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Automatic guided vehicle systems — General rules on the safety

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Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of International Trade and Industry through deliberations at Japanese Industrial Standards Committee in accordance with the Industrial Standardization Law:

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JAPANESE INDUSTRIAL STANDARD JIS D 6802 : 1997

Automatic guided vehicle systems — General rules on the safety

1 Scope This Japanese Industrial Standard covers general rules to ensure safety of transporting system of automatic guided vehicles (including automatic guided tractors and automatic guided fork lift trucks), from its introducing and planning stage to installing and operating stage.

Remarks: The following standards are normative references to this Standard:

JIS D 6201 *Glossary of terms relating to fork lift trucks*

JIS D 6801 *Glossary of terms relating to automatic guided vehicle systems*

2 Definitions The definitions of main terms used in this Standard shall be as follows, in addition to **JIS D 6201** and **JIS D 6801**.

(1) **safety checking style** The human and machine coexistence system whose starting or continuing operations are permitted only when human safety is confirmed.

(2) **fail-safe structure** The machine system which always operates to the safety side, without losing safety and protection of human and surroundings, in the case of some abnormal situation such as machinery breakdown, in the man and machine co-existing system. A function that the system always operates to the safety side in the case of failure, damage and so on.

(3) **brake opening switch** The switch which makes the brake of automatic guided vehicle ineffective when manually operated.

3 Basis of safety of automatic guided vehicle system The automatic guided vehicle system is an automatic transporting system to transport commodities, load and unload cargoes using automatic guided vehicles, whose working area is shared with humans.

In the human co-existing system, the important problem is to keep human safety. For this purpose, the desirable aim of system construction shall be the system formation of safety check style, and accordingly the sensor used in the interlock for the purpose of safety is desirable to be fail-safe structure.

However, there may be an impossible case to keep every system to safety check style even though the technology develops and improves. In such a case, the manufacturer and the user mutually discuss, recognize the limit of safety, treat carefully, and must keep safety, from the both sides of safe equipment which improve the safety index, and the operation regulation control in the construction field.

4 Keeping general safety at stage of design and planning

4.1 Structure and general safety

4.1.1 External form of automatic guided vehicle The external form of automatic guided vehicle shall be as follows:

(1) The external surface of automatic guided vehicle body, excepting the part required for operation, is to be free from dangerous part such as sharp corner, protrusions, etc.

(2) The obstacle contact bumper is to be such safe structure as to give no injury to contacting walker.

4.1.2 Confirmation of handling materials Cargo shall not only be free from deformation and collapse but also be systematically designed not to become overhanging or load-offsetting during the all movement such as transshipment, transport, etc.

4.1.3 Marking The marking shall be as follows:

(1) **Marking** The permissible load and self-weight shall be marked on a nameplate or the like placed on an automatic guided vehicle body where the nameplate can be seen easily.

(2) **Nameplate** The nameplate marked with the following items shall be attached on automatic guided vehicle body:

(a) **type** Mark the name of type designated by manufacturer

(b) **self-weight**

(c) **permissible load**

(d) **rated speed**

(e) **year and month of manufacture or its abbreviation**

(f) **manufacture number**

(g) **manufacturer's name or abbreviation**

(3) **Safety sign** Automatic guided vehicles shall be marked with safety sign on its body to secure human safety.

Further, it shall be marked on passages and the peripheral devices, if necessary.

4.1.4 Warning devices In order to communicate the movement of automatic guided vehicles and to rouse people's attention, the following warning devices shall be provided on its body.

(1) **Automatic driving status indicator** The indicator shall be lighted or flashed on its body while an automatic guided vehicle is automatically operated.

(2) **Starting alarm** When an automatic guided vehicle changes from the stationary status into the travelling status, the warning shall be generated before the vehicle starts.

(3) **Travelling alarm** Automatic guided vehicles shall actuate the warning devices continuously or intermittently which are suitable for the environment during running and automatic transferring.

(4) **Abnormal alarm** When automatic guided vehicles fall into the abnormal status, the warning indicator shall be lighted or the warning sound alarm or the like shall be blown to inform the worker of the abnormality.