

This non-reactivity test shall be carried out in accordance with NF P 18-454 [8], modified as follows:

- where the structure is situated on the coast (in a XS exposure environment) or exposed to alkalis (dosage of alkalis at 150% of the average quantity Tm);
- in all other cases, dosage of alkalis at 125% of the average quantity Tm;
- dimensional variations shall be measured throughout the test according to the time periods defined in NF P 18-454 [8].

The acceptance criteria shall be:

- in the case of a mix containing only CEM I: the expansion at 5 months shall be less than 0.02%,
- for all other cements (and combinations) in the mix: the expansion at 9 months shall be less than 0.02% or less than 0.03% at one year.

The margins to the reaction triggering threshold shall be estimated on the basis of additional tests with alkali content higher than 150%.

Polish way for identifying aggregates reactivity

In Poland, assessment for determining the aggregates reactivity is based on two methods that are used for identifying aggregates reactivity (Figure 2):

- PN-B-06714-34:1991 [13] (standard withdrawn in 2012, without replacement) – determining the linear change as well as destructive changes in concrete bars (cracks, color changes, rash, spills, chipping).
- PN-B-06714-46:1992 [14] – carrying out the reaction of aggregates with sodium hydroxide and determination of the weight loss aggregates and determining the content of reactive silica (this method is the most common due to the very short testing time).

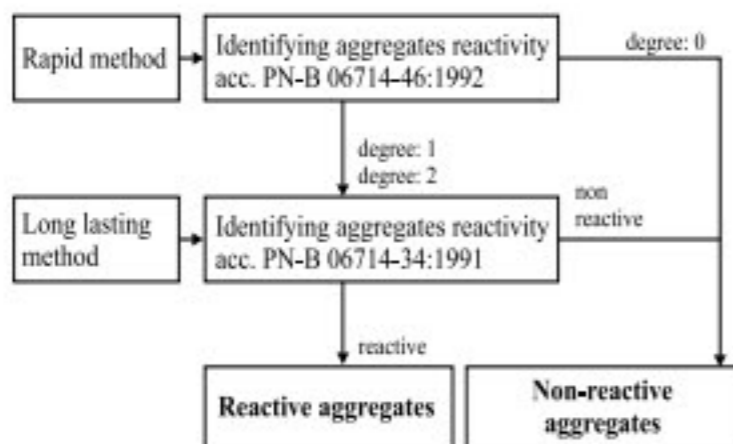


Fig. 2. Assessment scheme of aggregates reactivity in accordance to polish standards [7]
Rys. 2. Schemat oceny reaktywności kruszyw według norm polskich [7]

Used for initial (rapid) assessment of the national aggregates PN-B-06714-46 [14], allows only for coarse determination of the reactivity of aggregates. Test methods of aggregates reactivity in conditions similar to the exploitation (eg. PN-B-06714-34 [13]) providing more reliable results rely on long-term study of linear changes of concrete or mortar samples.

RILEM methodology

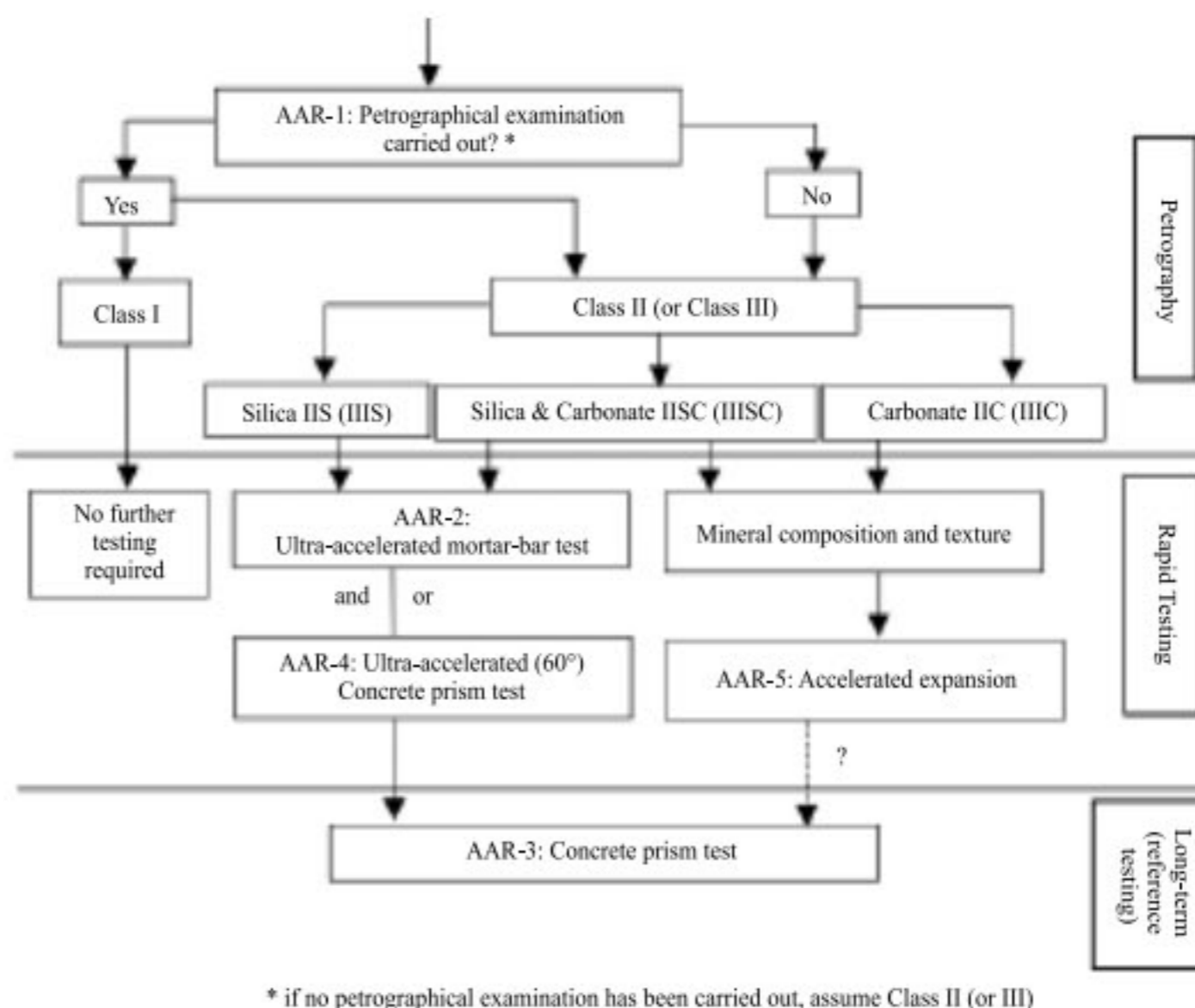
The new methodology, concern the new criteria of reactive aggregates evaluation was created by RILEM. A recom-

mended scheme for the integrated use of these assessment procedures are illustrated in Figure 3.

RILEM proposed five methods (Table 1) for the alkali-aggregate reactivity (AAR) assessment of aggregates. Petrographical examination AAR-1 should be carried out in all cases. Ultra-accelerated methods are AAR-2, AAR-4 and AAR-5 – a specialised procedure for the assessment of carbonate aggregates.

ASTM methods

Currently, in addition to RILEM methods for the assessment of aggrega-



* if no petrographical examination has been carried out, assume Class II (or III)

Fig. 3. Integrated assessment scheme by RILEM [17]

Rys. 3. Zintegrowany system oceny według RILEM [17]

Table 1. Outline of RILEM test methods [10]

Tabela 1. Przegląd metod badawczych RILEM [10]

Test method	Brief outline of method
RILEM AAR-1. Petrographic method	The reactivity of the aggregate is classified on the basis of its petrographic composition. Depending on the nature of the aggregate this can either be by hand separation, crushing and point counting under a microscope or by microscopic examination in thin section.
RILEM AAR-2. Accelerated mortar bar method	Mortar prisms made with the aggregate and a reference high alkali cement are stored in 1M NaOH at 80°C and their expansion monitored over a 14 days period.
RILEM AAR-3. Concrete prism method	Accelerated expansion test for 12 months. Wrapped concrete prisms made with the aggregate and a reference high alkali cement are stored in individual containers within a constant temperature room at 38°C and measured at 20°C.
RILEM AAR-4. Accelerated concrete prism method	Accelerated expansion test for 20 weeks. Wrapped concrete prisms made with the aggregate and a reference high alkali cement are stored in individual containers within a constant temperature room at 60°C and measured at 20°C.
RILEM AAR-5. Accelerated carbonate aggregate method	Rapid preliminary screening test for carbonate aggregate