

NEW KSB Construction Method

Krosaki Harima Corp. has developed " New KSB Construction Method " that greatly improved workability.

Characteristics of KSB Construction Method

- ◎KSB¹ is a precast block for heating furnace skid pipes.
- ◎Construction man-hours can be reduced by 30 to 50% compared with conventional casting construction. It neither require formers nor curing time.
- ◎EXEL306S has excellent insulating functions and save energy.
- ◎Compared with conventional monolithic casted structure, segment type KSB is less likely to have cracks due to expansion joint.

Characteristics of New KSB Construction Method

- ◎By adopting stud gun welding, welding is easy and no skilled welder is required.
- ◎By making H-shape with tongue and groove, each block holds together. Therefore, welding only the top and bottom is sufficient, and the construction time is shortened compared to individual block welding.

¹ K.S.B (Abbreviation of Japanese word, Kantan Sekou Block=Easy Installation Block)

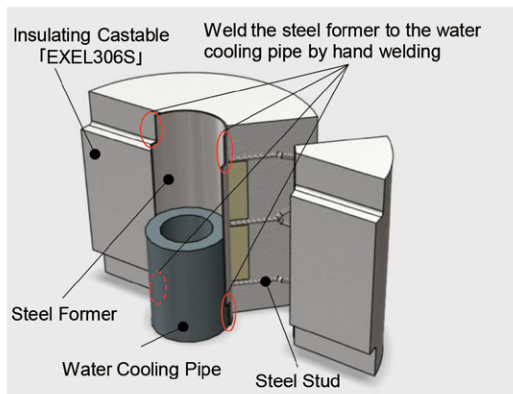


Fig. 1 KSB Structure

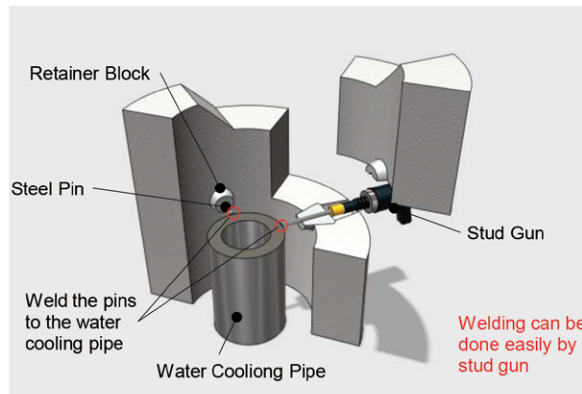
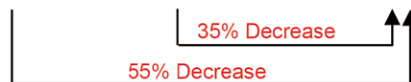


Fig. 2 New KSB Structure

■ Construction Time and Man-Hours

| The Case to the constructing 10 pieces of the skid post | | | | | | |
|---|---|-----------------|---|----------------|------------------------------|----------------|
| Items | Casting method | | KSB method (12pcs./post) | | New KSB method (12pcs./post) | |
| | Time | Man-hours | Time | Man-hours | Time | Man-hours |
| Hardware construction | 11 hr | 7.4 M-h | 8 hr | 5.5 M-h | 6.5 hr | 4.4 M-h |
| | Stud cutting, Stud welding | | Stud cutting, Surface polishing, Stud welding | | | |
| Refractory construction | 46 hr | 6.9 M-h | 6 hr | 4.4 M-h | 3 hr | 2.1 M-h |
| | Setting the frame, Casting, Curing, etc | | Block construction, etc | | | |
| Total | 57 hr | 14.3 M-h | 14 hr | 9.9 M-h | 9.5 hr | 6.5 M-h |



■ Typical Properties

| Product | EXEL306S | |
|------------------------------|--------------------------------|------|
| Chemical Composition (%) | Al ₂ O ₃ | 87 |
| | CaO | 12 |
| Bulk Density | 110°C | 1.36 |
| | 1300°C | 1.18 |
| Modulus of rupture(MPa) | 110°C | 1.7 |
| | 1300°C | 3.0 |
| Permanent Linear Change (%) | 1300°C | 0.4 |
| | at 800°C | |
| Thermal Conductivity (W/m·K) | | 0.39 |

Note: Above data is typical value and shall not be used as guaranteed value.



Fig. 3 Appearance of Stud gun Welding

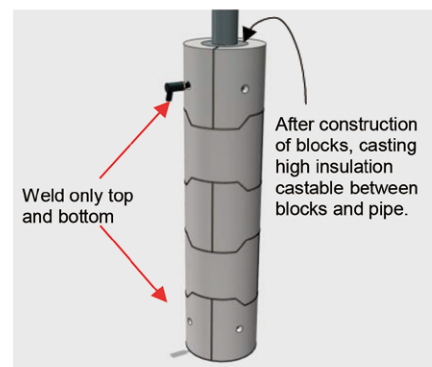


Fig. 4 Image after Construction of New KSB