The Bishop Report
Performance and Forecast of the World Connector Industry

Issue No. 359 | 4th Quarter 2022 | October 2022

Sales Up +15.5% in September But Order Demand is Soft

Regional Performance:
World sales are up +9.9% YTD in September.

In September, North America achieved the highest regional sales growth at +18.2% YTD.

ROW has the highest YTD growth in bookings at +8.7%.

Industry Outlook:
With backlog decreasing significantly, we are forecasting Q4 sales equaling $19,902 million. Bishop's 2022 sales forecast is for $83,822 million, up +7.5% over 2021 sales.

Industry Backlog:
September backlog was $24,846 million equaling 14.8 weeks. This is a decrease of $827 million from August.

2022 Currency Impact:
The industry grew +9.9% YTD in September in USD and 0.1% in local currencies. Sales growth is 9.8 percentage points lower when stated in local currencies.

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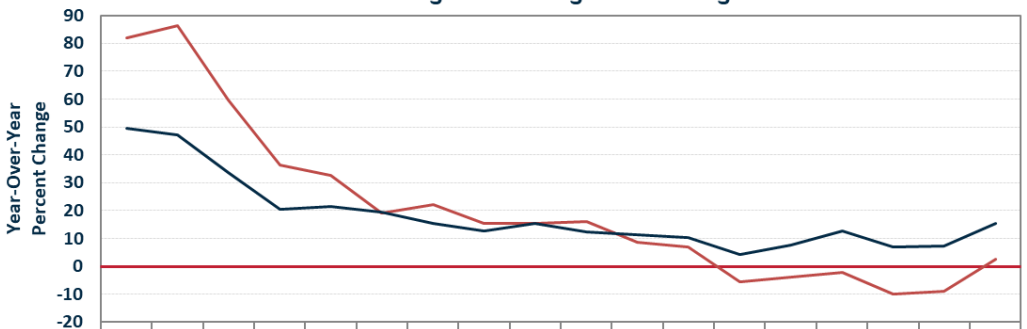
September bookings were up +2.6% but Q3 booking were down -5.6%. Billings were up +15.5%, continuing a 25-month string of growth, that has been generally trending down. Backlog decreased by $827 million in September to approximately 14.8 weeks.

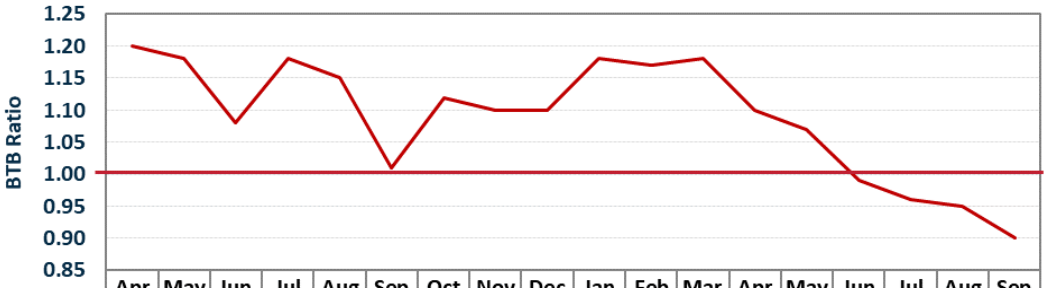
Bookings and Billings YOY Change



	Apr 21	May 21	Jun 21	Jul 21	Aug 21	Sep 21	Oct 21	Nov 21	Dec 21	Jan 22	Feb 22	Mar 22	Apr 22	May 22	Jun 22	Jul 22	Aug 22	Sep 22
Bookings	81.9	86.4	59.7	36.4	32.5	19.1	22.1	15.3	15.5	15.9	8.7	7.1	-5.5	-3.9	-2.1	-9.9	-8.8	2.6
Billings	49.5	47.1	33.5	20.6	21.5	19.4	15.3	12.8	15.5	12.4	11.2	10.2	4.1	7.7	12.7	7.1	7.3	15.5

The book-to-bill ratio in September was 0.90 and YTD was 1.05.

Connector Industry Book-to-Bill

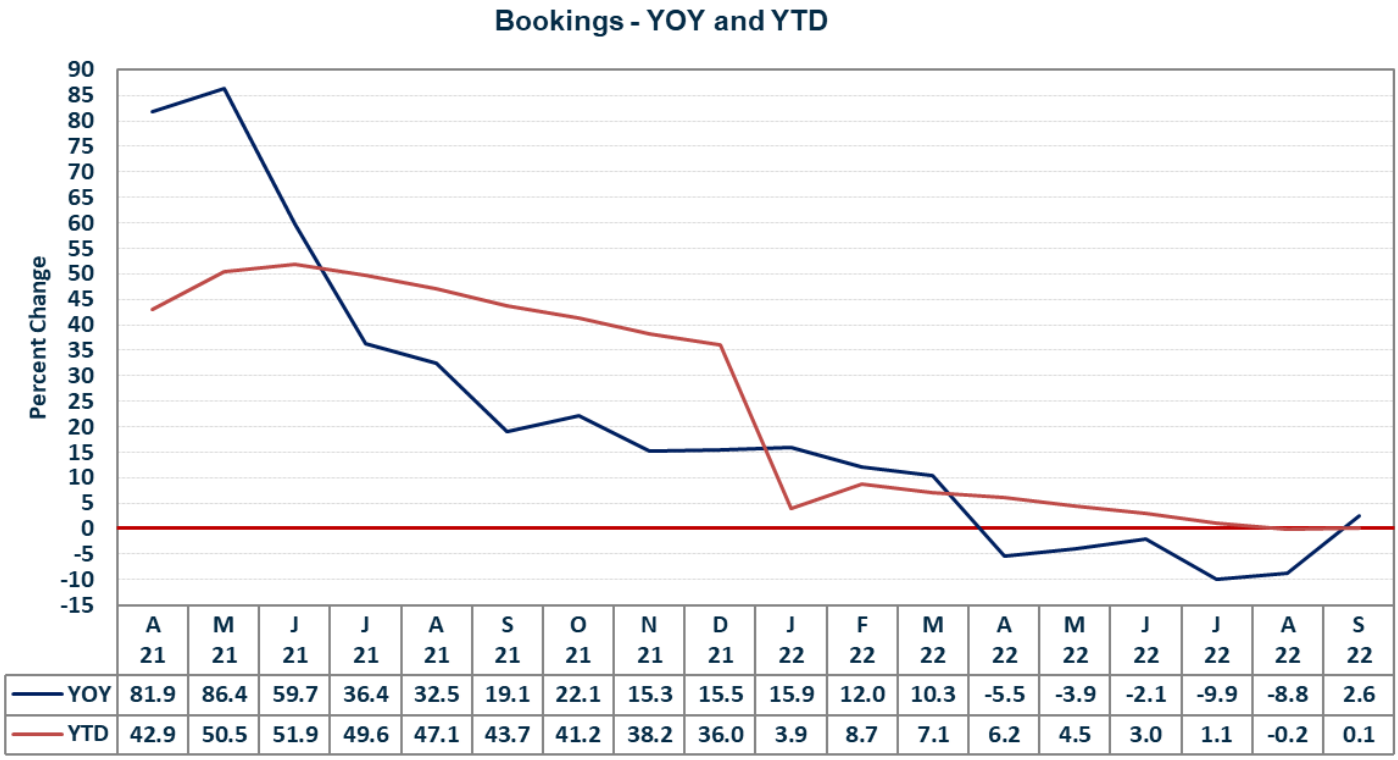


	Apr 21	May 21	Jun 21	Jul 21	Aug 21	Sep 21	Oct 21	Nov 21	Dec 21	Jan 22	Feb 22	Mar 22	Apr 22	May 22	Jun 22	Jul 22	Aug 22	Sep 22
BtB	1.20	1.18	1.08	1.18	1.15	1.01	1.12	1.10	1.10	1.18	1.17	1.18	1.10	1.07	0.99	0.96	0.95	0.90

Booking Highlights and Conclusions

Sequential, Year-Over-Year, and Year-To-Date Bookings Percentage Change – 2020/2021/2022

	Sequential			Year-Over-Year			Year-To-Date		
Month	2020	2021	2022	2020	2021	2022	2020	2021	2022
Jan	0.2%	2.3%	2.6%	3.9%	24.7%	15.9%	3.9%	24.7%	15.9%
Feb	5.5%	17.7%	10.4%	1.8%	38.9%	8.7%	2.8%	32.0%	12.0%
Mar	-1.4%	-3.5%	-5.3%	5.0%	34.5%	7.1%	3.5%	32.8%	10.3%
Apr	-27.2%	3.2%	-8.5%	-21.8%	81.9%	-5.5%	-2.7%	42.9%	6.2%
May	2.9%	5.1%	7.0%	-24.8%	86.4%	-3.9%	-7.3%	50.5%	4.5%
Jun	7.0%	-8.3%	-6.7%	-11.6%	59.7%	-2.1%	-8.0%	51.9%	3.0%
Jul	15.2%	-1.9%	-9.6%	-1.0%	36.4%	-9.9%	-7.0%	49.6%	1.1%
Aug	10.7%	6.6%	8.0%	1.8%	32.5%	-8.8%	-5.8%	47.1%	-0.2%
Sep	-0.9%	-11.9%	-1.0%	8.4%	19.1%	2.6%	-4.3%	43.7%	0.1%
Oct	4.7%	6.8%		13.0%	22.1%		-2.6%	41.2%	
Nov	15.2%	9.3%		17.5%	15.3%		-0.6%	38.2%	
Dec	-7.2%	-7.0%		18.3%	15.5%		1.0%	36.0%	



	A 21	M 21	J 21	J 21	A 21	S 21	O 21	N 21	D 21	J 22	F 22	M 22	A 22	M 22	J 22	J 22	A 22	S 22
YOY	81.9	86.4	59.7	36.4	32.5	19.1	22.1	15.3	15.5	15.9	12.0	10.3	-5.5	-3.9	-2.1	-9.9	-8.8	2.6
YTD	42.9	50.5	51.9	49.6	47.1	43.7	41.2	38.2	36.0	3.9	8.7	7.1	6.2	4.5	3.0	1.1	-0.2	0.1

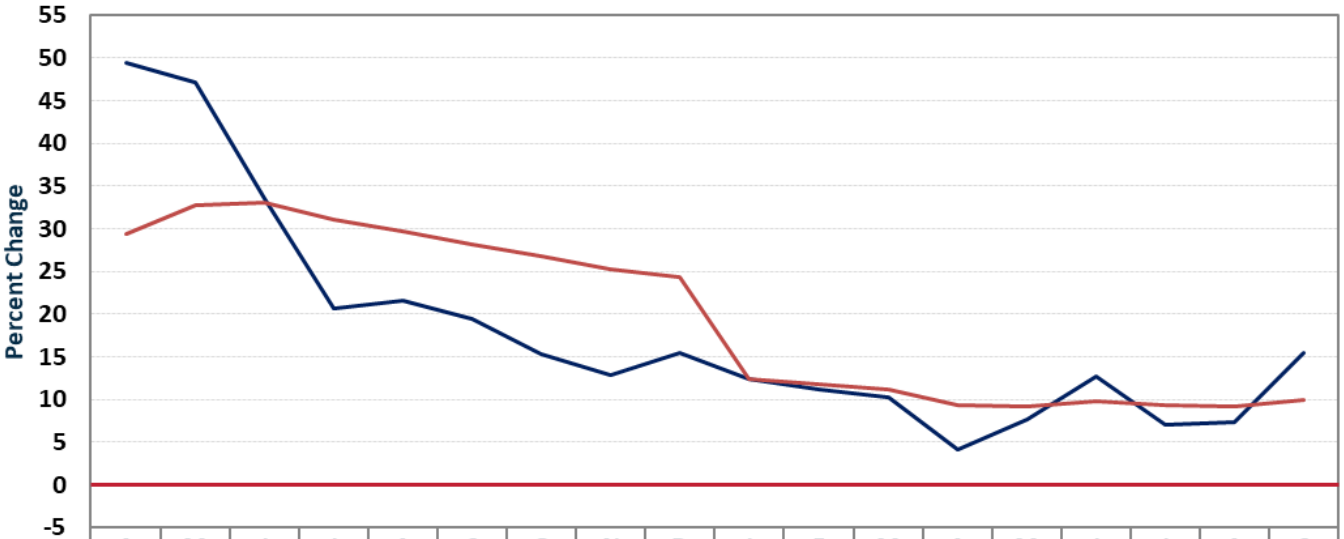
- September bookings increased +2.6% YOY. Bookings are up +0.1% YTD.
- Orders decreased -1.0% sequentially.
- 3Q22 bookings decreased -5.6% YOY.
- The book-to-bill ratio for September was 0.90, the lowest ever recorded by Bishop. The YTD ratio is 1.05.

Billing Highlights and Conclusions

Sequential, Year-Over-Year, and Year-To-Date Billings Percentage Change – 2020/2021/2022

	Sequential			Year-Over-Year			Year-To-Date		
Month	2020	2021	2022	2020	2021	2022	2020	2021	2022
Jan	-2.8%	-1.6%	-4.3%	-3.1%	19.0%	12.4%	-3.1%	19.0%	12.4%
Feb	5.5%	12.6%	11.4%	-4.3%	26.7%	11.2%	-3.7%	22.9%	11.8%
Mar	-0.9%	-1.1%	-2.0%	-2.0%	25.5%	10.2%	-3.1%	23.8%	11.2%
Apr	-21.2%	-1.2%	-6.6%	-19.9%	49.5%	4.1%	-7.2%	29.4%	9.4%
May	8.8%	7.0%	10.7%	-20.0%	47.1%	7.7%	-9.9%	32.8%	9.1%
Jun	5.8%	-3.8%	0.7%	-11.6%	33.5%	12.7%	-10.2%	33.0%	9.8%
Jul	9.0%	-2.0%	-7.1%	-1.6%	20.6%	7.1%	-9.0%	31.0%	9.4%
Aug	9.0%	8.7%	8.9%	-0.3%	21.5%	7.3%	-7.8%	29.7%	9.1%
Sep	1.7%	-2.3%	5.1%	5.0%	19.4%	15.5%	-6.3%	28.2%	9.9%
Oct	-1.0%	-3.4%		7.6%	15.3%		-4.9%	26.8%	
Nov	11.4%	9.4%		9.1%	12.8%		-3.6%	25.2%	
Dec	-7.7%	-5.6%		13.4%	15.5%		-2.2%	24.3%	

Billings - YOY and YTD



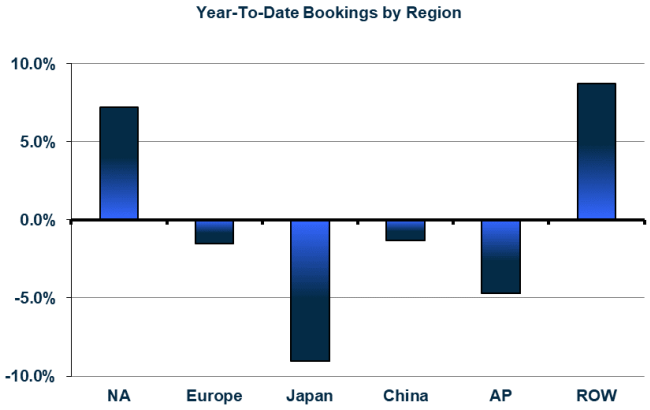
	A 21	M 21	J 21	J 21	A 21	S 21	O 21	N 21	D 21	J 22	F 22	M 22	A 22	M 22	J 22	J 22	A 22	S 22
YOY	49.5	47.1	33.5	20.6	21.5	19.4	15.3	12.8	15.5	12.4	11.2	10.2	4.1	7.7	12.7	7.1	7.3	15.5
YTD	29.4	32.8	33.0	31.0	29.7	28.2	26.8	25.2	24.3	12.4	11.8	11.2	9.4	9.1	9.8	9.4	9.1	9.9

- September billings increased +15.5% YOY. YTD, billings are up +9.9%.
- Sequentially, billings increased +5.1% in September.
- 3Q22 sales were up +10.0% YOY.

Regional Performance: BOOKINGS

September 2022 Bookings

Region	Sequential	YOY	YTD
NA	-6.6%	4.6%	7.2%
Europe	2.5%	8.3%	-1.5%
Japan	2.1%	-15.5%	-9.1%
China	0.0%	6.0%	-1.3%
AP	1.9%	-12.1%	-4.7%
ROW	-4.4%	11.8%	8.7%
Total	-1.0%	2.6%	0.1%

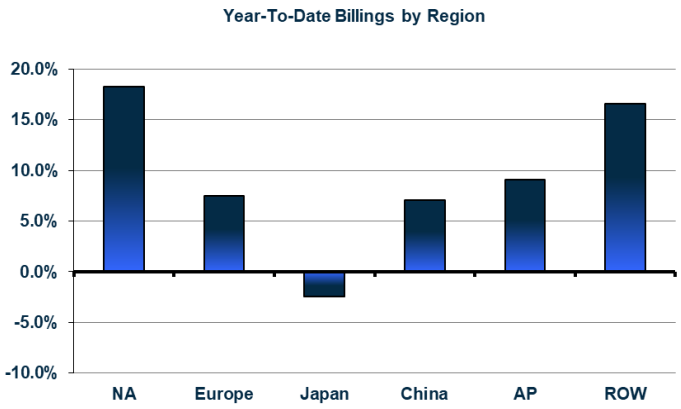


- September bookings increased +2.6% YOY.
- North America and ROW were the only regions achieved growth in September.
- Japan's YOY growth was down the most at -15.5% followed by Asia Pacific and ROW.
- The book-to-bill ratio was 0.90. This is the lowest overall ratio that Bishop has ever recorded.

Regional Performance: BILLINGS

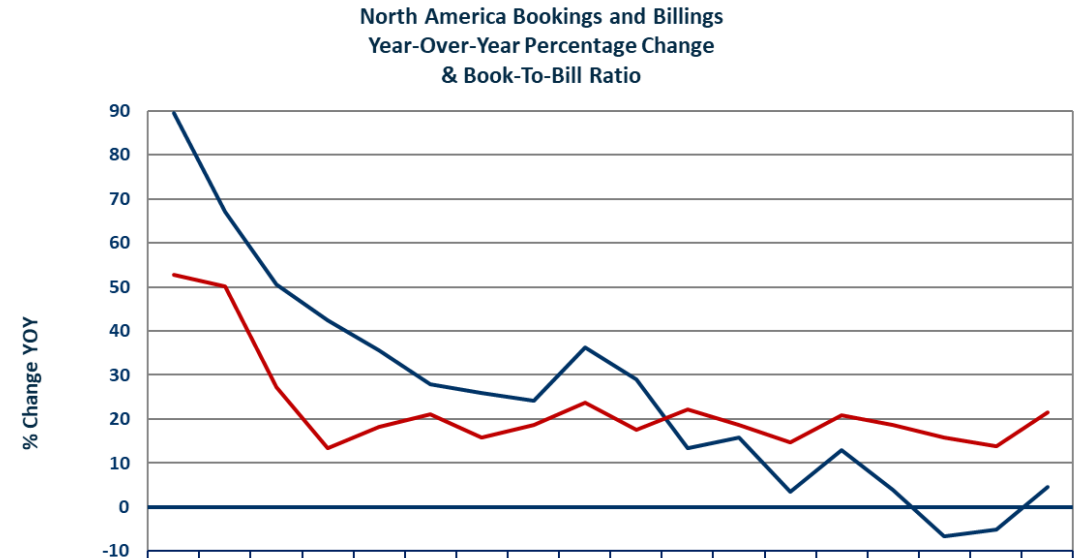
September 2022 Billings

Region	Sequential	YOY	YTD
NA	1.2%	21.6%	18.2%
Europe	13.1%	21.7%	7.5%
Japan	0.9%	-4.9%	-2.5%
China	2.9%	9.9%	7.1%
AP	4.2%	10.8%	9.0%
ROW	2.0%	19.7%	16.6%
Total	5.1%	15.5%	9.9%



- September connector sales increased +15.5% YOY. The industry is up +9.9% YTD with all regions, except Japan, showing growth.
- All regions grew sequentially.
- Even though industry growth is +9.9% year-to-date, performance in local currencies is only +0.1%. Given the 8.5% average inflation rate in US dollars, this likely means that growth measured in units is negative.

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.



	Apr 21	May 21	Jun 21	Jul 21	Aug 21	Sep 21	Oct 21	Nov 21	Dec 21	Jan 22	Feb 22	Mar 22	Apr 22	May 22	Jun 22	Jul 22	Aug 22	Sep 22
Bookings	89.5	67.0	50.5	42.4	35.5	28.0	26.0	24.2	36.2	29.1	13.3	15.8	3.5	13.0	4.0	-6.7	-5.0	4.6
Billings	52.7	50.1	27.2	13.4	18.2	21.1	15.8	18.7	23.7	17.6	22.2	18.6	14.8	20.8	18.6	15.9	13.8	21.6
Billing SEQ	0.4	8.2	23.7	-1.2	14.9	-5.3	-4.4	7.8	-1.9	-6.9	19.1	-4.6	-7.2	14.5	-6.6	-3.9	12.7	1.2
BTB	1.23	1.13	1.18	1.16	1.13	1.01	1.14	1.11	1.07	1.25	1.10	1.16	1.11	1.06	1.04	0.94	0.95	0.87

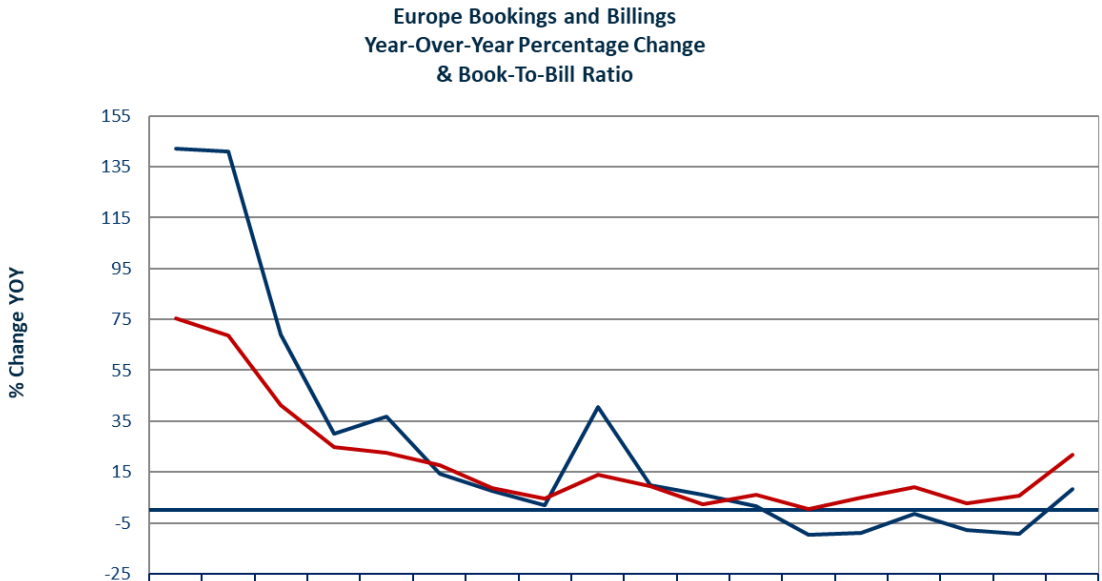
North America Performance

- Sales grew +21.6% and orders were up +4.6% YOY in September. North American billings were up sequentially +1.2%. The book-to-bill was a dismal 0.87.
- 3Q22 US GDP grew 1.8% YOY and was up 2.6% sequentially. The growth was due to sinking imports and rising exports. On the negative side, consumer spending was down from the second quarter.
- US inflation slowed to 8.2% in September primarily due to a slowdown in energy price increases but core inflation is up at a four decade record of 6.6%. The rate has been above 5% for 16 months.
- Industrial production increased 5.3% YOY in September.
- Manufacturing PMI was down to 49.9 in September marking the first contraction since June 2020.
- US unemployment was down to 3.5% in September.
- Retail sales were up 8.2% YOY in September.
- Housing starts were down 8.1% YOY in September and existing home sales were down 1.5% YOY.
- US automotive sales in September increased 7.7% YOY according to Cox Automotive.

Conclusions

Higher prices/inflation, continuing supply chain issues, rising interest rates, an unstable financial market, and the situation in Ukraine are a few of the headwinds. The production of new vehicles is still slow due to the shortage of semiconductors. China's "zero COVID" initiative is continuing to hamper manufacturing and logistics worldwide. These issues are negatively impacting the connector industry worldwide.

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.



	Apr 21	May 21	Jun 21	Jul 21	Aug 21	Sep 21	Oct 21	Nov 21	Dec 21	Jan 22	Feb 22	Mar 22	Apr 22	May 22	Jun 22	Jul 22	Aug 22	Sep 22
Bookings	142.2	141.2	69.2	29.9	36.8	14.5	7.6	2.1	40.4	9.9	6.0	1.5	-9.8	-9.0	-1.5	-7.7	-9.3	8.3
Billings	75.4	68.7	41.4	25.0	22.5	17.6	8.8	4.6	13.9	9.6	2.4	6.2	0.6	5.0	9.1	2.8	5.6	21.7
Billing SEQ	-5.3	10.3	45.7	-5.5	8.6	-1.8	-7.4	12.5	-9.0	-2.3	21.7	-4.5	-13.1	15.9	-2.9	-11.3	11.9	13.1
BTB	1.23	1.22	1.13	1.14	1.12	0.98	1.08	1.06	1.13	1.18	1.27	1.14	1.10	1.06	1.02	1.02	0.96	0.87

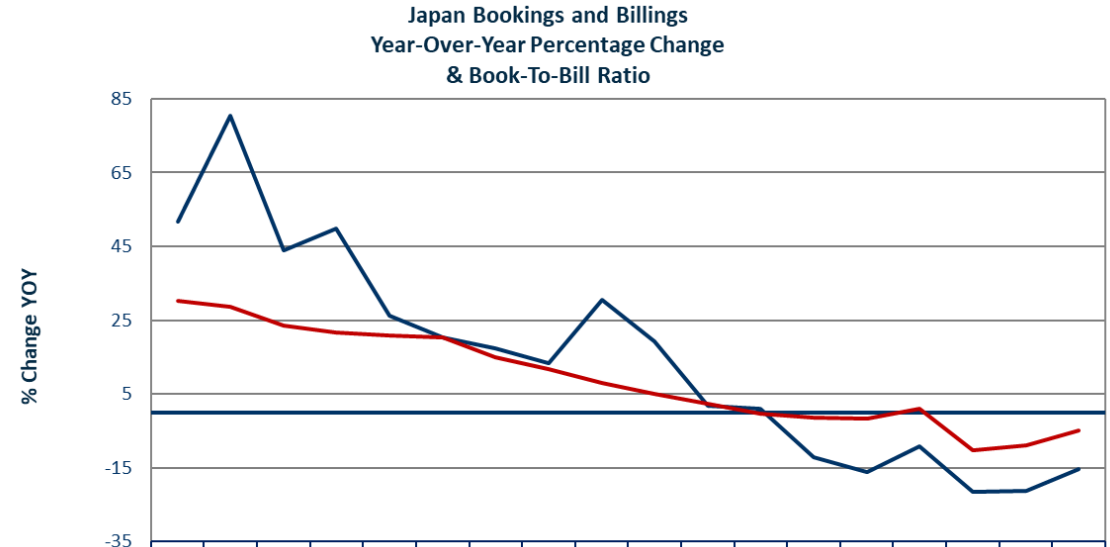
Europe Performance

- YOY billings were up +21.7% and orders were up +8.3%. The book-to-bill ratio was 0.87. Sequentially, sales were up +13.1%.
- 3Q22 GDP grew 2.1% YOY and was up 0.2% sequentially.
- Euro Area industrial production increased 2.5% YOY in August.
- The October manufacturing PMI was down to 46.6 from 48.4 in the prior month.
- Retail sales decreased 2.0% YOY in August.
- The inflation rate in October increased to a record high 10.7%. The largest contributor to the increase was energy. The German inflation rate was a record 11.6%.
- Year-over-year, September new car registrations grew 7.5% YOY but down almost 10% YTD.
- The unemployment rate remained at 6.6% in August.

Conclusions

European new car registrations are down YTD due in large part to the war in Ukraine disrupting the supply chain. Automotive is the largest connector market in Europe. The connector industry appears to be headed for a difficult year in Europe given the ongoing semiconductor shortages, possible energy rationing, high inflation, the situation in the Ukraine, and supply chain issues that will likely continue to dampen results.

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.



	Apr 21	May 21	Jun 21	Jul 21	Aug 21	Sep 21	Oct 21	Nov 21	Dec 21	Jan 22	Feb 22	Mar 22	Apr 22	May 22	Jun 22	Jul 22	Aug 22	Sep 22
Bookings	51.6	80.4	43.9	49.7	26.3	20.4	17.4	13.3	30.5	19.2	1.8	1.0	-12.1	-16.3	-9.1	-21.5	-21.3	-15.5
Billings	30.3	28.7	23.6	21.8	20.8	20.4	15.0	11.6	8.0	4.9	2.4	-0.3	-1.4	-1.8	0.9	-10.3	-8.9	-4.9
Billing SEQ	-2.8	0.3	28.6	1.0	5.4	-3.4	-4.5	9.7	-4.5	-11.1	15.1	-5.0	-5.0	-0.2	4.9	-9.7	7.0	0.9
BTB	1.22	1.23	1.10	1.17	1.10	1.08	1.14	1.13	1.14	1.17	1.12	1.38	1.09	1.05	0.99	1.02	0.95	0.96

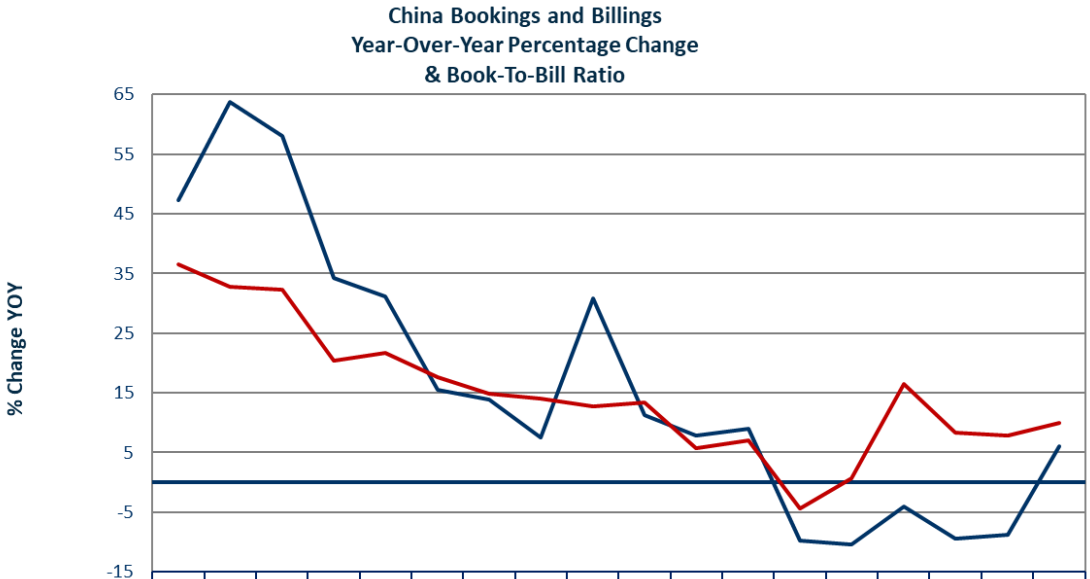
Japan Performance

- Bookings were down -15.5% in September. Sales declined -4.9%, and sequentially were up +0.9%. Japan's book-to-bill ratio was 0.96.
- The inflation rate in September remained at 3.0%.
- Japan's currency has devalued 29.7% against the US dollar thus far in 2022.
- Industrial production increased 9.8% YOY in September.
- September retail sales grew 4.5% YOY.
- Exports were up 9.4% sequentially in September.
- The October manufacturing PMI was 50.7.
- Housing starts increased 1.0% YOY in September.

Conclusions

Until April, Japan's bookings performance primarily was reflecting easy comparisons to 2021 results. The shortage of semiconductors is holding back growth in automotive industry sales in 2022. Billings have been weak for the last seven months primarily due to the devaluation of the yen to the US dollar.

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.



	Apr 21	May 21	Jun 21	Jul 21	Aug 21	Sep 21	Oct 21	Nov 21	Dec 21	Jan 22	Feb 22	Mar 22	Apr 22	May 22	Jun 22	Jul 22	Aug 22	Sep 22
Bookings	47.3	63.8	58.0	34.2	31.1	15.5	13.9	7.5	30.9	11.2	7.9	9.0	-9.7	-10.4	-4.0	-9.4	-8.7	6.0
Billings	36.5	32.7	32.3	20.4	21.7	17.6	14.8	14.1	12.8	13.4	5.8	7.0	-4.4	0.6	16.5	8.3	7.8	9.9
Billing SEQ	-0.4	4.2	28.6	0.3	5.6	0.9	-2.4	11.1	-5.2	-2.7	-3.9	3.2	-15.4	10.3	12.5	-6.6	5.2	2.9
BTB	1.19	1.21	1.14	1.12	1.18	1.00	1.08	1.00	1.03	1.12	1.14	1.22	1.12	1.07	0.94	0.94	1.00	0.97

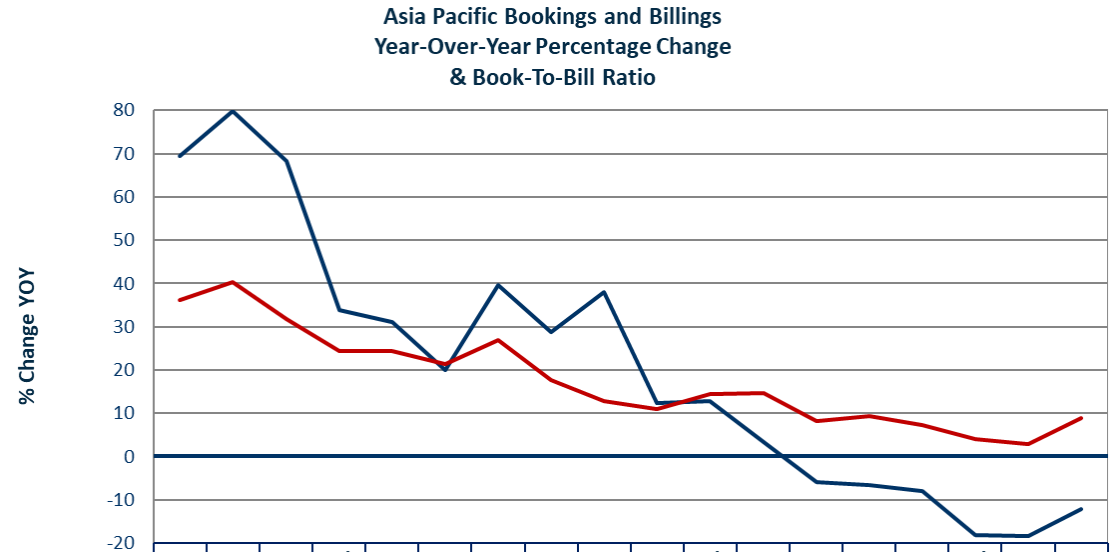
China Performance

- China's sales increased +9.9% YOY and orders increased +6.0% YOY. The BTB was 0.97. Sequentially, sales increased +2.9% in September.
- 3Q22 GDP grew 3.9% YOY and 3.9% sequentially, well below their target of 5.5%.
- Industrial production increased 6.3% YOY in September.
- China's manufacturing PMI declined to 49.2 in October.
- Retail sales increased 2.5% YOY in September.
- Exports from China were up 2.5% sequentially to $323 billion in September and up 5.7% YOY.
- China's total vehicle sales rose 25.7% in August. YTD sales are up 4.4% from prior year.
- The inflation rate declined to 2.8% in September.

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 have already stated that they do not believe they will achieve their GDP goals for 2022. This is likely to impact the growth in the Chinese connector industry for 2022.

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.



	Apr 21	May 21	Jun 21	Jul 21	Aug 21	Sep 21	Oct 21	Nov 21	Dec 21	Jan 22	Feb 22	Mar 22	Apr 22	May 22	Jun 22	Jul 22	Aug 22	Sep 22
Bookings	69.4	80.0	68.3	33.9	31.1	20.0	39.7	28.7	38.1	12.4	12.9	3.4	-5.9	-6.7	-7.9	-18.2	-18.4	-12.1
Billings	36.1	40.3	31.8	24.3	24.3	21.4	27.0	17.6	12.9	11.0	14.5	14.7	8.1	9.4	7.3	4.1	3.0	9.0
Billing SEQ	5.6	5.7	40.6	-2.6	4.4	-3.1	4.7	4.4	-7.1	-2.2	5.2	0.9	-5.0	7.3	-2.9	-5.7	3.3	10.8
BTB	1.23	1.24	1.09	1.09	1.09	1.06	1.23	1.50	1.04	1.16	1.15	1.21	1.07	1.06	0.94	0.86	0.96	0.84

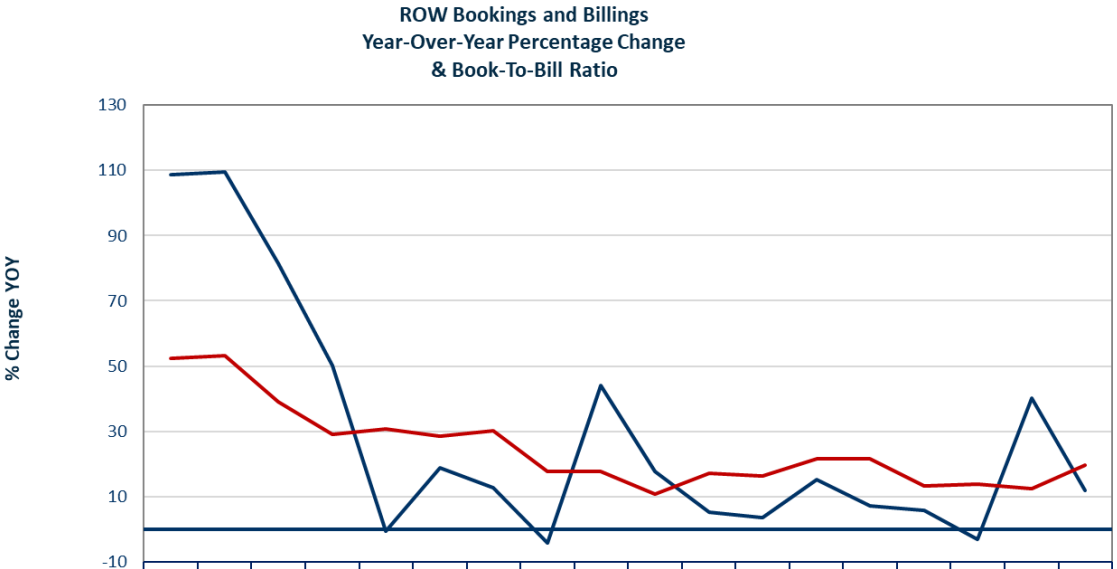
Asia Pacific Performance

- Orders were down -12.1% in September and sales increased +9.0% YOY. The book-to-bill ratio was 0.84. Sequentially, sales increased +10.8%.
- India's industrial production contracted 0.8% YOY in August. Exports increased 4.5% sequentially. Electrical and electronic equipment only represents 4.8% of the exports. The manufacturing PMI increased to 55.3 in October. Inflation in September increased to 7.41%.
- South Korea's 3Q22 GDP was 3.1% YOY and 0.3% sequentially. Industrial production rose 0.8% YOY in September. Exports increased 1.4% sequentially in October and rose 5.7% YOY. Electrical and electronic equipment comprise 31% of their exports. The manufacturing PMI rose to 48.2 in September contracting for the fourth straight month. Inflation decreased to 5.7% in August.

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.



	Apr 21	May 21	Jun 21	Jul 21	Aug 21	Sep 21	Oct 21	Nov 21	Dec 21	Jan 22	Feb 22	Mar 22	Apr 22	May 22	Jun 22	Jul 22	Aug 22	Sep 22
Bookings	108.7	109.6	81.6	50.2	-0.6	18.9	12.7	-4.3	44.0	17.6	5.3	3.5	15.2	7.2	5.9	-3.1	40.1	11.8
Billings	52.5	53.1	38.9	29.1	30.6	28.6	30.2	17.6	17.6	10.7	17.2	16.2	21.5	21.6	13.3	13.7	12.4	19.7
Billing SEQ	-4.0	12.2	41.5	-0.5	10.9	-4.3	1.3	1.9	-7.1	-5.8	18.5	-3.3	-5.3	13.1	-8.2	-2.2	9.6	2.0
BTB	1.17	1.20	1.23	1.29	0.74	0.93	1.01	0.85	1.89	1.16	1.20	1.07	1.11	1.06	1.02	1.10	0.92	0.86

Rest of World Performance

- Orders increased +11.8% and sales increased +19.7% YOY in September. Sequentially, sales in the region increased +2.0%. The book-to-bill ratio was 0.86.
- Brazil's industrial production increased 0.4% YOY in September. The inflation rate decreased to 7.17% in September from 8.73% in the prior month. The manufacturing PMI dropped to 50.8 in October from 51.1 in the previous month. The unemployment rate declined to 9.1% in July.
- Russia's economic data is still reported as unreliable at this point in time.

Conclusions

The region continues to experience growth within their connector industries. Sales have grown in the double-digit range since November 2020.

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.

Third Quarter Industry Results

The connector industry achieved sales in 3Q22 of $22,160 million, up +10.0% in US dollars compared to 3Q21, and up +7.8% sequentially.

The following table shows industry sales by quarter for 2020, 2021, and 2022, actual and forecast. Our full year 2022 forecast is $83,822 million, up +7.5% from prior year.

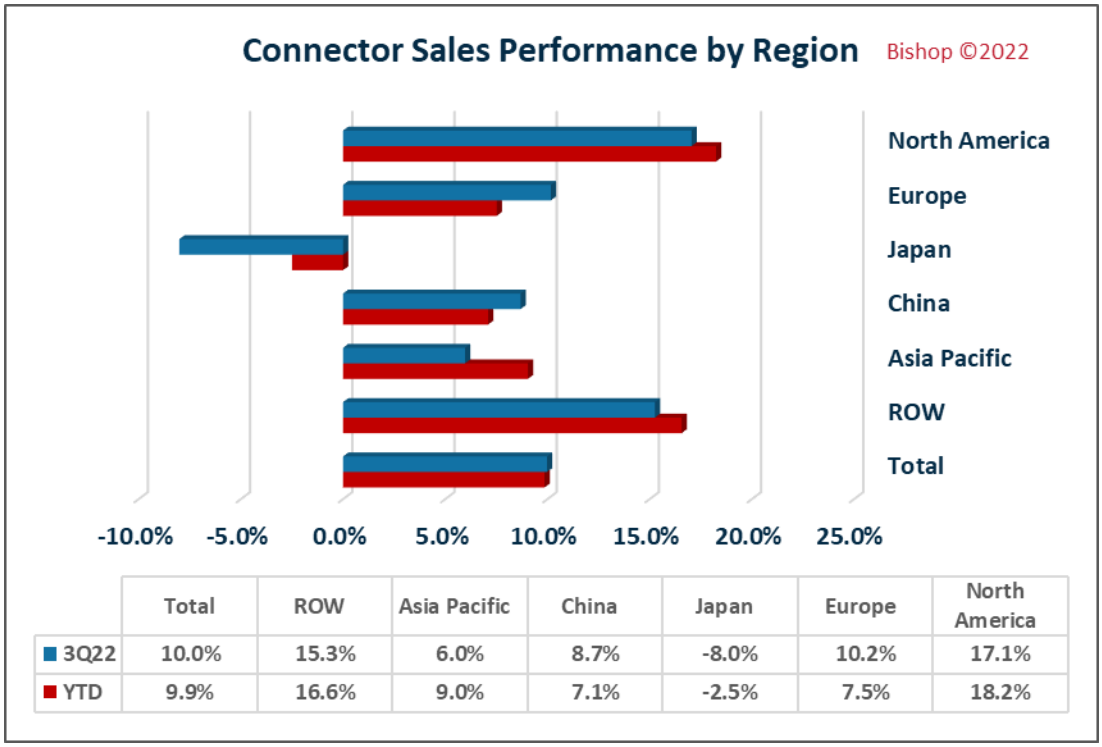
Connector Industry Quarterly Sales Results/Forecast

2020, 2021, and 2022

Quarter	2020 Actual	2021 Actual	YOY Change	2022 Forecast	YOY Change
1Q	$15,397	$19,061	23.8%	$21,200	11.2%
2Q	$13,333	$19,000	42.5%	$20,560	8.2%
3Q	$16,689	$20,150	20.7%	$22,160	10.0%
4Q	$17,308	$19,780	14.3%	$19,902	0.6%
Total	$62,727	$77,991	24.3%	$83,822	7.5%

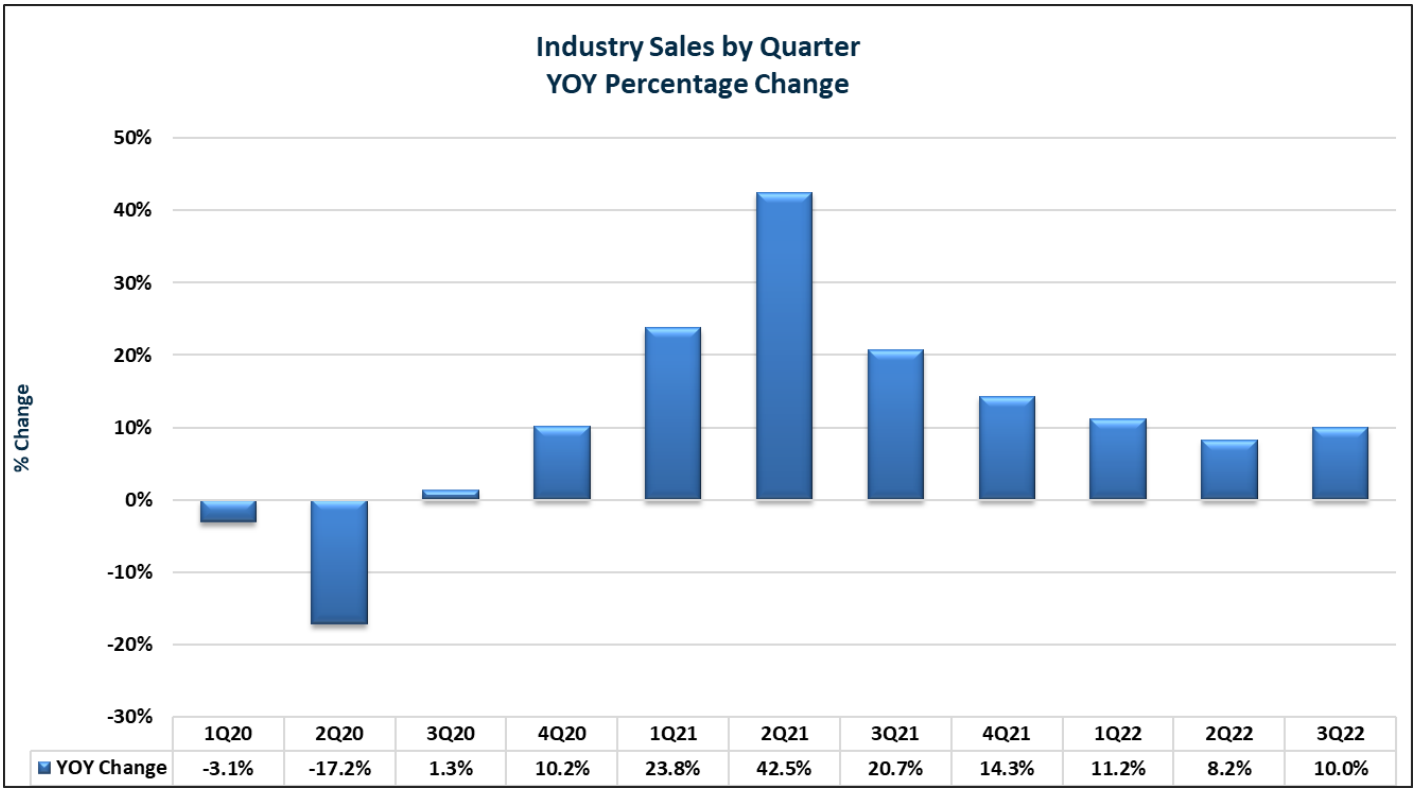
$ Million, Bishop ©2022, Red = Forecast

Year-to-date and YOY sales growth by region in the third quarter of 2022 can be seen in the following chart.



	Total	ROW	Asia Pacific	China	Japan	Europe	North America
3Q22	10.0%	15.3%	6.0%	8.7%	-8.0%	10.2%	17.1%
YTD	9.9%	16.6%	9.0%	7.1%	-2.5%	7.5%	18.2%

Connector industry sales growth by quarter can be seen in the following chart. In the last contraction, the industry contracted for seven consecutive quarters. Prior to that, the industry achieved eleven consecutive quarters of growth. We have now achieved nine consecutive quarters of growth.



Industry Backlog Shrinks

The industry backlog was $24,846 million at the end of September. This is down $827 million from the August backlog of $25,673 million. Based on the industry average weekly sales of $1,682 million, we have 14.8 weeks of backlog.

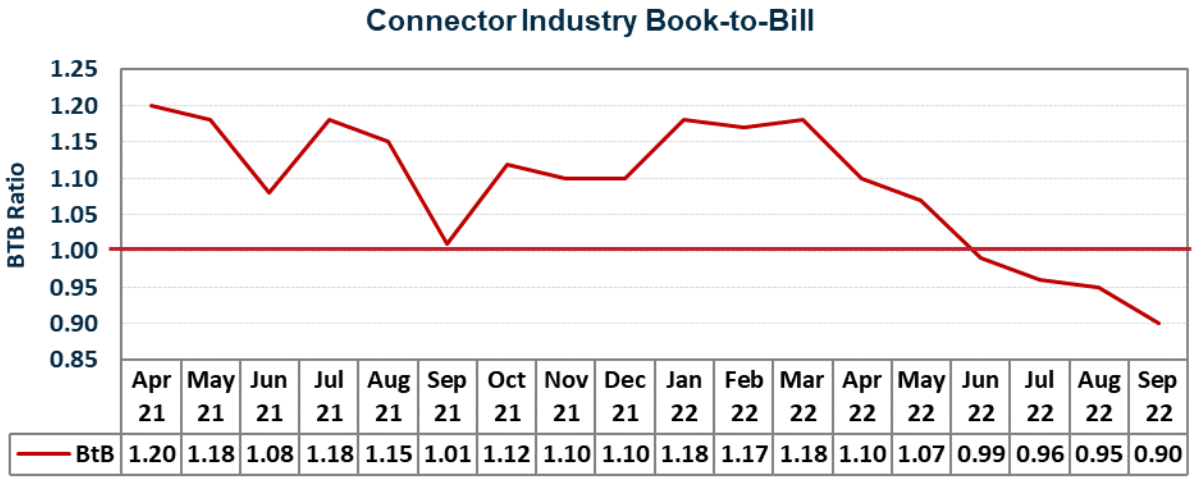
The following table displays the industry backlog year-to-date September 2022. To date, the industry has booked $67,282 million and achieved sales of $63,935 million.

Industry Backlog

	2021	YTD Sep 2022
BtB Ratio	1.14	1.05
Beginning Backlog	$10,530	$21,499
Bookings	$88,910	$67,282
Billings	$77,991	$63,935
Ending Backlog	$21,499	$24,846
Backlog in Weeks	14.3	14.8

$ Millions

The industry has reported four consecutive months of below 1.0 book-to-bill ratios. This is shown in the following graph. Note that September's BTB ratio 0.90 to 1.0. This is the lowest BTB ratio we have ever recorded.



Since the end of May, the backlog has declined $1,527 million.

Ending Backlog Since May

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

$ Millions

Connector demand is slowing down and the fourth quarter will probably continue this trend.

2022 Industry Outlook

Year-To-Date September sales are $63,935 million, up +9.9% from the same period in 2021. When calculated in local currencies, world connector sales are only up +0.1%. When inflation is considered (running over 8% worldwide), sales in units are below 2021 results.

As noted in our analysis of industry backlog, new orders are slowing, and we are starting to use up backlog.

The following table displays new orders by quarter in 2022. Each of the last two quarters resulted in fewer orders. Our fourth quarter order forecast is lower still.

Orders by Quarter

Quarter	Orders	Order Decline	Cumulative
1Q22	$24,921		
2Q22	$21,622	$3,299	$3,299
3Q22	$20,739	$883	$4,182
4Q22F	$18,907	$1,832	$6,014

$ Millions

The above table clearly shows the slow down in order demand. Note that our 4Q22 order forecast is based on our sales forecast of $19,902 million, and our belief that the BTB ratio will be below 1.0; probably around 0.95 ($19,902 x 0.95 = $18,907). This is $6 billion less in orders than booked in the first quarter.

Our full year 2022 forecast is for sales of $83,822 million, up +7.5% over 2021 sales of $77,991 million. We forecast North America as the fastest growing region with sales up +13.6%.

Bishop Forecast by Region

Region	2021	2022	Percent Change
North America	$16,484	$18,719	13.6%
Europe	$16,278	$17,249	6.0%
Japan	$5,276	$5,173	-2.0%
China	$24,978	$26,494	6.1%
Asia Pacific	$11,384	$12,195	7.1%
ROW	$3,590	$3,993	11.2%
Total World	**$77,990.6**	**$83,821.7**	**7.5%**

$ Millions

We will publish our five-year forecast report in the next thirty days. You will receive an email announcing the publication.

Strong U.S. Dollar Reduces Growth from 9.9% in USD to 0.1% in Local Currencies

The dollar has been strengthening against the euro, the yen, and the yuan. The following table measures the impact for September 2021 versus September 2022 and shows results for these three currencies.

Local Currency to One USD
September 2021 versus September 2022

Currency	2021	2022	% Change
Euro	0.8490	1.0082	18.8%
Yuan	6.4578	7.0000	8.4%
Yen	110.1140	142.7805	29.7%

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

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

Industry Sales Performance
YTD September 2022
USD-vs-Local Currencies

Region	U.S.$	Local Currency
North America	18.2%	18.2%
Europe	7.5%	-12.7%
Japan	-2.5%	-31.5%
China	7.1%	-1.9%
Asia Pacific	9.0%	9.0%
ROW	16.6%	16.6%
World	**9.9%**	**0.1%**

Connector sales are 9.8 percentage points lower when stated in local currencies rather than in US dollars, putting industry performance at +0.1% in September (versus +8.4% 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

Qnnect™ Acquires Hermetic Solutions Group

Qnnect™, a portfolio company of Arcline Investment Management, announced the acquisition of Hermetic Solutions Group ("HSG"), expanding Qnnect's offerings into hermetic packages and augmenting its existing portfolio of specialty interconnect solutions. HSG designs and manufactures highly engineered, mission-critical electronic solutions to protect, preserve, and facilitate electronic signal generation and transmission. With the acquisition, Qnnect adds HSG's seven industry-leading brands: Cristek Interconnects, FilConn, Hi-Rel Group, Litron, PA&E, Sinclair, and Zet-Tek Manufacturing.

"Our strategy is to acquire industry-leading manufacturers of connectivity solutions whose technology and customer relationships bring significant long-term growth potential to Qnnect." said Kevin Perhamus, CEO of Qnnect. "HSG's differentiated hermetic solutions and position on premier U.S. defense platforms further cement Qnnect as a leading supplier of critical connectivity solutions. We're excited to welcome the HSG team to our growing portfolio and look forward to working together to best serve our customers."

Molex Expands Manufacturing Operations

Molex is expanding its existing manufacturing operations in Hanoi to include a new 16,000 square meter facility. The company expects the expansion will support over 200 new jobs in advanced high-tech manufacturing. Molex opened its first facility in the country in 2007. The expansion will help support the growing demand for its products in many different applications, including smartphones, TVs, home appliances, test equipment, and medical devices. The fully integrated connector manufacturing facility will feature advanced robotics, high-speed injection molding, stamping, plating, and automated assembly processes along with tooling fabrication and reliability lab testing capabilities. As part of Molex's environmental stewardship initiatives, the expanded facility will feature an on-site solar installation that supports the site's energy needs and reduces greenhouse gas emissions.

TE Connectivity Receives GreenTech Award from SIQT

TE Connectivity, a world leader in connectors and sensors, has earned a GreenTech Award 2022/23 from the Swiss Institute for Quality Testing (SIQT) for the breadth of its recent innovations in sustainable technology.

The award was given to Switzerland-based companies that have distinguished themselves in one of eight sustainability segments defined by the Organization for Economic Co-operation and Development, a global intergovernmental forum created to develop policy standards to promote sustainable economic growth. SIQT, the awarding organization, is an independent market research institute based in Zurich that benchmarks companies against others in their industries.

TE was honored for the number of patents it received, as well as the influence of its advancements on other innovations, in three categories: Energy, Climate-Friendly Production of Goods and Transportation. TE engineers continue to advance technology that enables renewable energy sources, safer and more efficient factories, and electric and automated vehicles.

"Sustainability is an important part of our company's purpose, in how we manufacture our technology and what it enables," said CEO Terrence Curtin. "The work being done by TE's innovators globally is having a positive impact on our world and we are proud to be recognized for it."

SIQT scored each company based on the number of patents from patent offices worldwide from 2020-21, as well as any citations of its patents. Companies with an above average score in at least one of the technology fields were honored as winners of the GreenTech Award 2022/23.

US Factories Prepare for Decreased Demand

The pace of US manufacturing growth in October hit its lowest level in more than two years as new orders remained in contraction territory, backlog fell and demand for exports receded. The Institute for Supply Management's October PMI registered 50.2 percent, 0.7 percentage point lower than September's level of 50.9 percent. That's the lowest figure since May of 2020, when the index read 43.5 percent. U.S. manufacturing is right on the brink of contraction as a PMI above 50.0 indicates growth. But many of the factors constraining factory production have eased significantly. Prices paid by manufacturers fell 5.1 percent, from 51.7 in September to 46.6 percent in October. Supplier deliveries are in "faster" territory for the first time since February 2016, with the deliveries index decreasing by 5.6 percent in October to 46.8 percent. Production increased by 1.7 percent, to 52.3, compared with the September reading of 50.6.

Business activity in the computer and electronics sector has been "flat," according to one executive, and recent data from the ECIA trade association indicates demand for electronic components is dropping. ECIA's electronic component sales trend (ECST) index declined by 6.7 points to 75.6 in October. Measurements below 100 indicate negative sales growth sentiment. The semiconductor index alone collapsed from 96.4 in September to 69.2 in October. The computer and electronics sector fell into contraction territory between September and October, according to the ISM.

Smartphone Market Suffers Fifth Consecutive Decline in Global Shipments in Q3 2022

Worldwide smartphone shipments declined 9.7% year over year to 301.9 million units in the third quarter of 2022 (3Q22), according to preliminary data from IDC. The drop marks the largest-ever third quarter decline and the fifth consecutive quarter of decline for the smartphone market as shipments continue to struggle amidst weakened global demand and economic uncertainties.

"A majority of the decline came from emerging markets where lack of demand, rising costs, and inflation impacted consumers with lesser disposable incomes," said Nabila Popal, research director with IDC's Worldwide Tracker team. "With high inventory coming into the quarter, shipments and orders by OEMs were further reduced in an attempt to deplete inventory. Although Chinese vendors continue to suffer the most, all vendors were impacted, including Samsung and Apple. While Apple is the only vendor to deliver positive growth this quarter, it still faced challenges as its growth was stunted in many markets, including China, due to the poor macroeconomic situation. Looking to 2023, the market's expected recovery, which we continue to believe will happen, will be pushed further into the year. Moreover, we now expect a steeper shipment decline for 2022 and a softer recovery in 2023."

From a regional standpoint, all regions except for Central and Eastern Europe are expected to decline in 3Q22 and for the entire year. Previous expectations for China should remain relatively unchanged at a decline of just over 12% for the quarter. Given the size of China, that has a significant impact on the global results. Developed markets like North America, Western Europe, and Japan will do moderately better, but this still implies low to mid-single-digit declines. Emerging markets in Asia/Pacific, Latin America, the Middle East, and Africa should see a more significant double-digit declines.

Despite the challenging environment, vendor positioning did not change from last quarter. Samsung held the top spot with a 21.2% share, Apple came in second with a 17.2% share, while Xiaomi came in third with a 13.4% share. vivo and OPPO ended the quarter tied***** for the fourth position, each with 8.6% share. Except for Apple, all the top vendors suffered year-on-year declines. However, while Samsung and Xiaomi registered single-digit declines, vivo and OPPO continued to suffer high double-digit decreases.

Tablet and Chromebook Shipments Continued to Decline in Q3 Amidst Ongoing Market Headwinds
Worldwide tablet shipments were down 8.8% year over year in the third quarter of 2022 (3Q22), totaling 38.6 million units, according to preliminary data from IDC. This was the fifth straight quarter of decline for the tablet market. Chromebook shipments also struggled in 3Q22, falling to 4.3 million units and a year-over-year decline of 34.4%. Both markets have now shifted from supply constrained industries to ones that are demand challenged as consumer and education spending has slowed in the face of economic uncertainties.

Chinese vendors continue to do well in emerging markets where there is low-end demand. Sanctions from many vendors also enabled Chinese vendors like Huawei to perform well in the Russian market. Meanwhile, the emergence of low-priced Chinese OEMs like Realme, Xiaomi, Oppo and others, has fueled strong competition in the lower range devices. However, these gains still couldn't offset the decline experienced by the main tablet vendors.

Apple Cuts iPhone 14 Plus Production by up to 90% on Back of Weak Demand
It seems the iPhone 14 Plus isn't proving as popular as Cupertino had hoped. Following earlier reports that demand for the larger version of the non-Pro handset was low, we're now hearing that Apple has instructed two suppliers to lower production by 90%, less than two weeks after the phone debuted.

According to The Information, citing supply chain sources, Apple has instructed at least one manufacturer in China to immediately stop production of iPhone 14 Plus components while the US company's procurement team reevaluates demand. The publication also reports that two downstream Apple suppliers in China that rely on the parts and assemble them into larger modules are also cutting their production by 70% to 90%. These suppliers are said to be the only ones that make the specific module for iPhones. Apple's decision has reportedly impacted Pegatron, its iPhone assembly partner. The China Times writes that the company announced a new recruitment drive on October 12, but it reversed this decision three days later, announcing the suspension of the recruitment notice in the wake of Apple cutting iPhone 14 Plus production.

Apple only launched the iPhone 14 Plus on October 7, while the iPhone 14 was released on September 16. There were previous reports that Apple had instructed iPhone 14 suppliers to cut production by as many as six million units in the second half of 2022. iPhone 14 sales over the first three days of availability were down 11% in China compared to its predecessor a year earlier, partly due to the country's current economic woes. There have also been reports of Foxconn cutting production of the iPhone 14/Plus in favor of the Pro models.

Despite many of today's consumers being fans of phones with larger screens, it seems paying at least $899 for a 6.7-inch iPhone 14 Plus when they could get an iPhone 14 Pro for $100 more—or a 14 Pro Max for an extra $200—is too big an ask. However, all the reports stress that Apple will still release an iPhone 15 Plus next year.

Worldwide PC Shipments Decline Another 15.0% in the Third Quarter of 2022
Declines continued for the traditional PC market as global shipments totaled 74.3 million units during the third quarter of 2022 (3Q22), according to preliminary results from IDC. Cooling demand and uneven supply have contributed to a year-over-year contraction of 15.0%. However, shipment volumes remain well above pre-pandemic levels when PC volumes were largely driven by commercial refreshes due to the looming end of support for Windows 7.

PC Makers Continue to Struggle with Declining Shipments
Shipments of traditional PCs continued their downward trajectory in the third quarter. According to IDC, global shipments totaled 74.3 million units during the three-month period ending September 30, down 15 percent from the 87.3 million PCs that shipped during the same timeframe a year earlier. Lenovo led the pack with 16.9 million PC shipments, a contraction of 16.1 percent year over year. HP finished in second place with 12.7 million units shipped followed by Dell with 12 million PCs shipped. In fact, each of the top five manufacturers saw shipments

dip compared to the year-ago quarter except for Apple. The Cupertino-based company moved 10.1 million Macs during Q3, a 40 percent increase over the 7.2 million units shipped a year ago.

The traditional PC market isn't the only category that has experienced declines as of late. Gaming monitors are expected to experience the first year-over-year decline ever in 2022 and smartphone shipments continue to fall. Hard drive shipments dropped 33 percent year over year in the second quarter to approximately 45 million units.

China Semiconductor Production Experienced its Largest Ever Decline in August

China's semiconductor industry continues to suffer the effects of strict Covid policies, a struggling economy, and US sanctions. The country saw its largest-ever monthly drop in the production of integrated circuits in August, marking the sector's second consecutive month of decline. The South China Morning Post reports that output of ICs was down 24.7% year-on-year to 24.7 billion units in August, the single largest monthly fall recorded since records began in 1997. Production volume was the lowest on record since October 2020. This is the second month in a row that Chinese IC production has fallen; it was down 16.6% to 27.2 billion units in July. There had been a slight rebound in May and June, the result of lockdowns easing in Shanghai, where many assembly plants are located. The Post notes that a record 3,470 companies in China, including those that use the Chinese word for "chip" in their registered names, brands, or operations, went out of business in the first eight months of the year. With the impact of the most recent US restrictions yet to be felt, there's likely more woe in store for the country's tech industry.

Apple's Tech Supply Chain Shows Difficulties in Cutting Dependence on China

Bloomberg Intelligence estimates it would take about eight years to move just 10% of Apple's production capacity out of China, where roughly 98% of the company's iPhones have been made. American companies have had a growing list of reasons to downgrade their ties with China in recent years. Former President Donald Trump’s tariffs. Beijing’s stringent Covid lockdowns. The US-Sino standoff over Taiwan. Political pressure to “friend-shore” supply chains toward nations aligned with Washington. But breaking up, as the adage goes, is hard to do. That conclusion is evident from a Bloomberg Intelligence analysis of Apple Inc., which is trying to reduce its dependence on China. The Cupertino, California-based company already started producing some iPhone 14 models in India, in an earlier than usual move for new models. And Apple’s largest supplier, Foxconn Technology Group, recently agreed to a $300 million expansion of its production facilities in Vietnam.

Detangling U.S.-China Technology Supply Chain is Challenging, but Not Impossible

The United States’ dependency on Chinese technology supply chains could be reduced by up to 40% by 2030 in key segments, according to a new report from Bloomberg Intelligence (BI). If the United States were to move to lessen its supply chain from China, it could reduce its dependency by at least 20% in a moderate scenario. China’s dominance in chip manufacturing as well as the broader electronics manufacturing services sector (EMS) are marked obstacles for a more significant reduction in Chinese supply chain dominance.

Worldwide Foldable Phone Shipments Will Reach 41.5 million in 2026

IDC expects worldwide shipments of foldable phones, including flip and fold form factors, to reach 13.5 million units in 2022. This represents an increase of 66.6% over the 8.1 million units shipped in 2021. An updated IDC forecast projects that foldable phone shipments will reach 41.5 million units in 2026, with a compound annual growth rate (CAGR) of 38.7% from 2021 to 2026. The healthy growth of the foldable market has been led by Samsung with its Flip and Fold lineup. We expect the newly updated models will outperform their predecessors and grab more consumer attention in the category. The commercial segment of the market remains ripe for utilizing foldables as two-in-one devices that can replace both a phone and a tablet. Although IDC still believes this use case remains a low priority, falling prices and new business use cases make the idea more appealing moving forward. Next year will bring 55.1% growth for foldables with continued double-digit growth throughout the forecast period.

Apple Reluctantly Agrees to TSMC's Price Increases

Recently, TSMC has seen a high level of demand due to many of its customers launching new product lines. Nvidia's RTX 40-series graphics cards hit stores on October 12, and AMD recently released its Zen 4 processors, with RDNA 3 graphics cards soon to follow. While AMD and Nvidia are big names to tech enthusiasts, neither company compares to Apple regarding TSMC's bottom line. Apple accounts for over 25 percent of TSMC's total sales. Nearly all Apple devices use processors supplied by TSMC, showing that it relies heavily on the fabricator. The iPhone 15 is slated to pack a 3nm A17 Bionic chip from the Taiwanese manufacturer. Recently, TSMC announced that starting in 2023, it would institute a six-percent price increase to purchase processing wafers. The company's executives claim that inflation has increased the cost of labor, electricity, and raw materials used to produce wafers. They also note that fab plants are expanding production capabilities and that these higher prices will help TSMC in the long term.

Smart Home Device Growth Slows Along with Global Economy

Consumer buying continues to cool across the globe as macroeconomic issues persist. The slowdown in buying is expected to result in flat growth for smart home device shipments in 2022, according to IDC. Global shipments are expected to remain at 897.4 million with major categories such as smart speakers and TVs facing single digit declines.

"The extreme levels of buying that have taken place since the onset of the pandemic are coming to a close for smart speakers, TVs, and streaming devices as demand for these categories will remain muted until the economy sees some improvement towards 2024," said Jitesh Ubrani, research manager for IDC's Mobility and Consumer Device Trackers. "However, this does present an opportunity for cost saving devices such as smart thermostats and smart lighting as these products can help consumers reduce costs during an otherwise inflationary period."North America will lead the rest of the world in both shipments and value for most of the forecast period, due in part to the region being further along its adoption curve compared to other parts of the world," said Adam Wright, senior research manager, Smart Home and Office Devices. "By 2026, we expect the Asia/Pacific region will overtake North America in shipment volumes. Rising broadband penetration rates and an influx of vendors entering the market in the Asia/Pacific, Latin America, and EMEA regions will significantly contribute to the pace of adoption of smart home devices in these parts of the world."

Apple Supplier Foxconn Says it is 'Cautiously Positive' on Q4

Foxconn, a major supplier of Apple, warned Tuesday it is "cautiously positive" on the outlook for the fourth quarter after record September sales. The Taiwanese company's comments add further fuel to the debate over demand for iPhones in the coming months, given its outsized role in assembling Apple's flagship device. Foxconn said September revenue totaled 822.3 billion new Taiwan dollars ($25.9 billion), up 40.4% year-on-year and 83.2% higher than August, a monthly sales record for the company.

That massive revenue growth was driven by a "new product launch and smooth mass production" as well as strong performance of its smart consumer electronics products division, which includes its key smartphone business. Foxconn does not name its customers, including Apple, in its earnings releases.

Neil Shah, a partner at Counterpoint Research, said Foxconn's record revenue came on the back of "storming demand" for the higher priced iPhone 14 Pro and Pro Max models, which were launched last month.

While Foxconn maintained its full-year outlook, the company said Tuesday it is "cautiously positive" on the outlook for the fourth quarter. "The dynamics of inflation, the pandemic, and the supply chain still need to be closely monitored," Foxconn said.

Micron to Spend up to $100 Billion to Build a Computer Chip Factory in New York

Micron will spend up to $100 billion over at least the next two decades building a new computer chip factory in upstate New York. The announcement comes after the passage of the CHIPS and Science Act of 2022, a federal law championed by Senate Majority Leader Chuck Schumer, D-N.Y., that allocates $52 billion to encourage more domestic semiconductor production. Micron CEO Sanjay Mehrotra credited the passage of the law for making the investment possible, according to the Times. The risks in the U.S.′ reliance on foreign computer chip production became clear during the pandemic, as supply chain issues impacted a wide range of goods. Semiconductors are used in a variety of internet-connected devices, from cell phones to cars to medical devices.

When the CHIPS Act became law, it spurred a wave of investment announcements by semiconductor companies, including Micron, which at the time pledged $40 billion through 2030 for U.S. chip manufacturing, saying it would create up to 40,000 domestic jobs. Qualcomm also committed to buying an additional $4.2 billion worth of chips from GlobalFoundries' plant in New York. Intel had said its plans to invest up to $100 billion in chip manufacturing in Ohio relied heavily on the federal legislation.

Apple iPhone and Other Devices May be Forced to use a Common Charger after EU Lawmakers Approve Rule

European lawmakers approved a new law that would require electronic devices to use a common charger. The European Parliament approved the rule which, if passed, will mean all mobile phones, tablets and cameras sold in the European Union must be equipped with a USB Type-C charging port by the end of 2024. That would affect companies like Apple and others that currently don't use USB Type-C. Apple's iPhone uses its proprietary Lightning charger. In theory, Apple would need to include the common charging type if it were to sell its iPhones in the EU. Apple's newer iPads and MacBooks are already equipped with USB-C ports. The charging rules, which have been more than 10 years in the making, are currently going through the EU legislative process so have not yet come into effect.

The European Commission, the EU's executive arm, agreed on the legislation in June. Now the European Parliament has given it the green light. It is now up to the European Council, which is made up of representatives of governments of EU countries, to give it a final approval before it becomes law. EU lawmakers argue the rules will reduce waste as consumers do not need to buy a new charger every time they purchase a device. The EU said that this will reduce production and the disposal of new chargers. If the law is passed, in theory, consumers would be able to use a Samsung USB Type-C charger to charge their compatible iPhone.

Apple's iPhone Exports from India Set to Double in the Next Year in Diversification Away from China

Apple's iPhone exports from India crossed US$1 billion in the five months since April, signaling the South Asian nation is making progress with its bid to become a force in electronics manufacturing. At the current rate, outbound shipments of India-made iPhones, mainly to Europe and the Middle East, are set to reach US$2.5 billion in the 12 months through March 2023. That's almost double the US$1.3 billion worth of iPhones India exported in the year through March 2022.

From PCs to Cars: Nvidia, Qualcomm and Intel Race to Automotive Semis

Several years back, many of the world's largest semiconductor companies, including Nvidia, Qualcomm, Intel and others started making plans for what they saw as the next big digital device category: the smart connected car. Now, as we start to see the debut of model year 2023 cars with increasingly sophisticated tech-enabled functions, it's becoming clear that those early bets are starting to payoff. Each of these major tech vendors -- all of whom have typically focused on end user computing devices like PCs and smartphones -- are making important inroads into the automotive industry. In fact, each are now starting to highlight signs of the increasing importance that being a car component supplier is having on their respective bottom lines.

Commerce Adds Limits on Exports of Chip Tech to China

The U.S. Department of Commerce (DoC) added limits on exports of chips and related production tools to China, citing national security concerns. Following the announcement, U.S. Senate Majority Leader Chuck Schumer noted he is pressing for further restrictions. The DoC's Bureau of Industry and Security announced rules controlling China's ability to buy or make advanced chips and develop supercomputers. China uses the technology to produce military systems including weapons of mass destruction, as well as improve the effectiveness of its military and commit human rights abuses, according to the BIS announcement. The DoC has announced a series of restrictions on exports of chip technology to China in recent months, including limits on sales of GPUs from Nvidia and AMD. Today's announcement is the latest salvo in a tech war that started during the administration of U.S. President Donald Trump and intensified under current U.S. President Joe Biden. The BIS warned that it can still add more restrictions by moving Chinese companies to its so-called Entity List, effectively blocking their ability to buy semiconductors and production technology.

Military Ground Vehicle Market for Connectors

Military ground vehicles play an important role in today's military operations. They transport troops, fuel, and military supplies to a battlefield that is becoming more and more connected. They can be armored or soft-skinned (un-armored), they can be categorized as tracked or wheeled, light, medium, or heavy duty. They can be used to actively participate in battle or as peace-keeping vehicles. They can even be manned or unmanned. This report focuses on connector opportunities on motorized military ground vehicles and the equipment designed to be used with these vehicles.

A partial listing of the motorized military equipment covered in this report include the vehicles listed below. This report will not provide information on military aircraft (helicopters, drones, propeller aircraft, or jets), spacecraft, or modern soldier equipment.

The following military ground vehicles will be examined:

- Main battle tanks
- Infantry fighting vehicles
- Armored personnel carriers
- Armored combat support vehicles
- Mine protected vehicles
- Light armored vehicles
- Light utility vehicles
- Self-propelled artillery
- Prime movers and trucks
- Unmanned ground vehicles
- Miscellaneous vehicles

It is important to note that most of these vehicles are available with several additional options or layouts based on its initial task. These include radio & intercom systems, digital backbones, anti-IED kits, smoke grenade launchers, anti-armor missile systems, GPS, NBC systems (nuclear, biological, chemical), and RPG netting. Where applicable, this report provides detailed information on these additions, their role and even potential connector opportunities.

In addition to information on the actual vehicle, current and forecast information is provided by region on the types of connectors and cable assemblies used in military ground vehicles. An example of the types of tables found in this report are shown below.

Connectors Used in Military Ground Vehicles
By Region 2020 through 2027
with Five-Year CAGR and Percent Change

Region	2020	2021	Percent Change	2022	Percent Change	2023	Percent Change
North America	$XXX.X	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%
Europe	$XXX.X	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%
Japan	$XXX.X	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%
China	$XXX.X	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%
Asia Pacific	$XXX.X	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%
ROW	$XXX.X	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%
Total World	**$XXX.X**	**$XXX.X**	**Y.Y%**	**$XXX.X**	**Y.Y%**	**$XXX.X**	**Y.Y%**

$ Million

Region	2024	Percent Change	2025	Percent Change	2026	Percent Change	2027	Percent Change	5-Year CAGR
North America	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%	Y.Y%
Europe	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%	Y.Y%
Japan	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%	Y.Y%
China	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%	Y.Y%
Asia Pacific	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%	Y.Y%
ROW	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%	Y.Y%
Total World	**$XXX.X**	**Y.Y%**	**$XXX.X**	**Y.Y%**	**$XXX.X**	**Y.Y%**	**$XXX.X**	**Y.Y%**	**Y.Y%**

$ Million

North American Connectors used in Military Ground Vehicles
By Product Type
2020 through 2027 with Five-Year CAGR

North America	2020	2021	Percent Change	2022	Percent Change	2023	Percent Change
PCB	$XXX.X	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%
Rectangular I/O	$XXX.X	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%
IC Sockets	$XXX.X	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%
RF Coax	$XXX.X	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%
Circular	$XXX.X	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%
Telephone/Telecom	$XXX.X	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%
Fiber Optic	$XXX.X	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%
Terminal Blocks	$XXX.X	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%
Heavy Duty	$XXX.X	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%
Power/High Voltage	$XXX.X	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%
Application Specific	$XXX.X	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%
Other Connectors	$XXX.X	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%
Total	**$XXX.X**	**$XXX.X**	**Y.Y%**	**$XXX.X**	**Y.Y%**	**$XXX.X**	**Y.Y%**

$ Millions

North America	2024	Percent Change	2025	Percent Change	2026	Percent Change	2027	Percent Change	5-Year CAGR
PCB	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%	Y.Y%
Rectangular I/O	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%	Y.Y%
IC Sockets	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%	Y.Y%
RF Coax	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%	Y.Y%
Circular	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%	Y.Y%
Telephone/Telecom	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%	Y.Y%
Fiber Optic	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%	Y.Y%
Terminal Blocks	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%	Y.Y%
Heavy Duty	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%	Y.Y%
Power/High Voltage	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%	Y.Y%
Application Specific	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%	Y.Y%
Other Connectors	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%	Y.Y%
Total	**$XXX.X**	**Y.Y%**	**$XXX.X**	**Y.Y%**	**$XXX.X**	**Y.Y%**	**$XXX.X**	**Y.Y%**	**Y.Y%**

$ Millions

Japanese Cable Assemblies used in Military Ground Vehicles
By Product Type
2021 through 2027 with Five-Year CAGR

Japan	2021	2022	Percent Change	2023	Percent Change	2024	Percent Change
PCB	$XXX.X	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%
Rectangular I/O	$XXX.X	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%
RF Coax	$XXX.X	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%
Circular	$XXX.X	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%
Telephone/Telecom	$XXX.X	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%
Fiber Optic	$XXX.X	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%
Heavy Duty	$XXX.X	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%
Power/High Voltage	$XXX.X	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%
Application Specific	$XXX.X	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%
Other Connectors	$XXX.X	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%
Total	**$XXX.X**	**$XXX.X**	**Y.Y%**	**$XXX.X**	**Y.Y%**	**$XXX.X**	**Y.Y%**

$ Millions

Japan	2025	Percent Change	2026	Percent Change	2027	Percent Change	5-Year CAGR
PCB	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%	Y.Y%
Rectangular I/O	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%	Y.Y%
RF Coax	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%	Y.Y%
Circular	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%	Y.Y%
Telephone/Telecom	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%	Y.Y%
Fiber Optic	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%	Y.Y%
Heavy Duty	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%	Y.Y%
Power/High Voltage	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%	Y.Y%
Application Specific	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%	Y.Y%
Other Connectors	$XXX.X	Y.Y%	$XXX.X	Y.Y%	$XXX.X	Y.Y%	Y.Y%
Total	**$XXX.X**	**Y.Y%**	**$XXX.X**	**Y.Y%**	**$XXX.X**	**Y.Y%**	**Y.Y%**

$ Millions

The following table of contents shows the detail provided in this new report.

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