statistics f!ash

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February 2024

INDUSTRIAL PRODUCTION

- The index measures the monthly evolution of the volume of industrial production (excluding construction). From January 2022 the indices are calculated as annual chain-linked indices instead of fixed base indices. The weighting reference is now year 2023 while, starting from this edition, the reference base is the year 2021=100. Indices are produced according to Ateco 2007 classification (Italian edition of Nace Rev. 2).
- In February 2024 the seasonally adjusted industrial production index increased by 0.1% compared with the previous month. The change of the average of the last three months with respect to the previous three months was -0.7%.
- The calendar adjusted industrial production index decreased by 3.1% compared with February 2023 (calendar working days being 21 versus 20 days in February 2023).
- The unadjusted industrial production index increased by 0.4% compared with February 2023.

CHART 1. INDUSTRIAL PRODUCTION, SEASONALLY ADJUSTED INDEX AND THREE-MONTH MOVING AVERAGE
January 2019 – February 2024 (index, 2021=100)

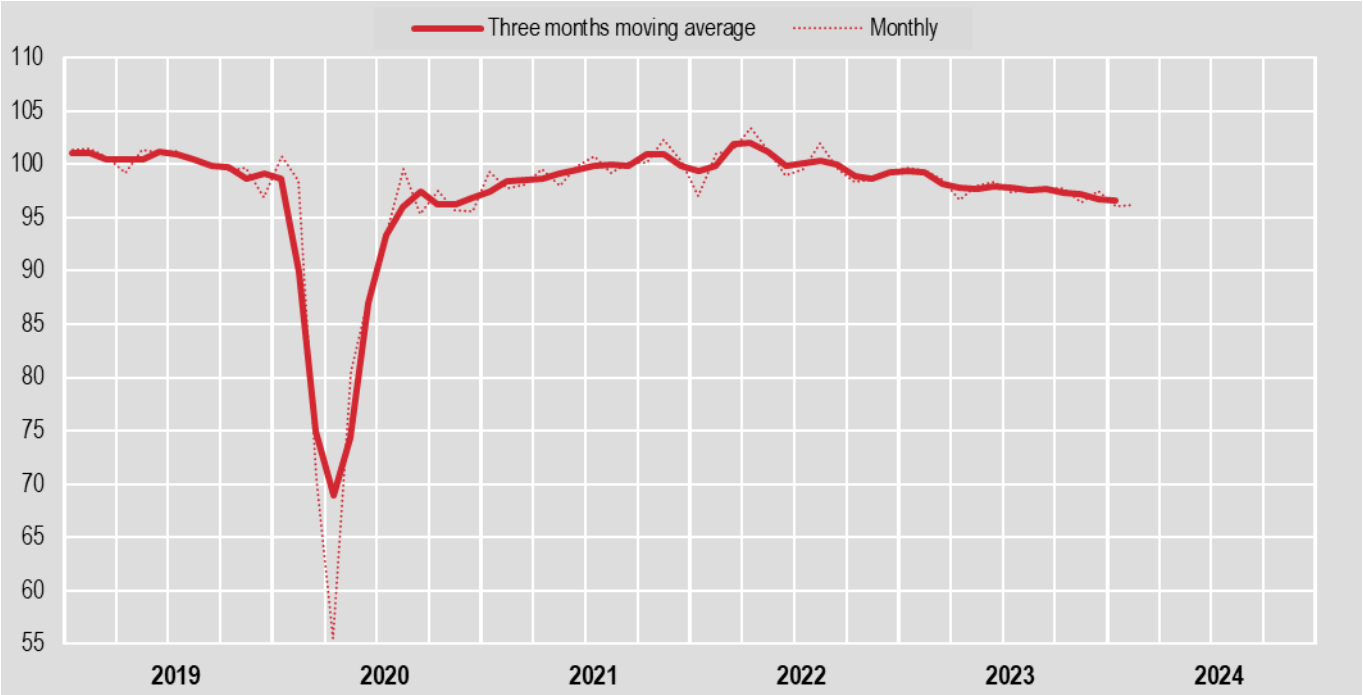


CHART 2. INDUSTRIAL PRODUCTION, MONTH ON SAME MONTH A YEAR AGO PERCENTAGE CHANGES

January 2020 – February 2024, calendar adjusted data (index, 2021=100)

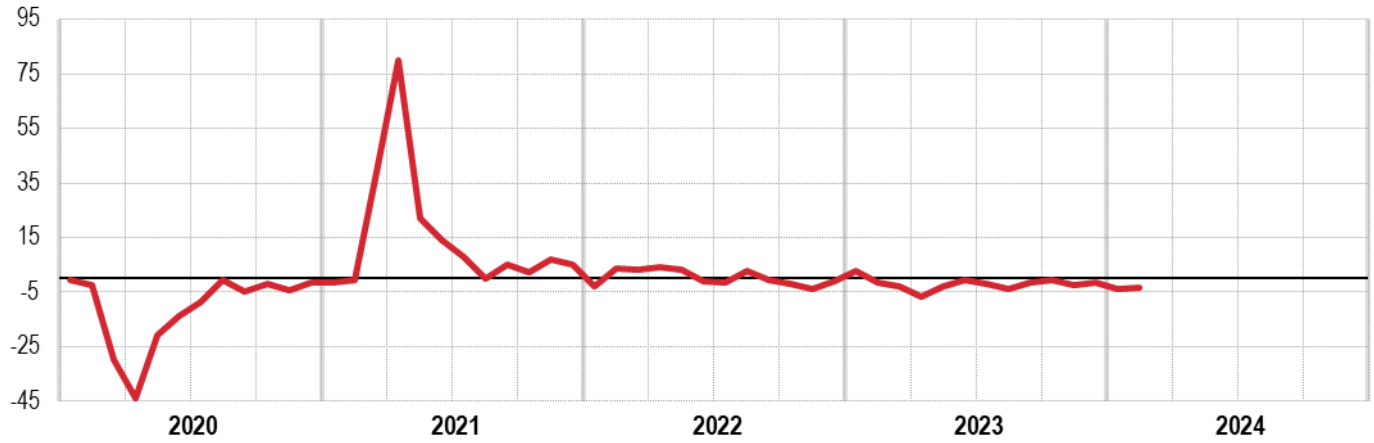


TABLE 1. INDUSTRIAL PRODUCTION INDICES (a), MONTHS ON PREVIOUS MONTHS AND ON SAME MONTHS A YEAR AGO PERCENTAGE CHANGES

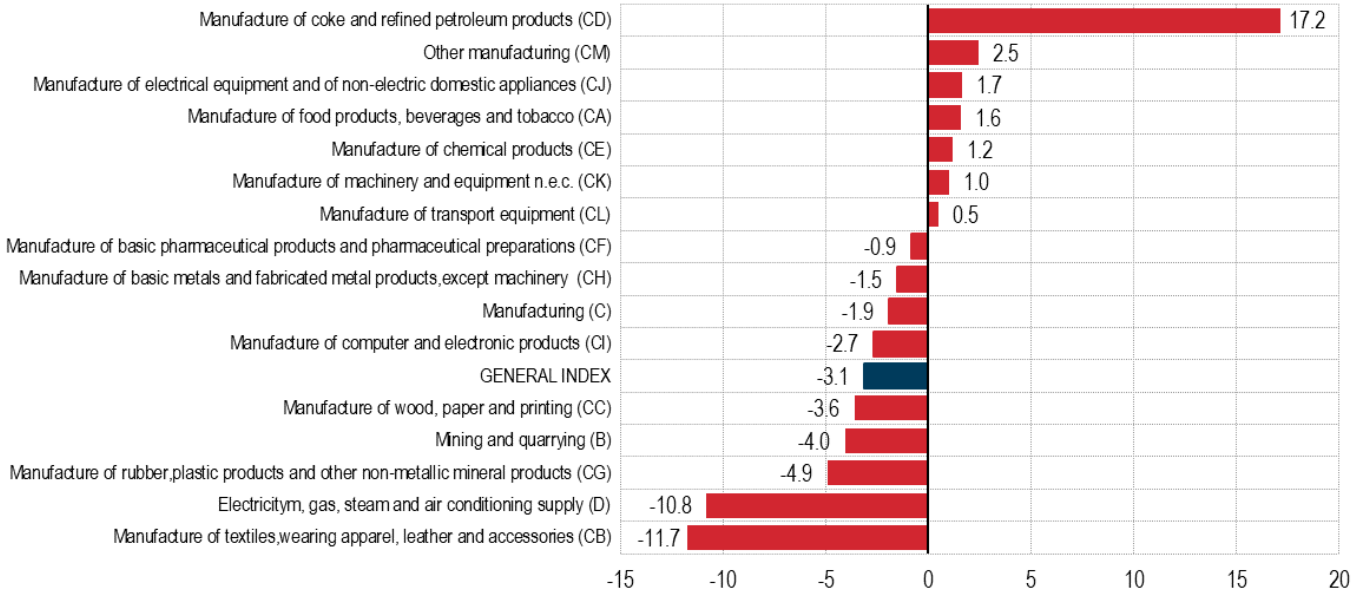
February 2024 (b) (index, 2021=100)

INDICES	Index (2021=100)	Months on previous months		Months on same months a year ago	
		Feb24 / Jan23	Dec23-Feb24 / Sep23-Nov23	Feb24 / Feb23	Jan-Feb 24 / Jan-Feb 23
Industrial production seasonally adjusted	96.2	+0.1	-0.7	-	-
Industrial production calendar adjusted	98.8	-	-	-3.1	-3.5
Industrial production non – seasonally adjusted	101.2	-	-	+0.4	-0.1
Calendar working days	21				

(a) Excluding construction.
(b) Data are provisional and subject to revisions. The first revision takes place with the dissemination of the following month and takes into account additional information received from enterprises. Since 2022 data undergo also an annual revision of the previous year.

CHART 3. YEAR-ON-YEAR GROWTH RATE BY INDUSTRIAL GROUPINGS

February 2024, calendar adjusted (index, 2021=100)



The table below shows routine revisions, calculated as differences (in percentage points) between first publication and the latest estimates concerning the same reference period. Revisions to year-on-year growth rate refer to not adjusted data of the month prior to the current reference period. With regard to the short-term growth rate, an additional monthly revision for seasonally adjusted data occurs as new observations can change the seasonal factors that are applied to the whole time series.

TABLE 2. INDUSTRIAL PRODUCTION BY MAIN INDUSTRIAL GROUPINGS, REVISIONS

January 2024, percentage changes revisions, percentage points changes (index, 2021=100)

Industrial Production Index		Durable consumer goods		Non-durable consumer goods		Capital goods		Intermediate goods		Energy	
Month-on-month change (a)	Year-on-year change (b)	Month-on-month change (a)	Year-on-year change (b)	Month-on-month change (a)	Year-on-year change (b)	Month-on-month change (a)	Year-on-year change (b)	Month-on-month change (a)	Year-on-year change (b)	Month-on-month change (a)	Year-on-year change (b)
-0.2	-0.3	0.0	-0.2	-0.3	-0.4	0.0	-0.2	-0.1	-0.1	-0.6	-0.8

Consumer durables: examples of consumer durables include household appliances, furniture, motorcycles and audio and video equipment.

Consumer non-durables: examples of consumer non-durables include food and beverages processing and preservation, several kinds of textile manufacturing and pharmaceutical manufacturing.

Intermediate goods: examples of intermediate goods include chemical industry, metal fabrication, metal products and electrical appliances manufacturing, wood industry and textiles processing.

Capital goods: examples include production of machinery and manufacturing equipment, measuring and test equipment and vehicles.

Survey sample: subset of statistical units selected from a larger population in order to conduct a survey. In short-term statistics, a theoretical sample is defined when rebasing the indices every five year to obtain longitudinal or panel data, considering the actual corporate changes over time.

Calendar adjusted data: calendar adjusted data refer to the correction for calendar effect in a reference period (month or quarter) that may vary from year to year. This method allows a reconciliation of asymmetries for calendar differences such as the number of working days, the week days distribution in the reference period and the occurrence of public holidays (including moving holidays like Easter) and of a leap year. Working day adjusted data permit to better compare year-on-year growth rate and average annual growth rate.

Seasonal adjusted data: seasonal adjusted data refer to the statistical technique designed to remove fluctuations related to seasonal factors (such as weather conditions, administrative measures, etc.…) and calendar effects when relevant. Seasonal adjustment provides a clearer view for a trend analysis of a short-term index.

Energy: examples of energy industries include extraction of raw materials (petroleum, natural gas, coal) and refining processes and electricity, gas, steam and air conditioning supply.

Working days: calendar days of the month, not including Saturdays, Sundays, religious and secular public holidays.

Industrial production index: industrial production index measures the monthly evolution of physical volume of production made by industrial establishments (excluding construction).

Main industrial groupings: consumer durables, consumer non-durables, intermediate goods and energy. the Commission Implementing Regulation 2020/1197 defines, for the whole European Community, the Main Industrial Groupings (MIGS): each industrial group and industrial activity division head to a different category of this aggregate classification. Istat also releases the Consumer Goods Index, calculated as the weighted average of the durable and non-durable components.

Economic activities sections: according to classification ANA/ISIC A38. The statistical classification of economic activities in the European Community (NACE Rev. 2) – from which Ateco classification derives – do not include subsections in the structure of the aggregates.

Month on month growth rate: short-term growth rate compares a period (typically a month or quarter) with the previous period, measuring the percentage change.

Year-on-year growth rate: Y-o-Y compares a period (typically a month or quarter) with the same period from the previous year, measuring the percentage change.

Sources and Regulatory framework

The industrial production index measures the change of the volume of goods produced over time by industry (excluding construction).

The legal basis for this indicator is the Regulation (EU) 2019/2152 of the European Parliament and of the Council on European business statistics, and the Commission Implementing Regulation 2020/1197.

The survey is provided by the current National Statistical Programme in force, accessible on the Istat internet site at https://www.sistan.it/index.php?id=52 (Italian only).

Population, analysis and survey units

The industrial production index is based on the results of a sample statistical survey, conducted among enterprises (survey units), that measures the volume of production of the goods included in a representative basket of products (analysis units). This allows the calculation of indices for product line items that, in turn, are grouped by business activity according to the Laspeyres formula and using a weighting structure that reflects the sector distribution of the industrial value added in the year set as the base period, which now is 2023.

The reference list for identification of the enterprises that take part in the sample is made up from the Statistical Archive of Active Companies (Asia), while the selection is made upon the results of the annual PRODCOM[1] survey.

Starting from this edition, for some groups of economic activity, the survey on industrial production uses information deriving from the survey on industrial turnover, appropriately deflated.

Survey design and data collection

The monthly survey of industrial production is conducted directly on a panel of approximately 5,400 companies, which provides the data concerning more 9,500 monthly production flows, generally defined in terms of physical quantity. Further statistical sources are used for the estimating production trends of specific industrial sectors. Amongst others, the survey on livestock slaughtered for red and white meat, conducted by Istat; the information provided by the National Offices for Mineral Resources, Hydrocarbons and Geothermal Energy of the Ministry of Enterprise and Made in Italy (MIMIT); the data of electrical energy production surveyed by TERNA (National Electric Network). Furthermore, starting from the 2023 calculation base, the survey on industrial production also uses data deriving from the survey on industrial turnover for some groups of economic activity[2].

With the transition to turnover data, the share - expressed in terms of the relative weight on the general index - of the products recorded in value increases compared to the other two measures with which the products are measured (hours and physical quantities). The incidence of products recorded in quantity remains predominant, however decreasing compared to the previous base (72.7% compared to 76.3%), followed by products recorded in value of production (15.1%), whose share instead, grows by almost 5 percentage points compared to the 2022 base. Finally, the incidence of production measure through hours worked is 12.2%. The latter related elementary product indices are calculated using productivity coefficients, while the indices measured through the value of production are appropriately deflated with a production price index.

Indicators, weighting structures and classification systems

For the indices of the year 2024, the calculation base is set at the year 2023 while the reference base, in line with the other economic indicators, has been updated to the year 2021.

The innovations introduced are in line with the indications of the main methodological manuals and with the orientation of Eurostat. In detail they concern the introduction of the new weighting system and the renewal of the sample of companies used in the survey. Companies provide detailed information on a monthly basis regarding the production of specific products, belonging to a reference basket chosen so as to be representative of all the production activities present in the Italian industry. The data received, appropriately aggregated, give rise to the index numbers relating to the individual product items. The elementary indices are then summarized by economic

[1] Annual survey of industrial production

[2] Specifically, these are the following Ateco groups 81, 89, 131, 133, 161, 202, 203, 206, 232, 237, 253, 254, 262, 264, 266, 321, 322, 323, 324.

activity, according to the Laspeyres formula, using a weight structure that reflects the sectoral distribution of industrial added value in the base year of calculation (2023 in the current version). In more detail, for each level of aggregation, the first slip coefficient of the series is represented by the average of the indices relating to the year 2021 based on 2021, while for subsequent years, by the product of the latter by the annual averages of the indices based on the calculation of each year following 2021 up to the year preceding the current one.The index is built according to Ateco 2007 classification of economic activities, the Italian version of Nace Rev. 2. To ensure the compliance with Regulation (EU) 2019/2152 the reference base year for IPI is presently 2021.

The adoption of the 2023 calculation base was an opportunity to review the panel of survey products. Specifically, 148 products were eliminated, of which 123 due to their replacement with the data collected from the turnover survey. At the same time, 42 new products were introduced into the survey, of which 19 were made up of the sectors covered by the FAT survey. The remainder are products that have taken on significant weight in some classes. With the transition to the 2023 calculation base, the previous basket of 612 product macro-items has changed, also following innovations on the sources used. Against 58 eliminated macroproducts, 40 were inserted: the number of elementary macroproducts of the new base is therefore equal to 594. Through the results of the investigation, the indices of the macroproducts are calculated and, by aggregating the latter, the indices of economic activity (according to the Ateco 2007 classification of economic activities), the general one and those for the Main Industrial Groupings (MIGS): durable consumer goods, non-durable consumer goods, capital goods, intermediate goods and energy. The Community Regulation has established, for all member countries, the criteria for the definition of MIGS: entire groups and/or divisions of economic activity are attributed to each of them, according to the prevalence criterion. The Consumer Goods Index, obtained as the weighted average of the consumer durable goods and consumer non-durable goods indices. The following table shows the weights, allocated within the weighting system used for the calculation of the industrial production index, the Main Industrial Groupings and the economic activity sectors.

TABLE 1. WEIGHTING STRUCTURE BY ECONOMIC ACTIVITY Link period 2023, percentage values

Main Industrial Groupings		**Year 2023**
	Consumer goods	24.8350
	Consumer durable goods	4.0910
	Consumer non-durable goods	20.7439
	Capital goods	28.6116
	Intermediate goods	34.4035
	Energy	12.1500
Economic activity sectors		
B	**Mining and quarrying**	1.28596
C	**Manufacturing**	88.51912
CA	Manufacture of food products, beverages and tobacco products	9.76181
CB	Manufacture of textiles, apparel, leather and accessories	7.12865
CC	Manufacture of wood and paper products, and printing	4.56031
CD	Manufacture of coke and refined petroleum products	1.07463
CE	Manufacture of chemicals and chemical products	4.46264
CF	Manufacture of basic pharmaceutical products and pharmaceutical preparations	3.08068
CG	Manufacture of rubber and plastic products and other non-metallic mineral products	8.38088
CH	Manufacture of basic metals and fabricated metal products, except machinery and equipment	15.88443
CI	Manufacture of computer, electronic and optical products	2.74651
CJ	Manufacture of electrical equipment and of non-electric domestic appliances	3.84412
CK	Manufacture of machinery and equipment n.e.c.	13.11598
CL	Manufacture of transport equipment	7.29534
CM	Other manufacturing, and repair and installation of machinery and equipment	7.18314
D	**Electricity, gas, steam and air conditioning supply**	10.19492
General index		**100.0000**

Seasonally and calendar adjusted series

In addition to the raw indices, calendar adjusted time series are also released. In accordance with the guidelines on seasonal adjustment for the European Statistical System, time series are corrected using a regression model, which identifies the effect of the working days (calendar days of the month excluding Saturdays, Sundays and secular and religious holidays not coinciding with Saturdays and Sundays), the leap years and Easter through the introduction of a set of regressors in the univariate model that describes the trend of the series. Since the effect due to the working days is not a zero mean value on an annual basis, the calendar adjusted series calculated through this method would not present an average of 100 for the reference base year. To release a set of indices with a common base and therefore allowing Eurostat to estimate the European aggregates, the adjusted time series are reported on a base of 2021=100 through a redistribution that maintains the dynamic profile unchanged. Moreover, regressors method results in the revision of the data, since each new monthly information added to the series may require new estimates of the regression parameters.

Given an equal number of working days, the procedures here described may cause discrepancies between y-o-y growth rate calculated on the raw time series and y-o-y growth rate calculated on adjusted data. Negligible differences may be determined from the redistribution and from the subsequent rounding; more relevant differences are due to the effects of the leap year and Easter[3], and to the type of model used for the correction of the calendar effects. In the case of the additive model, in fact, the differences are inversely proportional to the level of the indices and directly proportional to the absolute value of the trend variations calculated on the raw series.

In continuity with the choices already made on the occasion of the previous base change, the estimation period of the series is set at January 2001 and the indices relating to the period 1990-2000 will not be subject to further changes.

Finally, the seasonally adjusted indices are obtained through the TRAMO-SEATS+ procedure. Like the other seasonal adjustment procedures, also TRAMO-SEATS+ assumes that each intra-year time series is constituted of three different components, not directly observable: the trend-cycle, that represents the underlying medium and long-term movement; the combined seasonal and calendar effects, which are intra-year fluctuations; an irregular component, due to erratic factors. TRAMO-SEATS+ uses a model-based approach consisting in identifying a reliable and representative model for the time series to be seasonally adjusted.

In order to eliminate the seasonal component, it is necessary to select a decomposition model of the raw series into the previously listed different elements: the industrial production indices are seasonally adjusted using either an additive decomposition (the observed data are equal to the sum of the non-observable elements), or a multiplicative decomposition (the observed data are equal to the product of the non-observable elements).

The industrial production indices are calendar and seasonally adjusted separately for each economic activity sector, Main Industrial Groupings and for the general index, therefore the most aggregated indices are not calculated as synthesis of the seasonally adjusted data referring to lower classification levels. Since the addition of new monthly information allows a better evaluation of the different components of the series, each month previously published data concerning the most recent years are subject to revisions.

The statistical models used for the seasonal adjustment and for the correction are reviewed at the beginning of each year to ensure their ability to correctly represent the trend of the single time series. With the release of January 2024 data, not only unadjusted series have been updated, but also models for seasonally adjustment have been revised up to NACE Economic activity sectors level. In the next months, revision of models will be performed at division, group and class level.

The exceptional variations in raw data recorded during the 2020-21 health emergency were handled according to the guidelines issued by Eurostat, available at the URL:
https://ec.europa.eu/eurostat/documents/10186/10693286/Time_series_treatment_guidance.pdf

To allow the user to adopt the same processing specifications used by Istat in the context of the TRAMO-SEATS+ procedure, specifications are available upon request for analytical purposes.

Revision of the indices

The industrial production indices concerning the most recent month are provisional and subject to revision that takes place with the dissemination of the following month and takes into account additional information received from enterprises (revised indices are released on occasion of the press release).

[3] Since the regressor takes the week prior to Easter Sunday into consideration, the differences may be more or less consistent according to whether the whole week falls completely within one month or not.

A second type of revision occurs annually and concerns the time series of the indices. This revision aims at incorporating three types of information into the indices available after the publication of the first revision. Specifically, the elements considered in the revision process are the following:

- Responses received from the enterprises after the dissemination of the revised indices (which usually occurs around 60 days from the end of the reference period); it involves a very limited number of responses, which accounts, on average, for approximately 2.3% of the sample (measured in terms of production volume) but which may determine corrections on the disaggregated indices.
- The ex-post corrections of information already received from the companies, and which, on the basis of successive verifications, result to be affected by errors in the measurement of the phenomenon. Usually these modifications have a minor effect on the aggregated indices, however they occasionally may cause significant revisions for specific sectors.
- The update and periodic revision of the short-term statistics (turnover index and hours worked), on which the used annual productivity coefficients are based, as previously mentioned, for the products indicated through the monthly flows of hours worked. These products, whose weight, as previously noted, is 12.2%, are concentrated in some sectors (particularly in machinery and mechanical equipment, electrical equipment and, specifically, transport vehicles, repairs and systems installation). As a consequence, the effect of the coefficient revision may be significant for those specific sectors.
- From the year 2022 the annual reviews only concern the immediately previous year. Therefore the revision carried out with press release of January 2024 dataconcerns the monthly indices for the year 2023. Further information related to short terms indicators revisions is available at http://www4.istat.it/en/economic-trends/revisions.

Territorial breakdown

The indices are calculated and disseminated on a national level.

Timeliness

Dissemination of the monthly industrial production indices is made with a press release and series are published on the Istat data warehouse I.stat, 40 days past the end of the reference period.

Dissemination

The press releases are available on the internet site at http://www.istat.it/en/archive/industrial+production.

The monthly industrial production indices are available at IstatData, the Istat data warehouse, in the section “Industry and Construction /Production/Industrial Production Index”.

The description of the execution method of the survey and the activities performed to guarantee the quality of information produced is available in the Quality Information System (SIQual) of the Istat statistical processes.

For technical and methodological information

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