Sumter Cement Company, LLC
P.O. Box 410
Branford, Fl 32008

June 15, 2005

Ms. Trina Vielhauer
Division of Air Resources
Department of Environmental Protection
2600 Blair Stone Road, MS # 5500
Tallahassee, Florida 32399-2400

SUBJECT: **Construction Permit Application – New Kiln Project**
Sumter Cement Company, LLC – Center Hill Plant, Sumter County

Dear Ms Vielhauer:

Please find included in this package Sumter Cement Company's (SCC) Application for construction of a state-of-the-art New Kiln Line located in the city of Center Hill, Florida. SCC is operated entirely by Votorantim Cementos. Votorantim Cementos as you are aware also operates Suwannee American Cement (SAC) cement plant in Branford, Florida. The new SCC Center Hill plant and the SAC Branford plant will be both fully controlled and operated by Votorantim Cementos. Although the two cement plants will operate under different names both will share the valuable resources, information, and the vast knowledge provided by Votorantim Cementos as well as the experiences of SAC. As you are aware SAC has worked with the Department to achieve the highest environmental performance possible while producing the highest quality cement in the market at the existing facility located in Branford, FL. SAC's highest standards for environmental performance and quality will also be implemented at the SCC plant as well.

SAC has demonstrated its commitment to environmental performance by having the first and only cement plant in Florida to receive accreditation for our Environmental Management System (ISO 14000) in accordance with the International Organization of Standardization (ISO) at the Branford Plant. SAC has also voluntarily installed and tested innovative control technologies such as Selective Non-Catalytic Reduction (SNCR) for emission reductions at the Branford Plant. This knowledge and willingness to be at the forefront of environmental control technologies will be continued and expanded upon at the new SCC Center Hill Plant.

SCC looks forward to meeting and surpassing these environmental achievements and excellent performance in the future at the proposed new plant in Center Hill, Fl.

The following information is provided for the Departments review:

- Detailed Best Available Control Technology (BACT) Evaluation.

- Preliminary Modeling Report and Modeling Information for all required modeling,
- Permit Application with Supporting Information.
- Preliminary Facility Plot Plan and Process Flow Diagram, and
- Check for $7,500 for required Application Fees.

SCC welcomes the opportunity to working with the Department on this Project and if you or anyone at the Department should have any questions or require any additional information, please feel free to contact me anytime directly at (386) 935-5000 or Joe Horton at (386) 935-5039.

Sincerely,

Daniel R. Fritz

Dan Fritz
CEO/President
Sumter Cement Company

CC. Al Linero – DEP
Cleve Holliday – DEP
Celso Martini – SAC w/o Attachments
Tom Messer – SAC w/o Attachments
Joe Horton – SAC w/o Attachments

Department of Environmental Protection

Jeb Bush
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400
Telephone: (850) 488-0114 FAX: (850) 922-6979

Colleen M. Castille
Secretary

October 7, 2005

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Dan Fritz, CEO/President
Sumter Cement Company, LLC
P.O. Box 410
Branford, Florida 32008

Re: Request for Additional Information
DEP File No. 1190041-001-AC (PSD-FL-358)
Proposed Portland Cement Plant in Sumter County, Florida

Dear Mr. Fritz:

On September 8, 2005 we received your application for an air construction permit for a portland cement plant in the vicinity of Center Hill, Sumter County.

Pursuant to Rules 62-4.055, and 62-4.070 F.A.C., Permit Processing, the Department requests submittal of the additional information prior to processing the application. Should your response to any of the below items require new calculations, please submit the new calculations, assumptions, reference material and appropriate revised pages of the application form.

1. SCC relies on "good combustion" (GC) to control carbon monoxide (CO). SCC proposes a best available control technology (limit) by GC of 3.6 pounds of CO per ton of clinker (lb/ton) on a 30-day basis. The cost of further control by other technologies was calculated presuming that emissions without further control by GC will be 3.6 lb/ton. Please estimate the costs and cost-effectiveness of further control by GC by evaluating the following possibilities. Applicant's own possibilities are also encouraged.

   a. Given the present calciner design, estimate the CO emissions when using bauxite instead of fly ash as a raw material and only coal as fuel (except during startup).

   b. Evaluate costs of using bauxite instead of fly ash or other material high in carbon.

   c. Evaluate costs of minimizing petroleum coke and other difficult to burn fuels to maximize burnout in the calciner and ducting to the lower cyclone.

   d. Evaluate costs and benefits of increasing retention time (in increments of 0.5 seconds) in the calciner and duct work to the lower cyclone to maintain the requested fuel and raw materials options while achieving the CO emissions estimated in paragraph a. above.

   e. The Department notes that the above procedure would certainly be considered by any operator prior to assuming that a regenerative thermal oxidizer (RTO), estimated by the applicant at $47,000,000 (capital) and $17,900,000 per year, would be necessary to achieve lower CO emissions.

f. With respect to the comment on page 35 about the decommissioning of the RTO at TXI, an agreement was reached between TXI and petitioners to operate the RTO all year round.

g. Provide estimate of impacts on CO due to operation rates between the guaranteed manufacturer production rates and the expected (greater) production rates foreseen by SCC. This may be just a part of the exercise described in d. above.

[Rule 62-212.400(h)3., F.A.C. Requirement for: "A detailed description of the system of continuous emissions reduction proposed by the facility or modification as BACT, emissions estimates and any other information as necessary to determine that BACT would be applied to the facility or modification"]

2. Tarmac America, LLC, dba Titan Florida Cement, recently proposed a BACT limit for CO of 2.0 lb/ton (30-day basis) at the Pennsuco cement plant in Miami-Dade County. Please replace the "ND" value in Table 5-1 with the revised proposal. Also replace the value of 1.77 lb/ton given in the table for the Suwannee American Cement (SAC) Plant with the present BACT limit. It is possible that as many as half of the lb/ton values in the table are erroneous or possibly shifted by one row.

3. VOC control to achieve 0.12 lb/ton of clinker is also given as GC. Regardless of combustion practices, VOC emissions can be high unless raw materials (especially additives) are selected that will not evolve VOC in the preheater. Please describe the raw material procurement practices for mill scale, fly ash, etc. that can influence both VOC and CO emissions. The proposed value appears to be adequate.

   [Rule 62-4.070(1), F.A.C. (1) "A permit shall be issued to the applicant upon such conditions as the Department may direct, only if the applicant affirmatively provides the Department with reasonable assurance based on plans, test results, installation of pollution control equipment, or other information, that the construction, expansion, modification, operation, or activity of the installation will not discharge, emit, or cause pollution in contravention of Department standards or rules."]

4. Please provide a disk that includes a summary of 2005 data for 24-hr-averaged SO_2 emissions in terms of lb/ton from operation of the SAC plant. Indicate instances when injection of hydrated lime was practiced and the total amount of hydrated lime actually used for this purpose in 2005. [Rule 62-212.400(h)3., F.A.C.]

5. Please clarify whether fly ash injected into the calciner will be introduced within the area of the calciner burner as described on Section 1, page 1 or in the upper section of the calciner as apparent in the drawing referenced as Sheet 5 in Appendix F. The different locations have different implications regarding carbon monoxide burnout and emissions. [Rules 62-4.070(1) and 62-212.400(h)3., F.A.C.]

6. With reference to Table 3-1, please note that a 24-hour limit of 0.16 lb SO_2/ton applies to Florida Rock Industries pursuant to a permit issued in 2002 for a production increase at the existing FRI kiln.

7. Provide a qualitative if not quantitative discussion of the differences in sulfur and SO_2 generation potential due to raw materials differences between the quarries at SAC and SCC. [Rule 62-212.400(h)3., F.A.C.]

8. SCC relies on selective non-catalytic reduction (SNCR) to control nitrogen oxides (NO_X) carbon monoxide (CO). SCC proposes a BACT limit by SNCR of 1.95 lb NO_X/ton on a 30-day basis. The cost of further control by other technologies was calculated presuming that emissions without further control by SNCR would be 1.95 lb/ton. Please estimate the costs and cost-effectiveness of further control by SNCR by evaluating the following possibilities. Applicant's own possibilities are also encouraged.

a. Evaluate costs and NO_X reductions of further increasing ammonia injection up to a molar ratio of 1.0 (NH_3/NO_X) in increments of 0.1 moles NH_3 per mole NO_X. There would be separate cases depending upon the extent to which the calciner is operated in a reducing atmosphere for NO_X reduction prior to further control. [Rule 62-212.400(h)3., F.A.C.]

b. The Department notes that the above procedure would certainly be considered by any operator prior to assuming that a selective catalytic reduction (SCR) system, estimated by the applicant at $5,520,000 (capital) and $9,580,000 per year, would be necessary to achieve lower NO_X emissions.

c. With respect to the "experimental" nature (Section 4.4, page 23) at an SCR unit in Europe, it is noted that articles by the supplier, plant representative, and German government expert describe the system as a success. This is noteworthy because fewer of the factors claimed in the application to reduce the effectiveness of SCR are actually present in Florida compared with Germany. These include amount of sulfur and alkali in the exhaust gases.

[Rule 62-212.400(h)3., F.A.C.]

9. Please advise the meaning of the statement in Section 4, Page 22, "For the reaction to occur the ammonia must be present in excess molar ratio". If this means that the NH_3/NO_X ratio must be greater than 1.0, then the applicant is referred to the papers by the mentioned authors (Haug, Samant, and Sauter) showing that substantial reduction is possible at molar ratios much less than 1.0 (by SCR) at the Solnhofer Portland Cement Plant.

10. Please submit the information required on Page 3-61 related to the Process Fuel Segment for all fuels to be used at the facility.

11. Typical fuel specifications were provided for the proposed fuels with the exception of tires, the non-hazardous liquids including on-spec used oil, non-hazardous solids including plastics, filter fluff and wood waste. From the application, non-hazardous solids and non-hazardous liquids may account for up to 50 % of the total heat input in the kiln and calciner respectively. Provide a description and expected analysis of these additional fuels to be combusted.

12. What additives will be used to insure the correct alkali to sulfur ratio is maintained when using petroleum coke? Florida limestone is low in alkali. Use of high sulfur petroleum coke can upset the balance between alkali and sulfur that is needed to insure fuel sulfur is incorporated into the clinker rather than deposited within the internal cycle (calciner/bottom cyclone/kiln inlet). Submit a projected chemical analysis of the additives likely to be used at this plant.

13. What measures have been considered to minimize emissions of mercury entering the process or emitted from the kiln stack? Has SCC considered the possibility of inter-grinding a small portion of the dust collected in the (kiln/calciner/raw mill) air pollution control device with the clinker?

14. Has Sumter Cement Company or its affiliates had any violations (or received warning letters) in the past two years related to any Department regulations at any of their facilities? Please provide the status of any matters that have not yet been resolved.

    [Rule 62-4.070(5), F.A.C., "The Department shall take into consideration a permit applicant's violation of any Department rules at any installation when determining whether the applicant has provided reasonable assurances that Department standards will be met".

15. Has Sumter Cement Company or its cement operations affiliates (such as Votorantim and St. Mary's Cement) had any violations (or received warning letters) in the past two years related to the regulations of other states or EPA? Please provide the status of any matters that have not yet been resolved. Provide additional information in case the matters relate to actions by previous owners of the assets. [Rule 62-4.070(5), F.A.C.]

16. If the positions of plant manager and plant production manager are still to be determined, please describe the minimum requirements for this position established by your company including, but not limited to, total years experience in the cement industry, total years experience as plant operator, educational background, etc. [Rule 62-4.070(1), F.A.C.]

17. According to the application, the project has the potential to emit 103 tons per year of VOC. If a project has the potential to emit VOC over 100 tons per year, the applicant is required to perform an air quality analysis for this PSD pollutant. This includes a Pre-Construction Monitoring Analysis. Please provide a Pre-Construction Analysis for VOC and further, please explain how projected VOC emissions will not contribute to a violation of the National Ambient Air Quality Standard for ozone.

18. Although associated growth is addressed in the application, please provide an additional analysis to comply with Rule 62-212.400(5)(h)5, F.A.C.

19. The modeling submitted with the application has fugitive road emissions evaluated as "Area" sources. Please provide justification for using this type of source for the roads.

20. Please provide a table summarizing all pollutant emission rates from all sources that were included in the Class II PSD increment and NAAQS modeling. Include a list of major nearby sources that were omitted as well.

21. Since the modeling protocol was deemed sufficient, the standard for the Receptor Grid has become more refined within the Department. In order to have continuity with other cement projects in the State, it is requested that a 25 meter plant boundary receptor grid interval be used for this project. This includes 2 receptors, one on either side of each road where it intersects the plant boundary, at a minimum distance of 25 meters from the road edge. Please update modeling to reflect the new standard to ensure that this continuity is satisfied.

22. Please provide a more detailed plot plan. The Department is requesting both an electronic version (preferably a .dwg file) and an updated paper plan (preferably 2 x 3 feet). Please grid the plot plan in UTM coordinates and highlight the buildings and structures.

23. Please provide a diagram showing each road segment, its location and its emission parameters.

24. Please provide any Excel files for Tables in Appendix A to show how emission calculations were completed.

25. On page 5-18 of the application, Table 5-7 details the results of the PSD Class II Increment PM10 analysis. According to the text above the table, the modeling results for the 24-hour averaging period are based on the High, Fourth-High concentrations. The Increment should be based on the High, Second-High concentrations for the 24-hour averaging period. Please correct the table/Increment analysis.

26. Please update Tables in Appendix A to reflect the "Source ID" or "Source Description" for all sources in the modeling or vice versa.

27. Please explain how the Initial Lateral Dimension and Initial Vertical Dimension were determined for the Volume Sources.

28. Please explain how the Initial Vertical Dimension of the Plume of 1.86m was determined for the Road Sources in the modeling.

29. Although Building Downwash is included in the modeling, please provide the actual BPIP input and output files.

30. Please ask your professional engineer to review the seal used for compliance with the latest requirements of the Florida Board of Professional Engineers. It may be necessary to resubmit the P.E. certification. These are given at: http://www.engineerseals.com/order/floridape.php

We will forward any comments received from other agencies as soon as we receive them. Rule 62-4.050(3), F.A.C. requires that all applications for a Department permit must be certified by a professional engineer registered in the State of Florida. This requirement also applies to responses to Department requests for additional information of an engineering nature. Please advise the professional engineer to make sure he/she uses the correct seal in compliance with the applicable requirements of the Florida Board of Professional Engineers.

Permit applicants are advised that Rule 62-4.055(1), F.A.C. requires applicants to respond to requests for information within 90 days. If there are any questions, please call Cindy Mulkey at 850/921-8968. Matters regarding modeling issues should be directed to Debbie Nelson at 850/921-9537.

Sincerely,

A.A. Linero, Program Administrator
Bureau of Air Regulation
New Source Review Section

AAL/cm

cc: Dan Fritz, SCC*
Joe Horton, SCC
Jim Little, EPA
John Bunyak, NPS
Jim Cleary, DEP SWD
Porter Rivers III, P.E., B.P. Barber & Associates
Chair, Sumter County Board of County Commissioners
Mayor, Center Hill
Cary Cohrs, NRCF dba AMC

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1. Article Addressed to:

Mr. Dan Fritz
Suwannee American Cement, LLC
Post Office Box 410
Branford, Florida 32008

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X R Foster ☐ Agent ☐ Addressee

B. Received by (Printed Name) P. Foster
C. Date of Delivery 10/03/05

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Mr. Dan Fritz
Suwannee American Cement, LLC
Post Office Box 410
Branford, Florida 32008

PS Form 3800, January 2001 See Reverse for Instructions

F-850-921-9557 12 DEC 05

TO: CINDY MULKEY

FROM: HANS-H. THEMANN

5 PAGES E-MAIL

8 PAGES HG ANALYZER

BEST REGARDS,

Hans H. Themann

From: hnt44@comcast.net

To: cindy.mulkey@deo.state.fl.us

Subject: Cement Plants - re telecon today

Date: Mon, 05 Dec 2005 16:15:15 +0000

Hello Cindy and Al,

Thanks very much for your time to discuss the Sumter Co. cement plant with me. The article from Boulder is below.

Best regards,

Hans H Thiemann
1953 Lake Miona Dr.
Lady Lake, FL 32162

352 751 4286

Upset over Cemex plant

Facility ranks No. 6 for production "upsets" that violate emissions standards

By Todd Neff, Camera Staff Writer
December 4, 2005

On Nov. 1, a cloud of dust and exhaust billowed into the air above Cemex Inc.'s cement plant near Lyons. Kiln maintenance was the cause, company officials said.

On Aug. 25, a motor jam gave rise to a similar cloud. The jam cut power to the plant's kiln and other systems, including a massive fan that keeps air circulating through the kiln and pollution-control systems.

The kiln's coal, boiling crushed limestone and other ingredients of the 2-century-old recipe for Portland cement at 3,300 degrees didn't much care what the issue was. It burned on, pumping forth a plume of particulate matter and coal exhaust visible for miles. It was obeying physical and, as it turns out, state and federal law in the process.

Such production hiccups — known as "upset conditions" — are a part of doing heavy-industrial business, and they're recognized by state and federal regulators as an unfortunate part of complicated, high-volume production processes that create the refined petroleum, steel, electricity and other commodities upon which a modern economy depends.

Pollutants emitted in such upsets are noted on forms submitted to state regulators, but not counted against permitted emissions of particulate matter, sulfur dioxide, dioxins, heavy metals or various toxic compounds that cement-making can send into the environment.

A Daily Camera study of Mexican-owned Cemex Inc.'s upsets since 1999 shows the plant to have sent state regulators more upset reports than all but five industrial facilities in the state. Cemex reported 99 upsets between January 1999 and Oct 13 at its Lyons plant. Yet in light of data from selected cement plants in Colorado and Texas, Cemex's rate of production upsets appears to be typical.

Of the 130 Colorado facilities reporting upsets during that period, 99 had 10 or fewer, and 51 reported just one upset. Xcel Energy's Valmont Station east of Boulder, with 35 upsets, was the 15th worst.

The state's most prolific reporter of upsets was Swiss-owned Holcim Inc.'s cement plant in Florence, which reported 375 upsets during the same period. Holcim and Cemex are the only two cement plants in Colorado.

It turns out that cement manufacturing is hard on hardware.

The business of cement

Cement is the glue in concrete. It makes up 10 percent to 15 percent of the manmade rock we drive and live on.

Making cement is a violent endeavor. At the Cemex plant near Lyons, crushed limestone rides in on a 2-mile conveyor belt from the company's Dowe Flats quarry. The rock is again crushed, mixed with sand or clay, iron ore and other materials, crushed yet again, and preheated to roughly 1,800 degrees, or about triple the melting point of lead.

It lands in the cement kiln, one of industry's most massive pieces of hardware. Wide enough to drive a sport utility vehicle through, more than half the length of a football field and sloping gently downward as it rotates, the kiln's temperatures peak at about 3,300 degrees.

The inputs melt into marble-sized globs called clinker. Clinker is mixed with a small amount of gypsum and other trace additives, ground finer than talcum powder, and shipped as cement.

This is truly a bulk process: Cemex Lyons' 100 employees produce 630,000 tons of cement a year, or 1,725 tons a day, company spokesman Rick Shapiro said. The company sells it as fast as they can make it, primarily to the Denver metro-area market.

Cement plants across the country are operating at full-tilt to keep up with demand driven by a combination of booming construction and the political hurdles associated with opening new cement plants. Shapiro said the Lyons plant runs between 89 percent and 95 percent of the hours in a year.

To produce a ton of cement, the kilns require the energy equivalent of 1,240 kilowatt hours, or as much as an average household uses in about 42 days, according to the cement industry group Portland Cement Association.

The association says there are 118 U.S. cement plants in 38 states, producing about $8.6 billion worth of cement annually. Cement prices have risen about 21 percent since October 2003, U.S. Bureau of Labor Statistics' producer price index data shows.

Portland Cement Association economist Tom Carter said the industry is projected to boost current annual U.S. capacity from 83 million tons to 103 million tons by 2010. Cement imports have climbed to 27 percent of U.S. consumption and show no sign of slowing.

Combine an aggressive production schedule with a mechanically brutal process and you have a recipe for breakdowns, which are evident across the cement industry.

Apples to apples

Combining Colorado cement-plant upset data with a sample of that posted online by the Texas Commission on Environmental Quality offers a means for comparison across the cement industry. Although state air-pollution laws vary, they tend to stick to federal guidelines for opacity, the pollutant mentioned in the vast majority of cement-plant upset reports in both Colorado and Texas.

The Holcim plant in Florence reported nearly three times as many upsets as Cemex in the 34 months from February 2003 to November 2005. But Holcim also

produces three times as much cement. Pound for pound, the Cemex plant had slightly more upsets per ton than Holcim in Florence.

Adjusted for volume, Cemex's plant in Odessa, Texas, had about four times as many upsets as either of the Colorado plants, and its New Braunfels, Texas, plant had 50 percent more upsets.

Cemex's Shapiro said the company could not comment on the variability in the number of upsets among its plants. In a statement, Cemex officials said, "The three cement manufacturing plants that you have requested information on ... are each operated in an environmentally compliant and sensitive manner. In addition, each of the plants you have referenced are plants that have historically operated well from an operational perspective, and continue to do so."

Raw upset numbers aren't everything. The duration of each of Cemex's reported upsets since 1999 was brief — almost all less than an hour, and often less than 15 minutes. In contrast, upsets at Holcim in Florence sometimes last for days. That was the case with an upset that began Nov. 23.

The event, caused by a clinker transport pan falling off its rails, led to an unknown degree of excess opacity for 90 hours, according to the report filed with the state.

Holcim spokesman Tom Chizmadia said the upset numbers in Florence reflect the breaking-in of a new plant, built in 2002 on the site of a prececessor half its size. He said the upsets represent 0.2 percent of total operating time.

Colorado upset data shows that in 2005, Holcim's upsets actually accounted for 2 percent of its operating time through November; Cemex's amounted to 0.1 percent. In terms of upset count, Holcim has had fewer this year, with 18 reports filed through Dec. 1. Cemex had 21.

Eric Schaeffer, former head of enforcement at the U.S. Environmental Protection Agency and now director of the Washington, D.C.-based Environmental Integrity Project, said the number of upsets at Cemex's Lyons plant didn't strike him as extreme.

"A typical power plant will run opacity exceedances 3 or 4 percent of the time," many times longer than what Cemex has reported, Schaeffer said.

But upsets sometimes offer hints of a deeper problem.

Upsets as warning signs

Jana Milford, senior scientist with Environmental Defense in Boulder, said upsets represent a compromise within the Clean Air Act.

In exchange for more stringent pollution limits during normal operations, plants are given leeway for unplanned problems.

"But when there are a lot of (upsets), you've got to start worrying about whether there is something significant going on, and about whether peoples' health is being affected," Milford said.

It is a state health department inspector's job to decide whether reported upsets are indeed unpredictable, and "not due to poor maintenance, improper or careless operations, or ... otherwise preventable through the exercise of reasonable care," as the department's Air Pollution Control Division's policy states.

Paul Carr, the state inspector assigned to Cemex's Lyons plant, takes note of upsets such as the one Cemex filed May 24. The event began at 12:29 p.m. May 23 and lasted 17 minutes. The reason for the upset, as Cemex officials stated on a faxed-in upset form: "Exceeded temperature on main baghouse when primary pump to spray tower failed. Backup pump was activated immediately."

Rather than "opacity," which describes the clouds of particulates often reported by the plant's neighbors, this one's pollution description box contained the letters "DF."

DF stands for dioxins and furans, carcinogens that cement kilns can emit in certain circumstances. In Cemex's case, so-called stack tests, which test emissions at varying temperatures, have shown that dioxins form if temperatures at pollution-control equipment intakes are above 517 degrees.

Even at 522 degrees, Cemex's load of dioxins and furans is more than 10,000 times below U.S. Environmental Protection Agency thresholds, said Pamela Milmoe, air and waste coordinator for Boulder County Public Health.

The state's subsequent investigation using Cemex's own data found that the Lyons plant violated the 517-degree temperature limit 72,067 times in 2004 alone, amounting to about 15 percent of its total operating time. Cemex could face civil penalties of up to $15,000 per day.

Cemex told state and county regulators Oct. 20 that the computer system monitoring dioxins and furans had malfunctioned, but other production data showed temperatures to have been below 517 degrees. The investigation is ongoing.

"It's not the individual upsets. It's when they indicate a larger problem," Milmoe said. "It's the morass we're unable to get out of with Cemex."

Environmental watchdogs say industrial companies sometimes exploit upset regulations to avoid shutdowns and make more money. Neil Carman, a former cement-plant inspector for the state of Texas and now clean-air program director for the Lone Star Chapter of the Sierra Club, contends that many upsets are "not legitimate."

"They are preventable if they do their proper maintenance and prevention work, but they don't want to shut the plant down because they're not making money when they shut down," Carman said. "Companies gamble like this all the time."

David Ouimette, manager of the stationary sources program for Colorado's Air Pollution Control Division, said state inspectors watch for such behavior.

"We look for patterns (in upsets), then we seriously question whether it's an unforeseeable breakdown of equipment," Ouimette said.

What's in the air?

Cemex's production upsets comprise a tiny fraction of its operating time. But the combination of the unknown nature of what is billowing into the air during an upset and Cemex's plans to resume tire burning has some residents concerned.

Ouimette said the specific toxins released in an upset are often unknown, particularly when the problem is reported simply as "opacity."

"Opacity is an indicator of a problem," he said. "The problem isn't opacity. It's whatever (the opacity) is made of, and we don't know what that is, generally."

Upsets can blow particulate matter, nitrogen oxides, sulfur dioxides and carbon monoxide out of the kiln without necessarily passing through pollution-control equipment, said Boulder County's Milmoe.

The Sierra Club contends that upsets generally bring higher pollution rates, and that agencies have not monitored the health effects of such emissions, according to Carman, the former inspector with the environmental group's Texas chapter.

"They just take a leap of faith," he said. "It's an issue all across the country and especially in Colorado."

Cemex's plans to burn tires for the first time since 1993 has some locals concerned about air quality. Two federal reports concluded that burned chipped tires posed "no public health hazard" at Cemex. But the agency did not consider emissions during upset conditions.

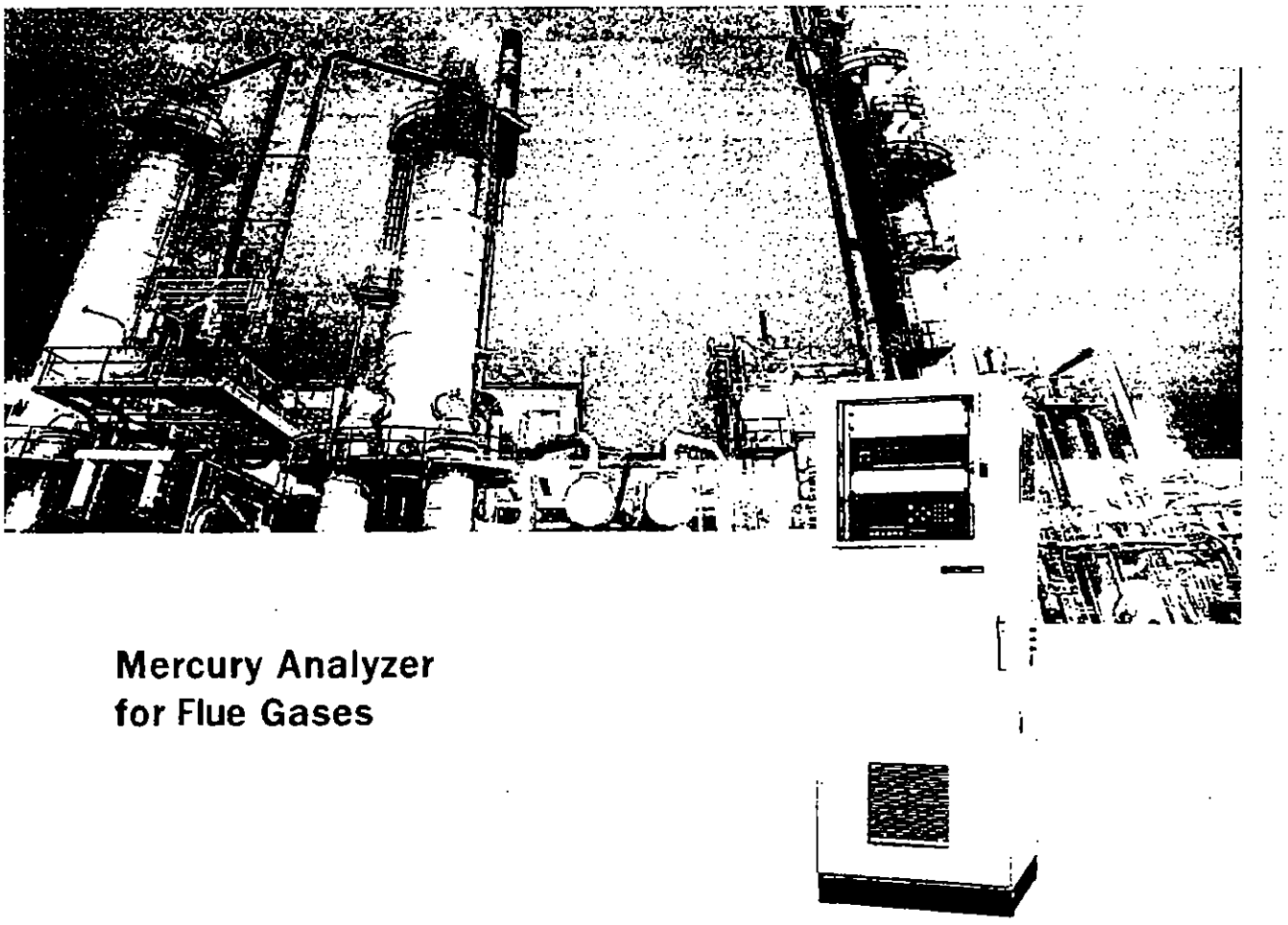
Burning tires as a supplement to coal is a widespread practice, and is already done at Holcim's Florence plant. But tires can produce more heavy metals and other toxins than coal.

Richard Cargill, who lives two miles east of the Lyons plant and leads the St. Vrain Valley Community Watchdogs, a group long critical of Cemex's operating record, opposes tire burning at the plant. He says the federal reports brush off the potential health impacts of upsets while burning tires because upsets are so infrequent.

"But I'm still very curious about what could be released out there if there's an upset when they're burning tires," Cargill said.

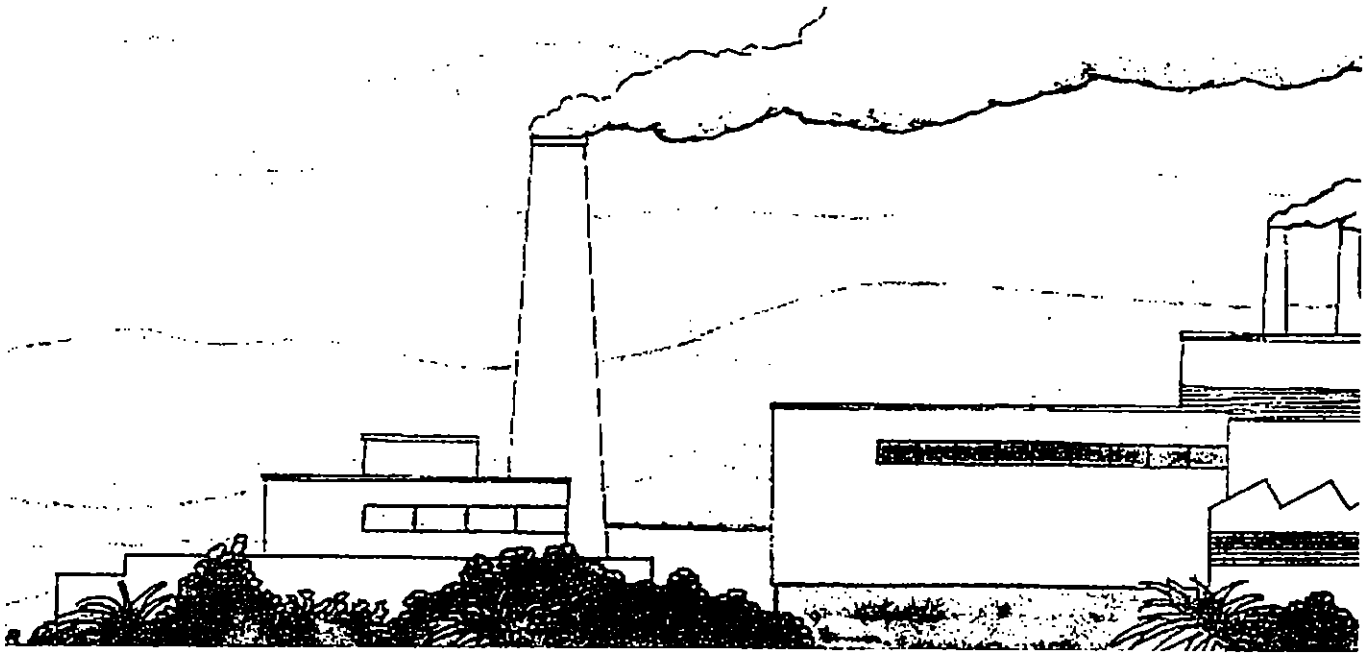
Contact Camera Staff Writer Todd Neff at (303) 473-1327 or neff@dailycamera.com.

{ Back }



Mercury Analyzer
for Flue Gases

Modern Measuring Technology for Today's Requirements



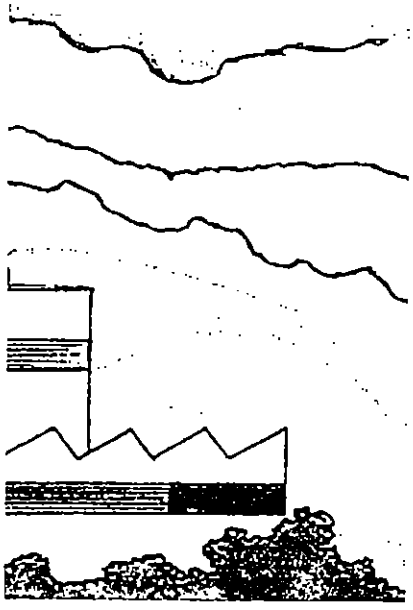
Emission limits for many known pollutants have been reduced. Additional pollutants that have to be monitored are appearing almost daily. SICK, as the world's largest manufacturer of analytical instrumentation, has always been at the forefront of industrial measurement technology.

With the MERCEM system, SICK has introduced a mercury monitoring system onto the market that has been especially designed to meet the latest requirements of emission monitoring technology.

Continuous Mercury Emission Monitoring

Several national regulations stipulate an emission limit of mercury. The MERCEM Emission Monitoring System has been developed to monitor not only this concentration limit but also even smaller measurement ranges. MERCEM combines the advantages of proven SICK system technology with those of modern analytical techniques. In this way, even complicated analytical methods become accessible for continuous industrial emission monitoring.

Reliable Detection of Mercury in Stack Gas



Among pollutant emissions, special regard must be paid to heavy metals because of their high toxicity. This is especially true for highly volatile mercury and its compounds. During combustion processes, such as in refuse incineration plants, mercury is mainly released as elemental mercury as well as mercury compounds. To record the total mercury emissions it is necessary to measure both components. Dust-bound mercury, however, plays only a minor part in the total emission.

Well-based Reduction Unit

To determine the total Hg-emissions in stack gas it is essential to reduce the mercury compounds to elemental mercury.
For this purpose the MERCEM system utilizes the tin(II) chloride reduction technique - well-established for manual measurements.

Low Detection Limits

High detection sensitivities are achieved by means of a preconcentration step following reduction (amalgamation procedure).
By varying the collection period the measurement range or the detection limit can be varied over a wide range to meet individual requirements.

No Interferences

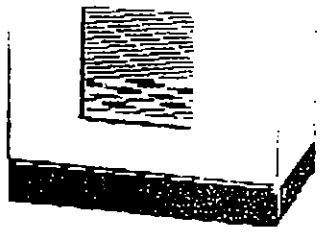
The amalgamation procedure features an additional major advantage, i.e. that the Hg analyzer is never in direct contact with the stack gas. Thus interferences caused by other components in the stack gas are eliminated.

Minimized Memory Effects

Mercury chloride compounds, in particular, can cause strong memory effects during sample collection. MERCEM minimizes these effects by utilizing very high sample gas flowrates and high temperatures within the system components that are in contact with the sample.

Low Operating and Maintenance Costs

When developing the MERCEM, special attention was paid to creating a simple and reliable system. Low chemical consumption and minimal maintenance requirements result in economic operating costs. Simple connection to the proven SICK MCS 100 HW and MCS 100 E HW Multi-Component Emission Monitoring Systems allows MERCEM to be operated without the need for an individual sampling system and consequently reduces the acquisition costs.



System Design

MERCEM comprises a system cabinet containing the sample gas transfer lines, analyzer unit with sample gas preparation assembly, and control unit. The MERCEM system can be used as a stand-alone unit with its own sampling device or it can be combined with an MCS 100 HW or MCS 100 E HW Multicomponent Emission Monitoring System.

Easy Handling and Accessibility

The ACE 100 control unit and the MFU heating controller are integrated as 19" slide-ins into the door of the system cabinet and are accessible via a separate transparent door. Consequently, the system can be operated without opening the system cabinet.
All components inside the cabinet can be easily accessed for maintenance purposes when the front door is open. The reservoir for the reductant solution is located directly behind the front door, making it very easy to replace.

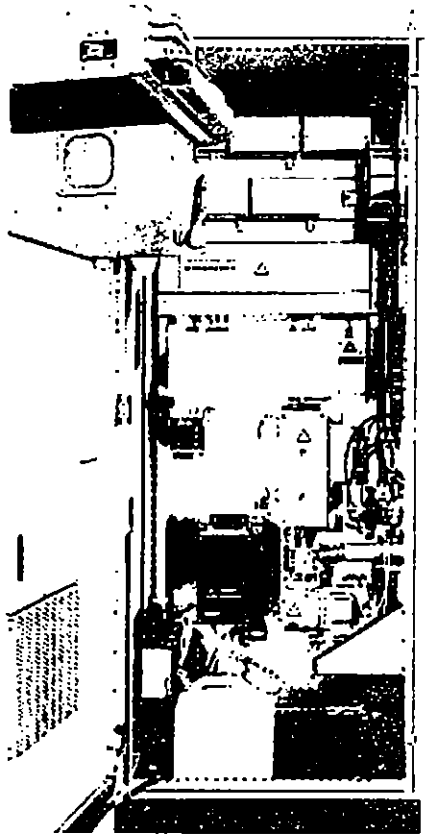
Automatic Operation with Self-monitoring

MERCEM is designed for continuous operation with low maintenance requirements and contains all control units and self-check functions required for automatic operation. The temperature and flowrate of the sampling system are constantly monitored. Large intervals between maintenance are achieved by automatic flushing cycles.

In the event of a malfunction, the sampling system is switched automatically to the standby mode and is purged free of corrosive flue gas by an inert gas stream. Correct functioning of the sample gas preparation system, including monitoring of the filling level of the reductant solution reservoir, and the analyzer are automatically controlled.

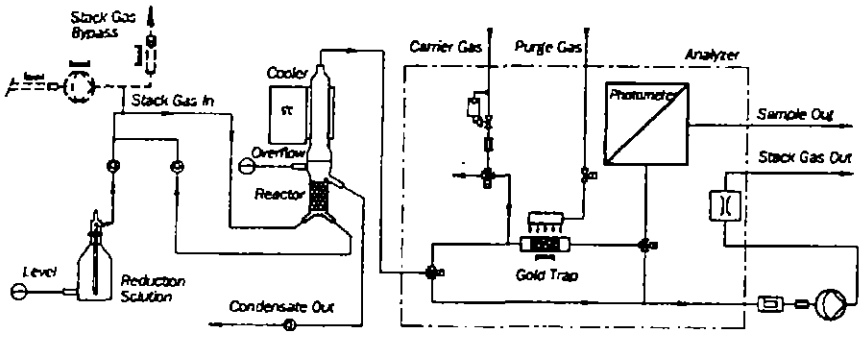
Safety

MERCEM meets the relevant guidelines for accident prevention and electromagnetic emissions.



Inside view of MERCEM

Sample Preparation and Analysis



Flow chart

Gas Flowpath

The gas flowpath consists of a strong bypass stream from which a small partial stream is extracted for sample preparation. The bypass stream is produced by the built-in gas transfer pump, or alternatively via the MCS 100 HW resp. MCS 100 E HW. Memory effects in the sampling system are minimized by the high sample gas flowrate. A second pump extracts the partial stream and feeds it to the reduction step and the amalgamation unit. To avoid condensation and memory effects, all components up to the reduction unit in contact with the gas are electrically heated to a high temperature.

Reduction

The reduction of mercury chloride compounds into elemental mercury is performed by wet-chemical reduction with $SnCl_2$ solution within a reduction vessel. Peristaltic pumps remove excess condensate and feed in fresh reductant solution.

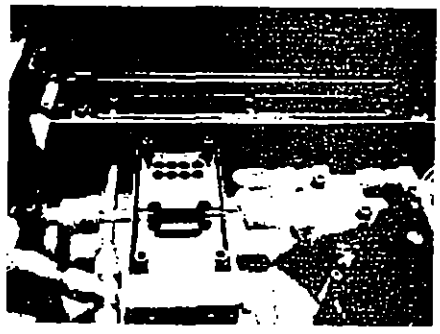
Within a subsequent heat exchanger the remaining condensate is removed and the sample is thermostatted to a constant dew point.
The sampling gas after processing is conducted into the gold trap.

Amalgamation

In the amalgamation procedure a precisely defined volume of the sample gas is conducted through a gold trap, whereby the metallic mercury forms an amalgam with the gold. At the end of this collection phase the gold trap is heated electrically, the mercury is released and transported through the cell of the photometer by an inert carrier gas stream. Following the purging cycle the gold trap is cooled and is then ready for the next collection period.
The sensitivity of the system can be adjusted to the desired measurement range by varying the sample collection time.
By utilizing the amalgamation technique, interferences to the measurement that can be caused by other flue gas components are avoided since the analyzer is only in contact with the carrier gas and the mercury.

Photometric Measurement

The mercury is measured by atomic absorption spectrometry. The single-beam photometer consists of a low pressure Hg-discharge lamp with high stability, a quartz cell, and a photodiode detector; the assembly is thermostatted. High stability of the measurements is ensured by baseline correction automatically performed before any measurement.



Gold trap and cell

The Sample Extraction System

The MERCEM sample extraction system is identical to that of the MCS 100 HW and MCS 100 E HW. It operates most reliably and has been designed for low memory effects. If MERCEM is operated in combination with an MCS 100 HW resp. MCS 100 E HW, no additional sampling system is required. The sampling system feeds the analytical system with a representative sample of the emission - cleaned from dust, but not changed in its chemical composition - with a suction capacity of approx. 1000 l/h. Additionally, calibration and security functions are integrated into the sampling system.

Heated Probe Tubes

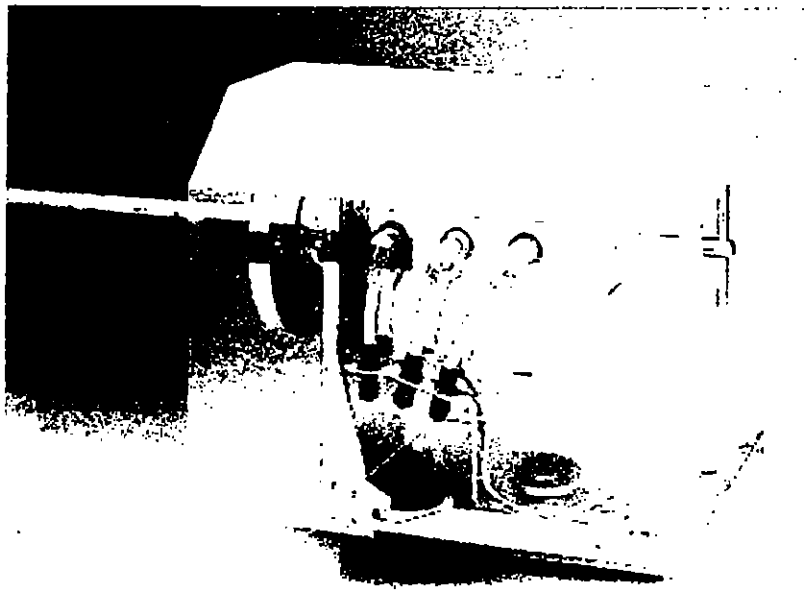
The probe tube is used to extract the flue gas sample from the stack and its length is adapted to the local circumstances. It is available as a heated or unheated version. If the stack gas temperatures exceed the dew point of the acid or the water vapor, probe tube heating may not be required. In this case a sintered metal filter is mounted at the probe tip for dust prefiltering. If the temperature is expected to drop below the condensation point, the sample must already be heated in the stack. For this purpose the electrically heated sampling tube is used. Dust prefiltering can then be carried out in the gas extraction filter. The latter is flanged to the stack and contains an additional fine filter element.

Automatic Backflush with Zero and Test Gas Sampling

Backflushing of the coarse filter as well as sampling of the zero or test gas are performed by means of nonreturn valves inside the gas sampling filter. Using this technique almost the complete sampling system is involved in the calibration, which significantly improves the reliability of mercury detection in the trace range. The connection to the sampling tube is closed by means of a pneumatic valve during the back flushing or the calibration procedures, respectively.

Sampling Line

The sample gas flows to the gas transfer pump via the sampling line. Normally, an electrically heated PTFE-line is used for this purpose. Depending on the length, the heating is divided into one or several control circuits. In the event of a malfunction the connection between the probe and the sampling line is closed by a pneumatic valve and the sampling system is purged with inert gas to avoid possible damage by corrosion.



Sample Extraction System

System Control and Interfaces

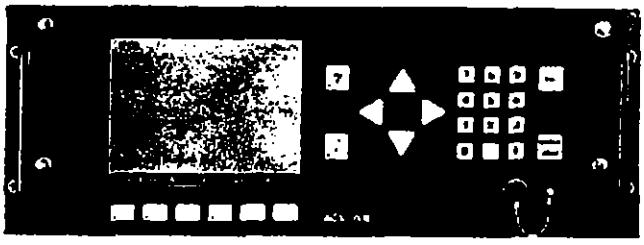
MERCEM is controlled via the ACE 100 system control unit. The ACE 100 is an industry-PC with a user interface especially tailored to the requirements of industrial measuring technology and contains particularly interference-proof interfaces.

Easy-to-use Software: 2 Operating Levels with Password Protection

Operation of the MERCEM meets the requirements for modern measuring systems. The software is easy to use,

Interference-proof Interfaces, Automatic Change of Measurement Range

Data input and output are performed via fiber-optic controlled relay interfaces in the ACE 100. Analog outputs



ACE 100 Control Unit

Integrated Data Acquisition System

ACE 100 is an IBM-compatible computer in a 19" slide-in cabinet with illuminated LC display and a special membrane keyboard. A silicon disk with no moving parts is used for mass storage.
ACE 100 controls the measurement sequence, calculates measured values, monitors limit values, and generates the results, warnings and alarms on the internal display and the opto-decoupled interfaces. Keyboard and display are mounted behind a lockable transparent door at the front of the system and are easily accessible. An external keyboard can be easily connected if required.

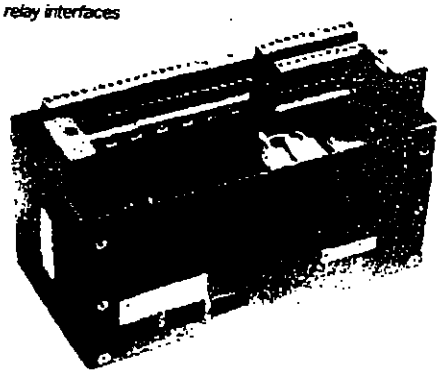
utilizing the cursor and function keys for menu selection. Two operating levels are available for the measurement mode and - password-protected - for changing control functions.

Display of Measured Values and Data Security

Together with the status reports all measured values are displayed numerically, graphically, or as a concentration curve on the LC display. Via the integrated mass storage unit it is possible to retrace the graphical display as well as the status reports.

(0/4-20 mA), with automatic switch-over of the measurement range as an option, are generated at the interfaces as well as the status signals. Digital and analog values generated by instruments of other vendors can easily be read in and processed.

Fiber-optic controlled relay interfaces



Technical Data MERCEM

Dimensions:	2100 mm x 800 mm x 600 mm (HxWxD) (incl. 100 mm base)
Material:	steel sheet
Weight:	approx. 340 kg
Color:	RAL 7032 - grey -
Degree of protection:	IP 54
Ambient temperature:	+5 °C to +40 °C
Ambient humidity:	Up to 80 % (non condensing)
Power supply:	3~230 V +10 % / -15 % / 50 Hz, optional 3~115 V / 60 Hz (1 phase possible)
Power consumption:	
- Control electronics (ACE 100):	max. 360 VA
- Analyzer unit:	max. 2000 VA
- Heated tube:	max. 150 VA/m
- Fine filter:	max. 400 VA
- Heated gas sampling:	max. 350 VA (not necessary in combination with MCS 100 HW or MCS 100 E HW)
Measurement range:	0-100 µg/m³ (smaller ranges on request)
Detection limit:	< 2 % of measurement range
Response time T_{90} :	approx. 180 s.
Cycle time of measurement:	< 180 s.
Zero drift:	< ±2 % / month
Span drift:	< ±2 % / month
Influence of temperature:	< 2 % of measurement range / 10 K
Linearization:	automatic after input of the calibration values
Limits:	two limits freely programmable as normally closed or normally open relay, automatic measurement range selection
Sensitivity control:	optional with Hg permeation system
Flow:	approx. 1000 l/h, analyzer unit: approx. 30 l/h
Auxiliary substances:	$SnCl_2$ reductant solution (consumption approx. 0.1 l/day), reservoir 10 l, inert gas (instrument air or N_2)
Sample point switching:	optional
Signal outputs:	galvanically separated via optocoupler
- Digital:	5 (optional max. 46), normally closed or normally open relays, freely assignable load: AC: max. 3000 VA / 250 V DC: max. 65 W / 230 V
- Analog:	8 (optional 24) 0/4-20 mA, max. resistance 500 Ohm
Interface:	RS232 (V24)
Inputs:	galvanically separated via optocoupler
- Digital:	12 (optional max. 72) freely assignable
- Analog:	6 (optional max. 32) freely assignable
Display:	7,4" monochrome LC Display with 640 x 480 pixel
Keyboard:	numeric membrane keyboard with cursor and function keys, external keyboard attachable
Operation:	2 levels, for user and programmer (password)
Memory:	2 MB (up to 32 MB optional) silicon disk
Standards:	IEC 1010-1 EN 50 081-2:92 (Emission of conducted and radiated noise) EN 50 082-2:92 (Electromagnetic compatibility)
Maintenance interval:	4 weeks
Approval:	lowest measuring range according German TÜV: 0 - 100 µg/m³ Hg, US EP

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