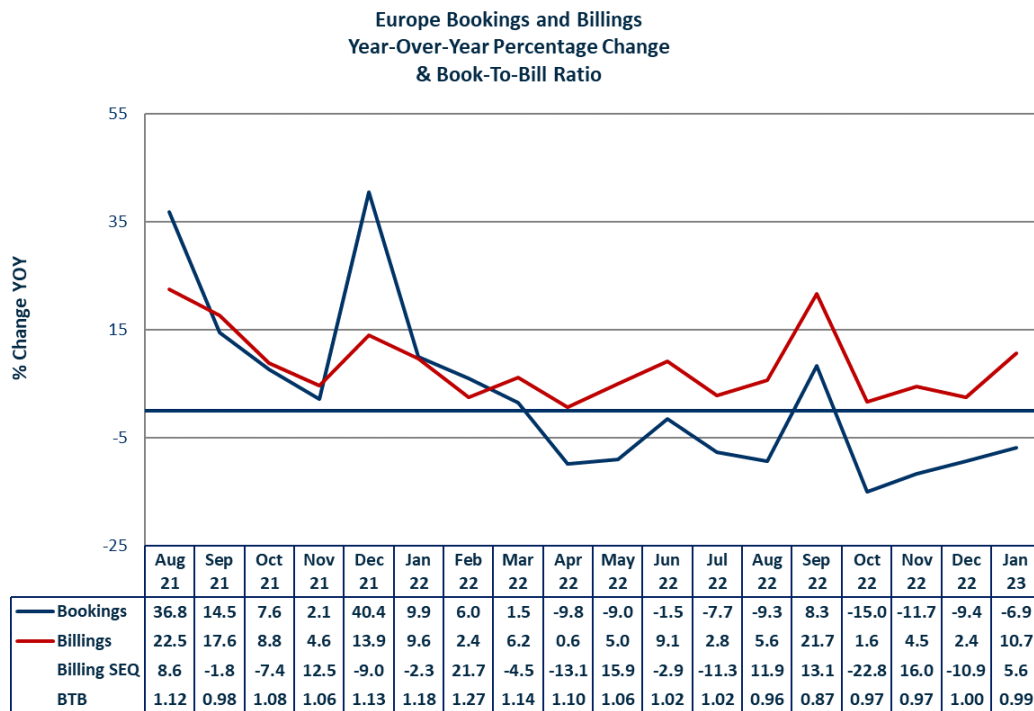
## North America Performance

- Sales grew +6.2% and orders were down -17.6% YOY in January. North American billings were down sequentially -5.0%. The book-to-bill was 0.97.
- US inflation slowed slightly to 6.4% in January, the lowest since October 2021. The overall inflation rate has been above 5% for 20 months. Core inflation decreased to 5.6%.
- Industrial production increased 0.8% YOY in January.
- Manufacturing PMI went up to 46.9 in January, but was the third consecutive month of factory activity below 50.0.
- US unemployment was down to 3.4% in January.
- Retail sales were up 6.4% YOY in January.
- Housing starts were down 4.5% sequentially in January.
- US automotive sales in January increased 5.8% YOY according to Marklines.

## Conclusions

A volatile financial market, led by higher prices/inflation, rising interest rates, and continuing supply chain issues, as well as the ongoing situation in Ukraine are just a few of the headwinds North America is experiencing. The production of new vehicles is still slow due to the shortage of semiconductors.

**Europe:** The following chart displays the year-over-year percentage change in bookings and billings for the last 18 months. The monthly book-to-bill ratio is also displayed.



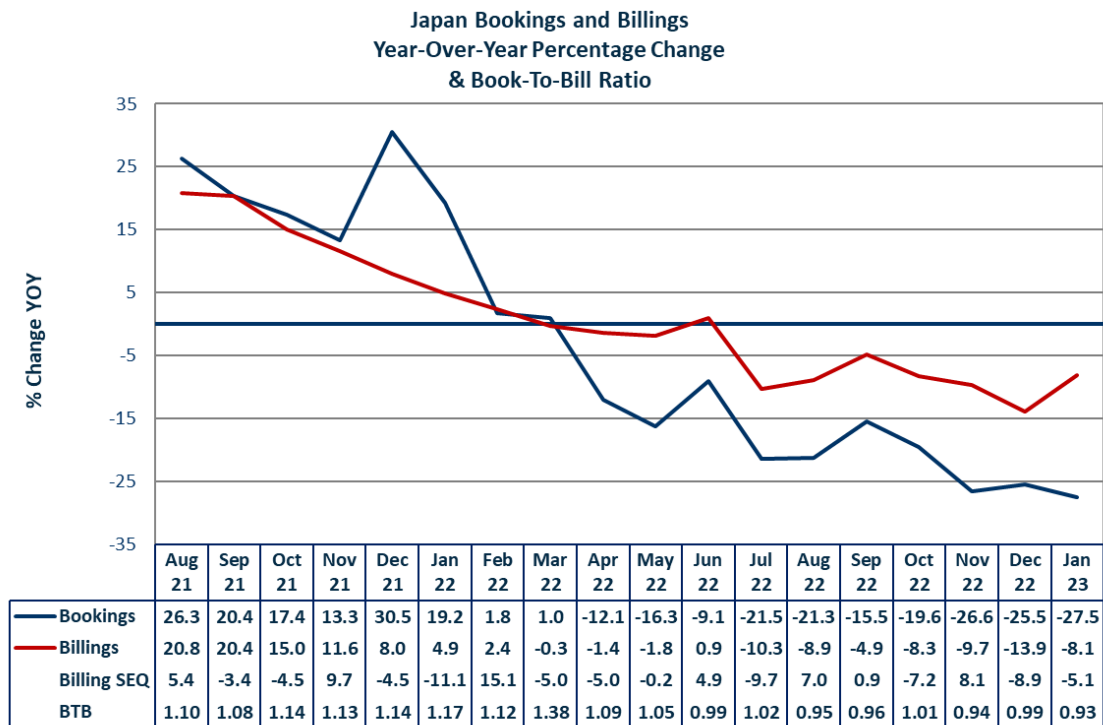
## Europe Performance

- YOY billings were up +10.7% and orders were down -6.9%. The book-to-bill ratio was 0.99. Sequentially, sales were up +5.6%.
- 4Q22 GDP was up 1.9% YOY and up 0.1% sequentially. For the full year, the GDP grew 3.5%.
- Euro Area industrial production decreased 1.7% YOY in December.
- The January manufacturing PMI rose to 48.8 in January.
- Retail sales decreased 2.8% YOY in December.
- The inflation rate declined to 8.5% in January.
- New car registrations grew 9.8% in January according to Marklines.
- The unemployment rate remained at 6.6% in December.

## Conclusions

The connector industry appears to be headed for a difficult 2023 in Europe given the ongoing semiconductor shortages, possible energy rationing, high inflation/unemployment rate, the ongoing situation in the Ukraine, and continuing supply chain issues.

**Japan:** The following chart displays the year-over-year percentage change in bookings and billings for the last 18 months. The monthly book-to-bill ratio is also displayed.



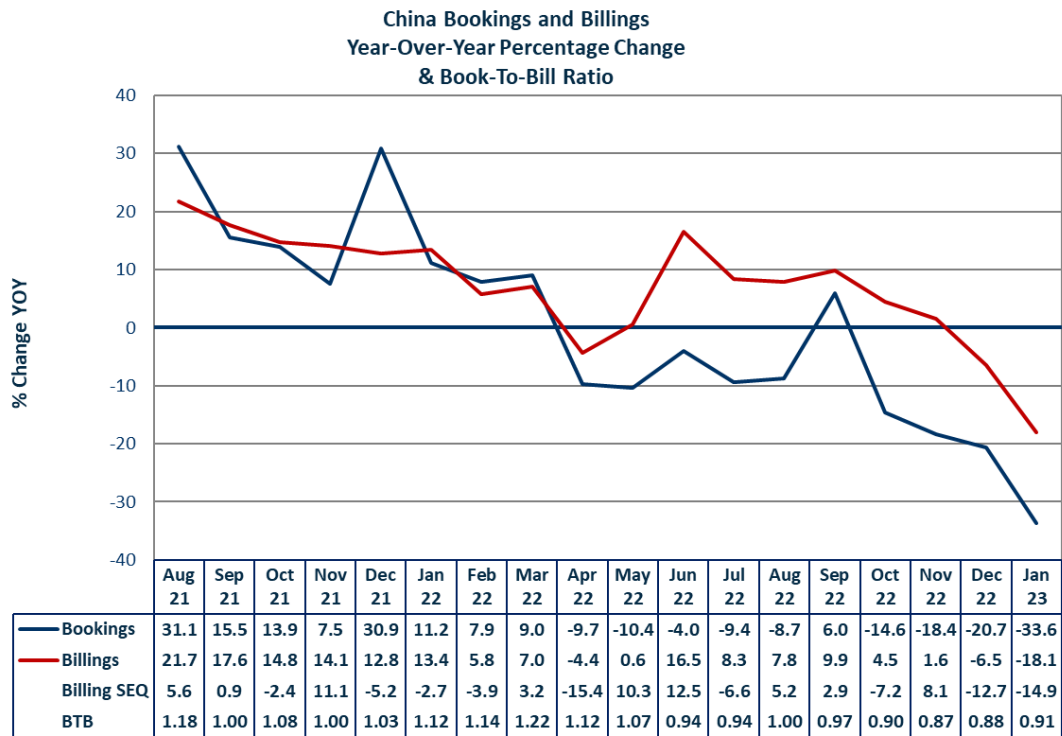
## Japan Performance

- Bookings were down -27.5% in January. Sales declined -8.1% YOY, and sequentially were down -5.1%. Japan's book-to-bill ratio was 0.93, the lowest since July 2020.
- 4Q22 GDP grew 0.6% YOY and 0.2% sequentially. For the full year, GDP was up 1.1%.
- The inflation rate in December increased to 4.0%, the highest since January 1991.
- Japan's currency devalued 13.4% against the US dollar in January YOY.
- The industrial production rate decreased 2.4% YOY in December.
- December retail sales grew 3.8% YOY.
- Exports were down 0.6% sequentially in December.
- The January manufacturing PMI was 48.9, the lowest in 26 months.
- Housing starts decreased 1.7% YOY in December.

## Conclusions

In 2022, the shortage of semiconductors held back growth in the automotive sector, Japan's largest connector market sector. 2023 is starting off with a slightly better situation for semiconductors.

**China:** The following chart displays the year-over-year percentage change in bookings and billings for the last 18 months. The monthly book-to-bill ratio is also displayed.



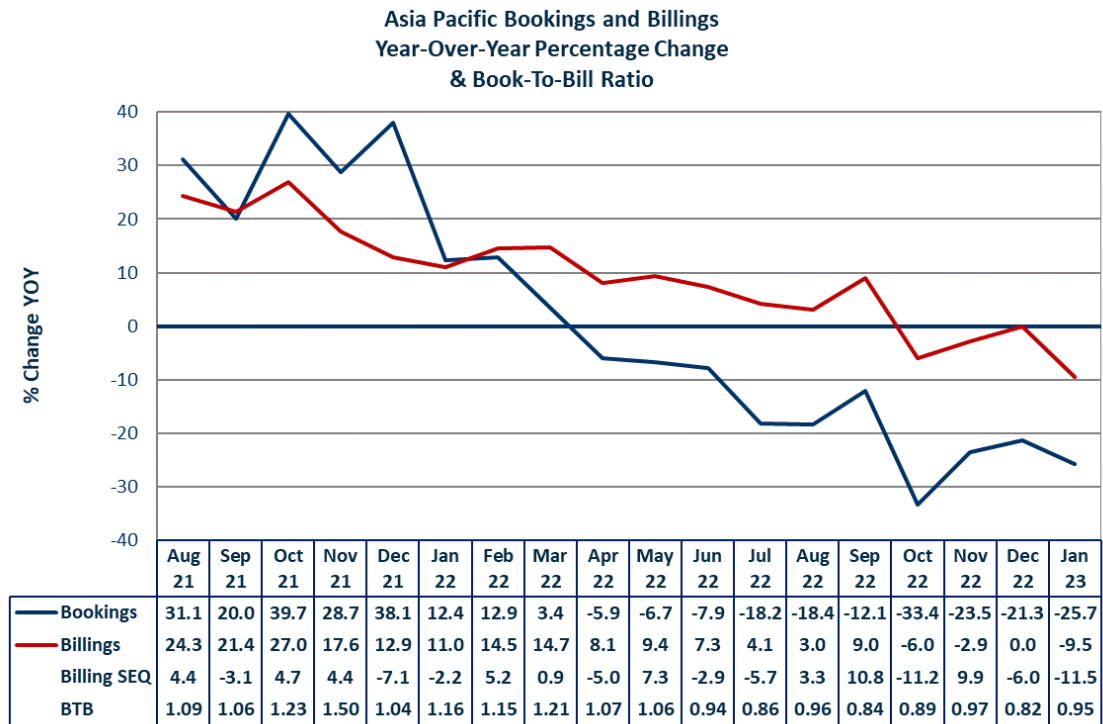
## China Performance

- China's sales decreased -18.1% YOY and orders decreased -33.6% YOY. The BTB was 0.91. Sequentially, sales declined -14.9% in January.
- 4Q22 GDP grew 2.9% YOY and 0% sequentially. For the full year, GDP grew 3.0%, the second slowest pace since 1976.
- Industrial production grew 1.3% YOY in December.
- China's manufacturing PMI was up slightly to 49.2 in January.
- Retail sales fell 1.8% YOY in December.
- Exports from China decreased 9.9% YOY in December.
- China's total vehicle sales fell 35% YOY in December.
- The inflation rate increased to 2.1% in January.

## Conclusions

As has been noted in the past, China's economy is slowing. Their headwinds include slowing sales domestically and internationally; recurring outbreaks of COVID variants (and strict lockdowns); supply chain issues; material shortages; power shortages; and political disagreements within the CCP. They did not achieve their GDP goal (5.5% growth) for 2022. Although China has loosened their COVID rules and restrictions, these headwinds are already affecting connector industry growth in China, and is anticipated to continue making 2023 a difficult year.

**Asia Pacific:** The following chart displays the year-over-year percentage change in bookings and billings for the last 18 months. The monthly book-to-bill ratio is also displayed.



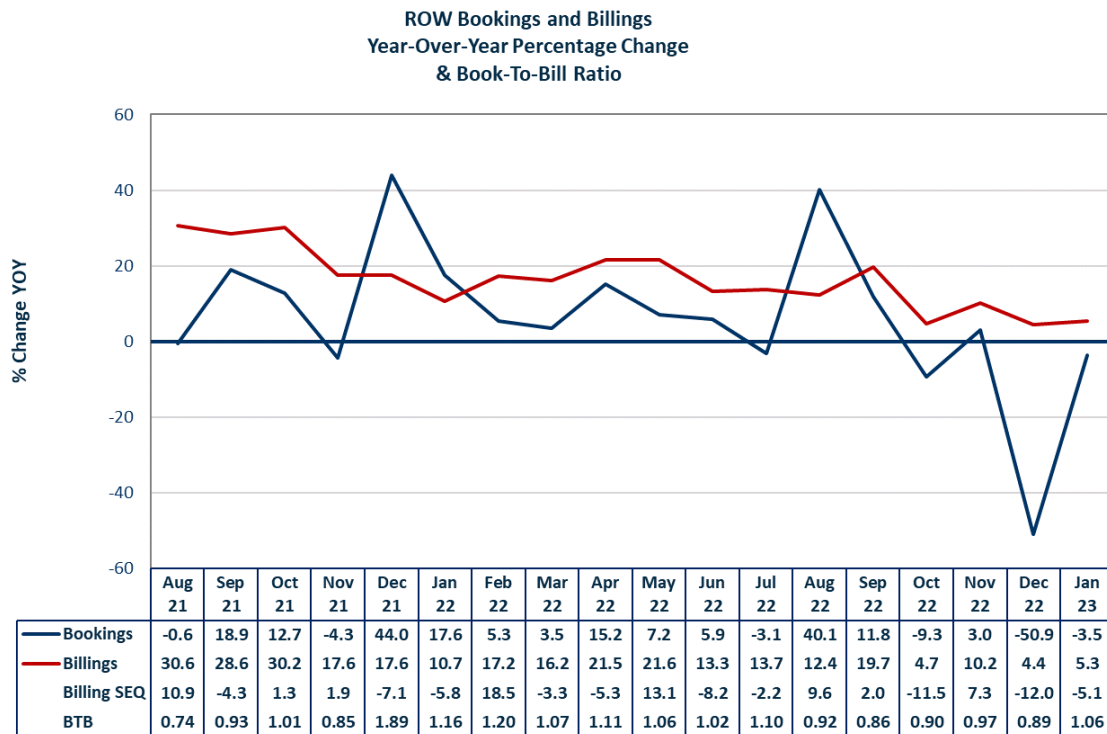
## Asia Pacific Performance

- Orders were down -25.7% in January and sales were down 9.5% YOY. The book-to-bill ratio was 0.95. Sequentially, sales decreased -11.5%.
- India's industrial production grew 4.3% YOY in December. Exports decreased 4.6% YOY in January. Electrical and electronic equipment only represents 4.8% of total exports. The manufacturing PMI decreased to 55.4 in January. Inflation in January increased to 6.52%.
- South Korea's industrial production fell 7.3% YOY in December. Exports decreased 16.6% YOY in January. Electrical and electronic equipment comprise 31% of their exports. The manufacturing PMI was 48.5 in January. Inflation increased to 5.2% in January.

## Conclusions

India's and South Korea's economies continue to grow YOY but not robustly. South Korea's connector sales have a positive outlook with growth anticipated in the electronics and automotive industries. India's economic growth has been weak. India has a smaller connector market than South Korea, reducing the impact on regional connector sales.

**Rest of World:** The following chart displays the year-over-year percentage change in bookings and billings for the last 18 months. The monthly book-to-bill ratio is also displayed.



## Rest of World Performance

- Orders decreased -3.5% and sales increased +5.3% YOY in January. Sequentially, sales in the region decreased -5.1%. The book-to-bill ratio was 1.06.
- Brazil's industrial production declined 1.3% YOY and the inflation rate decreased to 5.77% in December. The manufacturing PMI rose to 47.5 in January. The unemployment rate declined to 8.1% in November.
- Russia's economic data is still reported as unreliable.

## Conclusions

The region continues to experience growth within their connector industries. For the third time since November of 2020, YOY sales did not exhibit double-digit growth.

We anticipate that slowing economic growth in both countries will adversely affect connector growth in 2023. The black swan event for the region is Russia's invasion of Ukraine and the economic sanctions imposed by many NATO and Western countries on Russia. We anticipate a continued contraction of the Russian economy in the coming months although they are not a large connector market due in part to the majority of their connector sales being captive.

## Industry Backlog Contracts Slightly

The industry is currently shipping \$1,615 million/week. The January 2023 ending backlog is \$22,725 million, or 14.1 weeks.

The following table displays the industry backlog for January 2023.

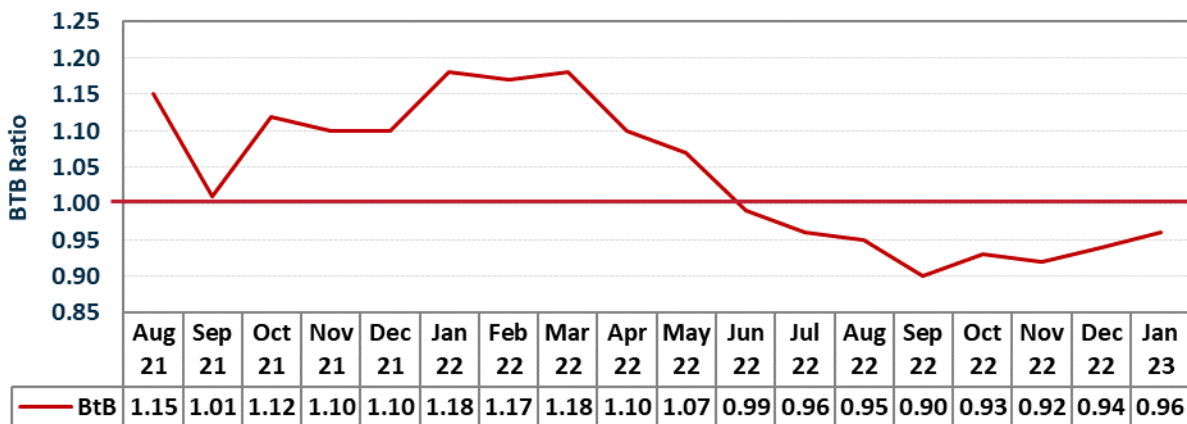
**Industry Backlog**

	2021	2022	Jan 2023
BtB Ratio	1.14	1.01	0.96
Beginning Backlog	\$10,530	\$21,499	\$22,983
Bookings	\$88,910	\$85,575	\$6,203
Billings	\$77,991	\$84,091	\$6,461
Ending Backlog	\$21,499	\$22,983	\$22,725
Backlog in Weeks	14.3	14.8	14.1

\$ Millions

The industry has reported eight consecutive months of below 1.00 book-to-bill ratios. This is shown in the following graph. January's BTB ratio is 0.96 to 1.00.

**Connector Industry Book-to-Bill**



The book-to-bill ratio has been below 1.00 for eight consecutive months beginning in June 2022.

## Ending Backlog Since May 2022

Month	Ending Backlog	BTB Ratio
May	\$26,373	1.07
June	\$26,302	0.99
July	\$26,036	0.96
August	\$25,673	0.95
September	\$24,846	0.90
October	\$24,396	0.93
November	\$21,828	0.92
December	\$22,983	0.94
January	\$22,725	0.96

\$ Millions

It is evident that demand is slowing:

- January 2023 orders were down -20.3% and sales were down -2.3%.
- The book-to-bill ratio has been below 1.0 for eight consecutive months (see above chart).
- The semiconductor industry has reported four consecutive months of year-over-year sales declines.
- The two largest connector companies, TE and Amphenol, both forecast first calendar quarter sales to result in small declines year-over-year.

## **2023 Outlook: A Historical Perspective**

One method of forecasting is analyzing what has happened in the past and using that analysis to project future results. This section uses past sales results to estimate the range of possible sales outcomes for 2023.

Over the past fifteen years (2008-2022), January has averaged 7.5% of full year sales. Assuming the historical average were to repeat, January 2023 sales results would indicate annual sales of \$86,147 million. This would be a growth of +2.4% over 2022 sales of \$84,091 million.

Another approach is to determine the most, and least, January sales has represented of the full year sales. The following table presents this analysis and findings.

### **2023 Forecast Range**

	Historical Range		
	High	Avg	Low
Jan Historical Sales %	7.1%	7.5%	8.0%
Jan Actual Sales	\$6,461	\$6,461	\$6,461
Full Year Forecast	\$91,000	\$86,147	\$80,763
2022 Actual Sales	\$84,091	\$84,091	\$84,091
<b>% Increase/Decrease</b>	<b>8.2%</b>	<b>2.4%</b>	<b>-4.0%</b>

**\$ Millions**

The following table summarizes the analysis including the Bishop forecast for 2023.

Category	2023 Forecast	% Growth
15 Year High	\$91,000	8.2%
15 Year Average	\$86,147	2.4%
Bishop Forecast	\$85,700	1.9%
15 Year Low	\$80,763	-4.0%

**\$ Millions**

Therefore, using the historical method, the industry will achieve 2023 sales in the range of +8.2% growth to -4.0% decline. Since demand is clearly slowing, we are forecasting growth of +1.9%, the low end of historical possible outcomes.

The first time we used the historical forecasting method was in January 2022 (Bishop Report #351). We thought it would be interesting to analyze the forecast versus actual results to determine if the historical method was useful.

The following table was published one year ago in Bishop Report #351.

## **2022 Forecast Range**

	Historical Range		
	High	Avg	Low
January Sales %	7.1%	7.5%	8.0%
Actual Sales	\$6,410	\$6,410	\$6,410
Full Year Forecast	\$90,282	\$85,467	\$80,125
2021 Actual Sales	\$77,991	\$77,991	\$77,991
<b>% Increase</b>	<b>15.8%</b>	<b>9.6%</b>	<b>2.7%</b>

**\$ Millions**

The following table reports the historical forecast, the Bishop forecast and the actual 2022 final results.

## **As of January 2022**

Category	2022 Forecast	% Growth
15 Year High	\$90,282	15.8%
15 Year Average	\$85,467	9.6%
2022 Actual	\$84,091	7.8%
Bishop Forecast	\$82,450	5.7%
15 Year Low	\$80,125	2.7%

**\$ Millions**

So, one year ago, the January historical average forecast sales of \$85,467 million, or sales growth of +9.6%. The industry actually achieved sales of \$84,091 million, growth of +7.8%.

We believe this methodology provides some value. Therefore, we will continue to share these findings with the industry.

## **Strong U.S. Dollar Reduces Growth from -2.3% in USD to -6.1 in Local Currencies**

The dollar has been strengthening against the euro, the yen, and the yuan. The following table measures the impact for January 2022 versus January 2023 and shows results for these three currencies.

### **Local Currency to One USD January 2022 versus January 2023**

<b>Currency</b>	<b>2022</b>	<b>2023</b>	<b>% Change</b>
Euro	0.8830	0.9276	5.1%
Yuan	6.3557	6.7967	6.9%
Yen	114.8422	130.2022	13.4%

Europe, China, and Japan account for approximately 60% of world connector sales. Currency fluctuation against the US dollar can have a significant impact on our reporting of sales performance in US dollars.

The following table shows January YTD sales performance by region in US dollars and local currencies.

### **Industry Sales Performance YTD January 2023 USD-vs-Local Currencies**

<b>Region</b>	<b>U.S.\$</b>	<b>Local Currency</b>
North America	6.2%	6.2%
Europe	10.7%	5.1%
Japan	-8.1%	-20.4%
China	-18.1%	-23.8%
Asia Pacific	-9.5%	-9.5%
ROW	5.3%	5.3%
<b>World</b>	<b>-2.3%</b>	<b>-6.1%</b>

Connector sales are 3.8 percentage points lower when stated in local currencies rather than in US dollars, putting industry performance at -6.1% growth in January (versus -2.3% in US dollars). This is the result of a stronger US dollar, on average, compared to the three primary currencies. This clearly shows no real growth in Europe, China, and Japan in unit volume.

## **Significant Events**

### **Infinite Electronics Acquires Bulgin Ltd**

Infinite Electronics Inc. has acquired Bulgin Ltd, a UK-based developer and manufacturer of connectors and related components for harsh-environment applications. Bulgin was previously owned by Equistone Partners Europe. Bulgin has a century of experience designing, developing, and manufacturing IP66, IP67, IP68, and IP69K harsh environment connectivity solutions for end-users across a wide range of industries. Bulgin's business focuses on bespoke services and custom capabilities with quick prototyping and a Rapid Response Team (RRT) to address customers' urgent needs. Since Equistone's acquisition of the business in 2019, Bulgin has grown significantly, opening a new site in Tunis, Tunisia, and new headquarters in Cambridge, U.K. Today, Bulgin has more than 600 distributor locations spanning 60 countries and six continents. It employs 680 people globally, including its U.K. headquarters, operations in Tunisia, and Santa Fe Springs, California, as well as a presence in the Asia-Pacific region.

### **Capvis Acquires Majority Interest in SCHURTER**

The Lucerne-based SCHURTER Group, owned by the Schurter family since its founding, announced a change in the company's ownership structure. Capvis, a well-known Swiss investor company based in Baar (canton of Zug), is acquiring a majority interest in SCHURTER Holding AG. The transaction is expected to be completed in spring 2023 following the necessary (European) regulatory approval process. "Capvis offers the ideal basis for keeping SCHURTER on its growth path. Capvis is known for advancing the development of successful, internationally active companies together with the management team," said Thomas Schurter, chairman of the board of directors. Capvis specializes in holding majority interests in leading SMEs in Switzerland, Germany, Austria, and Italy. It predominantly invests capital provided by institutional investors such as pension funds, asset managers, and family offices. The international trade press has repeatedly named Capvis the top private equity company in Switzerland. The Schurter family will remain an important shareholder in the group, which will continue to be managed by the existing management team led by CEO Ralph Müller. In line with the Capvis strategy, he will also be taking a stake in the company. SCHURTER, a producer of components for the clean and safe supply of power, input systems, and sophisticated integrated electronic solutions, has 20 subsidiaries in 17 countries. It generated revenues of around CHF 330 million in the 2022 financial year.

### **Phoenix Contact Group Acquires iS5 Communications**

The Phoenix Contact Group has acquired Canadian company iS5 Communications Inc., based in Mississauga, Ontario. The provider of industrial network products specializes in services and solutions for critical infrastructure networks. Cybersecurity and data analysis play a strategically vital role in this field. iS5 Communications was established in 2012 and currently employs more than 40 people who specialize in bringing IIoT and IT together and who have significant engineering expertise. Phoenix Contact invested in the company in 2018 through its venture capital company, Phoenix Contact Innovation Ventures, as part of its round of financing at the time. Building on this, product development and joint sales activities have already been initiated through the participation of Phoenix Contact USA Inc.

### **Indium Forms New Partnerships**

Indium Corporation has formed a strategic partnership with two materials distributors in Europe to better serve the company's customers in Sweden, Denmark, and Finland. ABIC Kemi AB will serve Indium Corporation's solder paste, wire, flux, and engineered solder materials markets in Sweden and Denmark; Lindberg & Lund OY AB will serve these markets in Finland. ABIC is part of the Lindberg & Lund group, which operates in Norway, Finland, Denmark, and Sweden, and consists of Lindberg & Lund AS, Lindberg & Lund OY AB, and ABIC Kemi AB. ABIC Kemi AB and the Lindberg & Lund group are in turn part of Biesterfeld Spezialchemie GmbH, a leading distributor of special chemical products for technical applications. ABIC Kemi AB is a distributor and supplies materials for joining and sealing, composite structures, models, prototypes and tools,

electric power and electronics, lubricants, and oils. The Lindberg & Lund Group imports, manufactures, and distributes lubricants, construction adhesives, solvents, composite materials, castings, and auxiliaries to the industry.

## **Phoenix Contact Announces Leadership Changes**

Phoenix Contact announced the promotion of Davis Mathews and Heath Scoggin as the new leadership team for Phoenix Contact Development and Manufacturing Inc. Mathews and Scoggin will lead the Industry Management and Automation (IMA) and Industrial Components and Electronics (ICE) business areas, respectively. In addition, Mathews will lead the company's overall development efforts, and Scoggin will lead the company's overall manufacturing efforts. The promotions follow the retirement of David Skelton, who served as vice president of the Development and Manufacturing company since it was founded in 2005.

## **Allied Electronics & Automation Rebrands as RS**

Allied Electronics & Automation, the main trading brand of RS Group plc in the Americas, has rebranded as RS. This rebranding will elicit new opportunities to help industrial customers overcome challenges and further enhance the company's user-friendly, technology-enabled customer experience in the region. Rebranding Allied as RS is RS Group's latest effort to consolidate the products, services, and experience of its trusted global brands under a single, unified RS brand identity. This will provide exciting new opportunities to improve efficiencies, generate sustainable value, and increase scalability for stakeholders worldwide. Customers in the Americas, extending from small single-site businesses to global multi-site companies, will continue to enjoy access to more than 750,000 stocked industrial and electronic products and a wide portfolio of service solutions for design, procurement, inventory, and maintenance. "Allied earned a reputation as a leading distributor of industrial products and services in North America and was recognized for being reliable and committed to solving our customers' problems. RS is founded on these same core values, so aligning under the banner of RS extends our ability to deliver value for our customers," said Jessie Dearien, RS Vice President of Marketing, Americas. "Being part of the global RS team will enable us to leverage our expertise and experience across the Group. Our aim is to think bigger, make the impossible possible, become the first choice for our stakeholders, and make amazing happen for a better world."

## **Wieland Acquires Hummock Industries**

With the acquisition of Hummock Industries, Wieland has acquired Heyco Metals, a leader in light and medium gauge copper, copper alloy, and stainless-steel strip processing, and National Bronze, a manufacturer and distributor of bronze-based bearing products. Hummock Industries is a family-owned holding company focused on long-term investments in North American-based manufacturing companies. These complementary operations will further strengthen Wieland's market position with expanded product offerings, manufacturing capabilities, and distribution networks in North America. Heyco Metals, founded in 1969, operates a re-roll mill in Reading, Pennsylvania, and delivers premium quality products to customers in the automotive, electronics, industrial, and medical markets. Founded in 1911 and headquartered in Roseville, Michigan, National Bronze is a well-known U.S. manufacturer and distributor of bronze bushings, bearings, and other industrial components for customers in a large range of industries. In addition, it operates a metal service center with bar stock of various non-ferrous materials.

## **Auxo Investment Partners Acquire Morgan Royce Industries**

Private investment firm Auxo Investment Partners announced today that it has acquired Morgan Royce Industries (MRI) and TACK Electronics (TACK), two manufacturers of custom wire harnesses, cable assemblies and box builds fabricated for the semiconductor equipment, aerospace and defense, gaming, medical, transportation and energy equipment industries. These additions follow Auxo's purchase of Golden State Assembly—a vertically integrated, complete lifecycle wire/cable assembly and harness manufacturer—and expand Auxo's growing wire platform. The respective CEOs of MRI and TACK, Larry Johnston and Todd

Maines, will remain in their current roles. MRI, headquartered in Fremont, California, manufactures wire harnesses and box builds—complete assemblies of cables, electronic components, and metal/plastic housings—for the semiconductor manufacturing equipment industry. The company also serves customers in the medical equipment, telecommunications, and power industries. TACK, based in Grand Rapids, Michigan, is a manufacturer of wire harnesses, cable assemblies and box builds that specializes in high-mix/low-volume products for a variety of industries, including aerospace and defense, gaming, medical, transportation and battery/energy equipment.

## **China's Smartphone Market Fell 13.2% to a Decade Low in 2022**

According to the IDC Worldwide Quarterly Mobile Phone Tracker, 285.8 million smartphones shipped in China in 2022, down 13.2% year-on-year (YoY) to below the 300 million mark for the first time in ten years. In 4Q22, the market declined 12.6% YoY to 72.9 million units.

Both full-year 2022 and 4Q22 shipments were near their decade-ago levels as the strict COVID policy and the economic slowdown discouraged demand. Even though smartphones are nearly ubiquitous in China today, the full-year market size neared the level ten years ago when two out of five mobile phone shipments were still feature phones.

## **India Wearable Market Ships 100mn Units in 2022, Growing by 47% YoY, Says IDC**

The India wearable market exited 2022 with a strong 46.9% YoY (year-over-year) growth, as shipments reached 100 million units according to the recent data from the International Data Corporation's India Monthly Wearable Device Tracker. 4Q22 (Oct-Dec) saw 25.2-million-unit shipments registering a 16.5% YoY growth. The second half of 4Q22 saw a cyclical dip in demand, following high shipments in the first half. The earwear category remained flat, while smartwatches grew by 73.6% YoY in 4Q22.

The second half of the year (Jul-Dec), accounting for more than 60% of the annual shipments, saw several new product launches ahead of the festival season combined with offers/discounts across channels. The share of smartwatches grew from 17.9% in 2021 to 30.7% in 2022.

Smartwatch (inclusive of basic and advanced) shipments were 30.7 million in 2022, a growth of 151.3% YoY. The Smartwatch ASPs continue to decline, at US \$42.5 (vs US \$61.2 a year ago). Basic smartwatches continue to dominate with a 95.5% share, growing by 158.0% annually in 2022. Wristbands declined for another year with -73.2% YoY, with shipments dropping to half a million.

Earwear category, with the lowest ASP globally at US \$19.8, accounts for 68.7% of the overall wearables category with 28.0% YoY shipment growth in 2022. Within earwear, Truly Wireless (TWS) dominates with a 55.3% share growing by 87.1% YoY, tethered grew by meagre 1.9%, while over-the-ear declined by more than 50% in 2022.

## **Chromebook Shipments Fall as Consumers Cut Spending**

Global Chromebook shipments plunged 48 percent year-on-year to 19.2 million units last year, as consumers tightened their belts amid an economic downturn, International Data Corp (IDC) said in a report on Friday last week.

Total shipments plummeted to 19.2 million units from 2021, when sales surged 180.5 percent year-on-year to 36.9 million units, bolstered by demand for remote learning at the height of the COVID-19 pandemic, IDC said.

Fourth-quarter shipments declined 24.3 percent from a year earlier to 3.6 million units, marking six straight quarters of declines, as PC sales came under pressure from weaker work-from-home and online learning demand as the COVID-19 pandemic eased, IDC data showed.

Even though the pandemic has brought about positive changes to Chromebook adoption and market watchers believe such devices would continue to play a fundamental role in education, consumer spending has weakened in the face of a slowing economy and still-high inflation worldwide.

“While Chromebooks have faced a tough few quarters, the excess channel inventory that had built up is starting to subside and could potentially lead to more normalized growth in the coming quarters as back-to-school season returns,” IDC mobility and consumer device research manager Jitesh Ubrani said in a statement.

“However, any traction that Chromebooks made outside the education sector will continue to suffer, as the economy stalls and as tablets and PCs supplant Chrome-based devices,” Ubrani said.

PC vendor Acer Inc last year ranked first in the global Chromebook market, although the company only shipped 4.2 million units, 33.8 percent less than a year earlier, IDC data showed.

That gave the Taiwanese firm a 22 percent market share in the year, up from 17.3 percent in 2021.

Dell Technologies Inc was second with shipments of 4.1 million, down 24.3 percent from the previous year, for a market share of 21.3 percent.

Lenovo Group Ltd placed third with 3.7 million units, dipping 54.4 percent year-on-year, for a market share of 19.5 percent.

HP Inc ranked fourth, with shipments of 3.5 million units, down 65.6 percent, followed by Asustek Computer Inc, which shipped 1.3 million units, 20.9 percent less than in 2021, IDC data showed.

The two secured market shares of 18.4 percent and 6.8 percent respectively, IDC said.

## **India's PC Shipments Fall by Nearly 30% in 4Q22**

India saw a steep fall in traditional PC shipments, and with inventories still high, the market is bracing for another demand drop in the current quarter. Even Apple, which stood out in India for the past quarters, may not be immune to the weak demand.

According to IDC, 14.9 million PCs were shipped in 2022, up a marginal of 0.3% annually. The fourth-quarter PC shipment dropped 28.5% year-on-year from 4.1 million units to 2.93 million units.

India's PC demands for 2022 were driven by the government and education segments, which saw annual growth of 117.6% and 28.3%, respectively. Despite the shipment growth from desktops and workstations, notebook shipments - the largest demand engine in India's PC market - dropped by 8.4% year-on-year due to softening demand across all segments, including commercial and consumer markets.

According to Bharath Shenoy, senior market analyst at IDC India, PC demands saw strong double-digit growth in the first half of 2022 but tapered off and plunged in the year's second half.

## **Self-driving Cars Would be a Climate Disaster**

A recent study by researchers at the Massachusetts Institute of Technology measured the energy consumed by powerful onboard computers that serve as the brains of autonomous vehicles. They found that widespread global adoption of self-driving cars would generate an additional 0.14 gigatons of greenhouse gas emissions per year—as much as the nation of Argentina.

The researchers highlighted a serious problem, one that has received scant attention in discussions about our supposedly autonomous future. Still, the authors didn't frame their conclusion as an indictment of self-driving cars, but as a reason to build AV computers that are less thirsty for power. "This has the potential to become an enormous problem," Soumya Sudhakar, a coauthor of the study, told *Dezeen*. "But if we get ahead of it, we could design more efficient autonomous vehicles that have a smaller carbon footprint from the start."

I hate to be the bearer of bad news, but Sudhakar is too optimistic. Even with a miraculous reduction in their computers' energy consumption, self-driving cars are poised to send global emissions skyrocketing. Assuming AV technology ultimately works (admittedly a big "if"), a 160-year-old theory of human behavior suggests it will compel people to drive much more than they otherwise would have, generating emissions as they go. Importantly, that will be true even if AVs are also EVs, running on electric power rather than gasoline. Although EVs emit no tailpipe emissions, they still produce greenhouse gas through the generation of electricity needed to charge their batteries, as well as from their manufacturing processes.

When you consider the net effect of many more miles driven, without combined trips, the problem of power-hungry AV computers looks like a modest part of a much larger problem. Even if the computer efficiency challenge is "solved," self-driving cars would be a climate catastrophe.

## **Indonesia's Smartphone Market Ended 2022 Down 14.3%**

Indonesia's smartphone market declined for the first time after 13 years of growth, as it dropped 14.3% year over year (YoY) to 35 million units in 2022 according to International Data Corporation's (IDC) Worldwide Quarterly Mobile Phone Tracker. The decline completely wiped out growth from the past three years, as market size came down to 2018 – 2019 levels. In 4Q22, the market declined 17.6% YoY, accompanied by a 3.9% quarter over quarter (QoQ) growth, reaching 8.5 million units. The quarterly growth was mostly driven by product releases and promotional efforts, although consumer demand was still subdued.

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## What's New ?

Bishop & Associates has recently completed several new research reports about the worldwide connector industry. A table of contents for each report can be found at <https://store.bishopinc.com>.

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