SRB Spartan Composite Sideform Benefits

1. Additional Material and Aluminium

The Precast Industry is changing dramatically with product quality and safety issues a major consideration. A significant part of these issues relate to formwork, which directly effects product quality, variety and flexibility, improvements in production, cost efficiencies and reduction of safety related incidents.

The traditional formwork available is based on a design utilising steel plate, with bends to form top and bottom chamfers. The outer face of the steel formwork is attached to a steel member to hold the formwork perpendicular to the table. Typically, holes are spaced evenly apart so the formwork can be screwed into place on the casting bed.

The SRB Spartan Sideform is a far better product than any other commercially available sideform solution, including aluminium formwork, and the only sideform on the market which addresses the above-mentioned issues directly. The comparatively higher up-front cost is due to the additional materials and features on the sideform that are not available on any other product.

The SRB Spartan Composite Sideform has:

• PVC capping,
• Rubber-like base insert,
• An epoxy powder-coat protective finish and
• An efficient high-grade aluminium span.

For further information please click here see Appendix A.
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2. Eliminating the of use of Silicone by using the SRB Spartan Composite Sideform

Steel casting beds and sideforms are never perfectly flat and small gaps appear between the underside of the sideform and the steel bed surface. Water from the poured concrete escapes through these gaps. This bleed starves the cement of water leaving unsightly stains called ‘burn marks’ on the visible edges. Bleeding can also cause irregularities in the concrete leaving small aggregate protrusions on the edge. This reduces the quality of the product, as the edge profiles of the concrete structure are generally the most visible.

Current precast practice prevents this concrete bleed by placing a bead of silicone sealant between the interface of the base of the sideform and the steel bed. To place the bead and then remove the silicone residue from the steel bed and sideform after the formwork has been stripped from the cured concrete member is extremely costly in labour.

Once the sideform is stripped there is cured silicone residue left on both the steel bed and the sideform. The cured silicone is difficult to remove due to its extremely strong bond to the steel bed and aluminium sideform surfaces. The only way to successfully remove the silicone is to first scrape of the bulk of the residue and then power wire brush or grind the silicone residue off the steel bed and sideforms surfaces. This is labour intensive, causes wear and tear as well as damage to the beds and sideforms. The process also reduces productivity and increases labour costs.

All current sideforms require silicone beads to be placed at the interface with the steel casting beds to prevent concrete bleeding.

The New SRB Spartan Composite sideform, which has a patented concept of inserting a rubber base seal under the sideform, is the only sideform design that prevents the concrete bleed without use of silicone.

The following graph gives a rough indication of what it would cost an average precast yard per linear metre of panel in labour to place and remove these silicone beads from the underside of the sideform and steel bed interface. This process is repeated every time these same sideforms are used to form a panel, thus these costs were extrapolated to a per annum basis for the same set of sideforms. (i.e. How many times this same set of sideforms would be used per annum to make panels and then divided by the lineal meters of that set of sideforms to convert the annual cost for that one set of sideforms to a lineal meter rate.)
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3. Less concrete sticking to the sideforms therefore less cleaning

There are significant problems using raw aluminium with concrete. The surface of raw aluminium is macroscopically very rough and porous allowing the concrete to enter and lock into these pores. The alkalinity of the concrete exacerbates the pores making the aluminium ever more porous and aggravates the problem. A significant amount of the concrete surface is actually torn away because it has bonded to the aluminium surface, giving the concrete edge a furry look, when the concrete is cured and the sideform stripped.

Consequently, many man hours are spent cleaning the concrete from the sideforms surface.

SRB Spartan Sideforms have protective epoxy powder-coating, which is extremely hard and fills all the pores in the aluminium surface. The powder-coat also provides a barrier preventing the alkalinity in the concrete from affecting the aluminium surface. Precasters can achieve a much smoother surface finish on the stripped concrete edge.

The SRB Spartan Sideform eliminates the problem of concrete peeling away on the sideform as well as drastically reduces the labour costs associated with having to clean the concrete that has stuck to the sideform surface.

4. Speed of Boxing

SRB Spartan Sideforms are quick and easy to assemble when compared to traditional sideforms. SRB Spartan Sideforms can take up to 30% less time to box-up. This advantage will have a significant impact on cost efficiencies in a typical precast environment.

5. Safety

Approximately 20% of injuries in the precast environment, such as lifting injuries, cuts, abrasions and sprains, are related to the handling of traditional steel sideforms. With the reduction of formwork weight, production incidents would be significantly reduced.

SRB Spartan Sideforms are significantly lighter than traditional steel sideforms and can reduce workplace injury incidents. At around 25kg per 6-metre length, SRB Spartan Sideforms are easier to handle, thereby reducing lifting injuries and sprains.

The SRB Spartan Composite Sideforms have end caps that protect the formwork from damage and the operator from scratches, abrasions and cuts. The rubber base insert will not cut or slice the operator during handling. The top cap is also designed to minimise harm to the operator.
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6. Versatility - the ability to use the one sideform for various heights

Instead of having to purchase an entirely new sideform for small incremental increases in height, or that have different edge finishes, profiles or splays, the precaster only has to purchase one main sideform frame. The customer can then purchase extruded plastic edge profiles that are substantially cheaper than purchasing entirely new sideform lengths.

To change the height of the SRB Spartan Sideform by changing the fillet profiles is equivalent to actually requiring new sideform sections if purchasing other products - if they are available at all.

The most common panel thicknesses in the market are the 150mm, 175mm/180mm panels.

These thicknesses are primarily required for either or both structural and fire rating purposes.

150mm panels are predominantly required for structural reasons as well as providing a 3 hour fire rating. Engineers determine their structural design parameters around a panel that is 150mm thick. Architects then specify various patterns, shadow lines and features in the panel surface so the panels do not look like plain flat slabs. Generally these patterns and shadow lines are 15mm deep in the concrete surface.

A 150mm thick panel with a 15mm pattern in the surface has an effective panel thickness of 135mm. 135mm may not be structurally adequate and does not provide the necessary fire rating. By increasing the thickness by 15mm to allow for the pattern moulding and still meet the required 150mm thickness for effective concrete, you would need a 165mm sideform of 165, which of course does not exist.

If the majority of contractors make 180mm thick panels then, every time a panel is cast, it is 0 to 5mm thicker - which is a waste of concrete.

An average panel is around 25m². If you are adding an additional 10mm concrete thickness, this equates to 0.3m³ per panel (0.8 additional tonne in additional weight) or $45.00 per panel. (Prices based on the Australian Precast Environment to illustrate comparisons only and may differ from current market conditions.)

In this example, a precaster would be adding 15mm to the thickness, this would equate to 0.45m³ (1.10 tonne in additional weight) or $76.50 per panel. (Prices based on the Australian Precast Environment to illustrate comparisons only and may differ from current market conditions.)

For an average precast yard that produces between 20,000 to 30,000 m² of panels per annum, approximately 20% of these would fall under this scenario. This equates to around 133 to 200 panels per annum, or additional costs of $10,000 to $15,000 per annum – a substantial amount just for one panel thickness. (Prices based on the Australian Precast Environment to illustrate comparisons only and may differ from current market conditions.)

The exact same scenario is also repeated with the 175mm thick panel with a 15mm thick pattern requiring a 190mm thick panel. However, without one available, the contractors use the standard 200mm thick panel instead.

Therefore when you take into consideration all the panel thicknesses there is a substantial amount of money the precaster spends per annum on concrete wastage through not having the capacity to economically produce a wide range of panel thicknesses.
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**Versatility - Cost Scenario**

Assuming that precasters would typically require 150mm and 165mm sideforms, a medium sized precaster would need at least 400m of each sideform size in order to be able to operate efficiently. Therefore, the following graph illustrates the purchasing of two sizes of traditional steel sideforms.

The SRB Spartan Sideforms have a PVC capping that snaps onto the top of the standard sideform blanks that can increase the height of the standard sideforms by 5mm increments. Therefore, the 150mm sideforms are used for both the 150mm & 165mm sideforms. Only an additional 15mm high PVC Capping is required.

There is a substantial saving in just 2 differing sizes with the SRB Spartan Composite sideforms. There are also significant savings in storage and handling. It is far more cost effective to store light thin PVC capping instead of complete sideform sections.
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7. Ability to snap on edge profiles

The ability to snap-on edge profiles in lieu of constantly using disposable foam or plywood, or buying spayed sideforms, is a major cost saving. The foam and plywood are consumable items that incur significant costs over the course of a year, whereas the SRB Spartan Composite Sideform enable a cost effective and simple PVC edge profile to be snapped onto the existing main sideform frame and snapped off when finished.

In this way the item can be re-used resulting in substantial material and labour cost savings.

8. Ability to change chamfer profiles

The ability to change chamfer profiles reduces the amount of sideforms the precaster needs to buy and keep in stock.

examples of inserts and capping combinations
Appendix A

Quality of the SRB Spartan Aluminium Extrusions

SRB Section

• Extruded by Capral Aluminium (largest in Australia).

• High Grade 6082 & 6005A Aluminium Alloys with higher ultimate tensile and yield strengths than the common standard 6061 aluminium alloys.

• Thick wall sections to allow proper screw bite when screw fixing to sideforms.

• High moment of inertia thus very rigid section. 150mm sideform designed for fixing points at 1.8m apart. Optimun strength, moment of inertia for aluminium weight.

• Comes coated in hard durable ‘epoxy’ powder-coat thus giving the section great protection against the precast elements.

• Rigid PVC Capping on top:
  o Allows sideform size to be increased by 5mm increments;
  o Allows chamfer profiles to be changed without buying new sideforms;
  o Does not allow for concrete to stick on top of sideform nor to rear of sideform as it channels the concrete away from the sideform;
  o Gives a sharp edge to concrete and resists concrete mounting;
  o Allows different panel edge profile to be snapped onto the same section e.g. 45° and 22.5° splays.

• Rubber Base Seal inserts prevent concrete bleed without silicone, as well as allowing edge profiles to be changed.

• Very accurate high tolerance section.

• Section has a semi-circular magnet securing rail at the rear that does not allow concrete to wedge in the rail thus easily removed. All the other sideforms have open backs or square or’ V’ channels in the back into which concrete will set making it extremely difficult to remove.

• Have internal joiner sleeves to allow for sideform sections to be permanently joined.

• Has a key lock in the rear to allow the straight sideforms to be joined by a stainless steel plate for internal openings and penetrations and when a magnet is not desired to be placed on a joint.