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Technical Data Sheet

FERROXID®120

(Micaceous Iron Oxide)

The characterization has been carried out using the following techniques and studies:

- Chemical analysis (two analyses have been carried out, one moist and another fluorescent with x-rays)
- Mineralogical analysis using the diffraction of x-rays, starting with different concentrates obtained by the FRANTZ isodinamic separator (The methodology used is shown in annex 1)
- Real and apparent density analysis (UNE 83133/90) and oil absorption analysis (UNE 48047).
- Granulometric analysis (sizes over 37 microns have been calculated using an analyzer laser the size of a particle in CILAS equipment.
- Morphological analysis using electronic scanning microscope SEM.

RESULTS

1. CHEMICAL ANALYSIS

(N.B :Figures expressed in % in weight over sample dried at 110ºC)

FERROXID®120 (Micaceous Iron Oxide)

Fe2O3…….. 95.62% (+/-0.5)
CAO…….. 1.10%(+/-0.1)
SIO2…….. 0.96%(+/-0.1)
AL2O3…….. 0.46%(+/-0.02)
MgO…….. 0.55%(+/-0.02)
MnO2…….. 0.15%(+/-0.01)
K2O…….... 0.08%(+/-0.01)
P2O5…….. 0.08%(+/-0.005)
PPC……..1.00%(+/-0.1)
TOTAL…….... 100.00%

2. MINERALOGICAL COMPOSITION

(N.B.figuresexpresed in % weight)

Sample	Specular Iron oxide	Dolomite	Epidote	Calcite	Moscovite	Quartz	Magnetite
FERROXID®120 (Óxido de Hierro Micáceo)	95.62	1.50	1.40	Traces	0.30	Traces	Traces

3. DENSITY AND ABSORPTION TESTS

Sample	Apparent density	Real density	Oil absorption index
FERROXID®120 (Óxido de Hierro Micáceo)	2.4(gr/cc)	5.2(gr/cc)	12.89(gr)

4. GRANULOMETRIC TEST OF THE FERROXID®120

SIZE(MICRONS) µ	≤ 10µ	≤ 20µ	≤ 30µ	≤ 40µ	≤ 50µ	≤ 60µ	≤ 70µ	≤80µ	≤ 90µ	≤100µ	≤120µ
ACCUMULATED %	3.5%	10 %	21.4%	30.5%	49.5%	55.5%	65.00%	73.5%	80.5%	90.5%	100%

5. PROPERTIES

- High laminar
- High iron oxide content
- Excellent UV stability
- Resistance to high temperatures
- High anticorrosive power and alkali resistance
- Low water soluble salts content
- High tinting strength
- ISO 10 601 Grade I, Type 3

6. GRAIN MORPHOLOGY

The morphology of the grains varies from grans in the shape of mica laminates to others tending towards equidimensionality both types having sharp edges. The grains in the shape of mica laminate show dimensions of very varied proportion; the surface dimension tends to vary in proportion from 1x1 to1x3 (with a grater frequency of proportion between 1x1 and 1x2),while its thickness varies between 1/6 and 1/20 of its maximum length (with a greater frequency of proportion ranging from 1/6 to 1/10).

OTHER INFORMATION OF INTEREST

Regarding the abrasiveness of the material being tested and as is shown both in the mineralogical test and in the chemical results, the silex content in the sample is found essentially forming part of epidote crystals and in much lesser proportion is also found in very low quantities of muscovite. The quantity of quartz in the sample is almost unappreciable (traces). The variety of epidote present in these sample corresponds to epidotes.str or pistacite, whose durability in the Mohs scale is level 6,analogous to that of specular iron oxide.

ANNEX I- Mineralogical study and methodological quantification

Mineralogical analyses of the whole sample and also of different concentrates obtained by electromagnetic separation have been carried out using R-X diffraction.Using a Frantz isodynamic separator the following fractions have been obtained.

- Parametric fraction obtained at an intensity of 0.25 amp.
- Parametric fraction obtained at an intensity of 0.6 amp.
- Diamagnetic fraction.

A minimum ferromagnetic fraction has also been obtained after having separated the sample using the Frantz isodynamic separator. It was found stuck to the wall of the separation channel.

The results of the mineralogical analysis using RX diffraction of the whole sample and also of the different fraction are as following:

1. The sample consists mainly (>95%) of iron oxide of the specular type and small quantities of dolomite, epidote, calcite, muscovite, quartz colourless mica and magnetite, theses latter minerals quoted in decreasing order.

2. The paramagnetic faction at an intensity of >0.25 amp. Almost exclusively consists of specular iron oxide with a small proportion of dolomite and traces of calcite, muscovite and quartz, as small particles stuck to the specular iron oxide.

3. The paramagnetic faction at an intensity of > 0.6 amp is manly made up of dolomite, calcite and epidote, with traces of muscovite iron oxide, quartz and goethite. Dolomite, calcite, muscovite y quartz appear in this paramagnetic fraction (in spite of being diamagnetic) as they are mixed grains together with specular iron oxide.

4. The diamagnetic fraction is composed mainly of dolomite, smaller quantities of calcite and traces muscovite and quartz.

5. The 3 and 4 fractions (impurities which come with the specular iron oxide) represent about 3% of the sample. However, although in extremely low quantities ,part of this impurities also form part of fraction 2 (specular iron oxide concentrate) in the form of tiny particles stuck to the specular iron oxide.

6. The ferromagnetic fraction (made up of tiny magnetite crystallites and intergrowths of magnetite and iron oxide) represent only 0.25% of the sample.