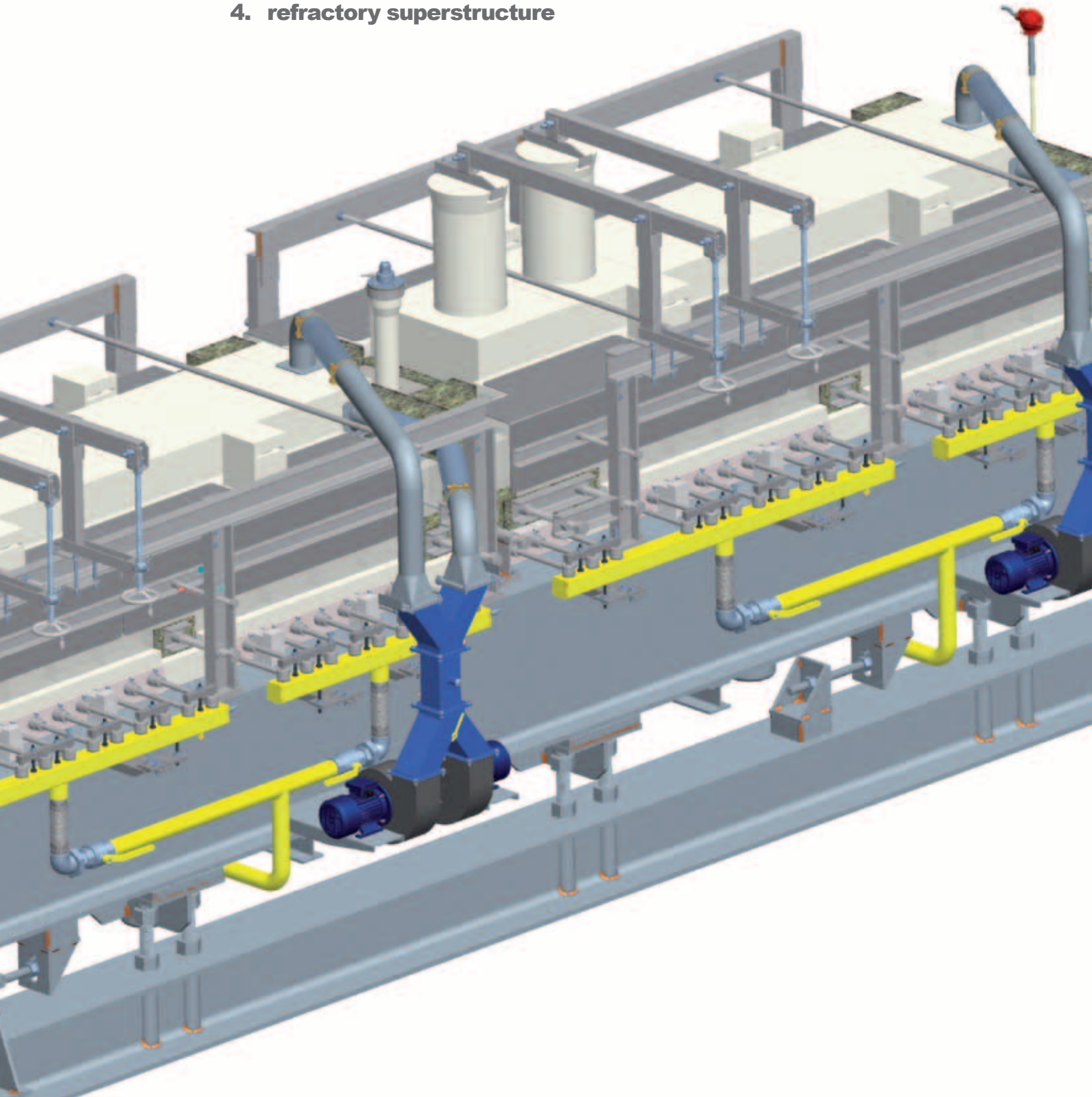
E-Forehearth

The new Revimac E-Forehearth

It has been developed to grant glass control above the standard, as required by NNPB production, with a special attention to

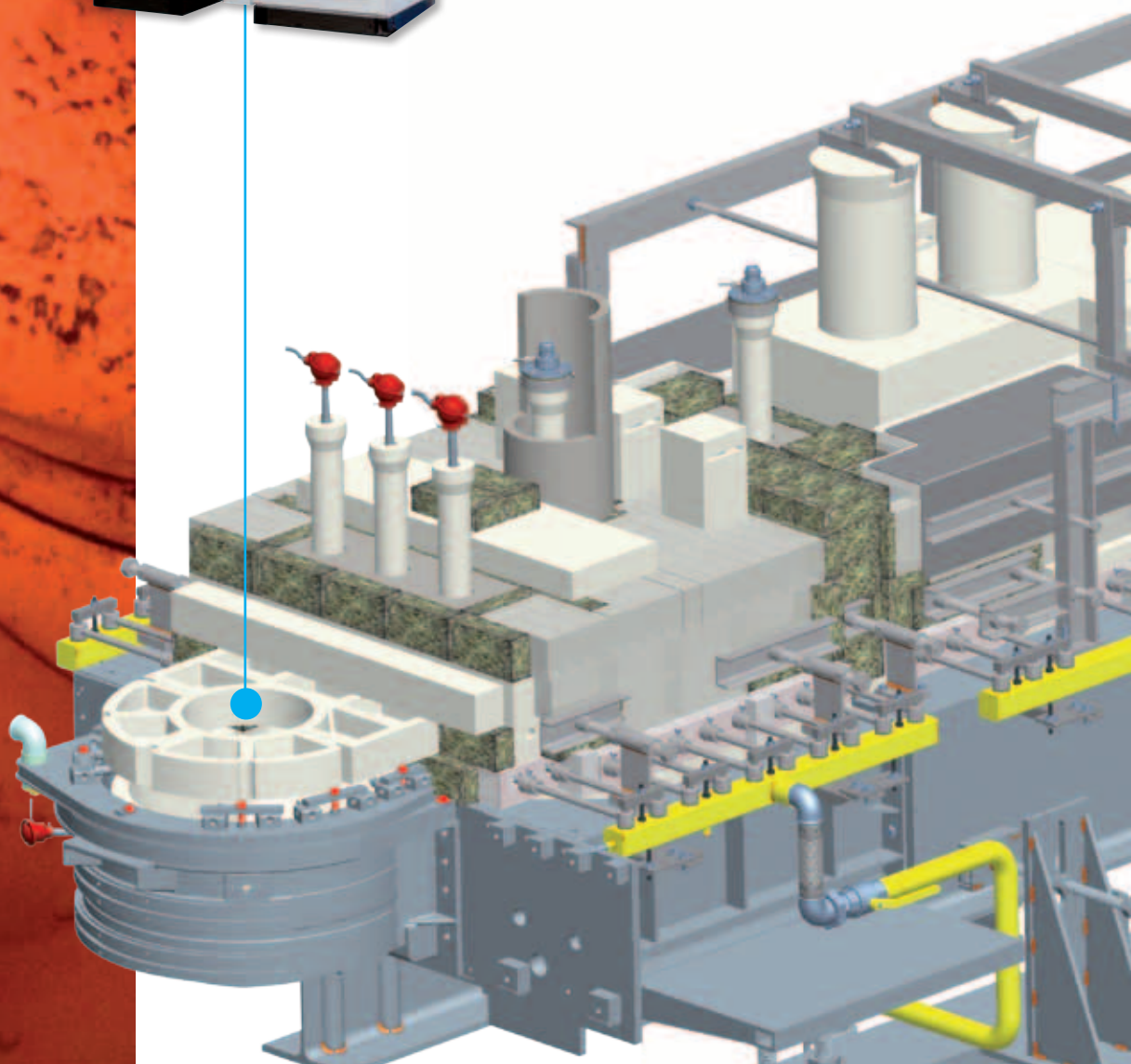
1. **New control system**
2. **“redundancy” or assurance of reliability**
3. **re-engineering of the combustion and cooling systems**
4. **refractory superstructure**



Revimac
Botterogroup

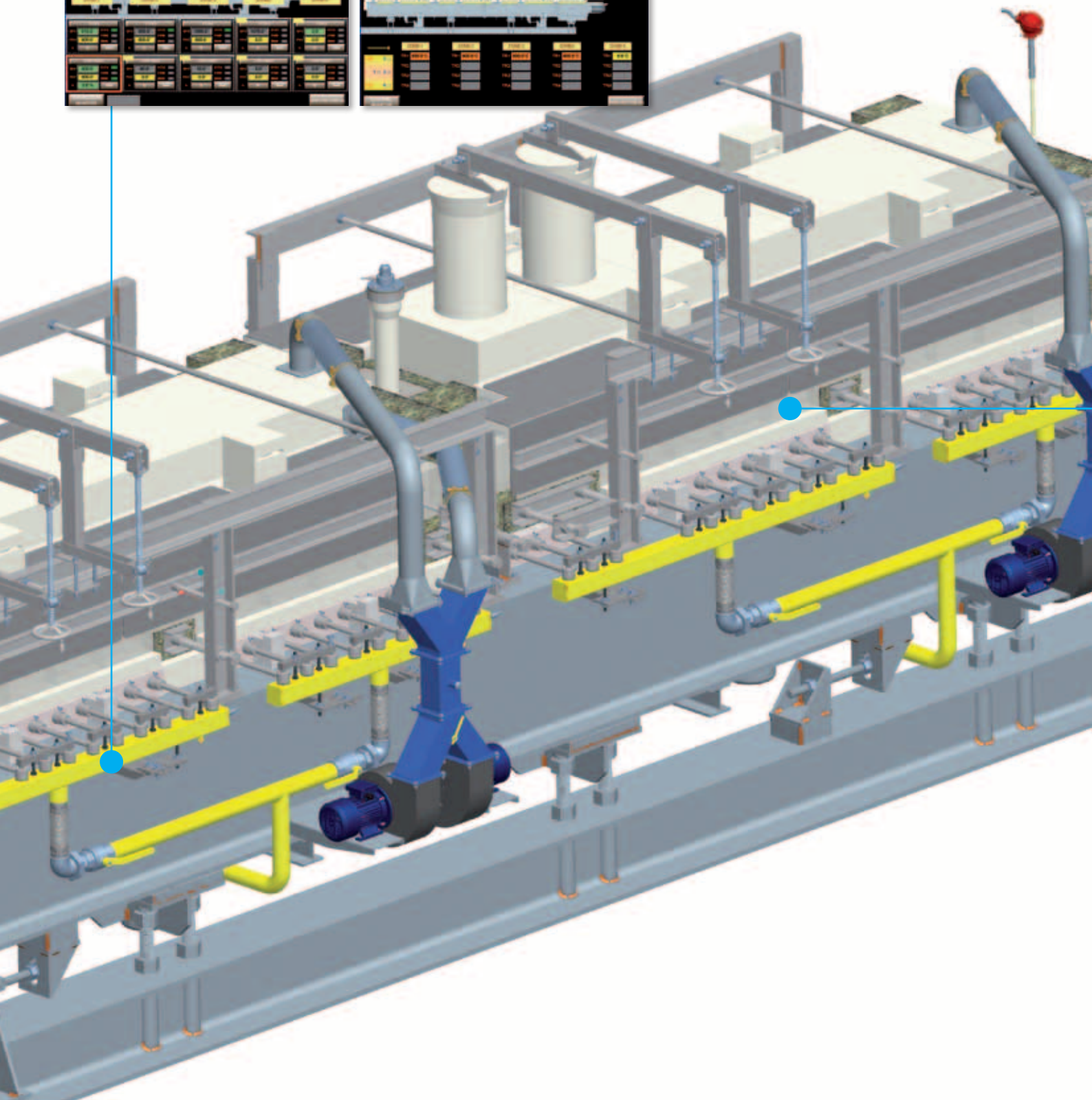
1 New control system

- Touch-screen operator interface that showing the ACTUALLY CONTROLLED FOREHEARTH
- Supervisor controlling in each zone up to 3 independent regulator instruments
- Individual control in each zone of the LH and RH separate independent firing.
- System enabling to control up to 5 forehearths with 5 controlled zone and one Working End with 8 controlled zones. Storage of memorized production recipes helps the operators to reduce down times.



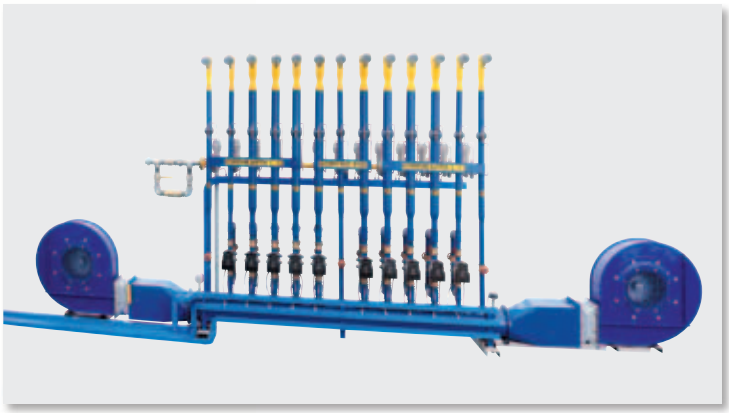
2 “Redundancy” as assurance of reliability

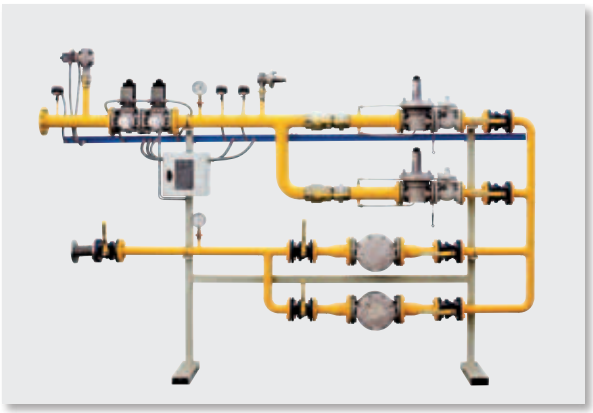
- Twin CPU and dual Can-Bus channel for data transmission ensure total reliability and guarantee the automatic switch-over in case of failure
- Flexibility of the system software in the management of inputs allows in case of failure of one thermocouple to assign the t° of another t° detection instrument until its replacement

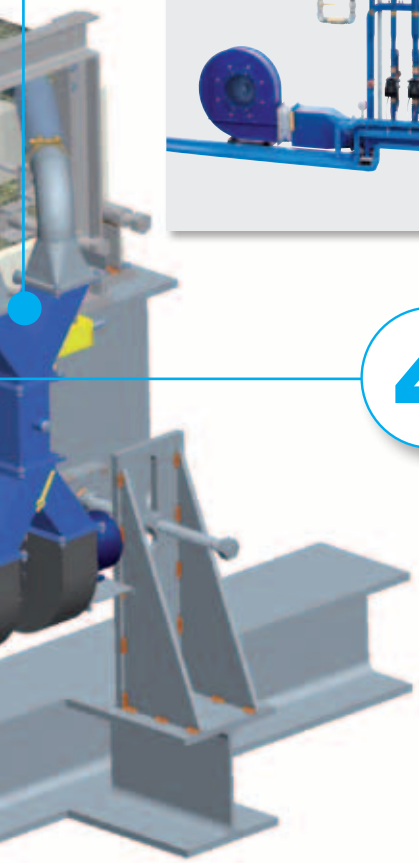


3 Re-engineering of the combustion and cooling systems

- Improved engineering of the combustion and cooling systems: two oversized ventilators, one operational and one as stand-by, are always available.
- Each ventilators unit features separate manual dampers for the blown air with option to feed the air stream to the direct cooling, to the indirect cooling ducts or to both of them. This allows a remarkable reduction of the time needed during changeovers.
- Newly designed systems are greatly contributing to achieve a dramatic reduction of field installation activity, completion time and related cost.

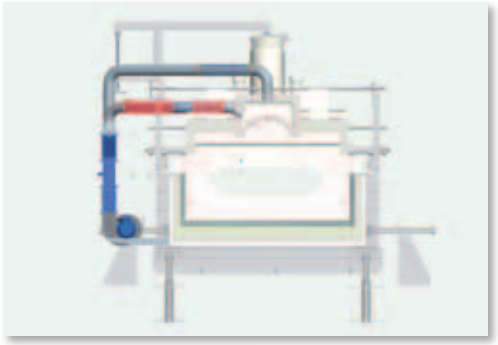




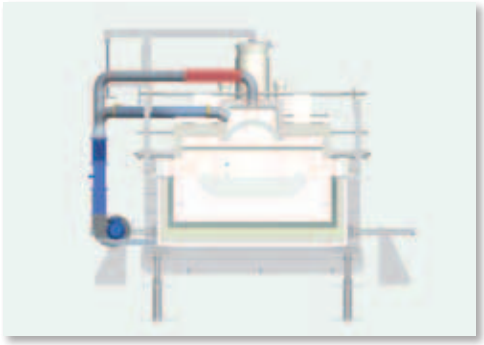


4 Refractory Superstructure

- Dual cooling systems: direct cooling on to the glass surface and/or conveying the cooling through the overhead longitudinal tunnel for reducing the time of temperature variation
- Use of either one of the cooling methods, or the combination of the two applied simultaneously is possible, offering moreover independent adjustment of the opening of the two separate cylindrical exhaust stacks
- Structural strength is granted by the newly designed roof blocks, supported by 3 lintels (architraves) in each zone with lateral members resting on the thicker and taller burner blocks
- The combination of the several forces applied ensures that the refractory blocks stay put in position and do not fall down inside the channel even in case of severe breakage.
- Design of glass contact channel blocks has been based on material with a 99% content of alumina



Direct cooling



Indirect cooling

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