



Dynaforce Review

A Case for a carbohydrate-electrolyte drink in the industrial sector?

Industrial Environment

It is known that industrial workers exposed to high temperatures and extended shift hours are at risk of heat stress. This state is characterised by hyperthermia (high core body temperature) and heat illness, the symptoms of which include:

- Fatigue
- Nausea
- Vomiting
- Dizziness
- Headaches
- Confusion
- Disorientation
- Syncope (fainting) in severe cases
- Stroke in extreme cases

Many of these symptoms are a direct result of dehydration, the loss of body fluid, which can impact both health and performance in the workplace. For example heat illness in conjunction with dehydration has been shown to be a direct cause of 50% of heat stroke cases in South African miners.

Dehydration and heat illness can further impact other measurable outcomes:

1. Safety – a loss in concentration, reduced hand-eye co-ordination and diminished mental acuity can increase risk for accidents in the work place.
2. Productivity – A 1-2% loss of body fluid according to weight can reduce work rate by 6-7%. A more severe loss of 3-4% body weight can lower output by between 20 and 50%.
3. Morale – heat stress and poor working environments increase absenteeism, staff frustration and staff turnover.
4. Cost – the combined result of poor safety, loss of productivity, absenteeism and staff turnover ultimately impacts the associated cost a company would incur due to heat illness.

Workplace strategies that aim to reduce heat illness, dehydration and its associated effects are well described in many health and safety procedures and guidelines. Successful implementation and education of employees regarding these issues is clearly warranted.

One such component is addressing employee hydration status. Research has confirmed trends in heat stressed work forces such as high sweat rates (on average 1 litre/hour), poor knowledge of hydration issues, lack of access to rehydration drinks, lack of time available to consume rehydration drinks, poor adherence to guidelines and protocols and starting work shifts hypohydrated.

One practical workplace solution is choosing a suitable rehydration drink that can be made available before, during and after shifts. Studies confirm that drinks aimed at benefiting rehydration are well tolerated with improved palatability profiles and subsequently good adherence to rehydration protocols for carbohydrate and electrolyte containing liquids over water and placebos.

A suitable rehydration drink should contain sufficient sodium with small amounts of carbohydrate. A sodium content of between 25 mg and 70 mg per 100 ml of fluid is well known to assist rehydration, replace sodium losses and benefit fluid retention. Small volumes of carbohydrate (3-5 g per 100 ml) improve intestinal absorption of the fluid and electrolytes and also provide valuable energy. Excess solute content (high levels of sodium, other salts or carbohydrate) is not advised, however, as it may delay fluid absorption or in some cases worsen hydration status. In addition excess intake of carbohydrate, or sugar, is not beneficial in terms of other health outcomes. The temperature of the liquid can also impact absorption with better rates observed with cooler drinks.

It should also be noted that providing water only as an option for rehydration should not be a recommended practice. Excess non-electrolyte containing fluid intake can lead to over-hydration and subsequently increased risks associated of hyponatremia (low blood sodium levels) with symptoms that mimic those of dehydration.

Would Dynaforce Be Suitable?



The Product

Dynaforce is a hypotonic, electrolyte and carbohydrate containing drink that can be reconstituted from powder form. It is available in 4 flavours; Naartjie, Tropical, Blueberry and Cherry Grape. Each flavour is available in various packaging options; 60 g, 240 g and a 25 kg bulk pack.

The ingredients and nutritional content are listed below:

Nutritional Information per 100 ml

	value per 100 ml
Energy	92 kcal
Carbohydrate	5.2 g
Sodium	31.0 mg
Potassium	43.3 mg
Fat	0 g
Protein	0 g
Vitamin C	40.0 mg
Calcium	8.7 mg
Magnesium	18.1 mg
Phosphorous	6.8 mg
Vitamin E	1.1 mg TE
Vitamin B6	0.2 mg
Folic Acid	40 µg

Ingredients: Sucrose, Maltodextrine, Dextrose, Citric Acid, Calcium Phosphate, Flavouring, Vitamin C, Potassium Chloride, Magnesium Oxide, Colourants, Vitamin E, Vitamin B6, Folic Acid

The sodium content is within an acceptable range to assist rehydration and replace losses associated with sweating as described in the desired characteristics of a rehydration drink. The carbohydrate content is moderate and sufficient to maintain an isotonic end product when mixed according to instructions. This characteristic provides for quicker absorption of the fluid. Other isotonic or hypertonic fluids (those with higher solute concentrations) are absorbed at a slower rate and not ideal rehydration options.

Interestingly the potassium content of this drink is higher than many other rehydration formulations. Very small amounts of potassium are lost through sweat and as such replacing this electrolyte is not a direct aim of rehydration. However drinks with higher potassium content may be beneficial to maintaining hydration via a fluid sparing and fluid retention effect that the potassium exerts at a cellular level.

The remaining nutritional elements of the drink include a number of vitamins and minerals which do not directly affect hydration status but are beneficial from a nutrient density value. As such Dynaforce is not just a source of electrolytes and carbohydrate, but also a source of these nutrients.

The drink is easy to mix and available in practical packaging options.

I am of the professional opinion that this is a suitable rehydration option for the industrial sector for the reasons outlined in the article.



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References

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