

Projects carried out by Polyworx

The following table contains all relevant projects in consultancy for Infusion Technology and RTM to Industry (and a few 'home builders'). A number of projects are carried out at the moment (indicated by 'open').



Project	Period	Contribution by Polyworx
Standfast 64'	14/3/2001 27/6/2001	Injection plans for hull and deck of a 64' sailing yacht in carbon/epoxy. Carried out in cooperation with Standfast Yachts and Fontys Hogescholen.
Slovenia 1, 80' racer for Technol, Slovenie	22/10/2001 3/7/2002	Implementation of vacuum infusion technology, training of personnel, advise on selection of consumables and equipment, injection plans for hull and deck, training and coordination on site.
Bolt Maritiem (boltmaritiem.nl)	21/3/2002 28/4/2004	Realisation of vacuum infusion technology, advise on materials (in cooperation with Brands Structural Products), injection plans for inner- and outer skin of hull and deck, training personnel, support of injections.
Prinz 40' Fly	12/6/2002 13/12/2002	Implementation of vacuum infusion technology, training of personnel, advise on lamination schedule, equipment and consumables. Injection plans for flybridge, hull and deck, on-site support of injections (Prinz has acquired a license for the RTM-Worx software).
Classicon Skilla 2000	20/6/2002 18/5/2004	Injection plans for outer and inner laminate of a 20 meter hull and coordination of infusions (glass/epoxy).
Bulkhead - Polyproducts, Werkendam	20/7/2002 15/4/2003	Knowledge transfer, and support for development of an injection strategy for infusion of a bulkhead for transport of grain. (Unifilo CFM with polyester).
Standfast 43'	8/11/2002 16/12/2002	Injection plans for deck and hull (carbon/epoxy composite) and support of injection of the deck (hull was infused during the METS).
African Cats 42' - African Cats (Amstelveen/Durban)	14/2/2003 10/10/2003	Implementation of vacuum infusion technology for injection of a 42' ultra lightweight catamaran. Training of key personnel, design of the laminate (glass/kevlar), selection of resin and consumables (in cooperation with Brands), design of a new groove pattern for foam(Divinycell), support of injections of the two hulls with both keels and the bridgedeck in a single shot. Design of infusion strategy for the deck and on-site coordination of the injection.



Project	Period	Contribution by Polyworx
FRAM F39 (Henny van Oortmarssen, home builder, see www.fram.nl)	19/3/2003 (open)	Implementation of vacuum infusion technology for extremely thin laminates directly on the foam core. Training (praktical & software), injection plans for floats and hull/deck (vertically separated - two infusions for the inside skin of two halves, assembly and one single injection for the outside laminate).
Alpomat - polyester roof	22/4/2003 18/5/2003	Injection plan and advise on injection of a roof for mobile units.
Fast Yachts 42' - Fast Yachts, Durban, RSA	22/8/2003 13/10/2003	Training of personnel, injection plans for- and support of vacuum infusion of a 42' monohull hull.
Pantera 76'	22/10/2003 31/12/2006	Production technology for hull and deck of the Pantera 76'. material selection, design laminate/sandwich (in cooperation with Fabio Buzzi Design, Italy), injection plans, support of preparation and coordination of injections. Project was cancelled because of financial trouble at Pantera.
Southernwind 100' - Southernwind Shipyard, Cape Town, RSA.	18/8/2004 24/3/2005	Realisation of vacuum infusion technology for hull and deck in 3-steps process: inject outer skin, glue the foam core (with vacuum), inject inner skin. Training of personnel, advise on materials, consumables, equipment (degassing) and support of all injections for the first SWS 100'.
Russel Coutts 44' - Technol, Slovenie	23/11/2004 9/2/2005	Injection plans for hull and deck of the RC44 prototype (carbon/epoxy, sandwich 1-shot injection).
Guardian 50 - Blueprint Marine	4/7/2005 16/8/2005	Injection plans for hull and deck, support and coordination of the injection of the hull (inner skin).
Falcon 44' (Piet Bos, particulier) in cooperation with Maritiem Kenniscentrum Delfzijl	4/9/2005 25/11/2005	Injection plans, support and coordination of infusion of the outer and inner skin of the hull in cooperation with MKC.
Dutch Carbon 36'	5/11/2005 16/5/2007	Production technology for all composite parts of the DC36, material selection, equipment (degassing), injection plans for hull and deck, on-site support, additional training, advise on moulds.
Maritiem Kenniscentrum Delfzijl - G-Force 22'	11/11/2005 20/3/2006	Injection plans for injection of hull and deck and coordination of injections.
Seminar Selcom SRL, Italy	2/2/2006 27/2/2006	Two day seminar for employees and distributeurs/agents of Selcom (multiaxial non-crimp fabrics in glass-,kevlar- and carbon fibre).



Project	Period	Contribution by Polyworx
Israelian Marine (Navy Seals) via Spike, Tel Aviv	15/2/2006 15/5/2007	Implementation of vacuum infusion technology for hull and deck of a special marine vessel. On-site support and coordination of injections, training of personnel, advise on moulds, materials, equipment and suppliers.
Carbon Cube 36' - Inside, Manfredonia, Italy	3/3/2006 5/10/2007	Development of Vacuum Infusion technology for production of a 36' sailing yacht in carbon/epoxy-sandwich and infusion of the mould for the deck (in cooperation with Hexion Stuttgart). Training of personnel, on-site support and coordination of infusions.
Polynova Tilburg	2/5/2006 17/5/2006	Infusion plan and on-site support and coordination of infusion of a 22' hull in glass/vinylester (Romilly).
Composite bridge Dronten, Netherlands - a project of Composieten Team (Jan Peeters), Rotterdam, The Netherlands	22/5/2006 31/12/2006	Injection plans for and on-site support of injection of bridge deck and lower deck (17 mm carbon UD with vinylester). advise on lamination schedule and support of experimental work by advise and analysis of trial injections.
Endeavor 44' - Vels Jachtbouw, Medemblik, Netherlands	20/7/2006 31/12/2006	Injection plans, training of personnel and support of vacuum infusion of the outer- and inner skin of the 44' Endeavor powerboat hull (a project of Max Rogmans).
Seminar Ebalta Kunststoff GmbH, Germany	17/11/2006 19/1/2007	Two day seminar on Vacuum Infusion technology, including practical course: infusion of test panels and some example parts, degassing etc.
Botenservice Reeuwijk (Fred Streekstra)	30/12/2006 29/1/2007	Injection plan for the deck of the Rapsody 30. (pictures of this infusion can be found in the Vacuum Injectie Handleiding - in Dutch - of Brands Structural Products).
100' Coachroof for Southernwind Ship Yard, Cape Town, South Africa	17/5/2007 25/9/2007	Plans for injection of the mould (glass/epoxy with Lantor Soric core) and coachroof (carbon/epoxy) incl. design of the laminate schedule for the mould.
BEL technologies, Beer Sheva, Israel in cooperation with Xenom Ltd., Tel Aviv, Israel	7/6/2007 21/9/2007	Injection plans for composite 'discs' of 4 meter diameter. In cooperation with Xenom, by providing background support (by e-mail, phone and on-site).
NGup 48m Airpac blade (Nijverdal, Netherlands)	28/8/2007 25/9/2007	Advise on material selection and implementation of several improvements for existing (10 year old) Airpac/GE Wind injection technology.



Project	Period	Contribution by Polyworx
X-Yachts 37' and 64', Haderslev, Denmark.	28/9/2007 30/1/2009	Implementation of vacuum infusion technology for the X-64. Infusion of a 37' hull for training and proof of concept. Includes material selection, setup of production facilities, advise on moulds, infusion plans, training of personnel and on-site support and coordination of injections.
Philips Medical Systems	30/1/2008 28/3/2008	Flow analysis calculations for injection of carbon reinforced part with epoxy resin, optimise gate locations, sensitivity study.
Schaap Composites (builders of the ABN Amro Volvo Ocean racers)	28/2/2008 28/3/2008	Practical advice (lamination plan, use of consumables) and infusion plan for a 'half pipe' (an Airborne BV project).
Southernwind, Cape Town, South Africa	26/3/2008 16/9/2008	Injection plans for hull (3 parts) and deck (two parts) of the new Southernwind 110' sailing yacht.
Zaadnoordijk Yachtbuilders, Heerenveen, The Netherlands	28/3/2008 6/2/2009	Training of production personnel, material and equipment selection, injection plan for 40' 'VanDutch' powerboat hull, coordination of first infusion. Zaadnoordijk acquired a RTM-Worx license with training and support.
TCNN / NHL, Leeuwarden, The Netherlands	8/4/2008 4/6/2008	Vacuum Infusion Course: practical training based on theoretical insight and understanding of the physics. Combined with demo injection of a small sloop (hull and deck) by Giezen Composieten.
Hanze Hogeschool, Groningen, The Netherlands	15/4/2008 27/6/2008	Injection of the mould for the hull of the (very succesfull) solar boat for the Frisan Solar Challenge of the Hanze Solar Team (finished first in the A-class).
Polymat, Workum, The Netherlands	5/5/2008 30/6/2008	Infusion of the sloop 'Elke 3.10'. Preparation and infusion outsourced to Giezen Composieten, Delfzijl.
Polynova, Tilburg, The Netherlands	4/6/2008 27/6/2008	Injection plan, assistance with preparation and coordination of injection of a '16 kwadraat' (open sailing boat).
Geuzenboats, Sneek, The Netherlands	27/6/2008 6/2/2009	Development of injection technology (material selection, lamination schedule, support of, injection plans etc.) for the Wavefarer 'Light'. Training of personnel, knowledge transfer.
Zevenhuizen Yacht Builders, Franeker, The Netherlands.	2/7/2008 9/3/2009	Injection of outer skin (done) and inner skin (to do) of 42' hull, used as plug for the mould and finished after making the mould to serve as hull of the first boat.
Zevenhuizen Yacht Builders	7/10/2008 22/1/2009	Infusion of 42' mould: injection plans and on-site assistance and coordination.



Project	Period	Contribution by Polyworx
RMK (Oyster), Tuzla, Turkey	25/8/2008 (open)	Development of infusion technology for production of a 100' sailing yacht: Injection plans, material selection, assistance with preparation and coordination of injection(s).
Joptek Oy, Finland	16/9/2008 28/1/2009	Injection plan for 'Crew Floor', with Nidacore honeycomb core.
Frisian Inspiration, The Netherlands	17/9/2008 30/12/2008	Feasibility study to- and development of injection technology for moulds. Specific case: 42' power boat hull.
Blauwe Boei and Valent, Lemmer, The Netherlands	17/9/2008 (open)	Infusion technology (injection plans, support, coordination etc.) for the Pro 25, a fast open glass/epoxy sailing boat.
Promorfo, The Netherlands	6/4/2009 (open)	Development of new technology for production of plugs and moulds (combination of infusion and CNC technology)
Ind. Fibrovent Ltda, Santiago, Chile	8/5/2009 (open)	Consultancy on production of wind turbine blades, initial training for use of RTM-Worx flow simulation software.
Flexiteek, Sneek, The Netherlands	1/6/2009 (open)	Infusion technology for 7 meter sloop (injection plans, on-site assistance).

RTM-Worx Licencees (active users)



Automobili Lamborghini S.P.A., Italy
AIDC, Taiwan
Boschman, The Netherlands
Dominion Radio Astrophysical Observatory, Canada
Cogit Composites, France
Composite Technology Laboratory, St. Petersburg, Russia
Comtek Advanced Structures, Canada
DIAB USA, Texas, USA
DIAB Australasia, Australia
Durban Inst. Technology, South Africa
DLR Braunschweig, Germany
DLR Stuttgart, Germany
Ecole d'Ingénieurs Saint-Imier, Switzerland
EMP Composites, Australia
Fontys Hogescholen, Eindhoven, The Netherlands
GH-Craft, Japan
Gaiker, Spain
Greg Marshall Composites, Canada
GKN Aerospace, UK
Hellenic Aerospace Industries, Greece
Hexion MGS, Stuttgart, Germany
HTEP, Gdansk, Poland
Israel Aircraft Ind., Tel Aviv, Israel
INASMET, San Sebastian, Spain
Ishikawajima Harima Heavy Industries, Japan
Kanazawa Institute of Technology, Japan
Kok en van Engelen BV, The Hague, the Netherlands
Lightweight Structures BV, Delft, The Netherlands
LM Glasfiber A/S, Denmark / the Netherlands
Mitsubishi Heavy Ind., R&D Nagasaki, Japan
Mtorres, Spain
National Aerospace Laboratories NLR, The Netherlands
National Technical University of Athens, Greece
North American Bus Corp., USA
Northrop Grumman Ship Systems, Pascagoula, USA
Prinz Adriatic, Oroslavje, Croatia
Res. Inst. Medium & Small Shipbuilding, South-Korea



Resin Sistem (Feretti group), Fano, Italy
Sekisui Corp., Japan
SICOMP, Sweden
Siemens Wind Power, Denmark
Singapore Insitute for Manufacturing Technology
Stork-Fokker Special Products, Hoogeveen, The Netherlands
Suzlon, india
Tian Jin Polytechnic University, China
Turkish Aerospace Industries, Ankara, Turkey
UDEC, Chile
Umoe Mandal, Norway
UNINA (University of Napels), Italy
United Ship Design & Dev. Center, Taipei, Taiwan
Universal Ship Building Corp., Japan
University of Alabama at Birmingham, USA
University of California, San Diego, USA
University of Southern Queensland, Australia
VZLU Prague, Czech Republic
Zaadnoordijk Yacht Builders, Heerenveen, The Netherlands