# KİREÇ NEDİR?

Kireç, doğada kireçtaşı veya kalker ($CaCO_3$) olarak bulunan kayaçların
- belli ebatlara indirgendikten sonra - fırınlarda yakılmasıyla elde edilir.

**Kalsinasyon**

**Kireçtaşı + Isı —> Kireç (sönmemiş) + Karbondioksit**

$CaCO_3 + 900°C \longrightarrow CaO + CO_2$

(100 g) (42 400 cal) —> (56 g) (44 g)

Elde edilen sönmemiş kireç, higroskopik özelliklere sahiptir ve suyla reaksiyona sokularak toz halindeki sönmüş kireçe dönüştürülür:

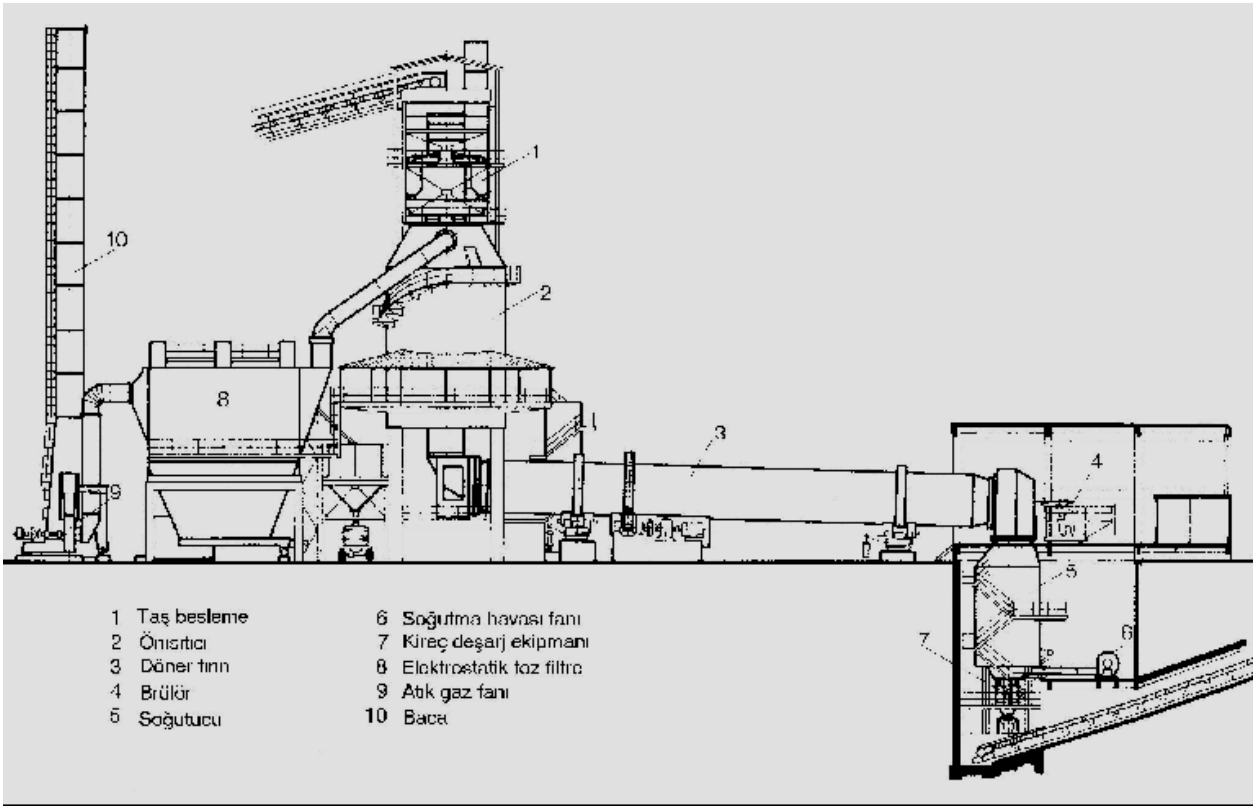
**Hidratasyon**

**Sönmemiş Kireç + Su —> Sönmüş kireç + Isı**

$CaO + H_2O \longrightarrow Ca(OH)_2$

(56 g) (18 g) —> (74 g) (15 456 cal)

## KİREÇ FIRINI – ŞAFT ÖN ISITMA & DÖNER FIRIN



# ARITMA ÇAMURLARININ KİREÇLE STABİLİZASYONU UYGULAMALARININ AB ÜLKELERİNDEKİ DURUMU

COMMISSION OF THE EUROPEAN COMMUNITIES

Brussels, 11.7.2003
COM(2003) 250 final/3

**CORRIGENDUM**
Annule et remplace le point 3.3 (Autosuffisance en matière d'élimination des déchets - Article 5- concerne la Finlande) ainsi que le tableau 3.1 du document COM(2003)250 du 19.5.2003
Concerne toutes les versions.

**REPORT FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT**

**ON THE IMPLEMENTATION OF COMMUNITY WASTE LEGISLATION**
**Directive 75/442/EEC on waste,**
**Directive 91/689/EEC on hazardous waste,**
**Directive 75/439/EEC on waste oils,**
**Directive 86/278/EEC on sewage sludge and**
**Directive 94/62/EC on packaging and packaging waste**

**FOR THE PERIOD 1998-2000**

## INTRODUCTION

This report intends to inform the other Community Institutions, Member States and the interested public of the implementation of waste legislation for the period 1998 to 2000, in particular the implementation of

- Directive 75/442/EEC[1] on waste
- Directive 91/689/EEC[2] on hazardous waste (replaced Directive 78/319/EEC)
- Directive 75/439/EEC[3] on the disposal of waste oils
- Directive 86/278/EEC[4] on the protection of the environment, and in particular of the soil, when sewage sludge is used in agriculture
- Directive 94/62/EC[5] on packaging and packaging waste

It has been drafted according to Article 5 of Directive 91/692/EEC[6] standardising and rationalising reports on the implementation of certain Directives relating to the environment. The Commission has already published a report on the implementation of Directives 75/442/EEC, 91/689/EEC, 75/439/EEC and 86/278/EEC for the period 1995 to 1997[7], as well as a report for the period 1990-1994[8].

Under Directive 91/692/EEC Member States are required to submit reports, drawn up on the basis of questionnaires. Questionnaires relating to Directives 75/439/EEC, 75/442/EEC and 86/278/EEC were adopted by Commission Decision 94/741/EC[9] of 24 October 1994. Questionnaires relating to Directives 91/689/EEC and 94/62/EC were adopted by Commission Decision 97/622/EC[10] of 27 May 1997.

Directive 91/692/EEC requires the Commission to publish a consolidated report. The aim of this Community report is to enable Member States and the Commission to assess the progress made in implementing the waste management Directives throughout the Community and, at the same time, provide the general public with information on the state of the environment.

The report is primarily based on information received from Member States; as such, its content depends largely on the completeness, quality and precision of the national contributions. As regards in particular the legal cases mentioned in the report, updated information has been included which is subsequent to the reporting period 1998-2000.

According to Directive 91/692/EEC Member States had to submit their reports by 30 September 2001. The reports from Austria, Germany, Denmark, Spain, Finland, France, Greece, Ireland, Italy, Luxembourg, Sweden, the Netherlands and the UK were transmitted between November 2001 and February 2002. Reports from the 3 regions of Belgium were

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1 OJ L 194, 25.07.1975, p. 47 as amended by Directive 91/156/EEC (OJ L 78, 14.01.1991, p. 32)
2 OJ L 377, 31.12.1991, p. 20
3 OJ L 194, 25.07.1975, p. 31 as amended by Directive 87/101/EEC (OJ L 42, 22.12.1986, p. 43)
4 OJ L 181, 04.07.1986, p. 6
5 OJ L 365, 31.12.1994, p. 10
6 OJ L 377, 22.12.1991, p. 48
7 COM (99) 752 final of 10.01.2000
8 COM (97) 23 final of 27.02.1997
9 OJ L 296, 17.11.1994, p. 42
10 OJ L 256, 19.9.1997, p. 13

The **United Kingdom** reports 10 sites where the normal limits for all metals may be exceeded in accordance with Annex I C, footnote 1. It is generally land adjoining waste water treatment plants which was once used as a sewage farm. The total surface area of this sites (estimated) is 2 516 hectares.

### 3.7. Description of the technologies employed for treating sludge – Article 6

*According to Article 6 (without prejudice to Article 7) sludge shall be treated before being used in agriculture. Member States may nevertheless authorise, under conditions to be laid down by them, the use of untreated sludge if it is injected or worked into the soil.*

In **Austria** the treatments applied are simultaneous stabilisation, separate anaerobic stabilisation and aerobic stabilisation (not heated), mesophilic anaerobic and aerobic stabilisation, thermophilic aerobic stabilisation, liming composting and drying.

In the Wallonia Region of **Belgium** sludge is digested, aerobically stabilised, mechanically dried, thermally dried or conditioned with lime or polyelectrolites. In the Flemish Region the following technologies are employed: aerobic stabilisation, mesophilic anaerobic stabilisation, cold fermentation, thermal drying, and lime stabilisation.

In **Denmark** the following technologies are employed for treating sludge: stabilisation (anaerobic stabilisation by fermentation in heated digester or treatment in a bioreactor; aerobic stabilisation) by sludge aeration and composting under conditions where the temperature is not controlled; chemical treatment by addition of lime); controlled composting (composting with daily measurement of temperature so that all material is subject to a temperature of 55°C as a minimum for two weeks), and controlled sanitisation (treatment in reactor which ensures a temperature of 70°C as a minimum for one hour).

In **Greece** only small quantities of sludge have been used in agriculture so far. Research programmes concerning the treatment of sludge and its use in agriculture are being conducted in various areas of the country. Methods for sludge treatments are being examined in these research programmes.

In **Finland** sludge undergoes anaerobic digestion, is stabilised by aeration or lime conditioning, or it is composted.

In **France** sludge is subject to prolonged aeration, aerobic or anaerobic stabilisation, lime conditioning, composting, or thermal drying.

In **Germany** different technologies are applied such as anaerobic digestion, aerobic stabilisation, lime conditioning, etc. Normally a combination of these techniques is used for sludge treatment.

In **Italy** the most common treatments are aerobic digestion (including composting), anaerobic digestion, mechanical dewatering, thermal drying, chemical treatment with alkali. Aerobic digestion is normally carried out on small sized plants up to 50,000 population equivalent (p.e.), while anaerobic digestion is for plants bigger than 50,000 p.e.



In **Ireland** sludge is either dewatered on filter tables and stored for 6 months, or undergoes anaerobic digestion.

In **Luxembourg** sludge is digested and then conditioned with lime or iron salts. Mechanical devices are used for dewatering. Polyelectrolites are added to sludge which is not conditioned with lime in order to facilitate dewatering.

In the **Netherlands** sewage sludge must be treated by biological, chemical or thermal means, by long-term storage or any other suitable methods which has killed off most of the pathogenic organisms in the sludge.

In **Portugal** the technologies employed are drying beds (drainage on sand beds and evaporation of humidity), thickening, mechanical dehydration (band filters, filter presses, vacuum filters or centrifugal machines) and various stabilisation processes.

In **Spain** anaerobic digestion, long-term storage and composting are the most widely used techniques.

In **Sweden** the following techniques are used: thickening (gravity thickening, flotation), stabilisation (anaerobic, aerobic, lime), conditioning, dewatering (centrifuge, filter belt press, air drying), thermal drying and composting.

In the **United Kingdom** the technologies employed are mesophilic and thermophilic anaerobic digestion, composting, lime stabilisation, liquid storage, dewatering and storage, thermal drying.

### 3.8. As regards the frequency of analysis – Annex II A, paragraph 1:

*According to Article 6(5) sewage sludge producers shall regularly provide users with all the information referred to in Annex II A (sludge analysis).*

In **Austria** the frequency of analysis depends on the Land. It is linked to the size of the treatment plant and varies from every two months for plants treating more than 30,000 p.e. in Styria to every three years for plants up to 500 p.e. in Carinthia.

In the Wallonia Region of **Belgium** the frequency of analysis is linked to the size of the treatment plant, i.e. one analysis per year for a plant treating less than 5 000 population equivalent (p.e.), up to one analysis per month for plants larger than 100 000 p.e. In the Flemish Region four analyses per year have to be carried out.

In **Denmark, Greece, Ireland, Portugal, Spain** and the **United Kingdom** the same requirements as in the Directive apply.

In **Finland** the frequency of analysis is linked to the size of the treatment plant, i.e. one analysis per year for a plant treating less than 200 p.e., up to one analysis per month for plants larger than 100 000 p.e. These frequencies can be relaxed when the quality of the incoming water does not change in time.

In **France** the frequency of analysis varies from twice a year for small plants to once a week for the biggest plants.