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Worldwide Report

ENVIRONMENTAL QUALITY

(FOUO 5/81)

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JAPAN

NITROGEN OXIDE EMISSION CONTROLS FOR DIESELS TO REQUIRE 13 PERCENT CUT

Tokyo JAPAN TIMES in English 30 May 81 p 2

[Text]

The Environment Agency decided Friday to introduce a new emission control standard in 1983 to reduce NOx concentrations in exhaust fumes from large diesel engine trucks and buses by 13 percent from the present levels.

The agency also decided to introduce a new noise control standard also in 1983 to reduce noise levels of trucks and microbuses with a load capacity of 2 to 4 tons by three phons.

The agency said permissible levels of NOx concentration in exhaust fumes from large diesel engine trucks and buses and new noise levels of the trucks and microbuses would be announced in August after consultations with the Transport Ministry.

NOx emission control standards for auto exhaust fumes were first introduced in 1973.

Passenger cars are now subject to the 1978 NOx emission control standards. Trucks, microbuses, and other gasoline engine automobiles as well as a certain type of diesel engine vehicles are now subject to the 1971 and 1977 control standards.

Large trucks and buses with a different type of diesel engine will be subject to the 1983 control standards.

As a result, all types of gasoline and diesel automobiles will be subject to the NOx emission control standards in 1983, the agency said.

The first noise control standard was announced for passenger cars in September last year for enforcement from next year.

Most of the large trucks and buses have a diesel engine that is driven by directly injecting fuel into the combustion chamber.

It has been considered difficult to reduce NOx concentration in exhaust gas from such trucks and buses.

However, the Environment Agency's advisory body has recently come up with a report that it has become technically feasible to reduce NOx emissions from these vehicles by 13 percent by introducing a new combustion chamber and improving air intake, exhaust and fuel injection systems.

Japan's automobile ownership was 37 million as of the end

of March 1980.

Of this figure, 904,000 buses and trucks, slightly less than 2.5 percent, have direct injection diesel engines.

However, according to an estimate made by the agency on the basis of a survey in Tokyo and three adjacent prefectures, such trucks and buses accounted for 20.5 percent of the total NOx emissions.

Therefore, much expectation has been placed on the reduction of auto NOx emissions through the introduction of NOx control standards for such trucks and buses.

Under the planned noise control standards, trucks and microbuses with a loading capacity of 2 to 4 tons are required to reduce their noise output by three phons beginning in 1983.

However, small vehicles weighing less than 3.5 tons, which are more numerous than the medium-size automobiles, are to be exempted from the 1983 control standards because of technical difficulties in reducing their noise output.

Plan to Cut NOx

The Cabinet Friday decided on a plan to reform part of the Air Pollution Law in order to restrict aggregate amounts of nitrogen oxides (NOx) by areas.

Under the plan the government is to carry out, a permissible level of NOx is set for each area and each factory is required to cooperate in restricting the concentration of NOx for the area.

At present, each plant is requested not to discharge NOx above a given allowable level.

According to the legislative plan, the total amount control system will be applied to the 23 wards of Tokyo, Musashino, Mitaka, Chofu, Hoya and Komae (Tokyo), Yokohama, Kawasaki, Yokosuka (Kanagawa Prefecture), Osaka, Sakai, Toyonaka, Suita, Izumiotsu, Moriguchi Hirakata, Yao, Neyagawa, Matsubara, Daito, Kadoma, Settsu, Takaishi, Higashi-Osaka, Shijonawate, and Katano (Osaka Prefecture).

CSO: 5000/4530

CZECHOSLOVAKIA

HIGH-QUALITY INDUSTRIAL DUST FILTER DEVELOPED

Prague TECHNICKY TYDENNIK in Czech No 16, 1981 p 9

[Article by Eng Jiri Albrecht, CSc: "An Important Stride Toward Protection of the Atmosphere"]

[Text] Particulate matter from a wide variety of industrial sources is increasingly polluting the environment, causing considerable harm. Separating equipment which varies widely in effectiveness is used to trap it. Accordingly, industrial filters based on intermittent trapping of the particulate matter on filter fabric and removal of the dust layer from it are coming to the fore. The main advantage of industrial filters is their excellent separating ability: while mechanical (cyclone) separators allow hundreds of milligrams of particulate matter per cubic meter of air to pass and electrical filters at their best pass 50 to 100 mg/m^3, industrial filters purify the air to 10 to 50 mg/m^3.

Industrial filter research and development is concentrated in the Research Institute of Air Engineering in Prague. While before 1970 the development of industrial filtration was backward, in recent years it has had much success. The institute has completed development of the Finet standard series of modern filter fabrics, working together with the Wool Research Institute in Brno, and has put it into series production at Nitop Mimon. At the same time, the institutes have completed development and started production of the FKA industrial filter, which decreases the output concentration to 20 mg/m^3. This has concluded the first comprehensive stage in the long-term plan for development of industrial filtration, bringing Czechoslovakia to the level of advanced foreign producers of filtration equipment.

What About Fine Dust?

Research and development have also aimed at a radical decrease in particulate matter in industrial filters and at capturing so-called "fine particles." The institute has accomplished the state plan assignment "High-Efficiency Filtration for Industrial Purposes (1977-1980)," aimed at developing a new high-efficiency filter which would give output concentrations below 1 mb/m^3 throughout the lifetime of the filter fabric.

It is well known that the Finet woven filter textiles make it possible to decrease output concentrations. But we know from experience that in actual operation, even when they use woven filter fabrics, domestic and foreign filters have output con-

centrations on the order of 10 to 50 mg/m^3. Before work began on the assignment, all of the factors affecting the output concentration were identified: the quality of the filter fabric, its shape, the regeneration method used on the dust-covered fabric, the reliability of the attachment of filter textiles under operating conditions, the design of the separating baffles between the clean and dirty sides of the filter, and the reinforcement of the fabric.

All of these factors were analyzed in detail and the findings were used to design the FKB filter. For high-efficiency filtration, the new textile Finet-PES-4/NZ (produced by Nitop Mimon), which fully meets all requirements and demonstrated satisfactory characteristics in tests using Spongelit test dust, was developed. The experience gained in monitoring the operation of the earlier FKA filter was used in the design of the FKB.

Two Possibilities for Regeneration

During development, a bag-type filter insert of new design with a filter surface of 25 mm made from one piece of filter fabric 23 meters long was tested. The ease of producing these liners and the minimum length of the connection eliminate the danger of high leakage which frequency occurred in hose-type connections. The baffle wall between the clean and dust-covered side of the filter is manufactured in such a way that leaks are prevented in the production process. Tighteness of the filter textiles within the filter during replacement and operation is an especially important matter. For example, changing the filter hoses in earlier filters is extremely toilsome, and the quality of the work depends only on the care with which it is performed. Experience shows that individual hoses are often incorrectly clamped. The clamping of the FKB filters is different from that used in the FKA. The new so-called "two circuit" clamping makes incorrect fastening impossible even by unskilled personnel. The FKB is regenerated by reverse blowing either with air from the surroundings of the filter or with purified air from the blower output. The filter has the same design for both methods, and output and connecting parts are added. The positive-draft part of the air-engineering equipment may be operated in the case of FKB filters regenerated with purified air, by using a separate blowback fan.

The institute devoted particular attention to reinforcing filter fabrics to make them keep their shape. A synthetic reinforcement usable at air temperatures up to 90° C which is being prepared will considerably decrease overall labor inputs required by the filter.

During the development process, four FKB 4/100 filters were also produced. The first has been in use in the laboratory of the Research Institute of Air Engineering in Prague as part of its measuring line. The measurements obtained using Spongelit test dust on an FKB filter fitted with the high-efficiency Finet-PES-4/NZ fabric surprised everyone participating in the assignment. Such low output concentrations (in the thousandths of a milligram per cubic meter) had not been expected even in extremes of optimism these excellent filter characteristics had to be tested in industry. It was decided to install filters at Solo Susice, which planned to return the purified air to the working area, at Kovohute Mnisek (where the dust that had to be separated was extremely fine), and at the Zemedelsky Agricultural Purchase and Supply Enterprise Milin.

Excellent Operating Results

At Solo Susice the dust is exhausted from lines where Sololit boards are sanded. The grinding dust is one of the finest and most clinging types of dust. Measurements were made during 1979 and 1980 at filter speeds of 4 cm/sec and 5.2 cm/sec. The average output concentration for 44 measurements was 0.0065 mg/m^3 and the average pressure losses 682 Pa (filtration speed 4 cm/sec) and 979 Pa (5.2 cm/sec). The experiments showed that the FKB filter could be used in the wood-processing industry when the purified air was to be returned to the work area. Energy savings in a single winter period amount to 15 percent of the purchase price of the filter, so that the users recoup their investment is less than 7 years.

The FKB filter has been in use at Kovohute Mnisek since 1979 to trap particulate matter from an electric arc furnace used in the production of silicon. The dust is extremely fine, with an average particle size of 0.29 micrometers, and with 85 percent of the particles smaller than 0.5 micrometers. A filter from the French Prat-Daniel company is in use there. The FKB filter is now in operation under the same load (filtration speed 1 cm/sec) and is connected to the duct between the cooler and the Prat-Daniel filter. In December 1979 the FKB was connected to the automatic unit controlling the Prat-Daniel filter and has since been operating simultaneously with it. By the end of 1980 it had been in operation for 5,400 hours and 22 measurements had been made. The average output concentration was 0.049 mg/m^3 and the average pressure loss 2.414 Pa. Comparison with the output concentration from the Prat-Daniel filter, which ranges from 20 to 60 mg/m^3, indicates unambiguously the quality of our filter.

The fourth FKB filter was produced and installed by workers in the shops of the Agricultural Purchase and Supply Enterprise in Prague (KUD [Kraj Maintenance Shop] Uhlirske Janovice) in accordance with documentation that was furnished. In this case, the effect on filter quality, i.e. on its high efficiency, resulting from manufacture by different producer was studied. This FKB 4/100 filter using Finet-VL/POP filter fabric was installed in the grinding compound production area of the Agricultural Purchase and Supply Enterprise plant in Milin, and since December 1979 has been separating particulate matter from transport routes and equipment for the production of fodder mixtures (two-shift operation). By the end of last year it had been in operation for more than 400 hours; the average output concentration was 0.031 mb/m^3 and the pressure loss was 956 Pa (filtration speed 2.1 cm/sec).

Production in a Repair and Maintenance Shop

FKB filters have been tested in facilities where the dust to be separated varied widely in character and fineness. The summary value of all output concentration measurements is 0.026 mg/m^3. There were no malfunctions, and with the exception of the collection mechanisms the filter requires no maintenance, and its production entails no subsupply other than the electric motors that drive it. Any ordinarily equipped shop can produce it. A lifetime of at least 15,000 operating hours is expected for the bag-type filter liners.

A complete set of technical specifications, including a description of the filter, the range of uses, performance characteristics, weight, principal dimensions and connector dimensions, installation instructions, and electrical control design suggestions and circuits, has been developed. A complete set of drawings and production documentation for the type series is available. But the greatest problem is

production of the filters. According to its operating plans, by 1984 ZVVZ [Air Engineering Equipment Plants] Milevsko is to produce eight FKB filters. Many enterprises which urgently need them will be producing them in their own shops according to the institute's documentation.

Thus a new high-efficiency industrial filter which returns air to the surroundings with a much lower than usual impurity content has been prepared. The output concentration far below 1 mb/m^3 places our FKB at the top of current industrial filter development worldwide. We know of no producer abroad who offers a filter with comparable characteristics.

The high-efficiency FKB industrial filter is an important success of Czechoslovak research and development. Its use will radically limit particulate matter in many industrial operations and thus will decrease the harm done to the natural surroundings and human health by industrial discharges.

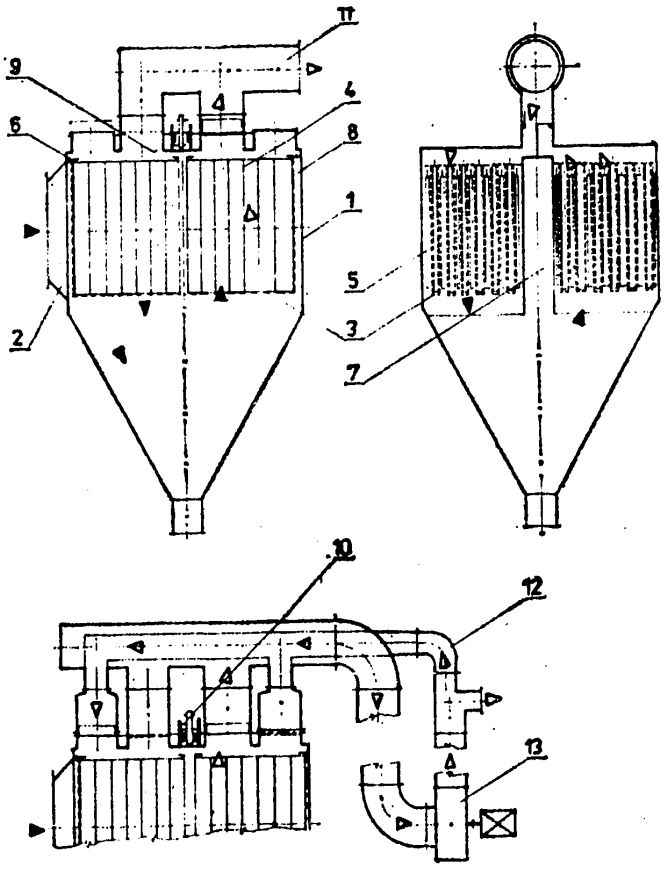

Schéma vysokoúčinného průmyslového filtru FKB: skříň filtru — 1, vstupní díl — 2, filtrační kapsová vložka — 3, vnitřní výztuž — 4, vnější výztuž — 5, těsnicí lišta — 6, vstupní komora — 7, filtrační komora — 8, výstupní komora — 9, regenerační zařízení — 10, výstupní díl — 11, proplachovací potrubí — 12, ventilátor — 13.

The high-efficiency FKB industrial filter.

Key:
1. Filter housing
2. Inlet section
3. Bag-type filter liner
4. Inner reinforcement
5. Outer reinforcement
6. Sealing bar
7. Inlet chamber
8. Filter chamber
9. Outlet chamber
10. Regeneration equipment
11. Output section
12. Blowback duct
13. Blower

8480
CSO: 5000/3022

SAUDI ARABIA

BRIEFS

DESALINATION PLANT--Nagoya, 22 May (JIJI PRESS)--Ishikawakima-Harima Heavy Industries, Ltd (INI) will ship 1.5 units of sea water desalination facilities, which have been recently completed at its Aichi plant in Chita, to Saudi Arabia next Tuesday. It earlier landed a 53-billion-yen (about $265 million) order for a total of 10 units from Saline Water Conversion Corp of the desert kingdom. The equipment with multistage flash distillation process is capable of desalting 23,600 tons of sea water a day. The remaining 8.5 units will be finished by February next year. These facilities will constitute part of the world's largest sea water desalination plant to supply industrial and drinking water to a huge industrial complex (the second phase) now under construction at Al Jubayl. [Text] [Tokyo JIJI in English 1409 GMT 22 May 81 OW]

CSO: 5000

END