

## **Ball Aerospace-built Geostationary Air Quality Instrument Launches Successfully**

### **The Geostationary Environment Monitoring Spectrometer instrument launched on board the Korea Aerospace Research Institute's GEO-KOMPSAT-2B satellite**

BOULDER, Colo., Feb. 18, 2020 /PRNewswire/ -- The Geostationary Environment Monitoring Spectrometer (GEMS) instrument, jointly developed by Ball Aerospace and Korea Aerospace Research Institute (KARI) under the leadership of Ball Aerospace, launched successfully on Feb. 18, 2020. GEMS was integrated onto KARI's GEO-KOMPSAT-2B satellite.



Once operational in space, GEMS will be the first air quality sensor in geostationary orbit where it will help monitor pollution events in the Korean peninsula and Asia-Pacific region.

"GEMS is a result of more than 30 years of innovation in advanced spectrometers at Ball Aerospace," said DrMakenzie Lystrup, vice president and general manager, Civil Space, Ball Aerospace. "Data from GEMS will enable KARI's mission to assess and forecast air pollution by identifying sources and distribution of pollutants in the atmosphere."

Ball Aerospace led GEMS development under a contract with KARI for the National Institute of Environmental Research in the Ministry of Environment of South Korea. GEMS will make hourly measurements of key constituents that make up air pollution, including ozone and nitrogen dioxide, which will improve early warnings for potentially dangerous pollution events.

GEMS is one part of a global air quality monitoring constellation of geostationary satellites that will include NASA's [Tropospheric Emissions: Monitoring of Pollution](#) (TEMPO) spectrometer. Ball completed TEMPO in September 2018 for NASA Langley Research Center and Harvard Smithsonian Astrophysical Observatory. TEMPO is scheduled to launch in 2022.

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This release contains "forward-looking" statements concerning future events and financial performance. Words such as "expects," "anticipates," "estimates," "believes," "targets," "likely," "positions" and similar expressions typically identify forward-looking statements, which are generally any statements other than statements of historical fact. Such statements are based on current expectations or views of the future and are subject to risks and uncertainties, which could cause actual results or events to differ materially from those expressed or implied. You should therefore not place undue reliance upon any forward-looking

statements and any such statements should be read in conjunction with, and, qualified in their entirety by, the cautionary statements referenced below. The company undertakes no obligation to publicly update or revise any forward-looking statements, whether as a result of new information, future events or otherwise. Key factors, risks and uncertainties that could cause actual outcomes and results to be different are summarized in filings with the Securities and Exchange Commission, including Exhibit 99 in our Form 10-K, which are available on our website and at [www.sec.gov](http://www.sec.gov). Additional factors that might affect: a) our packaging segments include product capacity, supply, and demand constraints and fluctuations; availability/cost of raw materials and logistics; competitive packaging, pricing and substitution; changes in climate and weather; footprint adjustments and other manufacturing changes, including the startup of new facilities and lines; failure to achieve synergies, productivity improvements or cost reductions; mandatory deposit or other restrictive packaging laws; customer and supplier consolidation; power and supply chain interruptions; potential delays and tariffs related to the U.K's departure from the EU; changes in major customer or supplier contracts or a loss of a major customer or supplier; political instability and sanctions; currency controls; changes in foreign exchange or tax rates; and tariffs, trade actions, or other governmental actions in any country affecting goods produced by us or in our supply chain, including imported raw materials, such as pursuant to Section 232 of the U.S. Trade Expansion Act of 1962 or Section 301 of Trade Act of 1974; b) our aerospace segment include funding, authorization, availability and returns of government and commercial contracts; and delays, extensions and technical uncertainties affecting segment contracts; c) the company as a whole include those listed plus: the extent to which sustainability-related opportunities arise and can be capitalized upon; changes in senior management, succession, and the ability to attract and retain skilled labor; regulatory action or issues including tax, environmental, health and workplace safety, including U.S. FDA and other actions or public concerns affecting products filled in our containers, or chemicals or substances used in raw materials or in the manufacturing process; technological developments and innovations; information technology initiatives and management of cyber-security processes; litigation; strikes; labor cost changes; rates of return on assets of the company's defined benefit retirement plans; pension changes; uncertainties surrounding geopolitical events and governmental policies both in the U.S. and in other countries, including the U.S. government elections, budget, sequestration and debt limit; reduced cash flow; interest rates affecting our debt; and successful or unsuccessful joint ventures, acquisitions and divestitures.

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