

## FIVE-YEAR EXPERIENCE OF HALON 2402 RECLAIMING

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To meet the requirements of the Montreal protocol, the production and consumption of Halons 1301 and 1211 were stopped in Russia by 1 Jan. 1994; however, in the overwhelming majority of firefighting systems, Halon 2402 continued to be used. The changeover to nonozone depleting substituents seemed impossible for a number of reasons. First, the available Halon 2402-based fire extinguishing systems were technically nonapplicable with substituents, the former being liquefied gases. Second, there was no full-scale manufacture of nonozone depleting substituents in Russia. Third, financial problems did not allow, and soon will not permit, the change to nonozone depleting substituents. Based on the evidence derived from Russian Research Institute on Fire Protection (VNIPO), the average expense of the use of halon substituents is 4-4.6 times higher than that of reclaimed halons, the expense of carbon dioxide application is 6.5 times higher, and that of Inergen-541 is 14 times higher. This was why Russia had to address the Ozone Secretariat for a quota on Halon 2402 production from 1996-2000. Since the quota was being reduced every year, no significant inventory of Halon 2402 was stored.

Many enterprises met serious difficulties in providing fire safety for particularly important establishments. The total amount of Halon 2402 in all existing firefighting systems is estimated to be 8-10 thousand tons. Some firefighting systems were removed or are now being removed from service and not applied according to their purpose. Beginning in 1999, the company "Ozon" started recovering and reclaiming unused Halon 2402 to apply it further in the plants under operation. The reclaiming procedure is applied to Halon 2402 recovered from both nonoperated written off systems and systems under operation but with exhausted guarantee periods. The total amount of Halon 2402 reclaimed is shown in Figure 1. Ozon, Ltd., has reclaimed 162 tons of Halon 2402, which is about 75-80% of all Halon 2402 reclaimed in Russia.

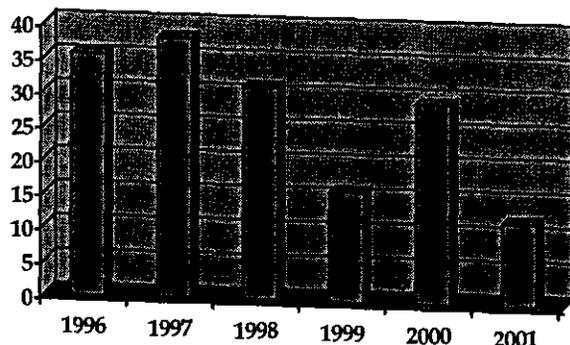


Figure 1. Halon 2402 reclaimed by Ozon, Ltd.

Halon 2402 for reclaiming comes mainly from firefighting systems providing for the safety of computation centers equipped with large electronic computers. Russian construction standards required that such centers would be provided with systems of bulk firefighting, the total amount of Halon 2402 in a system being 400-1000 kg. Those large computation centers lost their actuality with the transition to personal computers, and the appropriate firefighting systems started being phased out. Other sources of halon to be reclaimed are firefighting systems of military and civil establishments removed from service.

What is the practical procedure of recovery and reclaiming? **As** a rule, Halon 2402 is delivered to the reclaiming station in the 40l cylinders usually applied in firefighting systems (Figure 2). The cylinders are unmounted from the system and moved to the technical area. **As** halon in the cylinders is compressed by nitrogen or air to 100 bars, the firefighting charge at first enters a separator, where this compressing

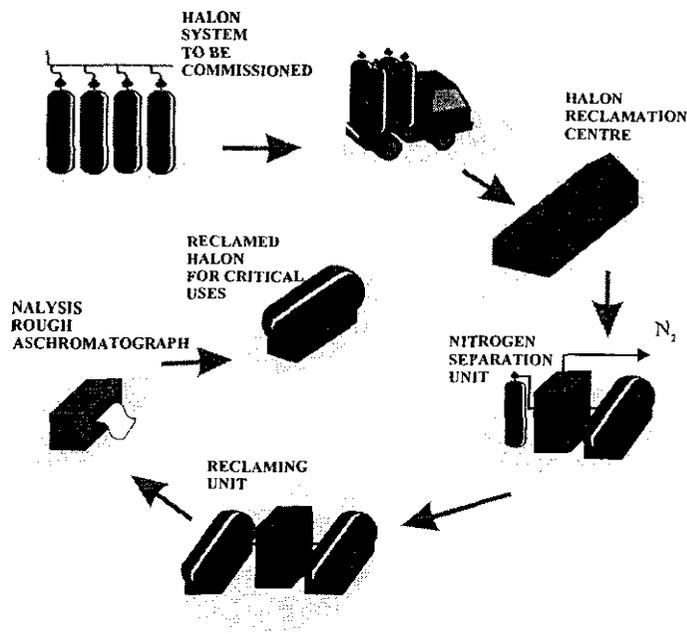


Figure 2. Recovery and reclamation procedure

gas is separated from Halon 2402, and halon is then poured out into a receiver. A sample is then taken from each receiver and analyzed for quality. If the percentage of the main substance is no less than the standard level, halon is passed on to the reclaiming area (Figure 3). If the main substance content is below the standard level, the halon is directed to more complicated processing.

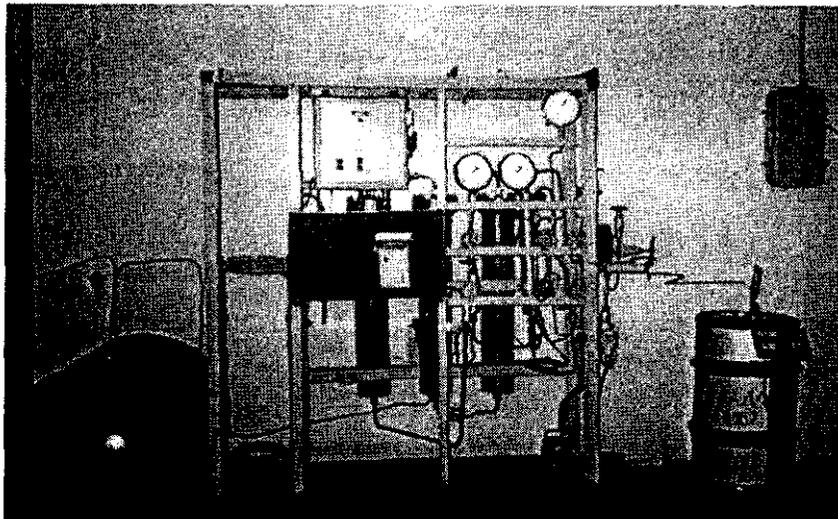


Figure 3. Reclamation set up.

Reclaimed Halon 2402 meets all requirements of Russian technical conditions (TU 2412-090-04806898-2001) and is stored in aluminum barrels of capacity 100l or 250l. Halon 2402 is only supplied to establishments with applications classified as “essential uses” (ships, aviation, etc.). After 20 Dec 2000, i.e., after the phaseout of the manufacture of all ozone depleting substances in Russia, including that of Halon 2402, the reclaimed Halon 2402 will be the only source of safety for the most important establishments before 2005 and in the future. The **Russian** State Program on halon banking and reclamation now being implemented in Russia takes into account the experience of Ozon, Ltd., in this area.