

**NF A49-312-74 STEEL TUBES SEAMLESS TUBES FOR MECHANICAL APPLICATION SUPPLEMENTARY SERIES****1. Chemical Composition**

| Grade  | Mfg. Process | Chemical Composition (%) |           |           |          |          |    |    |    |        |
|--------|--------------|--------------------------|-----------|-----------|----------|----------|----|----|----|--------|
|        |              | C                        | Si        | Mn        | P        | S        | Ni | Cr | Mo | Others |
| TU52-b | S            | 0.20Max                  | 0.50Max   | 1.5Max    | 0.04Max  | 0.04Max  | -  | -  | -  | -      |
| TUXC35 | S            | 0.38~0.38                | 0.15~0.40 | 0.50~0.80 | 0.035Max | 0.035Max | -  | -  | -  | -      |

**2. Mechanical Properties**

| Grade  | Tensile Test MPa or N/mm <sup>2</sup> |                  | Remarks<br>(Similar to JIS) |
|--------|---------------------------------------|------------------|-----------------------------|
|        | Min Yield point                       | Tensile Strength |                             |
| TU52-b | t<16 340                              | 510Min           | (STKM18)                    |
|        | t 16Min                               | 490Min           |                             |
| TUXC35 | t<16 320                              | 540Min           | (STKM16)                    |
|        | t 46Min                               | 520Min           |                             |

**JIS Number and Corresponding Foreign Standards**

| JIS                |         |      | ASTM               |        |      | BS                 |       |      | DIN                |         |      | NF                 |       |      | ISO                |       |      | Index<br>Number |
|--------------------|---------|------|--------------------|--------|------|--------------------|-------|------|--------------------|---------|------|--------------------|-------|------|--------------------|-------|------|-----------------|
| Standard<br>Number | Grade   | Type | Standard<br>Number | Grade  | Type | Standard<br>Number | Grade | Type | Standard<br>Number | Grade   | Type | Standard<br>Number | Grade | Type | Standard<br>Number | Grade | Type |                 |
| G3445              | STKM11A | C    | A512               | MT1010 | C    | 1717               | ERWC1 | C    | 2391               | St30Si  | C    |                    |       |      | 3304               | R28   | C    | C017            |
|                    |         |      | A513               | MT1010 | C    |                    |       |      |                    | St30A1  | C    |                    |       |      | 3305               | "     | C    |                 |
|                    |         |      |                    |        |      |                    |       |      | 2393               | St28    | C    |                    |       |      | 3306               | "     | C    |                 |
|                    |         |      |                    |        |      |                    |       |      |                    | RSt28   | C    |                    |       |      |                    |       |      |                 |
|                    |         |      |                    |        |      |                    |       |      | 2394               | St28    | C    |                    |       |      |                    |       |      |                 |
|                    |         |      |                    |        |      |                    |       |      |                    | USt28   | C    |                    |       |      |                    |       |      |                 |
|                    |         |      |                    |        |      |                    |       |      |                    | RSt28   | C    |                    |       |      |                    |       |      |                 |
|                    | STKM12A | C    | A512               | MT1015 | C    | 1717               | ERWC2 | C    | 2391               | St37-2  |      |                    |       |      | 3304               | R33   | C    |                 |
|                    |         |      | A513               | MT1015 | C    | 6323               | HFS3  | C    |                    | RSt37-2 |      |                    |       |      | 3305               | "     | "    |                 |

|  |         |   |      |        |   |      |       |   |      |         |   |         |        |   |      |     |   |  |
|--|---------|---|------|--------|---|------|-------|---|------|---------|---|---------|--------|---|------|-----|---|--|
|  | STKM12B | C | A512 | MT1015 | C |      |       |   | 2394 | St37-2  |   |         |        |   | 3306 | "   | " |  |
|  |         |   | A513 | MT1015 | C |      |       |   |      | Ust38-2 |   |         |        |   |      |     |   |  |
|  |         |   | A519 | MT1015 | C |      |       |   |      | RSt-2   |   |         |        |   |      |     |   |  |
|  | STKM12C | C |      |        |   | 1717 | CEWC2 | C |      |         |   | A49-322 | TU37b  | C |      |     |   |  |
|  |         |   |      |        |   | "    | CFSC3 | C |      |         |   | A49-327 | TU37b  | C |      |     |   |  |
|  |         |   |      |        |   | 6323 | CFS3  | C |      |         |   |         |        |   |      |     |   |  |
|  |         |   |      |        |   | "    | CFS3A | C |      |         |   |         |        |   |      |     |   |  |
|  | STKM13A | C | A312 | MT1020 | C | 1717 | ERWC3 | C | 2391 | St45    | C | A49-324 | TU37b  | C | 2937 | TS4 | C |  |
|  |         |   | A513 | MT1020 | C |      |       |   | 2393 | St44-2  | C | A49-330 | TU37b  | C | 3304 | R37 | " |  |
|  |         |   |      |        |   |      |       |   | 2394 | St44-2  | C | A49-343 | TU38b  | C | 3305 | "   | " |  |
|  | STKM13B | C | A513 | MT1020 | C |      |       |   |      |         |   |         |        |   | 3306 | "   | " |  |
|  | STKM13C | C |      |        |   | 1717 | CEWC3 | C |      |         |   |         |        |   |      |     |   |  |
|  |         |   |      |        |   | "    | CFSC4 | C |      |         |   |         |        |   |      |     |   |  |
|  |         |   |      |        |   | 6323 | CFS4  | C |      |         |   |         |        |   |      |     |   |  |
|  | STKM14A | C | A513 | MT1020 | C | 6323 | HFS4  | C |      |         |   |         |        |   | 2937 | TS9 | C |  |
|  |         |   |      |        |   |      |       |   |      |         |   |         |        |   | 3304 | R42 | " |  |
|  | STKM14B | C |      |        |   | 6323 | HFS5  | C |      |         |   |         |        |   | 3305 | R42 | C |  |
|  | STKM14C | C |      |        |   |      |       |   |      |         |   |         |        |   | 3306 | "   | " |  |
|  | STKM15A | C | A513 | 1030   | C |      |       |   |      |         |   |         |        |   |      |     |   |  |
|  |         |   | A519 | 1030   | C |      |       |   |      |         |   |         |        |   |      |     |   |  |
|  | STKM15C |   |      |        |   |      |       |   |      |         |   |         |        |   |      |     |   |  |
|  | STKM16A | C | A519 | 1040   | C |      |       |   |      |         |   | A49-311 | TUXC35 | C |      |     |   |  |
|  |         |   |      |        |   |      |       |   |      |         |   | A49-312 | TUXC35 | C |      |     |   |  |
|  | STKM16C | C |      |        |   |      |       |   |      |         |   |         |        |   |      |     |   |  |
|  | STKM17A | C | A519 | 1050   | C | 6323 | HFS8  | C |      |         |   |         |        |   |      |     |   |  |
|  | STKM17C | C |      |        |   | 6323 | CFS8  | C |      |         |   |         |        |   |      |     |   |  |
|  | STKM18A | C | A519 | 1518   | C | 1717 | ERWC5 | C |      |         |   | A49-310 | TU52b  | C |      |     |   |  |

[illegible]