Commodities
International
Survey Services

Clays, Kaolin & Sands, Cement & Clinker SURVEY

It's Shipping & Survey

Our Company CISS GROUP (Commodities International Survey Services) – this is a team of professionals with experience of doing business in major international survey companies more than 15 years.

ABOUT COMPANY

Head office of **CISS GROUP** is located in Singapore: we have teamed up our forces, experience and knowledge in order to offer only the best practice and business solutions in the field of independent inspections for active commodities traders, producers and others players all over the world.

Operational excellence and high standards of **CISS GROUP** allow our partners feel protected twenty-four-hour a day.

ISO FOSFA INTERNATIONAL Gafta MEMBER

It's Shipping & Survey

CEMENT & CLINKER

Cement is a finely milled mineral powder, usually grey in color. The most important raw materials for the production of cement are limestone, clay, and marl. Mixed with water, cement serves as an adhesive to bind sand, gravel, and hard rock in concrete. Cement hardens both in the air and under water, and remains in its hardened state once reached.

Cement is usually available in the form of a homogeneous bulk dry good. It's characteristics are standardized in order to ensure the required stability, reliability, and process ability in the application.

Cements are classified according to their early and final strength as well as their composition. In addition to cements that consist of 100% clinker, there are so-called composite cements, in which a portion of the clinker is replaced by alternative raw materials, such as fly ash, ground slag, or limestone. As the production of clinker is energy-intensive and releases large amounts of CO_2, the use of alternative raw materials can conserve natural resources and reduce CO_2 emissions.

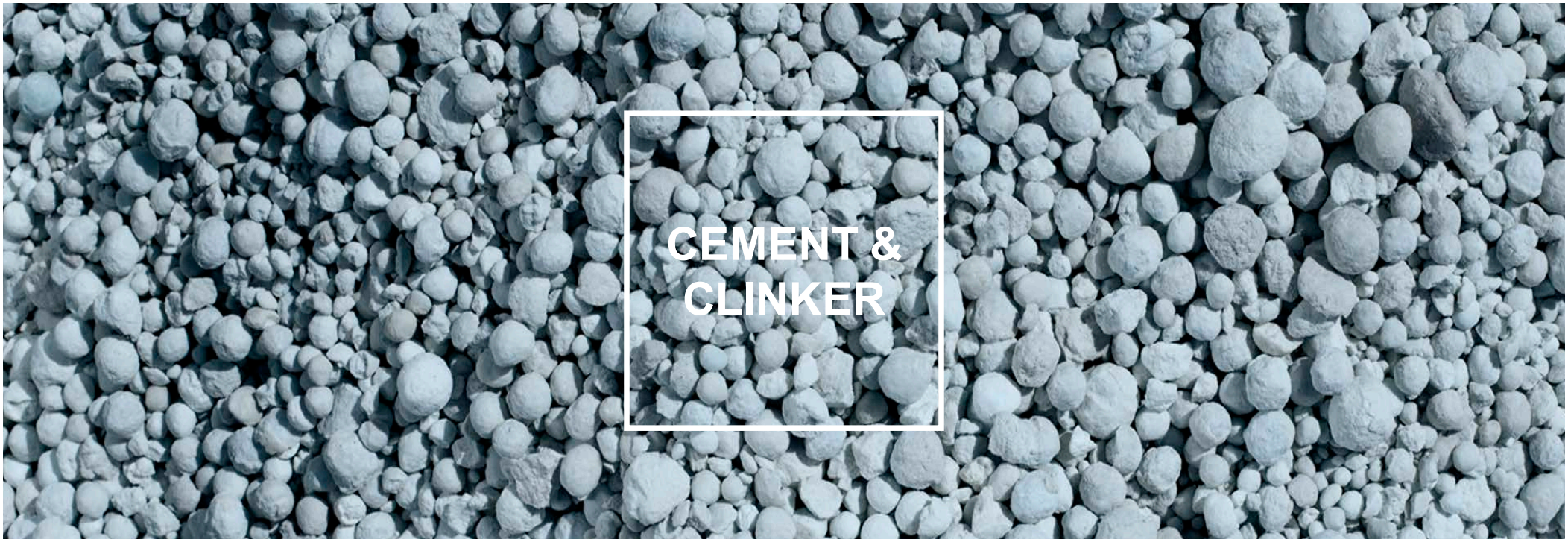
It's Shipping & Survey

Depending on the desired application, different types of cement – each with a specific composition – are necessary. Cement characteristics can also be modified through the use of additives.

We offer our customers a broad range of cement's inspections services, including quality testing and parameters control in laboratory.

There are some specifications for testing:

- compressive
- strength
- fineness
- setting time
- soundness
- color etc.



It's Shipping & Survey

Concrete

A concrete survey, concrete sampling and concrete testing is required to establish the condition of a concrete structure. The durability and condition of reinforced concrete depends on the relationship between the cover to the reinforcement, the carbonation depth, the chloride ion content, the exposure conditions and quality of the concrete.

For example, elevated levels of chloride within the concrete can lead to accelerated deterioration of concrete under damp conditions.

Chloride may have been used in the original concrete mix or may have ingresses as sea spray or de-icing salts.

The use of High Alumina Cement (HAC) was found to have caused a number of well publicized structural failures during the 1970's. The use of HAC was subsequently banned.

It's Shipping & Survey

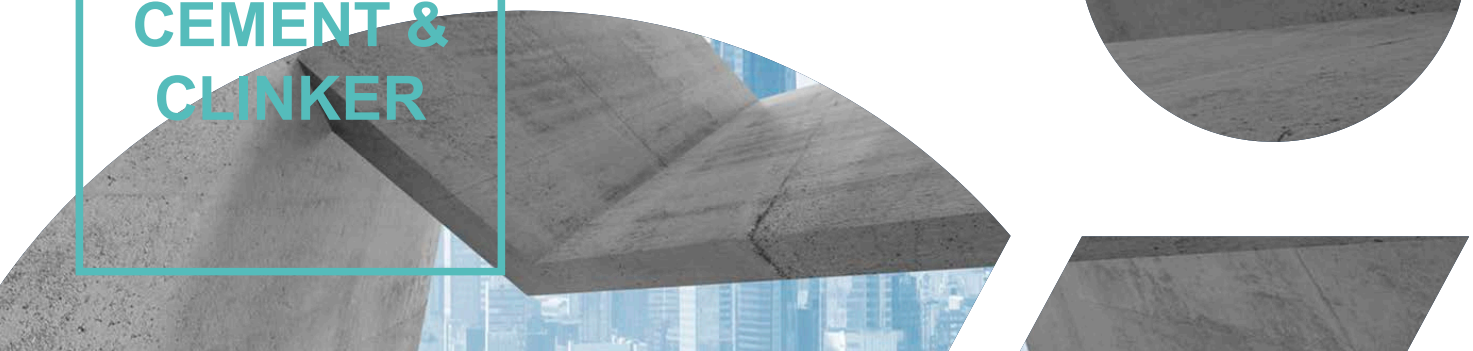
Hence, particularly during property acquisition surveys by CISS GROUP's inspectors, it is imperative that a condition and durability assessment of the structural concrete is undertaken.

Typically this involves detailed concrete surveys, concrete sampling and concrete testing.

A concrete survey, incorporating concrete sampling and concrete testing, will confirm the condition of a concrete structure or individual element.

CISS GROUP offers the following concrete survey services:

- Visual Inspection.
- Site concrete sampling for laboratory analysis.
- Analysis to determine the Chloride content (through laboratory concrete testing).
- Analysis to identify HAC (through laboratory concrete testing).
- Site concrete testing for long term durability purposes (depths of concrete cover and carbonation).



CEMENT & CLINKER

Following a concrete survey and concrete sampling exercise CISS GROUP produces detailed interpretative reports that confirm the condition of the concrete investigated, whether deleterious materials are present and also makes comment on the long term durability of the concrete.

CISS GROUP provides technical advice with regard to any types of concrete. If required some remedial works, our inspectors can also supervise such works.

CISS GROUP uses the results of the concrete surveys, concrete sampling and concrete testing to estimate the likely lifespan of a structure and advise what maintenance will be required during that period. Concrete surveys can generally be carried out whilst a building remains in use. Concrete surveys are carried out by experienced and qualified inspectors.

It's Shipping & Survey

CLAY & KAOLIN

Clay is arguably one of the most important industrial minerals on Earth. This diverse, naturally occurring material created through the breakdown of rock is used in an endless number of applications throughout a host of industries.

Found in many of the products that surround us throughout our daily lives, few materials can boast such varied use as clay. Clay comes in many forms and with variations of accompanying minerals, but with such diversity in both origin and end use, comes unpredictability.

This makes testing a necessity when it comes to product and process development around clay products or when using clay as an additive in other products.

Testing capabilities include particle-size distribution analyses to measure the amounts of clay, silt and coarser material present;

X-ray diffraction analyses to determine the mineralogy of both bulk-rock samples and clay-size material; and leaching tests to measure the amount of insoluble material present. The results of these tests aid in determining the value of clay materials to the public and industry, and their importance in scientific research. For mineral separation we are using heavy liquids, water, or other methods to separate heavy minerals.

It's Shipping & Survey

Soil and Rock Characterization

CLAY & KAOLIN

Particle size analyses

Particle-size distribution analyses to measure the amounts of clay, silt and coarser material present.

Paste pH and conductivity

Determine the paste pH and paste conductivity of rock and soil samples. Paste tests are used to evaluate the geochemical behavior of mine waste materials subject to weathering under field conditions and to estimate the pH and conductivity of the pore water resulting from dissolution of secondary mineral phases on the surfaces of oxidized rock particles.

Density and specific gravity

Bulk density is the ratio of sample mass to sample volume for a dry sample. Bulk density can be calculated from the particle density or the specific weight of a dry soil given the sample porosity (or void volume). Bulk density or sample volume are needed to convert gravimetric moisture content to volumetric moisture content.

Deionized water leach

This test is designed to extract soluble sulfates from minerals without attacking insoluble minerals such as silicates, and in particular, clay minerals. It provides an estimate of the soluble minerals, cement, and amorous material in the sample.

Gravimetric Moisture Content

Gravimetric moisture content is used to estimate the moisture content of the material at a specific time

If the material's bulk density is known, then the gravimetric water content can be converted to volumetric moisture content, and thus the material's in situ matric potential can be determined from a known volumetric moisture content – matric potential relation, also called the Soil-Water Characteristic Curve (SWCC) or moisture retention curve. Observations of in situ matric potential and moisture content values are critical to modeling the seepage and stability of the rock piles

It's Shipping & Survey

Soil and Rock Characterization

CLAY & KAOLIN

ABA and NAG

Determine the balance between acid producing and acid consuming components of mine waste. It is based on the Sobek Acid Base Accounting (ABA) Procedure.

Determines the net acid remaining, if any, after complete oxidation of waste rock material with hydrogen peroxide and allowing complete reaction of the acid formed with the neutralizing components of the material. The NAG test provides a direct assessment of the potential for a material to produce acid after a period of exposure and weathering and is used to refine the results of the theoretical acid-base accounting (ABA) predictions.

Slake Durability

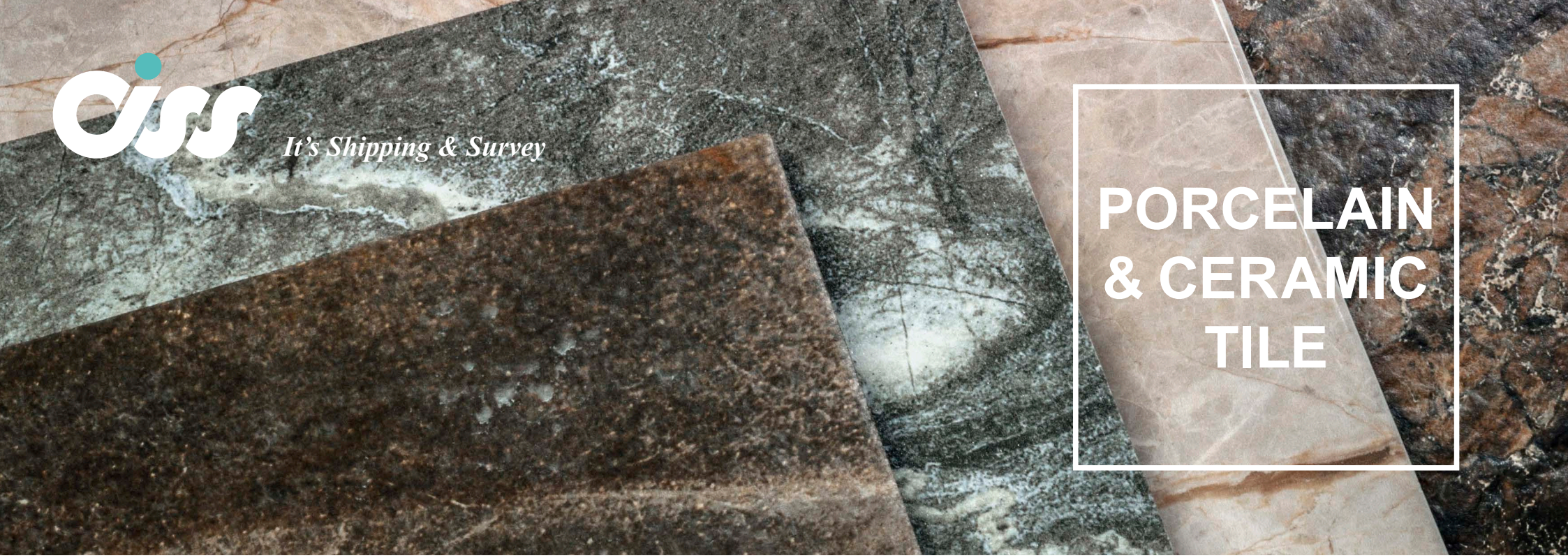
ASTM D 4644-87 (Reapproved 1992) Standard Test Method for Slake Durability of Shales and Similar Weak Rocks. The slake durability tests are conducted to estimate the durability and strength of rock samples.

Petrographic Analyses

Petrographic analyses involves optical examinations and mineral identification, which are the basis for all geologic models and characterization, specifically in differentiating various rock units, determining rank and intensity of alteration, determining chemistry of alternating fluids, describing cementation, and determination of paragenesis of mineralization, alteration, and cementation. Alteration rank is based upon the mineral assemblages, which infers temperature, pressure, and permeability conditions at the time of formation.

Semi-quant chemistry (PXRF)

Semi-quantitative chemistry by portable X-ray Fluorescent analyses. PXRF can be used for quick mineral identification.



Ceramic tile is made from natural clay, sand and water.

These materials are molded to form square or rectangular tiles and then baked in a kiln to remove most of the moisture.

Porcelain tile is also made from clay but tends to be made using denser types of clay than ceramic.

Porcelain tiles are baked at very high temperatures for long periods of time so that almost all the water is removed. This longer drying time makes porcelain tile much harder and denser than ceramic

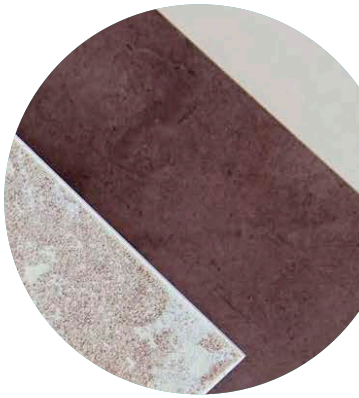
CISS GROUP is proudly introducing ceramic tile and porcelain laboratory's testing capacities:

- Appearance tests
- Measurement of dimensions
- Surface Abrasion
- Scratch resistance
- Determination of grazing resistance test
- Thermal shock resistance
- Deep abrasion
- Module of rupture test
- Water absorption

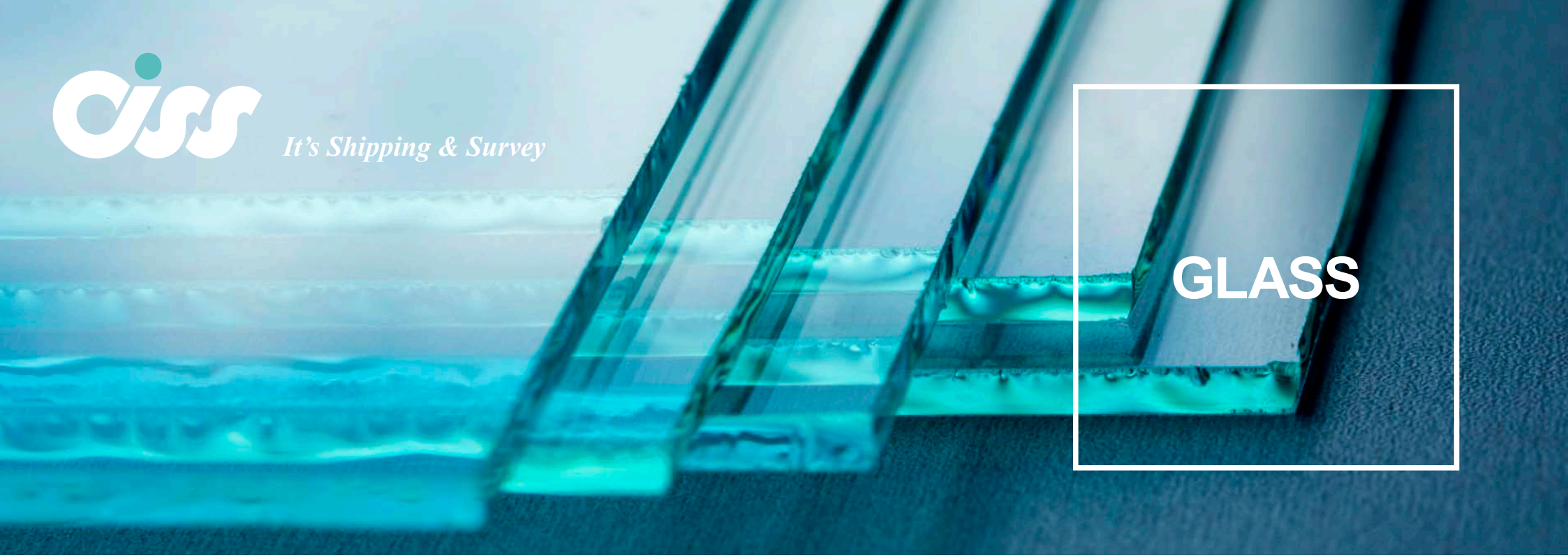
It's Shipping & Survey

Some kind of sands commonly used for porcelain and ceramic files. Quartz sans and limestone is used for glass production. We provide the following analyses for sands:

- Ilmenite content,TiO_2, Fe_2O_3, FeO, V_2O_5, P_2O_5, Cr_2O_3, SiO_2, Al_2O_3, MnO, CaO, MgO.
- For zircon – $ZrSiO_4$ or ZrO_2.
- Rutile – TiO_2 and others impurities: Cr, Nb, Ta, V, Sn, Ta_2O_5.
- Granulometry (sieve analysis).
- Colour determination.
- Melting temperature.
- Dencity.
- Glassfiber content.



PORCELAIN & CERAMIC TILE



CISS GROUP Laboratory can help you with all your Glass testing, analysis, scientific research and development, inspection, certification, engineering, failure investigation, and product development needs including:

- Optical Properties Testing
- Strength Testing
- Reflectivity Testing
- Refractive Index Testing
- Robustness Testing
- Surface Testing
- Bending Strength Testing
- Non-Destructive NDT Testing
- Environmental Exposure Testing
- Total Solar Energy Transmittance Testing
- Thermal & ultraviolet Transmittance Testing
- Temperature Variation Testing
- Tensile Strength Testing
- Optical Dispersion Testing
- Radioactivity Testing
- Impurities Testing
- Cleanliness Testing
- Durability Testing
- Accelerated Weathering Testing
- Thermal Expansion Testing
- Heat Resistance Testing
- Resistance to Arrack Testing

It's Shipping & Survey

Glass Test Method and Standards which can be privided by **CISS GROUP** in independent laboratories:

GLASS

Glass products maybe tested according to many different Glass Test Method and Standards including:

- **SO 1288-1:2016** Glass in building
- **Federal Motor Vehicle Safety Standards FMVSS 205** Glazing Materials
- **FMVSS 208** Occupant Crash Protection
- **ASTM C 146** Standard Test Methods for Chemical Analysis of Glass Sand
- **ASTM C 169** Standard Test Methods for Chemical Analysis of Soda-Lime and Borosilicate Glass
- **ASTM C 1036** Standard Specification for Flat Glass
- **ASTM C 147** Standard Test Methods for Internal Pressure Strength of Glass Containers
- **ASTM C 600** Standard Test Method of Thermal Shock Test on Glass Pipe
- **ASTM C 1648** Standard Guide for Choosing a Method for Determining the Index of Refraction and Dispersion of Glass
- **ASTM C 158** Standard Test Methods for Strength of Glass by Flexure (Determination of Modulus of Rupture)
- **BS EN356** Glass in building. Security glazing. Testing and classification of resistance against manual attack
- Others:
  BS 6206
  ANSI Z97.1
  EN 12543
  EN 12600

It's Shipping & Survey

MARBLE & GRANITE TESTING

CISS GROUP can help you with following tests:

- Water Absorption Test
- Hardness Test
- Breaking Strength Test
- Thermal Shock Test
- Modulus Rapture Test
- PVC Flooring Tile Test
- Frost Resistance Test

It's Shipping & Survey

Water Absorption Test:

The amount of water that refractory can absorb is measured by the water absorption test. The results of water absorption tests are used for quality assurance.

Test Method: **IS: 1124-1974, IS: 13030-1991, ASTM C 97-2009.**

Hardness Test:

This test helps in determining the hardness of rock. Because granite is a rock composed of multiple minerals, only crystals of specific minerals within the granite would be tested for hardness.

Test Method: **IS: 13630 (P-13) 2006**

Breaking Strength Test:

Rocks are considerably weaker in tension than in compression. Characterizing tensile strength of rocks thus is of great importance in many engineering and geophysical applications. The tensile strength can be defined as the failure of stress.

Test Method: **IS: 13630 (P-6)2006, IS: 4457-2007**.

It's Shipping & Survey

MARBLE & GRANITE TESTING

Thermal Shock Test:

Thermal shock is the name given to cracking as a result of rapid temperature change. Glass and ceramic objects are particularly vulnerable to this form of failure, due to their low toughness, low thermal conductivity, and high thermal expansion coefficients. However, they are used in many high-temperature applications due to their high melting point.

Test Method: **IS: 13630 (P-5)2006, EN-104, ISO 10545 (P-4)**.

Modulus Rapture Test:

The modulus of rupture (MOR) is the maximum surface stress in a bent beam at the instance of failure. One might expect this to be exactly the same as the strength measured in tension, but it is always larger because the volume subjected to this maximum stress is small, and the probability of a large flaw lying in the highly stressed region is also small.

Test Method: **IS: ASTM C 99-2009, IS: 1578 (P-5)1993.**
This test is done to check the dimensional stability of the rock.

Test Method: **IS: 1130-1969, IS: 3316-1974, IS: 14223 (P-1) 1995, IS: 3622-1977, ASTM C 625, 616, 629, 503**.

Frost Resistance Test:

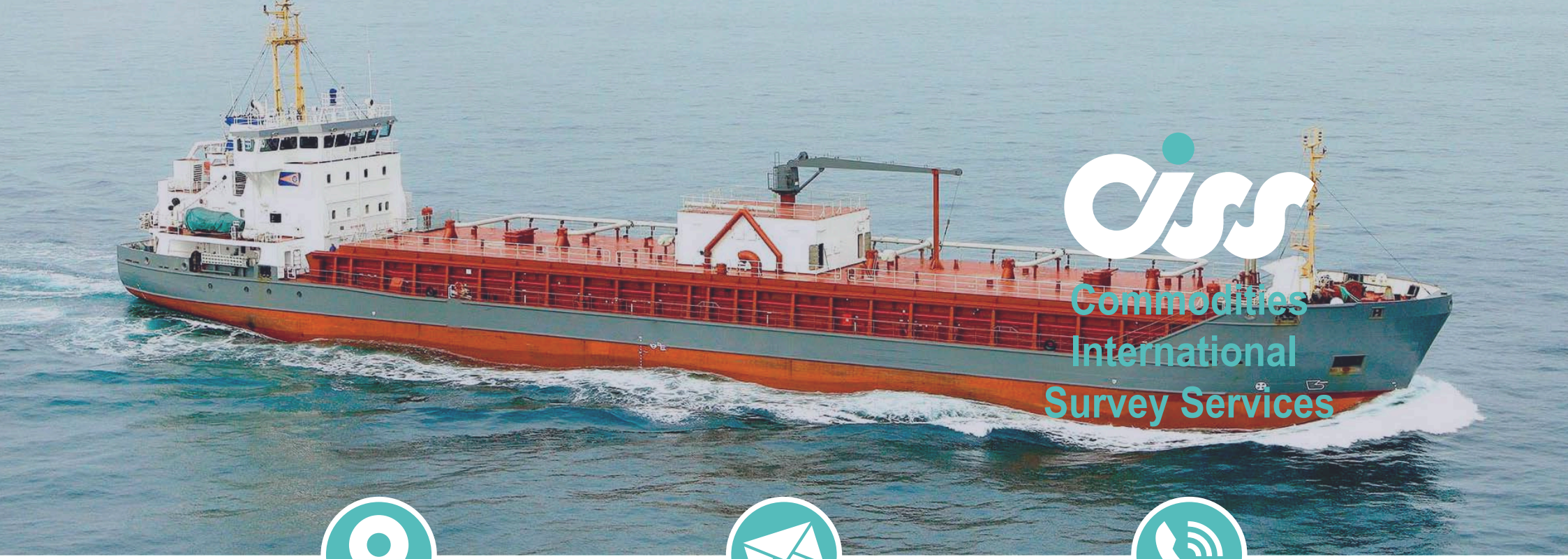
Ceramic tile frost resistance is defined as the ability of a ceramic tile to withstand freeze/thaw conditions with minimal effect. The frost resistance of any ceramic tile is dependent on the tile's porosity and water absorption levels. Frost damage can occur when the variety of ceramic tile absorbs moisture through its pores, causing the water to freeze internally when the temperature drops. Since water expands when it freezes, tension is then exerted inside the body of the ceramic tile. This internal pressure may become high enough to cause cracks in the ceramic tile.

Test Method: **IS: 13630 (P-10), BS EN 12371**.

PVC Flooring Tile Test:

PVC Flooring provides dust-free, noise-absorbing, resilient, non-porous, decorative surface. It shall consist of a thoroughly blended composition of thermoplastic binder, filler, and pigments.

Test Method: **IS: 3461**



10 Anson Road #29-05a
International Plaza
Singapore (079903)
Reg.No 201618838r

Operation office:
77 Science Park Drive Str.,
Business Center
CINETECH III, #03-25/26,
Singapore 118256

www.ciss-group.com

Department
of contracts execution:
ciss@ciss-group.com
inspection@ciss-group.com

General questions:
office@ciss-group.com

+(65) 9391-9397
Singapore, Head office

+41 79 235 23 28
Switzerland

+31 6 826 86968
Netherlands (ARAG)

+48 (668) 103 000
Poland

+90 (539) 640 09 45
Turkey

+380 67 6300 181
+380 50 3277 575
Black Sea Region