Reflex CASTORS AND WHEELS

Electrostatic discharge wheels / specialised

We offer “Anti-Static” non-marking wheels in 75mm (3”), 100mm (4”) and 125mm (5”) diameters hat can be assembled into our M series castors. These wheels are designed for use in ESD (Electrosta ic Discharge) environments as part of an effective ESD Control Program. Our wheels have a conductivity of < 1099 Ohms as recommended by ANSI/ESD S20.20-1999 for Mobile Equipment in Protected Areas (sec ion 6.2.3)

When used wi h plastic expanding adaptors (codes ER/ES - see page 80-81 for details) provisions for electrical con inuity between the castor and trolley will be required.

Further technical notes follow. These notes are summaries of complex matters originally prepared as background material for the internal use of Fallshaw staff. In allowing others to access them without charge we assume no legal liability.

Background:
Nearly everyone has experienced a static shock when touching a metal object (eg: motor car, door handle) after walking for a while, particularly if dressed in synthetic fibres and wearing synthetic shoe soles. That shock comes from a sudden flow of static electricity to earth. This is know as Electrostatic Discharge (ESD). If it is of a sufficiently high voltage, it can either ignite flammable vapours (eg. ether or chloroform) or destroy sensi ive electronic equipment. This can be prevented by ensuring there is always a pathway for the static electricity to leak slowly to earth rather than being restrained until it builds up to dangerous voltages and then surges to earth.

What causes charges to build up?
Basically when electrons are brushed off a moving surface, leaving it electrically unbalanced. Air can cause his on moving motorcars, but within buildings the normal cause is clothing fibre brushing against itself, or nearby furniture or flooring.

How high does the static voltage get?

This depends on the balance between how much is being added in, and how much can leak away. But as an example, a person clothed in a nylon uniform and wearing synthetic shoe soles, and on a hot day with low humidity, has been measured at in excess of 50,000 volts.

What can be done to reduce static being formed?
To reduce he build up it is better if natural fibres can be used. If material used for uniforms, clothing, sheets etc, can have (al least) the majority of natural rather than synthetic fibres, this will reduce he build up, and because they are open fibres containing moisture, they allow the static charges to slowly move away rather than building up in a restricted area. The same applies to leather soles on shoes. All electrical equipment should be properly earthed.

What can be done to allow the safe dispersal of static charges (ESD)?
The two main types of danger from ESD are areas that contain (albeit only occasional or briefly) explosive vapours (eg. hospital operating areas or chemical laboratories) or areas containing electronic equipment (eg. computer rooms, control rooms etc). Such rooms should have conduc ive floors installed so that the charges on people or trolleys can be dispersed. Specific work areas on benches etc. should have conduc ive mats installed. These are directly connected to earth. If he floors are adequately conduc ive, then as we move around, the sta ic charges are constantly dispersed and do not build up to dangerous levels. Most conduc ive floors are made wi h either copper sheet or strip under conduc ive PVC or other plastic sheeting, which allows for adequately fast, but not surging, dispersal.

The Standard: ANSI/ESD-S20.20-1999
In his Standard the ESD Association recommends (section 6 2.3) that in a Protected Area he floor should have a resistance of less than 109 ohms.

If suitably conductive floors are installed do they need special maintenance?
Modern conductive floors if properly installed have a working life in excess of 20 years. BUT - they depend on the ‘earthing’ being maintained. Any changes to he surrounds of he floor that might disrupt the earth path must be guarded against and the floor must not be ‘waxed’ or treated with ‘protective layers’ hat will increase he resistance. Cleaning is best done with ammonianated water, as most comercial cleaners contain ‘polish’. NEVER wax he floor, or apply a ‘protec ive coating’.

What about the castors and wheels for use in ESD Protected Areas?
Once you have a conduc ive floor you need conductive wheels on the trolley. To ensure the wheels have a reasonable life the Standard recommends they have a resistance of of less than 1099 Ohms. Until recently the only way to ensure sufficient conductivity was to use activate carbon in rubber tyres. Unfortunately this marked floors and lost its conductivity over (about) 3 years. Recently additves have been developed that retain their conductivity for longer, and hold it at he recommended standard. Our ESD wheels have been developed to provide the necessary conductivity and provide a non-marking tyre with enhanced durability.

Installation of ESD wheels:
ESD wheels must be properly installed to ensure a conductive path from the trolley leg, through the stem, and the castor and the axle and the bearing, and through the centre and tyre. Solid metal pin les will provide such a conductive path. If plastic expanding stems are selected, they will need to be installed with a copper wire attached to he stem and wrapped between he adaptor and tube inner to ensure a conductive path.

What ESD wheels do Fallshaw offer?
We offer 75mm (3”), 100mm (4”) and 125mm (5”) wheels that can be assembled into our M series castors. Our ESD wheels are non-marking and have resistance of less than 1099 ohms as recommended by the Standard.

Hub Width x Bore **mm** / inches	Bearing Type	Load Capacity **kg** / lb	Diameter x Width **mm** / inches	Tyre Material	Fork Type Wheel Only	Plate Swivel /MZP	Plate Total Brake /MZPTB	Plate Direction Lock /MZPDL	Plate Fixed /MZF	Bolt Hole Swivel /MZH	Bolt Hole Total Brake /MZHTB	Bolt Hole Direction Lock /MZHDL
40x8 $1^{9}/_{16}$x8	**Ball**	**85kg** 190lb	**75x32** $3x1^{1}/_{4}$	Anti-static	**MAQ75G**	**MAQ75G**/MZP	**MAQ75G**/MZPTB	**not available**	**MAQ75G**/MZF	**MAQ75G**/MZH	**MAQ75G**/MZHTB	**not available**
40x8 $1^{9}/_{16}$x8	**Ball**	**90kg** 200lb	**100x32** $4x1^{1}/_{4}$		**MAQ100G**	**MAQ100G/MZP**	**MAQ100G/MZPTB**	**MAQ100G/MZPDL**	**MAQ100G/MZF**	**MAQ100G/MZH**	**MAQ100G/MZHTB**	**MAQ100G/MZHDL**
40x8 $1^{9}/_{16}$x8	**Ball**	**100kg** 220lb	**125x32** $5x1^{1}/_{4}$		**MAQ125G**	**MAQ125G/MZP**	**MAQ125G/MZPTB**	**MAQ125G/MZPDL**	**MAQ125G/MZF**	**MAQ125G/MZH**	**MAQ125G/MZHTB**	**MAQ125G/MZHDL**