

Table 1 — Distillate marine fuels

| Characteristics   | Unit               | Limit | Category ISO-F-               |       |       |                   | Test method reference            |
|---|--------------------|-------|-------------------------------|-------|-------|-------------------|----------------------------------|
|   |                    |       | DMX                           | DMA   | DMZ   | DMB               |                                  |
| Kinematic viscosity at 40 °C <sup>a</sup>                               | mm <sup>2</sup> /s | max.  | 5,500                         | 6,000 | 6,000 | 11,00             | ISO 3104                         |
|   |                    | min.  | 1,400                         | 2,000 | 3,000 | 2,000             |                                  |
| Density at 15 °C  | kg/m <sup>3</sup>  | max.  | —                             | 890,0 | 890,0 | 900,0             | see 7.1<br>ISO 3675 or ISO 12185 |
| Cetane index  | —                  | min.  | 45                            | 40    | 40    | 35                | ISO 4264                         |
| Sulfur <sup>b</sup>   | mass %             | max.  | 1,00                          | 1,50  | 1,50  | 2,00              | see 7.2<br>ISO 8754<br>ISO 14596 |
| Flash point   | °C                 | min.  | 43                            | 60    | 60    | 60                | see 7.3<br>ISO 2719              |
| Hydrogen sulfide <sup>c</sup>   | mg/kg              | max.  | 2,00                          | 2,00  | 2,00  | 2,00              | IP 570                           |
| Acid number   | mg KOH/g           | max.  | 0,5                           | 0,5   | 0,5   | 0,5               | ASTM D664                        |
| Total sediment by hot filtration  | mass %             | max.  | —                             | —     | —     | 0,10 <sup>e</sup> | see 7.4<br>ISO 10307-1           |
| Oxidation stability   | g/m <sup>3</sup>   | max.  | 25                            | 25    | 25    | 25 <sup>f</sup>   | ISO 12205                        |
| Carbon residue: micro method on the 10 % volume distillation residue    | mass %             | max.  | 0,30                          | 0,30  | 0,30  | —                 | ISO 10370                        |
| Carbon residue: micro method  | mass %             | max.  | —                             | —     | —     | 0,30              | ISO 10370                        |
| Cloud point   | °C                 | max.  | —16                           | —     | —     | —                 | ISO 3015                         |
| Pour point (upper) <sup>d</sup>   | winter quality     | max.  | —6                            | —6    | —6    | 0                 | ISO 3016                         |
|   | summer quality     | max.  | 0                             | 0     | 0     | 6                 | ISO 3016                         |
| Appearance  | —                  | —     | Clear and bright <sup>l</sup> |       |       | e, f, g           | see 7.6                          |
| Water   | volume %           | max.  | —                             | —     | —     | 0,30 <sup>e</sup> | ISO 3733                         |
| Ash   | mass %             | max.  | 0,010                         | 0,010 | 0,010 | 0,010             | ISO 6245                         |
| Lubricity, corrected wear scar diameter (wsd 1,4) at 60 °C <sup>h</sup> | µm                 | max.  | 520                           | 520   | 520   | 520 <sup>g</sup>  | ISO 12156-1                      |

Table 1 (continued)

| Characteristics | Unit   | Limit | Category ISO-F- |     |     |     | Test method reference |
|-----------------|--|-------|-----------------|-----|-----|-----|-----------------------|
|                 |  |       | DMX             | DMA | DMZ | DMB |                       |
| a               | 1 mm <sup>2</sup> /s = 1 cSt.  |       |                 |     |     |     |                       |
| b               | Notwithstanding the limits given, the purchaser shall define the maximum sulfur content in accordance with relevant statutory limitations. See Annex C.  |       |                 |     |     |     |                       |
| c               | Due to reasons stated in Annex D, the implementation date for compliance with the limit shall be 1 July 2012. Until such time, the specified value is given for guidance. For distillate fuels the precision data are currently being developed. |       |                 |     |     |     |                       |
| d               | Purchasers should ensure that this pour point is suitable for the equipment on board, especially if the ship operates in cold climates.  |       |                 |     |     |     |                       |
| e               | If the sample is not clear and bright, the total sediment by hot filtration and water tests shall be required, see 7.4 and 7.6.  |       |                 |     |     |     |                       |
| f               | If the sample is not clear and bright, the test cannot be undertaken and hence the oxidation stability limit shall not apply.  |       |                 |     |     |     |                       |
| g               | If the sample is not clear and bright, the test cannot be undertaken and hence the lubricity limit shall not apply.  |       |                 |     |     |     |                       |
| h               | This requirement is applicable to fuels with a sulfur content below 500 mg/kg (0,050 mass %).  |       |                 |     |     |     |                       |
| j               | If the sample is dyed and not transparent, then the water limit and test method as given in 7.6 shall apply.   |       |                 |     |     |     |                       |