

- Dyckerhoff MIKRODUR® R95-

- General information -

Dyckerhoff Mikrodur R95 is an ultrafine blend of ground blast furnace slag as the main component and ground portland clinker. The blast furnace slag is from a German source and particularly known for its consistency.

By subsequently blending the separately ground components a high batch-to-batch consistency is provided. This special and more complex method of manufacturing slag type ultrafine cements is only used by Dyckerhoff. The abbreviation "R" stands for "resistant" (against sulfate attack), "95" for 95 % of particles less 9,5 µm.

Dyckerhoff Mikrodur R95 is intended to be preferably used for squeeze cementing operations eg. repair of deficient primary casings or reducing the Gas/Oil ratio (GOR). So far its suitability for well cementing applications has been confirmed by our clients up to 200°F BHCT. At present the applicability as a lightweight cement and as a component for deep water formulations/blends is examined in several research and field labs.

In comparison to other slag type microfine cements **Dyckerhoff Mikrodur R95** offers high early compressive strengths while providing good workability (no serious gelation with increasing the temperature).

The performance data outlined on page 2 are for neat slurries with a maximum water content that still provides a stable slurry with no excessive free fluid. **Dyckerhoff Mikrodur R95** is easy to disperse with most common dispersants. This enables further reduction of the water-to-cement-ratio in order to obtain much higher (early) compressive strengths than stated without gelation problems.

Average Data Sheet 2020
Dyckerhoff MIKRODUR® R95 Ultrafine Cement

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| <u>Fresh water to cement ratio for all tests performed (w/c):</u> | 1,20 |
| <u>Slurry formulation:</u> | neat |
| <u>Specific gravity of slurry (slurry density):</u> | 1,42 (11,87 ppg) |
| <u>Absolute grain density of dry powder:</u> | ~2,90 kg/dm ³ |
| <u>Grain size distribution D (95%), D (50 %):</u> | ~ 9 µm (< 9,5 µm), ~ 3 µm (< 3,5 µm) |
| <u>Bulk Density</u> | ~ 0,8 kg/dm ³ |

Slurry mixing according to API Spec 10 (July 1, 1990), Section 5

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| <u>Thickening time</u> API schedule 5, BHP = 5.160 psi, BHCT = | 52 °C |
| Max Bc between 15 - 30 min | 3 Bc |
| Time to 100 Bc | 210 min |
| <u>API free fluid at:</u> | 27 °C |
| | 2,5 ml/250 ml |
| <u>Rheology* at:</u> | 27 °C 74 °C |
| Dial readings at rpm 300-200-100: | 36-22-19 49-41-32 |
| Dial readings at rpm 60-30-20: | 19-15-12 33-24-18 |
| Gel Strength (10''/10') | 10/10 lbf/100ft 13/18 lbf/100ft |
| <u>Cube compressive strengths at:</u> | 38 °C 60 °C |
| | atmospheric atmospheric |
| After 8 h | 35 psi (> 20 psi) 800 psi (> 500 psi) |

In Bold and Brackets: Internal Quality Requirements

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* Without second mixing after removing the slurry from the atmospheric consistometer