



Pyrotek Thermally Formed Combo Bags

PROCESS

Vertical direct chill (VDC) aluminium slab casting

PYROTEK PRODUCT

Pyrotek's thermally formed (TF) combo bags are effective molten aluminium distributors for VDC slab casting. The fibreglass fabric, manufacturing process, and coating create excellent rigidity, reduced emissions, and provide precise dimensional control and casting performance.

With optional features like drain holes, integrated spout socks, and varied fabric styles, Pyrotek TF combo bags can be customized for specific applications.

Benefits

- Easy installation on existing mounting system
- Rigid at standard casting temperatures for up to 90 minutes
- Minimal fumes, smoke, and flame during cast start-up
- Reduced turbulence and oxide generation
- Collects oxides and large particles
- Improved bottom block filling
- Oxide attachment resistance
- Potential butt curl and scalping reduction

CASE STUDIES

In trials comparing Pyrotek's TF combo bag with a standard sewn combo bag; the TF bag demonstrated better metal distribution; reduced oxide generation, weight, and butt curl; less scalping; and other benefits.

Case Study 1: Oxide Generation

Casting Parameters

Alloys	AA-3003, AA-5052, AA-5182
Casting Technology	Wagstaff® Tru-Slot
Mould Sizes	635x1320 mm (25x52 in) 660x1660 mm (26x65.4 in)
Cast Length	4.8 m (15.7 ft)
Degasser	Alpu SX-3000
Filter	30 ppi CFF
Grain Refiner	Ti (5%), B (1%)



Results

- The TF combo bag retained its original shape.
- From a sample of 50 bags of each type, the used TF combo bags weighed 12–15% less than the used sewn combo bags.



Top, standard combo bag with retained oxides. Bottom, Pyrotek TF combo bag with retained oxides.

Case Study 2: Oxide Generation

Casting Parameters

Alloy	AA-3004 (can stock)
Casting Technology	Wagstaff LHC™
Mould Size	686x1829 mm (27x72 in)
Cast Length	4.8 m (15.7 ft)
Degasser	Pyrotek SNIF P-180
Filter	Deep-bed filter (DBF)
Grain Refiner	Ti (5%), B (1%)



CASE STUDY

Pyrotek Thermally Formed Combo Bags

Results

- Reduced oxide generation (reduced turbulence)
- Weight of used TF combo bag was 54 percent less than weight of sewn bag, meaning that less oxides were captured in the bag. Assuming the difference was oxide, that leaves about 306 grams (10.8 ounces) of available metal.
- Pyrotek TF combo bag was easy to use
- No fumes or flames were emitted from the TF bag
- Improved priming with the TF bag
- Improved bottom block filling with the TF bag



Distributor deformation and retained oxides—TF combo bag vs. standard combo bag.

Case Study 3: Butt Curl

Butt curl on an aluminium slab is caused by rapid solidification/shrinkage at the beginning of a cast and leads to increased scrap that must be cut from the slab (e.g. engineered scrap) and an increased potential for cracking.

Casting Parameters

Alloy	AA-5052
Casting Technology	Internal mould technology
Mould Size	520x990 mm (20.5x9 in)
Cast Length	4.8 m (15.7 ft)
Degasser	Pyrotek SNIF P-60
Filter	40 ppi CFF
Grain Refiner	Ti (5%), B (1%)

Results

- Pyrotek TF combo bag butt curl: 6 mm (0.2 in)
- Sewn combo bag butt curl: 13 mm (0.5 in)
- The butt curl was reduced by 50 percent with the TF combo bag due to improved priming, block filling, and reduced thermal gradients.



Case Study 4: Scalping

Casting Parameters

Alloys	AA-1235, AA-5005, AA-5052
Casting Technology	Internal mould technology and Wagstaff technology
Mould Sizes	520x1050 mm (20.5x41.3 in) 520x1350 mm (20.5x69.7 in) 520x1770 mm (41.3x70 in)
Cast Length	4.8 m (15.7 ft)
Degasser	Pyrotek SNIF P-140
Filter	Porous tube filter (PTF)
Grain Refiner	Ti (5%), B (1%)

Results

- After processing more than 300 slabs, 62 percent of slabs cast with sewn combo bags required rescalping, while only 12 percent of slabs cast with TF combo bags required rescalping.
- TF bag was easier to centre under the spout
- No fumes or flames emitted from the Pyrotek TF bag
- Less oxides attached to the external surface of the TF bag
- Butt curl reduced occasionally with the TF bag

Pyrotek®