

DIN EN 1034-21:2012-11 (E)

Safety of machinery - Safety requirements for the design and construction of paper making and finishing machines - Part 21: Coating machines

| Contents | | Page |
|--------------------|---|-------------|
| Foreword | | 4 |
| Introduction | | 6 |
| 1 | Scope | 7 |
| 2 | Normative references | 7 |
| 3 | Terms and definitions | 9 |
| 4 | List of significant hazards | 14 |
| 5 | Safety requirements and/or measures | 16 |
| 5.1 | General | 16 |
| 5.2 | Workplaces, means of access, walkways, passageways | 16 |
| 5.3 | Start-up warning device | 17 |
| 5.4 | Emergency stop device and braking system | 17 |
| 5.5 | Isolation and energy dissipation, prevention of unexpected start-up | 18 |
| 5.6 | Electric drive system and power transmission elements | 19 |
| 5.7 | Control system and actuators | 19 |
| 5.8 | Electrical equipment | 21 |
| 5.9 | Hydraulic equipment | 21 |
| 5.10 | Pneumatic equipment | 22 |
| 5.11 | Equipment and measures for make-ready, maintenance and lubrication | 22 |
| 5.12 | Machine equipment for cleaning and removal of broke | 22 |
| 5.13 | Noise | 23 |
| 5.14 | Hot surfaces | 24 |
| 5.15 | Integrated lighting | 24 |
| 5.16 | Ergonomic principles | 24 |
| 5.17 | Chemical substances | 24 |
| 5.18 | Fire | 25 |
| 5.19 | Rolls, pull stacks, outer rolls | 25 |
| 5.20 | Water jet knives, severing knives, rotary knives | 26 |
| 5.21 | Machine-specific tools | 27 |
| 5.22 | Drying cylinders, steam and condensate systems | 27 |
| 5.23 | Whole body access to confined spaces | 27 |
| 5.24 | Threading devices | 28 |
| 5.25 | Unwind | 29 |
| 5.26 | Coating units | 31 |
| 5.27 | Smoothing and drying unit with high gloss polished cylinder/chrome cylinder (used in the cast coating method) | 32 |
| 5.28 | Moistening device | 32 |
| 5.29 | Pull stacks | 32 |
| 5.30 | Flotation dryers | 32 |
| 5.31 | Infrared dryers | 33 |
| 5.32 | Drying sections with steam-heated cylinders | 34 |
| 5.33 | Calenders | 35 |
| 5.34 | Conditioning | 35 |
| 5.35 | Measuring device | 35 |
| 5.36 | Drum reeler | 36 |
| 5.37 | Roll handling equipment in the reel up section | 39 |

| | | |
|---|---|-----------|
| 5.38 | Shaftless reeler | 39 |
| 5.39 | Reeler with winding shaft | 40 |
| 5.40 | Integrated pulpers and their loading facilities | 41 |
| 5.41 | Integrated sheeter | 41 |
| 6 | Verification of safety requirements and/or measures | 41 |
| 7 | Information for use | 42 |
| 7.1 | General information | 42 |
| 7.2 | Instruction handbook | 42 |
| 7.3 | Marking | 44 |
| Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC | | 46 |
| Bibliography | | 47 |
| Figures Figure 1 -- Example of a coating machine | | 10 |
| Figure 2 -- Example of a coating machine with four coating sections | | 11 |
| Figure 3 -- Example of a S-type pull group | | 12 |
| Figure 4 -- Safety distance 2,70 m on drum reeler | | 36 |
| Figure 5 -- Safety distance 500 mm to prevent crushing by reels behind the drum reeler | | 38 |
| Tables Table 1 -- List of significant hazards | | 14 |
| Table 2 -- List of safety functions, Performance Level and Safety Integrity Level specified in this standard | | 20 |
| Table 3 -- Methods used to verify safety requirements and/or measures | | 42 |