



3300 / 4500 / 5500 / 7000

The intelligent sprayer
COMMANDER



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3300 / 4500 / 5500 / 7000

SPECIFICATIONS

- ▶ **Tank:**
3300 / 4500 / 5500 / 7000 l
- ▶ **Controller:**
HC 8600, HC 9600, HC 8700, HC 9700 or ISOBUS
- ▶ **TurboFiller:**
Integrated working table, high capacity
- ▶ **Liquid system:**
DynamicFluid4 – shorter response time and more precise application in the field
- ▶ **Tracking:**
SafeTrack (optional)
- ▶ **Axle:**
Adjustable 1.8-2.25 m
- ▶ **Booms:**
DELTA FORCE: For higher speeds and greater performance 24-39 m
TWIN FORCE: Air-assisted booms from 18-36 m

Concept

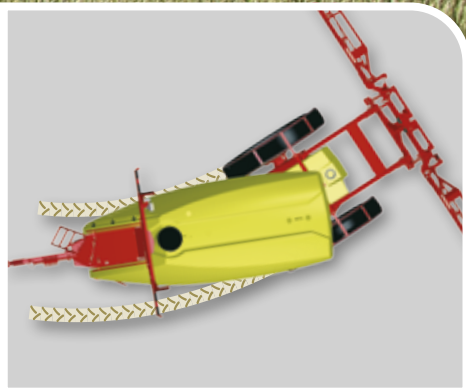
Farming practices are constantly changing. Farmers are met with a daily challenge to improve capacity and reduce operating costs. To help you to meet this challenge HARDI has developed the COMMANDER trailed sprayers.

The COMMANDER is designed to meet the demands of the modern professional farmer world-wide. This generation of sprayers is designed to lead the way in

capacity, reliability, safety, optimization, ease of operation and precision.

The COMMANDER is a highend performer designed for continuous use by demanding operators. An example of the functional design is the logical layout of the left hand side of the sprayer, where all primary operations are located.

Take a closer look at some of the features making the COMMANDER the best choice on the market for trailed sprayers.



Perfect steering

With the HARDI SafeTrack you do not have to choose between either tight turning radius or stability. This ensures a minimum of crop damage combined with safe and user-friendly operation. SafeTrack ensures that the boom is always 100% perpendicular to the tramlines. This ensures perfect application when turning at the end of the fields.



Reduce drift and chemical usage

TWIN – Make money on your spraying budget. The world's best application system will help you saving up to 30% of your chemical costs, and with higher spraying speed and lower drift you can boost your capacity up to 100%. The TWIN system will enlarge your spray window to be able to spray in more windy conditions making the job easier for you.



Higher precision in your spray job

Precision is key to spraying. The HC 9700 controller offers the possibility to use field maps in conjunction with your preferred farm management software.

- ▶ High application precision
- ▶ Less usage of chemicals
- ▶ No overlapping areas



Intelligent control of liquid system

With the COMMANDER "i", a FluidBox is located at the WorkZone in the front. With a functional design, the sprayer operator will be able to quickly start the demanded operation.

- ▶ Easy operation of the SmartValves
- ▶ Control of filling, agitation, spraying and cleaning

Chassis

Designed for high-speed driving

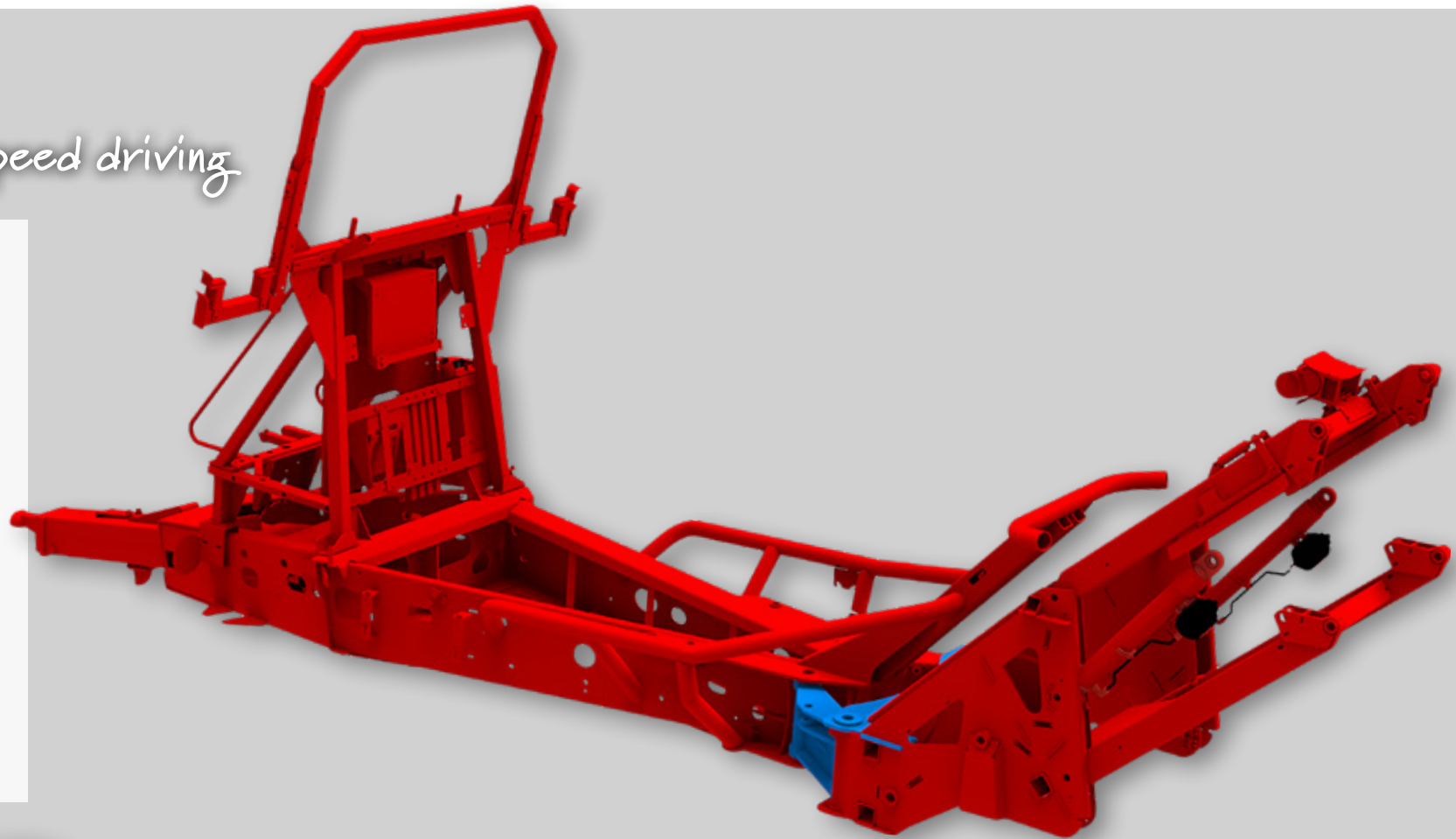
The heavy-duty COMMANDER chassis and axles are designed for high speed driving under the most demanding field and road conditions ready to meet the tough demands of the professional farmer.

The platform is compact and very easy to access and gives you unobstructed access to the tank lid. The rear and floor plate can be removed allowing easy access to the fluid and electric system.

Low center of gravity

The design of the chassis with all steel parts located as low as possible in combination with a perfect match with the polyethylene tank provides low centre of gravity.

The 500 l RinseTank is placed over the rear axle and provides extra stability.



Suspended axle and drawbar

The HARDI COMMANDER is available with an optional unique hydraulic suspension system. The strong hydraulic cylinders absorb the shock loads instead of transferring them to the boom and the tractor. This offers you a high comfort level at high driving and spraying speeds.

The drawbar and axle on the COMMANDER 7000 l are as standard fully suspended. Axle suspension on 5500 l is an option. The full up and down load at the drawbar from the sprayer to the tractor is transferred through rubber dampers built into the chassis.

High quality surface treatment

The chassis as well as all other steel components have been pre-treated with zinc phosphate before a high quality coating of powder paint. This treatment provides outstanding protection against corrosion from chemicals and harsh weather conditions.



Perfect steering

With the HARDI SafeTrack you do not have to choose between either tight turning radius or stability. This ensures a minimum of crop damage combined with safe and user-friendly operation.

A computer constantly monitors forward speed and turning radius to make sure that the correction made by the tracking system is as safe as possible.

This revolutionary design merges the benefits from other traditional systems into one high performance system. The HARDI SafeTrack is available on the COMMANDER (optional).

SafeTrack ensures that the boom is always 100% perpendicular to the tramlines. This ensures perfect application when turning at the end of the fields.

Safe in all conditions

If the tractor driver tries to do a 90° turn at for example 15 km/h, the SafeTrack system automatically computes the data and straightens up the trailer to prevent tilting over.

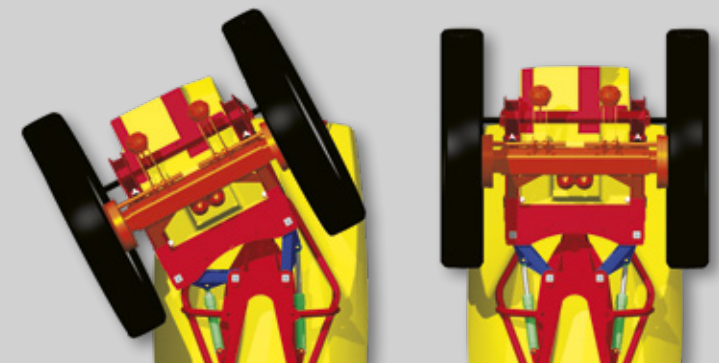
The unique geometry in the SafeTrack concept, with trapeze arms, gives a turning radius down to 6 m.

In transport mode, the SafeTrack function automatically locks in straight ahead position.

Extended Drawbar

The drawbar of the 5500 and 7000 I has a hydraulic support leg as standard and is driven by a separate hydraulic outlet on the tractor. This ensures easy and safe attachment of the sprayer.

For the 36 m TWIN boom on the 5500 and 7000 I, we offer an extended drawbar as an option.



WorkZone

Easy operation

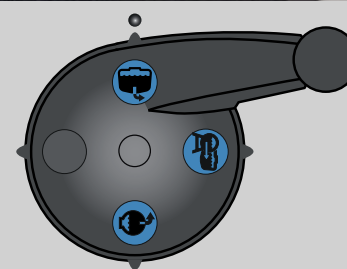
The COMMANDER has a WorkZone where all primary functions are placed in an easy to reach position. Everything you need to operate the sprayer is available in this area, and everything is designed to be simple and logical to understand and operate. The large safety locker is placed right over the WorkZone along with the clean water tank.

SmartValve




All primary functions needed to operate the sprayer when filling or cleaning are located in the centre of the WorkZone. The logically placed handles with easy to read icons make the system very easy to operate. This greatly reduces the start-up and operation time of the sprayer.

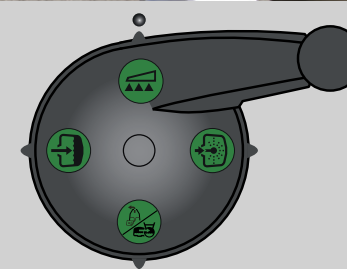
High mixing capacity

The advanced TurboFiller is one of the best on the market. It is specifically developed to handle large quantities of powders and liquids. Using a combination of high vacuum and powerful rotation inside the hopper, it mixes all types of chemicals quickly and safely. In addition, the TurboFiller is easy to both operate and clean.







Suction

-  Suction from main tank
-  Suction from RinseTank
-  Suction from external source



Pressure

-  Tank cleaning
-  PressureEmpty/TurboFiller use
-  Filling
-  Spraying



Easy operation

With the COMMANDER "i", the FluidBox is located at the WorkZone in the front. With a functional design, the sprayer operator will be able to quickly start the demanded operation. For non "i" version COMMANDER machines, a manual handle operation is offered.

- ▶ Easy operation of the SmartValves
- ▶ Control of filling, agitation, spraying and cleaning

The liquid system

— *Fast and reliable*

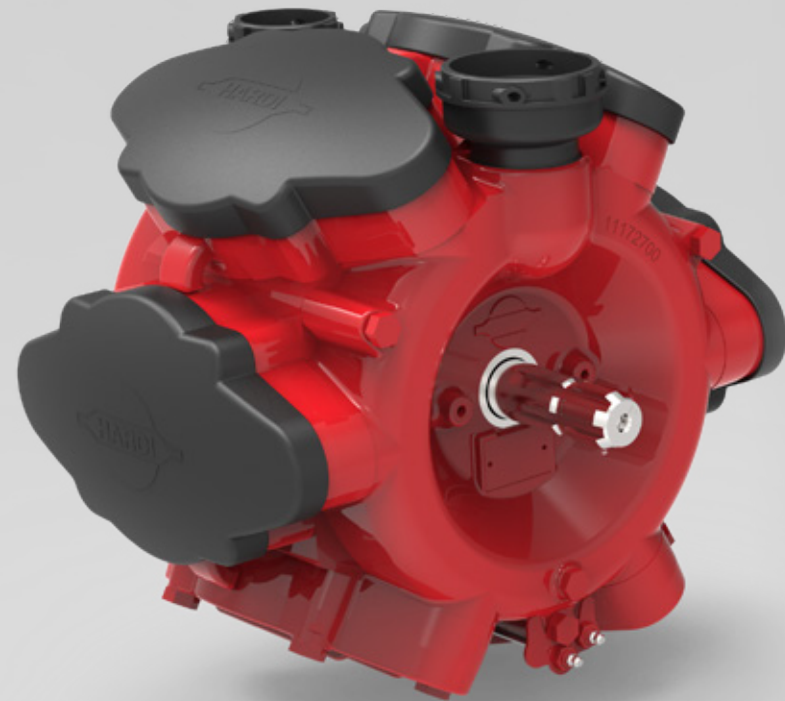
The COMMANDER's fluid system (DynamicFluid4) employs advanced fluid dynamics and application rate control to deliver fast response and accurate target rate application.

Pressure, flow, pump speed, forward speed, boom sections and application rate are monitored and processed using advanced computations. The DynamicFluid4 processor analyses the spraying data 20 times a second and provides pre-emptive rate control capability, altering the pump speed with pinpoint precision.

The liquid system can be operated from the cabin or from the ground.

The diaphragm pump

At the heart of the COMMANDER sits the robust and easy-to-service pump that HARDI is so well known for. The invention of this pump constituted the foundation upon which HARDI was founded more than 60 years ago. HARDI was the first to use diaphragms to separate the liquid from bearings, crankshaft and other vital pump parts, thereby allowing the pump to run dry without damage. In addition, this pump distinguished itself by being operated directly from the tractor's PTO shaft.



Advanced filters

- ▶ EasyClean filter (Suction)
- ▶ CycloneFilter (Pressure)

Suction filter

The EasyClean filter is a high-capacity suction filter. The filter's condition can be constantly monitored via a SafeSpray vacuum gauge to ensure it is cleaned only when necessary. When it's time for cleaning, simply twist the filter's lid 90° to close off its tank valve and open the filter for inspection. It doesn't get much easier than this.



Pressure filter

The CycloneFilter is a unique self-cleaning pressure filter. A high-speed circular flow makes the cleaning very effective. A unique boost function allows the filter to be flushed when needed.



Controllers

Full ISOBUS control

Complete integration

The complete integration of all important information on one work screen is a highly demanded criterion for most farmers. The HARDI touch-screen controller series are very easy to operate while providing an optimal overview for maximum control of the spray job.

All HARDI touch-screen terminals are ISOBUS terminals and made for spraying purpose. In combination with the Grip and the SetBox the operation in the field is easy and fast.

Integrated electronics

From the working screen, the driver can operate AutoHeight, AutoSectionControl as well as guidance and dosing. The map screen view can 2D or 3D. The HC 9600, HC 8700 and HC 9700 screens are able to divide the information with split screen for a better overview.

Data management and data transfer

The USB ports and the WiFi adapter allows data to be exchanged. This simplifies application reporting, providing

an easy way to generate detailed application reports for governmental record keeping. The data can be transferred to different farm management software.

ISOBUS terminal

The HARDI COMMANDER can be operated with a universal ISOBUS terminal. The customer can order the COMMANDER and use the intelligent functions like AutoSectionControl direct from his own ISOBUS terminal if supported.

To make the complex sprayer operation easier, the proven HARDI JoyStick will be delivered with the COMMANDER sprayer.

Extend your work screen

Use your mobile device or tablet to perform calibration, diagnostics, tank fill and many other activities anywhere around your machine. Using the XTEND technology, you can extend the user interface of your HC 8700 and HC 9700 to the screen of a iOS or Android device using a WiFi connection.

Feature	HC 9700	HC 8700	HC 9600	HC 8600
Mode of action	12.1" (30.7 cm)	8.4" (21.3 cm)	12.1" (30.7 cm)	8.4" (21.3 cm)
Mode of action	Touch screen	Touch screen	Touch screen	Touch screen
ISOBUS Universal Terminal	✓	✓	✓	✓
Mini view screens	3	2	UT Split screen	✗
Dashboard & Interaction Keypad	✓	✓	✗	✗
HARDI workscreen	✗	✗	✓	✓
USB ports	✓	✓	✓	✓
WiFi adapter	✓	✓	✓	✓
Horizon XTEND	✓	✓	✗	✗
AutoSectionControl	✓	✓	✓	✓
Lightbar Guidance	On screen	On screen	In housing	In housing
Coverage Mapping	✓	✓	✓	✗
Data Logging	✓	✓	✓	✓
Variable Rate Application	✓	+	✓	✓
Application Report	✓	✓	✓	✗
Boom Height Control	UT	UT	Integrated	Integrated
Camera Support	✓	✓	✓	✓
ISOXML data transfer	✓ In/Out	✓ In/Out	✓ Out	✓ Out



HC 8600

HC 9600

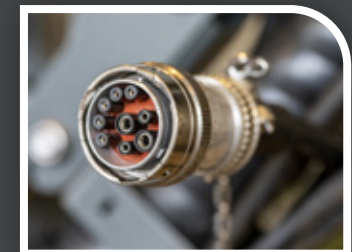


HC 8700

HC 9700



SetBox and Grip



ISOBUS

Field mapping

– Minimise chemical usage and costs

Higher precision in your spray job

Precision is key to spraying. The HC 9700 controller offers the possibility to use ISOXML field maps in conjunction with your preferred farm management software. Task Data mode allows you to select, configure and run a task from the imported task data. Drawing on the features of the AutoSectionControl system, the HC 9700 allows you to shut off boom sections automatically in accordance with your field maps. Avoiding over-spraying reduces expenses and makes your farm more environmentally friendly. Field maps also makes it easier to work in conditions of low visibility such as dust or darkness.

Field mapping benefits

- ▶ High application precision
- ▶ Less usage of chemicals
- ▶ No overlapping areas



TWIN FORCE

A boom for ultimate capacity



Save time, money and environmental impact

The TWIN FORCE boom employs the world's best system for spray control. Using an adjustable curtain of air to entrain and direct the spray, TWIN FORCE can reduce drift by an astounding 80%. The result is close to no loss of plant protection products or contamination of adjacent areas.

Air-assisted spraying also guarantees better spray penetration and coverage than conventional applications. All this translates into real savings for the farmer of at least 50% on water usage and up to 30% on plant protection products.

TWIN FORCE gets the job done faster. Efficient drift control means more spraying days – up from 31 to 76 days in one study – as well as higher application speeds and fewer filling stops. The result is higher sprayer productivity. In fact, TWIN FORCE will increase your spray capacity by up to 100%.

The TWIN FORCE boom is available from 18 m to 36 m.

TWIN system advantages:

- › Increase spray capacity by at least 100%
- › Reduce drift by up to 80%
- › Save plant protection products by up to 30%
- › Save water by at least 50%
- › Improve crop penetration and coverage
- › Improve spray economy
- › Faster spray speeds
- › Optimal field timing
- › 30+ years' experience



PrimeFlow – Pressure circulation

PrimeFlow circulates and primes the boom before the actual spraying and is controlled by an ON/OFF motor at each nozzle body. Open/close action is instant.

- › No untreated areas at spray start
- › HARDI PENTALET 5-nozzle holders as standard
- › No chemical sedimentation in the spray lines
- › Flush of boom lines is possible without spraying on the ground
- › Dynamic setup of sections



- ▶ Superb boom stability with AutoTerrain and NegativeTilt
- ▶ Precise application with hydraulic AntiYaw dampening
- ▶ Higher durability and lower weight, due to new folding system and extensive use of aluminium in the outer wings
- ▶ Manual control at power outage
- ▶ Easy handling with hydraulic support wheels and AutoTerrain sensors



18-36 m



AutoTerrain



AutoSlant



AntiYaw



NegativeTilt



**REDUCE DRIFT
WITH HARDI TWIN**

UP TO **80%**



**SAVE PLANT
PROTECTION PRODUCT**

UP TO **30%**

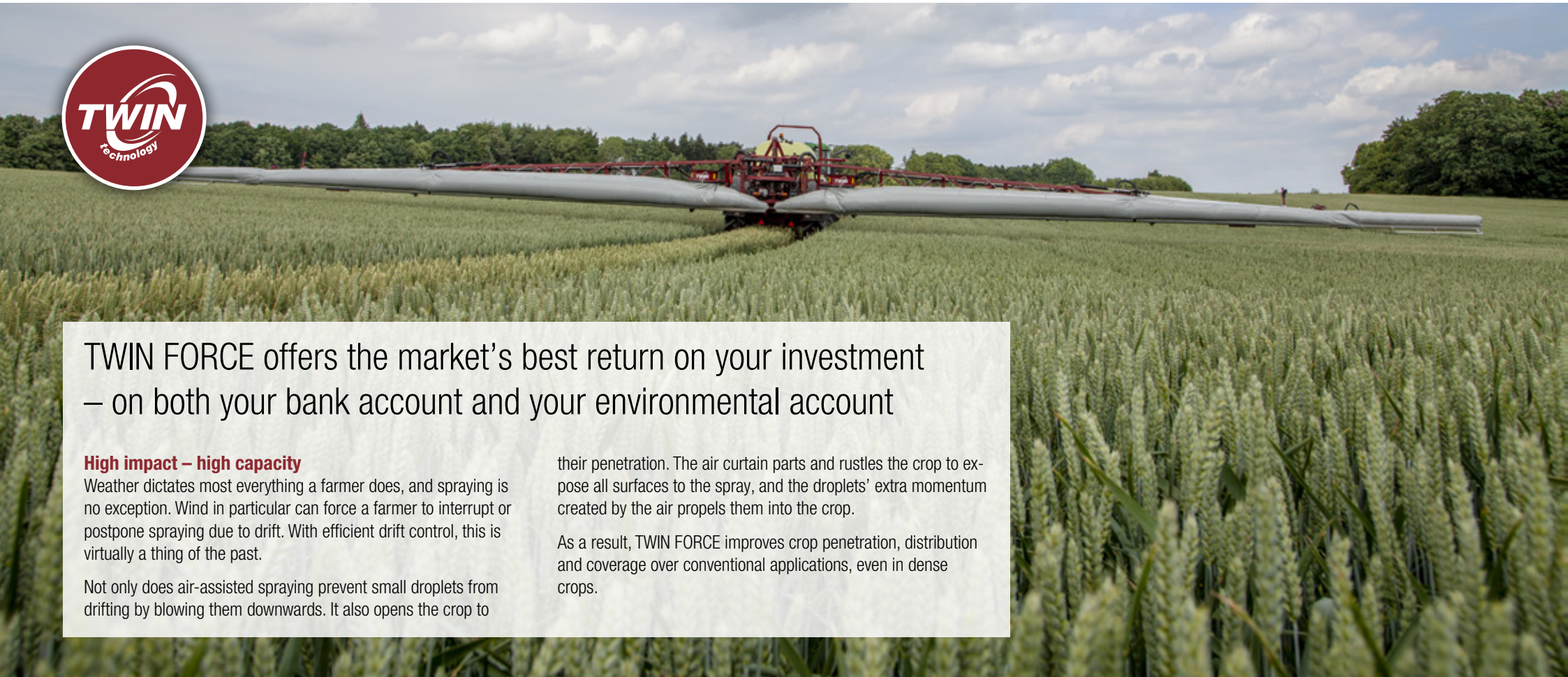


Change nozzles on the go
Automatic and safe change of nozzles from the drivers seat to quickly overcome more field- and weather conditions with AutoSelect Duo.

Save money
Insert your spray figures in our HARDI TWIN calculator app to find out just how much money you can save by using a TWIN FORCE boom.

www.hardi-twin.com





TWIN FORCE offers the market's best return on your investment – on both your bank account and your environmental account

High impact – high capacity

Weather dictates most everything a farmer does, and spraying is no exception. Wind in particular can force a farmer to interrupt or postpone spraying due to drift. With efficient drift control, this is virtually a thing of the past.

Not only does air-assisted spraying prevent small droplets from drifting by blowing them downwards. It also opens the crop to

their penetration. The air curtain parts and rustles the crop to expose all surfaces to the spray, and the droplets' extra momentum created by the air propels them into the crop.

As a result, TWIN FORCE improves crop penetration, distribution and coverage over conventional applications, even in dense crops.

Proven and tested

The outstanding performance of TWIN FORCE has been confirmed by numerous case stories from around the world along with field trials and studies.

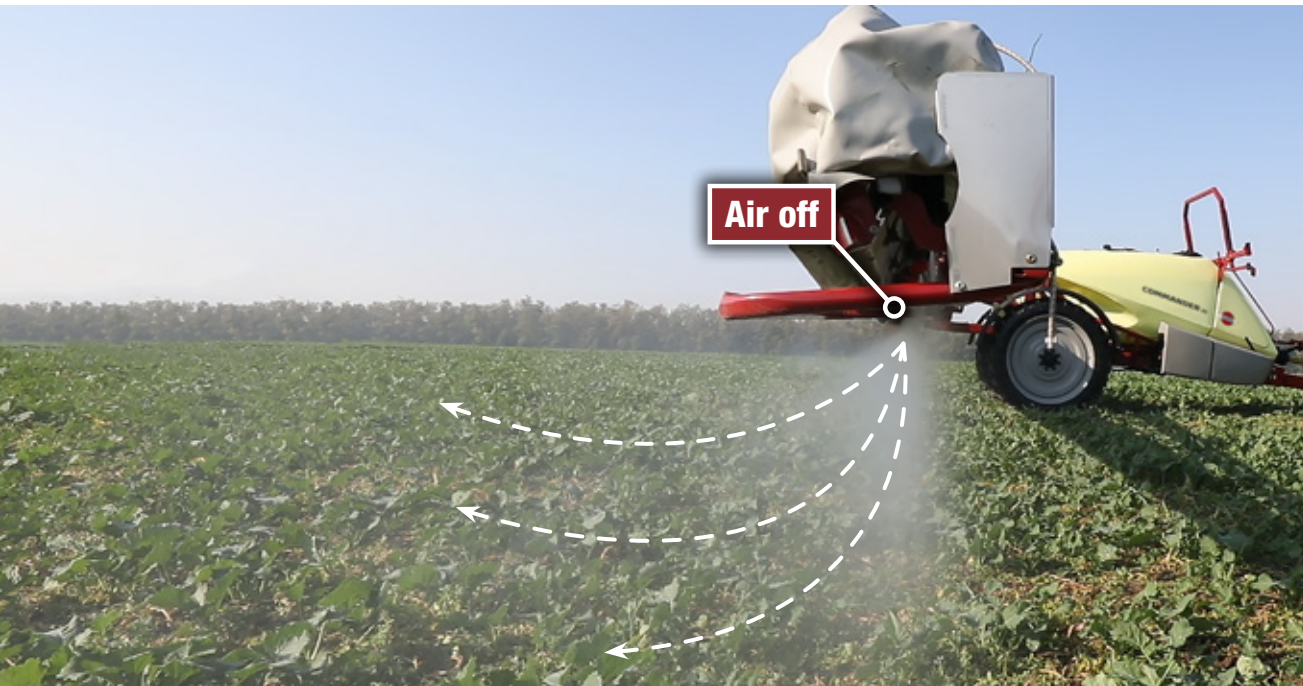
One independent, scientific study from the Research Centre Flakkebjerg/Aarhus University, Denmark, demonstrated that the spray

application quality of a HARDI TWIN sprayer with a 24 m boom was unaffected by high wind at driving speeds of 8 to 12 km/h.

The researchers concluded that TWIN gives a more uniform deposition and significantly lower drift than conventional applications, especially in windy conditions. The study confirmed that TWIN can reduce spray drift by up to 80% – translating into a reduction in use of chemical products of up to 30%.



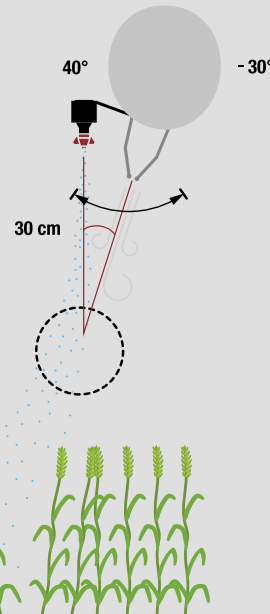
Download test results:
www.hardi-twin.com



Conventional spraying

Spraying with TWIN

The concurrent angling of air and spray is a distinctive and important feature of TWIN FORCE



Better than competitors

TWIN FORCE gives the operator more options for spray control than other air-assisted sprayers. By adjusting the air curtain's speed and angle, from no air to full air, in effect producing two sprayers in one (hence the name – TWIN), the operator can guide all droplets, irrespective of size, to the target.

Two powerful blower units provide air to the left and right boom sides. Each blower can be stepless adjusted to a maximum output of 2,000 m³/h per metre of boom and a maximum air speed of 35 m/sec.

The DELTA FORCE boom

– High performance



Compact on the road – wide in the field

The DELTA FORCE boom is made to perform. It is a practical but strong boom designed for productivity and performance. We have optimised weight and strength to produce a large boom for reliable performance at fast spray speeds. Despite its width, the DELTA FORCE boom is only 2.55 m wide when folded up for transport. The boom's simple yet effective pendulum suspension controls boom movements, while a low centre of gravity ensures perfect boom balance. With just two parameters to adjust

(pendulum and dampening), the DELTA FORCE boom is easy to customise and maintain.

The DELTA FORCE boom is available from 24 m to 39 m.

One boom – two spray widths: HARDI's boom-folding system allows the operator to spray at two different widths by choosing whether to fold out the last section.



Less drift

The DELTA FORCE boom can be fitted with additional nozzle holders to allow for a 25 cm spacing between nozzles in addition to the standard 50 cm.

In combination with the AutoTerrain boom management system, this reduces potential drift by allowing for a lower boom height. It also means that smaller nozzles with smaller droplets can be used to improve crop coverage.



Minimize boom movement

For a perfect application result, reduction of the horizontal movements is crucial.

The DELTA FORCE boom is as standard equipped with an anti-yaw dampening system between the center section and the boom wings. The 24 to 30 m booms have a rubber dampening system as standard and hydraulic dampening as option, while the 32 to 39 m are equipped with an hydraulic dampener as standard.



- ▶ Superb boom stability with AutoTerrain and NegativeTilt
- ▶ Precise application with hydraulic AntiYaw dampening
- ▶ Higher durability and lower weight, due to new folding system and extensive use of aluminium in the outer wings
- ▶ Manual control at power outage
- ▶ Easy handling with AutoTerrain sensors



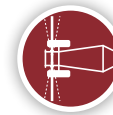
24-39 m



AutoTerrain



AutoSlant



AntiYaw

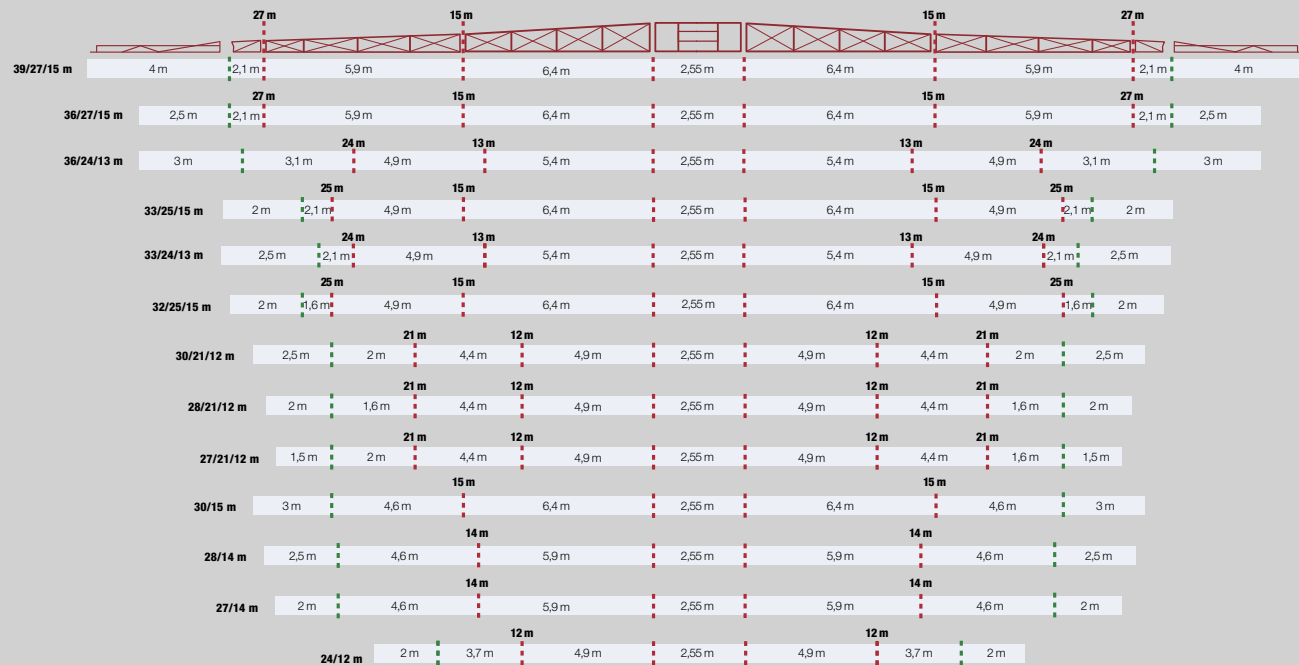


NegativeTilt

HARDI DELTA FORCE is available in:

3-fold: 39/27/15 m, 36/27/15 m, 36/24/13 m, 33/25/15 m, 33/24/13, 32/25/15 m, 30/21/12 m, 28/21/12 m, 27/21/12 m.

2-fold: 30/15 m, 28/14 m, 27/14 m, 24/12 m



Material optimisation

We always seek to use the most innovative combinations of materials. The DELTA FORCE boom is a prime example. The 27 to 39 m booms consist of a high-strength steel centre with lightweight aluminium break-away.

Boom management systems



Fast and precise applications

Our boom management systems are all designed to ensure superb boom stability. A stable boom is key to spray precision and productivity, especially when working with low boom heights at high speeds

Automatic control of height, slant, tilt and yaw optimises the boom position, and all but eliminates the risk of hitting the ground. It also reduces the risk of drift to the benefit of farmer and environment.

Yaw is counteracted by hydraulic accumulators, which power up every time the boom unfolds. Each

side can be automatically levelled independently, giving you the possibility of negative tilt. The result is exceptional application precision, even at fast driving speeds.

A stable boom reduces wear and tear on both the sprayer and its operator. The sprayer will have a longer lifespan, and the operator will experience less fatigue and stress, because the automatic systems reduce the need for constantly monitoring the boom.



AutoSlant

AutoSlant controls boom height and slant.

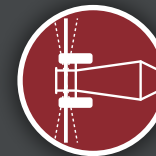
- ▶ Boom height
- ▶ Hydraulic slant
- ▶ 2 ultrasonic sensors
- ▶ Available for:

DELTA FORCE and TWIN FORCE



NegativeTilt

Negative tilt for superb boom stability, allows for downward tilting of the boom by up to -4° , especially useful when spraying a lower level, for instance on a ridge.



AntiYaw

Dampens horizontal movements and shock loads in the boom.



AutoTerrain

This unrivalled boom management system distinguishes itself from others by preventing rather than correcting unintended boom movements. Using ultrasonic sensors on the boom wings and angle sensors at the centre, it monitors the boom's movements continuously, responding to forces acting upon the boom before it is disturbed. By making smooth adjustments to the boom's slant, tilt and height, AutoTerrain provides accurate contour following and crop clearance – essential for precise spray application.

The AutoTerrain system has been tested under rigorous field conditions, showing excellent performance when spraying with low boom heights at high driving speeds of more than 15 km/h.

When turning on headlands, the AutoTerrain system will counter the boom's natural pendulum effect to prevent the inner side from dipping. The result is a level boom throughout the turn.



AutoTerrain:

- ▶ Boom height
- ▶ Hydraulic slant
- ▶ Individual tilt of boom wings
- ▶ NegativeTilt
- ▶ 3 or 5 ultrasonic sensors
- ▶ 3 temperature controlled proportional valves
- ▶ Available for:

DELTA FORCE and TWIN FORCE

Optional extras



FastFiller

The high-capacity FastFiller is capable of filling up to 800 l/min. The system is 100% self-priming. It works in combination with the ChemFiller and simultaneous filling from both.

Pressure Emptying

When fitted, this allows you to return liquid fertilizer or any other solution back into the storage tank.



Extended drawbar

For the 36 m TWIN boom on the 5500 and 7000 l, we offer an extended drawbar as an option.



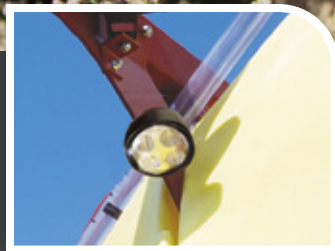
Boom Lights

For night spraying, lights can be added to the boom.



Controllers

The HC 8600, HC 9600, HC 8700 and HC 9700 controllers offer growers a powerful, full-featured precision farming tool.



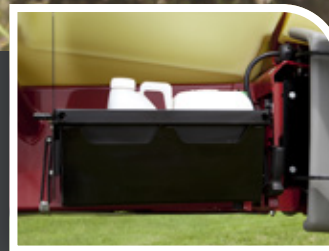
Night spraying light

Working light can be fitted if spraying and mixing are done at night.



FlexCapacity pump system

COMMANDER 5500/7000 l can be equipped with a FlexCapacity pump system.



ChemLocker

A ChemLocker can be fitted and holds chemical containers or bags.



External cleaning equipment

Spray gun and hose wheel for external cleaning.

Technical specifications

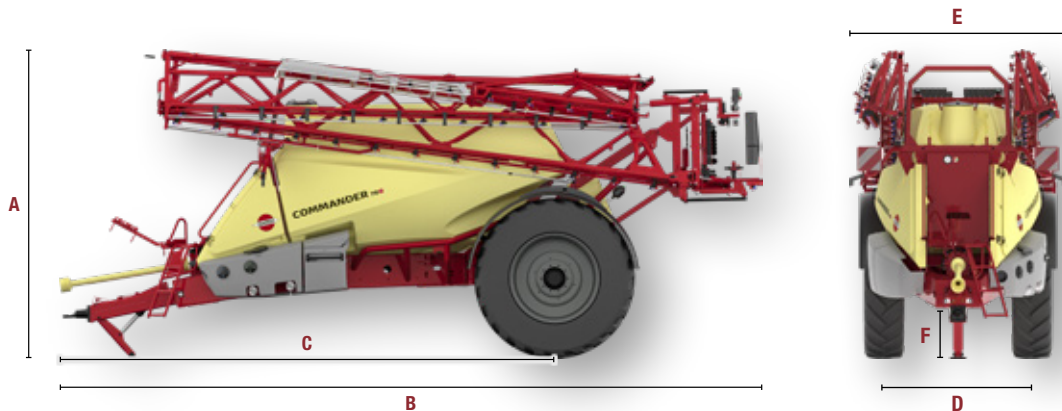
Tank, litres	3300	4500	5500	7000
Pumps, type – l/min	464-280 / 464H-334	464-280 / 464H-334	464H-334 / 2x464-598	464H-334 / 2x464-598
Booms, m	TWIN FORCE 18-30 m	TWIN FORCE 18-36 m DELTA FORCE 24-39 m	TWIN FORCE 24-36 m DELTA FORCE 24-39 m	TWIN FORCE 24 -36 m DELTA FORCE 27-39 m
RinseTank	500	500	500	500
Total height, m A)	3.60 (13.6x48)	3.60 (13.6x48)	3.80 (20.8x42)	3.80 (20.8x42)
Total length, m B)	7.30	7.80	8.50	8.50
Length draw to axel, m (C)	4.80	5.30	6.05	6.05
Turning radius SafeTrack, m	6.00	6.20	9.00	9.00
Track width, m D)	1.50-2.25	1.50-2.25	1.80-2.25	1.80-2.25
Width DELTA boom, m E)	2.55	2.55	-	-
Width DELTA FORCE, m E)	2.55	2.55	2.55	3.00
Width TWIN FORCE, m E)	3.00	3.00	3.00	3.00
Clearance, m F)	0.8 (13.6x48)	0.8 (13.6x48)	0.78 (20.8x42)	0.78 (20.8x42)
Weight total (empty tank), kg	3800-4950	3950-5500	5100-7200	5800-7250
Hydraulic suspension	Optional	Optional	Optional	Standard
Suspended drawbar	-	-	Standard	Standard

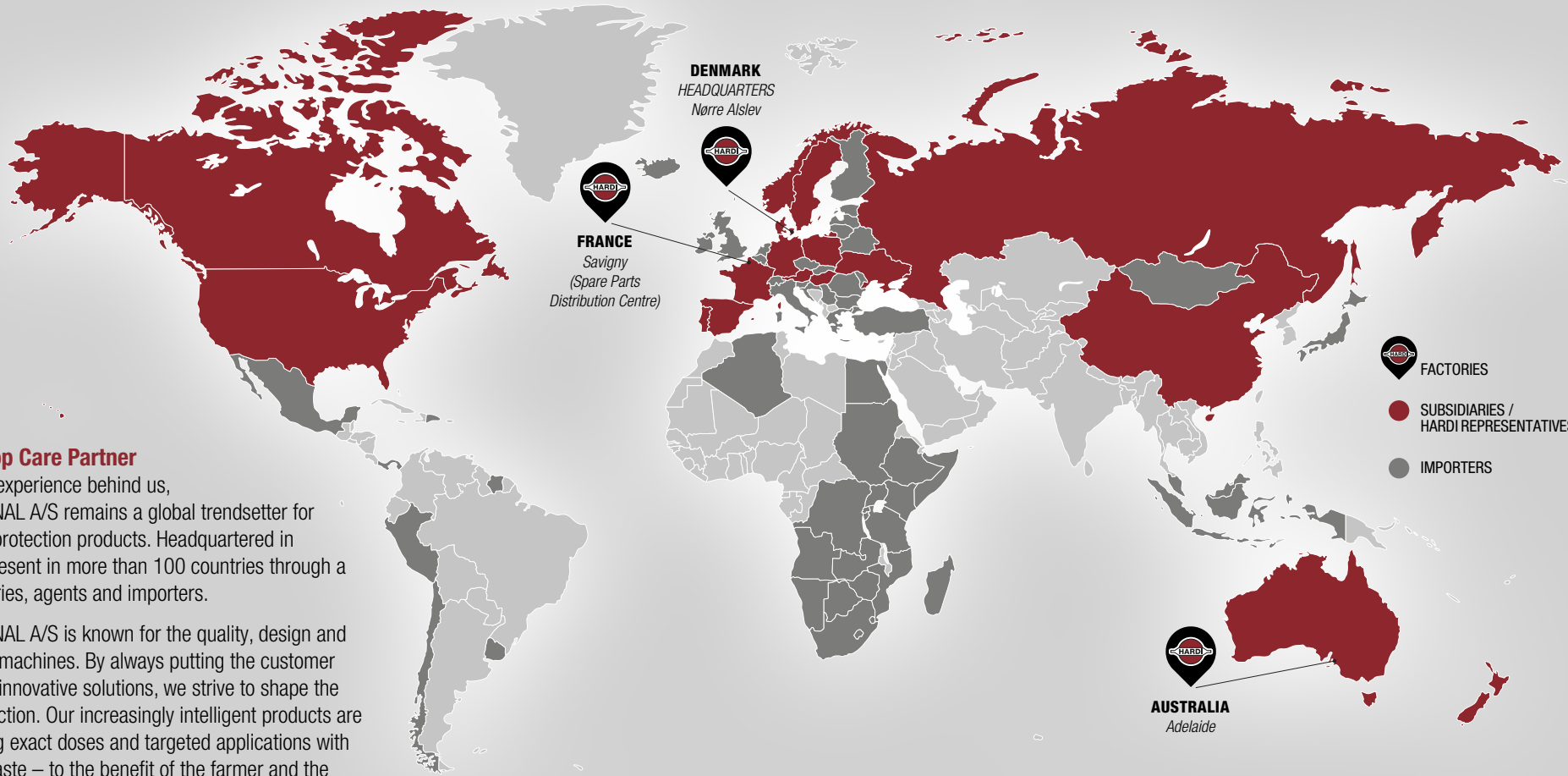
DELTA FORCE 24-39 m

DELTA FORCE is designed to be a large boom. The selection of features and the layout of the boom structure is targeted to perform at high driving speed and high performance at boom widths of 24-39 m.

TWIN FORCE 18-36 m

The TWIN FORCE boom offers the same strength and durability as the FORCE boom combined with the advantages of HARDI's unique TWIN air system.





HARDI – Your Crop Care Partner

With over 60 years experience behind us, HARDI INTERNATIONAL A/S remains a global trendsetter for application of crop protection products. Headquartered in Denmark, we are present in more than 100 countries through a network of subsidiaries, agents and importers.

HARDI INTERNATIONAL A/S is known for the quality, design and performance of our machines. By always putting the customer at the centre of our innovative solutions, we strive to shape the future in plant protection. Our increasingly intelligent products are capable of delivering exact doses and targeted applications with minimal drift and waste – to the benefit of the farmer and the environment.

We believe in a future where our products will be able to take care of plants one by one.

The HARDI Group is a division in the Agricultural Spraying segment of Exel Industries S.A.



Your Crop Care Partner

HARDI INTERNATIONAL A/S

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