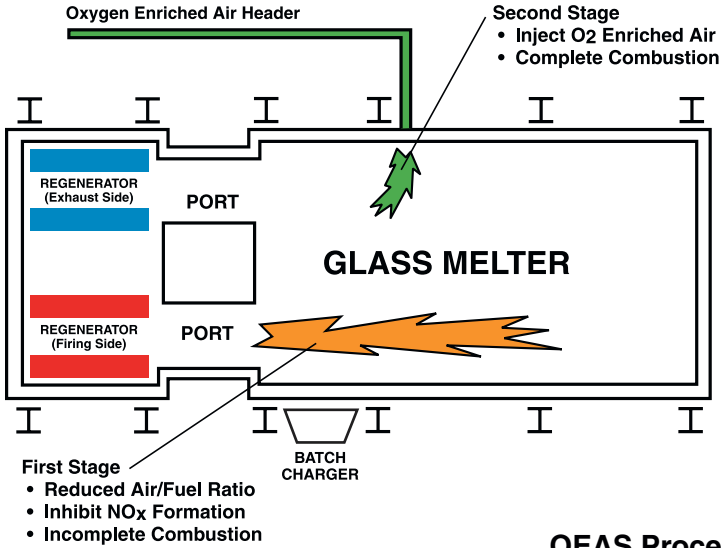




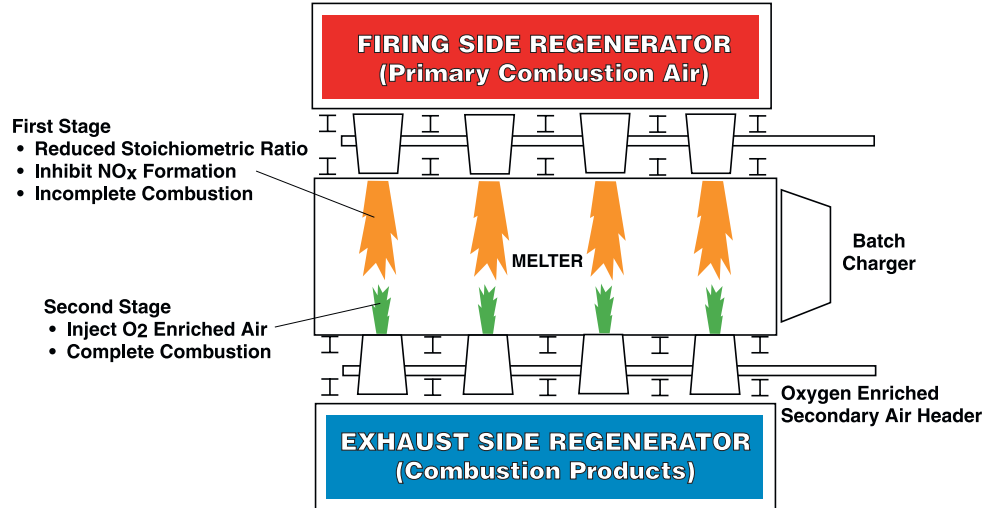
# Oxygen- Enriched Air Staging

## for NO<sub>x</sub> Reduction in Regenerative Glass Melters

### OEAS Process for Endport Regenerative Furnaces



### OEAS Process for Sideport Regenerative Furnaces



### Selected OEAS Glass Furnace Results

| Furnace #                                | 1       | 2       | 3       | 4        | 5        | 6       |
|--|---------|---------|---------|----------|----------|---------|
| Furnace Type                             | Endport | Endport | Endport | Sideport | Sideport | Endport |
| Firing Ports                             | 1       | 1       | 1       | 6        | 4        | 1       |
| Container Glass Type                     | Flint   | Amber   | Flint   | Amber    | Flint    | Amber   |
| Glass Pull Rate, ton/day                 | 150     | 200     | 320     | 300      | 350      | 175     |
| Oxygen % (top of regenerator)            | 0.7%    | 2.0%    | 1.4%    | —        | 1.2%     | —       |
| CO (@ 0% Oxygen) in stack, ppm           | <50     | <50     | <50     | <20      | <20      | —       |
| Base Line NO <sub>x</sub> , lbs/ton      | 5.5     | 8.9     | 5.8     | 3.3      | 15.7     | 8.9     |
| Second Stage Oxidant                     | OEA     | OEA     | OEA     | OEA      | Air      | OEA     |
| NO <sub>x</sub> with Staging, lbs/ton    | 2.4     | 2.4     | 2.2     | 2.2      | 7.2      | 4.6     |
| % NO <sub>x</sub> Reduction with Staging | 56%     | 73%     | 62%     | 35%      | 54%      | 46%     |

OEA = Oxygen Enriched Air

CAS = Compressed Air Staging