

Comparitive Analysis of NewEng FerboRain Hose-reel Irrigation Machines

NewEng FerboRain hose-reel irrigation machines manufactured by *Ferbo s.r.l.* have evolved over the years to provide a highly efficient means of applying water to your crops based on the following design parameters.

- User friendly – all the controls are conveniently arranged for maximum productivity;
- Heavy duty construction – design prototypes are tested to withstand hard working conditions;
- Compactness – reduced overall dimensions ease manageability and reduce crop damage;
- Low energy consumption – careful hydraulic design reduces pressure requirements;
- Low purchase and running costs – highly competitive purchase and whole life costs.

This bulletin demonstrates the mechanical and hydraulic features of our *FerboRain* hose-reel irrigation machines, illustrating the advantages over alternative makes and their absolute quality making them a leader in the field.

1. TURBINE:

Our turbine range is the result of years of study and practical field tests. This experience provides the following benefits:

- Very low pressure losses across the turbine, typically 0.3 Bars at 25 to 30 m/h hose rewind speed;
- almost no risk of turbine stall due to the self cleaning flow path and automatic speed compensator bypass system;
- an exclusive system of freeing the turbine impeller in the unlikely event of it seizing without opening up the turbine (photo1), and a much easier access to the mechanical seal behind the impeller in comparison to the most of our competitors (photo 2).

PHOTO 1

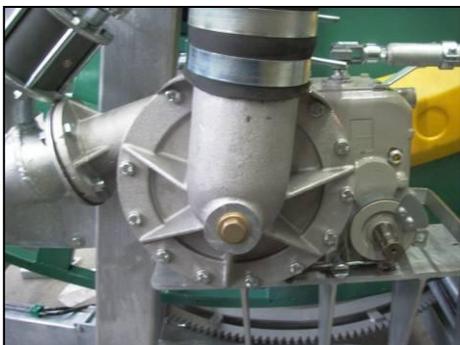


PHOTO 2



2. CHASSIS AND FRAME:

In addition to the structural strength of the fabricated chassis and frame, *Ferbo* have always paid attention to the correct distribution of weight in order to spread it between the machines axle and the adjustable support legs fitted behind the towing eye, this provides increased stability when working and when being moved by a tractor.

HOSE DRUM:

FerboRain hose drums have always been characterised by their great strength, a fact often overlooked because hidden inside them are up to 5 reinforcement circles together with support beams (photo 3), so rewinding the hose under higher drag conditions is less likely to damage the drums compared to some of our competitors.

The inside core of the drum is fabricated with rolled steel plate that does not damage the first layer of the polyethylene hose as it is wound tightly onto the drum (photo 4).

Many of our competitors produce cheaper drums with box section spars forming the core that can seriously damage the first layer of the hose (photo 5). The first layer of hose that is wound onto the drum is the part that suffers the most stress, since it is subjected to maximum tension combined with a smaller bending radius.

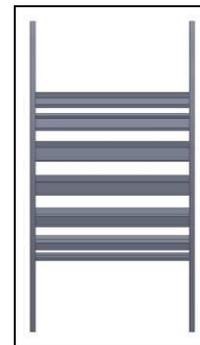


PHOTO 3
PHOTO 4
PHOTO 5

4. POLYETHYLENE HOSE:

FerboRain hose-reels are fitted with medium density polyethylene hose, in the past high density hose was used because a lesser wall thickness is required to achieve the necessary pressure rating and therefore the cost was less. However HDPE has been found to be more susceptible to stress cracking after being repeatedly wound on and off the drum for a few years and, because there is less wall thickness, is prone to wear out more quickly on abrasive land. Medium density hose, being much more ductile will last for many more irrigation cycles.

Some manufacturers still use the cheaper HDPE as the thinner wall thickness provides a slightly greater internal diameter and therefore there is slightly less pressure loss between the reel and the raingun/boom.

Developments in the manufacturing process now allow the MDPE hoses to be produced with a variable wall thickness which can be progressively reduced towards the raingun/boom end where the internal pressure is lower, as less material is used in the hose there are cost savings and the increased internal diameter reduces pressure loss and hence energy running costs. However for those operating on highly abrasive soils our advice would be to request a hose with constant wall thickness and opt for the next size up hose if you want to minimise pressure losses.

5. ROTATING DRUM SEAL:

Where water enters the rotating drum the central axle is supported in a resin lubricated bush (photo 7 and 8) providing two very important features that alternative systems (bearings for example) can't assure:

- it does not need maintenance (thanks to the special resin of the bush and low speed of rotation, tests show imperceptible wear after the equivalent of more than 10 years normal use);
- it allows a larger diameter water passage in comparison with the traditional bearing method (larger water passage means less pressure loss);

PHOTO 7

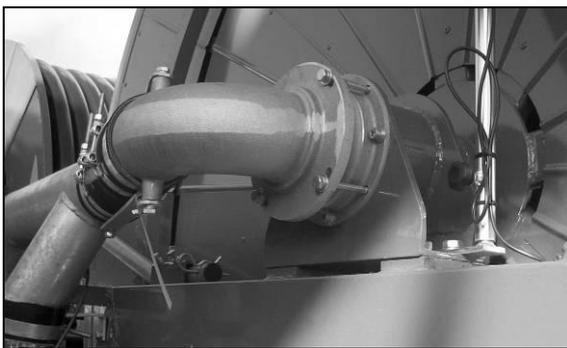
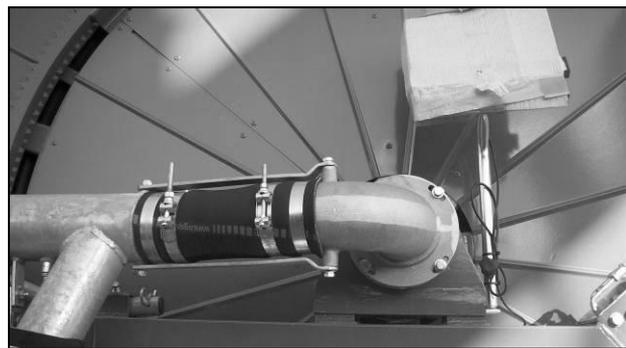


PHOTO 8



6. RAINGUN TROLLEY:

FerboRain raingun trolleys are designed according to a simple and rational principal. By using 2 wheels and 1 central smaller wheel (photo 9) trolleys tend to follow the course of the hose even when it has not been pulled out straight. On the contrary, 4 wheel trolleys tend to want to follow straight lines and are less inclined to follow a curve (see photo 10);

Where a 4 wheel trolley is specified the individual tandem axles are able to pivot on the upright leg in such a way that the wheels are free to follow variations in the ground. Some competitors use 4 main wheels without pivoting equalizers, but in this case, particularly on uneven fields not all wheels stay on the ground and it cause instability problems;

PHOTO 9



PHOTO 10



PHOTO 11

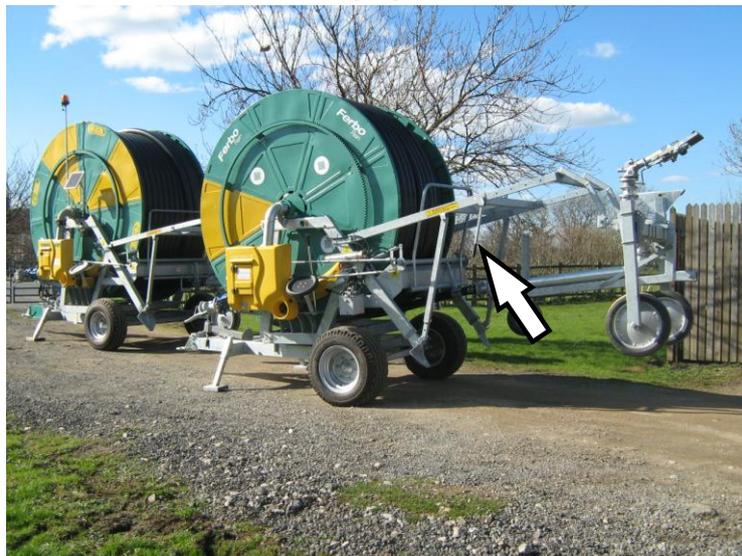


7. MANUAL DRUM ROTATION BY TROLLEY LIFTING FRAME:

The most popular models (GC-GD-GE) have an exclusive system to manually rotate the drum which allows one person to release the turntable with the lever attached to the lifting frame (photo 12), rotate it to the correct position by pushing on the trolley lifting frame and then lock it again without letting go of the lifting frame:

- this significantly speeds up the process of rotating the turntable;
- enables one operator to release, rotate and lock the turntable in the required position;
- reduces the risk of personal injury to the operator by the drum rotating under its own weight on sloping ground if you have to let go of the drum to engage the turntable lock as on some competitors machines

PHOTO 12



8. HYDRAULIC STAKER LEGS FOR LIFTING TROLLEY:

Hydraulic rams for operating the trolley lift / staker legs are fitted inside the structure (photo 13 and 14) this way they are protected from the elements and accidental damage. Most competitors mount hydraulic rams outside the structure;

PHOTO 13

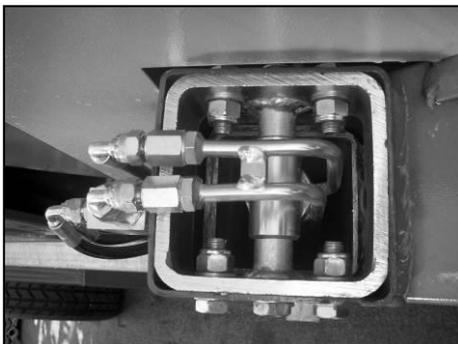


PHOTO 14



9. SIDE STAKER LEGS ON THE TOW-BAR:

All the machines in the “G” and “GH” ranges are equipped with supplementary staker legs behind the towing eye that provide increased stability and also the possibility to retrofit a spray boom without major modifications to the irrigation machines;

PHOTO 15



10. USER FRIENDLINESS:

All *FerboRain* hose-reel controls are positioned on the same side of the machine (photo 16) in order to make the user’s operations easier like:

- lifting the hydraulic staker legs and trolley lifting frame;
- selecting the correct gearbox ratio, setting the mechanical rewind speed compensator or the electronic computer controller;
- operating the manual turntable locking device;

On some competitors machines the controls can be positioned on 3 different sides of the hose-reel.

PHOTO 16

