MATERIAL DATA SHEETS FOR STRUCTURAL STEEL
This NORSOK standard is developed by NTS with broad industry participation. Please note that whilst every effort has been made to ensure the accuracy of this standard, neither OLF nor TBL or any of their members will assume liability for any use thereof. NTS is responsible for the administration and publication of this standard.

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**FOREWORD**

NORSOK (The competitive standing of the Norwegian offshore sector) is the industry initiative to add value, reduce cost and lead time and eliminate unnecessary activities in offshore field developments and operations.

The NORSOK standards are developed by the Norwegian petroleum industry as a part of the NORSOK initiative and supported by OLF (The Norwegian Oil Industry Association) and TBL (Federation of Norwegian Manufacturing Industries). NORSOK standards are administered and issued by NTS (Norwegian Technology Center).

The purpose of NORSOK standards is to contribute to meet the NORSOK goals, e.g. to develop standards that ensure adequate safety, value adding and cost effectiveness and thus are used in existing and future petroleum industry developments.

The NORSOK standards make extensive references to international standards. Where relevant, the contents of a NORSOK standard will be used to provide input to the international standardisation process. Subject to implementation into international standards, the NORSOK standard will be withdrawn.

**INTRODUCTION**

This standard was previously numbered M-CR-120.

The reference document for grade specifications is the October 2000 edition of prEN 10225 (Final draft).

The main changes in Rev. 3 are as follows: (not marked)

For MDS’s:
- New grade designation for all MDS’s refering to prEN 10225
- Y01 revised
- Y02 and Y03 deleted (included in Y01)
- Y05, Y06, Y07, Y08, Y15, Y 16, Y28 and Y70 added

Note: It should be observed that the requirement to fabrication tolerances in M-101 may be more strict than the manufacturing tolerances for steel products according to this standard.
1 **SCOPE**

This standard includes a collection of Material Data Sheets (MDS) applicable to selected material standards and grades for use in steel structures.

2 **NORMATIVE REFERENCES**

The following standards include provisions which, through reference in this text, constitute provisions of this NORSOK standard. Latest issue of the references shall be used unless otherwise agreed. Other recognized standards may be used provided it can be shown that they meet or exceed the requirements of the standards referenced below.

Normative references are given in the individual data sheets.

The reference document for grade specifications is the October 2000-edition of prEN 10225 (Final draft).

3 **ABBREVIATIONS**

CTOD  Crack Tip Opening Displacement  
DFT   Dry Film Thickness  
MDS   Material Data Sheet  
PWHT  Post Weld Heat Treatment

4 **COLLECTION OF MATERIAL DATA SHEETS**

4.1 **General**

The materials shall be delivered in accordance with the standard referred to in the MDS. In addition the MDS specifies the selected options in the referred standard and modified requirements which shall supersede the corresponding requirements in the referred standard. Ref. also Note in the introduction.

The material selection menu for the actual strength levels and grades is shown in table 1.

All listed MDS’ are enclosed.

4.2 **Selection Criteria**

The number of steel grades used in a project should be limited to the practical minimum. An evaluation should be carried out to determine the optimum grades.
Table 1: Material Data Sheets for Structural Steel

<table>
<thead>
<tr>
<th>MD S No.</th>
<th>Rev. No.</th>
<th>Standard</th>
<th>Steel Grade</th>
<th>Product Type</th>
<th>Steel Quality Level</th>
<th>Former designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y01</td>
<td>3</td>
<td>EN 10025</td>
<td>S235JRG2</td>
<td>Plates and Sections</td>
<td>IV</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>S275JR</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>S355J0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Y05</td>
<td>1</td>
<td>EN 10113</td>
<td>S355NL/ML</td>
<td>Plates and sections</td>
<td>III</td>
<td></td>
</tr>
<tr>
<td>Y06</td>
<td>1</td>
<td>prEN10225</td>
<td>S355G1+N</td>
<td>Hot finished tubulars</td>
<td>III</td>
<td></td>
</tr>
<tr>
<td>Y07</td>
<td>1</td>
<td>EN 10210</td>
<td>S355/NH</td>
<td>Hot finished tubulars</td>
<td>III</td>
<td></td>
</tr>
<tr>
<td>Y08</td>
<td>1</td>
<td>EN 10219</td>
<td>S355MLH</td>
<td>Cold formed tubulars</td>
<td>III</td>
<td></td>
</tr>
<tr>
<td>Y15</td>
<td>1</td>
<td>EN 10113</td>
<td>S420NL/ML</td>
<td>Plates and sections</td>
<td>III</td>
<td></td>
</tr>
<tr>
<td>Y16</td>
<td>1</td>
<td>EN 10219</td>
<td>S420MLH</td>
<td>Cold formed tubulars</td>
<td>III</td>
<td></td>
</tr>
<tr>
<td>Y20</td>
<td>3</td>
<td>prEN 10225</td>
<td>S355G10+N/G10+M</td>
<td>Plates</td>
<td>I</td>
<td>S355N4z/M4z</td>
</tr>
<tr>
<td>Y21</td>
<td>3</td>
<td>prEN 10225</td>
<td>S355G12+N/G12+M</td>
<td>Rolled Sections</td>
<td>I</td>
<td>S355N3z/M3z</td>
</tr>
<tr>
<td>Y22</td>
<td>3</td>
<td>prEN 10225</td>
<td>S355G15+Q/G15+N</td>
<td>Seamless Tubulars</td>
<td>I</td>
<td>S355Q3z/N3z</td>
</tr>
<tr>
<td>Y25</td>
<td>3</td>
<td>prEN 10225</td>
<td>S355G9+N/G9+M</td>
<td>Plates</td>
<td>II</td>
<td>S355N4/M4</td>
</tr>
<tr>
<td>Y26</td>
<td>3</td>
<td>prEN 10225</td>
<td>S355G11+N/G11+M</td>
<td>Rolled Sections</td>
<td>II</td>
<td>S355N3/M3</td>
</tr>
<tr>
<td>Y27</td>
<td>3</td>
<td>prEN 10225</td>
<td>S355G14+Q/G14+N</td>
<td>Seamless Tubulars</td>
<td>II</td>
<td>S355Q3/N3</td>
</tr>
<tr>
<td>Y28</td>
<td>1</td>
<td>prEN 10225</td>
<td>S355G13+N</td>
<td>Welded Tubulars</td>
<td>II</td>
<td></td>
</tr>
<tr>
<td>Y30</td>
<td>3</td>
<td>prEN 10225</td>
<td>S420G2+Q/G2+M</td>
<td>Plates</td>
<td>I</td>
<td>S420Q3z/M3z</td>
</tr>
<tr>
<td>Y31</td>
<td>3</td>
<td>prEN 10225</td>
<td>S420G4+M</td>
<td>Rolled Sections</td>
<td>I</td>
<td>S420M3z</td>
</tr>
<tr>
<td>Y32</td>
<td>3</td>
<td>prEN 10225</td>
<td>S420G6+Q(mod)</td>
<td>Seamless Tubulars</td>
<td>I</td>
<td>S420Q3 (z mod)</td>
</tr>
<tr>
<td>Y35</td>
<td>3</td>
<td>prEN 10225</td>
<td>S420G1+Q/G1+M</td>
<td>Plates</td>
<td>II</td>
<td>S420Q3/M4</td>
</tr>
<tr>
<td>Y36</td>
<td>3</td>
<td>prEN 10225</td>
<td>S420G3+M</td>
<td>Rolled Sections</td>
<td>II</td>
<td>S420M3</td>
</tr>
<tr>
<td>Y37</td>
<td>3</td>
<td>prEN 10225</td>
<td>S420G6+Q</td>
<td>Seamless Tubulars</td>
<td>II</td>
<td>S420Q3</td>
</tr>
<tr>
<td>Y40</td>
<td>3</td>
<td>prEN 10225</td>
<td>S460G2+Q/G2+M</td>
<td>Plates</td>
<td>I</td>
<td>S460Q3z/M3z</td>
</tr>
<tr>
<td>Y41</td>
<td>3</td>
<td>prEN 10225</td>
<td>S460G4+M</td>
<td>Rolled Sections</td>
<td>I</td>
<td>S460M3z</td>
</tr>
<tr>
<td>Y42</td>
<td>3</td>
<td>prEN 10225</td>
<td>S460G6+Q (mod)</td>
<td>Seamless Tubulars</td>
<td>I</td>
<td>S460Q3 (z mod)</td>
</tr>
<tr>
<td>Y45</td>
<td>3</td>
<td>prEN 10225</td>
<td>S460G1+Q/G1+M</td>
<td>Plates</td>
<td>II</td>
<td>S460Q3/M3</td>
</tr>
<tr>
<td>Y46</td>
<td>3</td>
<td>prEN 10225</td>
<td>S460G3+M</td>
<td>Rolled Sections</td>
<td>II</td>
<td>S460M3</td>
</tr>
<tr>
<td>Y47</td>
<td>3</td>
<td>prEN 10225</td>
<td>S460G6+Q</td>
<td>Seamless Tubulars</td>
<td>II</td>
<td>S460Q3</td>
</tr>
<tr>
<td>Y50</td>
<td>3</td>
<td>prEN 10225</td>
<td>S500G2+Q/G2+M 1)</td>
<td>Plates</td>
<td>I</td>
<td>S500Q3z/M3z 1)</td>
</tr>
<tr>
<td>Y51</td>
<td>3</td>
<td>prEN 10225</td>
<td>S500G4+M 1)</td>
<td>Rolled Sections</td>
<td>I</td>
<td>S500M3z 1)</td>
</tr>
<tr>
<td>Y52</td>
<td>3</td>
<td>prEN 10225</td>
<td>S500G6+Q (mod) 1)</td>
<td>Seamless Tubulars</td>
<td>I</td>
<td>S500Q3 (z mod) 1)</td>
</tr>
<tr>
<td>Y55</td>
<td>3</td>
<td>prEN 10225</td>
<td>S500G1+Q/G1+M 1)</td>
<td>Plates</td>
<td>II</td>
<td>S500Q3/M3 1)</td>
</tr>
<tr>
<td>Y56</td>
<td>3</td>
<td>prEN 10225</td>
<td>S500G3+M 1)</td>
<td>Rolled Sections</td>
<td>II</td>
<td>S500M3 1)</td>
</tr>
<tr>
<td>Y57</td>
<td>3</td>
<td>prEN 10225</td>
<td>S500G6+Q 1)</td>
<td>Seamless Tubulars</td>
<td>II</td>
<td>S500Q3 1)</td>
</tr>
<tr>
<td>Y70</td>
<td>1</td>
<td>prEN 10225</td>
<td>S690+Q 1)</td>
<td>Plates</td>
<td>I</td>
<td></td>
</tr>
</tbody>
</table>

Note 1): This steel grade designation is not included in prEN 10225.
All references in the MDS are to the relevant material standard unless otherwise specified.
# MATERIAL DATA SHEET

**MATERIAL DATA SHEET**

**MDS - Y01**

**Rev.3**

## TYPE OF MATERIAL:
Structural Steel,

### PRODUCT | STANDARD | GRADE
---|---|---
Plates and sections | EN 10025 | S235JR G2, S275JR, S355J0
Hot finished tubulars | EN 10210 | S235JR H, S275J0H, S355J0H
Cold formed tubulars | EN 10219 | S235JR H, S275J0H, S355J2H

## SCOPE
This MDS specifies the selected options in the referred standard and modified requirements which shall supersede the corresponding requirements in the referred standard. These grades shall not be used for thicknesses above 25 mm.

## STEEL GRADE
The grades listed represent the minimum requirements for Y 01. Other “higher” grades from the referred standards are acceptable as substitutes.

## QUALIFICATION

### HEAT TREATMENT/DELIVERY CONDITION
For steel grade S235JR G2 the steel shall comply with type “FN”, ref. option 3.

### CHEMICAL COMPOSITION

### TENSILE TESTING

### EXTENT OF TESTING

### DIMENSIONS/TOLERANCES

### NON DESTRUCTIVE TESTING (NDT)

### SURFACE PROTECTION
The surface of the material shall comply to Rustgrade A or B or better according to ISO 8501-1.

### MARKING

### CERTIFICATE
EN 10 204 Type 2.2 or higher. For EN 10219 S355J2H Type 3.1B or higher.
**MATERIAL DATA SHEET**

**TYPE OF MATERIAL:** Structural Steel,

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>STANDARD</th>
<th>GRADE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plates, sections</td>
<td>EN 10113</td>
<td>S355NL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>S355ML</td>
</tr>
</tbody>
</table>

**SCOPE**

This MDS specifies the selected options in the referred standard and modified requirements which shall supersede the corresponding requirements in the referred standard. The thickness is limited to 25 mm.

**QUALIFICATIONS**

**HEAT TREATMENT/DELIVERY CONDITION**

**CHEMICAL COMPOSITION**

**TENSILE TESTING**

**EXTENT OF TESTING**

**DIMENSIONS/TOLERANCES**

**NON DESTRUCTIVE TESTING (NDT)**

**SURFACE PROTECTION**
The surface of the material shall comply to Rustgrade A or B or better according to ISO 8501-1.

**MARKING**

**CERTIFICATE**

EN 10 204 Type 3.1B.
**TYPE OF MATERIAL:** Structural Steel,

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>STANDARD</th>
<th>GRADE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hot finished tubulars seamless or welded</td>
<td>prEN 10 225 Oct.00</td>
<td>S355G1+N</td>
</tr>
</tbody>
</table>

**SCOPE**

This MDS specifies the selected options in the referred standard and modified requirements which shall supersede the corresponding requirements in the referred standard. The thickness is limited to 25 mm.

**QUALIFICATIONS**

**HEAT TREATMENT/DELIVERY CONDITION**

**CHEMICAL COMPOSITION**

**TENSILE TESTING**

**EXTENT OF TESTING**

**DIMENSIONS/TOLERANCES**

**NON DESTRUCTIVE TESTING (NDT)**

**SURFACE PROTECTION**

The surface of the material shall comply to Rustgrade A or B or better according to ISO 8501-1.

**MARKING**

**CERTIFICATE**

EN 10 204 Type 3.1B.
**TYPE OF MATERIAL:** Structural Steel,

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>STANDARD</th>
<th>GRADE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hot finished tubulars</td>
<td>EN 10 210-1</td>
<td>S355NH</td>
</tr>
<tr>
<td>seamless or welded</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SCOPE**

This MDS specifies the selected options in the referred standard and modified requirements which shall supersede the corresponding requirements in the referred standard. The thickness is limited to 25 mm.

**QUALIFICATIONS**

<table>
<thead>
<tr>
<th>HEAT TREATMENT/DELIVERY CONDITION</th>
<th>CHEMICAL COMPOSITION</th>
<th>TENSILE TESTING</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CEV max 0.43 for all thicknesses</td>
<td></td>
</tr>
</tbody>
</table>

**DIMENSIONS/TOLERANCES**

**NON DESTRUCTIVE TESTING (NDT)**

**SURFACE PROTECTION**

The surface of the material shall comply to Rustgrade A or B or better according to ISO 8501-1.

**MARKING**

<table>
<thead>
<tr>
<th>CERTIFICATE</th>
<th>EN 10 204 Type 3.1B.</th>
</tr>
</thead>
</table>
**TYPE OF MATERIAL:** Structural Steel,

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>STANDARD</th>
<th>GRADE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cold formed tubulars</td>
<td>EN 10 219-1</td>
<td>S355M LH</td>
</tr>
</tbody>
</table>

**SCOPE**

This MDS specifies the selected options in the referred standard and modified requirements which shall supersede the corresponding requirements in the referred standard. The thickness is limited to 25 mm.

**QUALIFICATIONS**

- **HEAT TREATMENT/DELIVERY CONDITION**
- **CHEMICAL COMPOSITION**
  - S max 0,015
  - P max 0,025

**TENSILE TESTING**

**EXTENT OF TESTING**

- **DIMENSIONS/TOLERANCES**
- **NON DESTRUCTIVE TESTING (NDT)**

**SURFACE PROTECTION**

The surface of the material shall comply to Rustgrade A or B or better according to ISO 8501-1.

**MARKING**

**CERTIFICATE**

EN 10 204 Type 3.1B.
<table>
<thead>
<tr>
<th>TYPE OF MATERIAL:</th>
<th>Structural Steel,</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>STANDARD</th>
<th>GRADE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plates, sections</td>
<td>EN 10113</td>
<td>S420NL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>S420ML</td>
</tr>
</tbody>
</table>

| SCOPE            | This MDS specifies the selected options in the referred standard and modified requirements which shall supersede the corresponding requirements in the referred standard. The thickness is limited to 25 mm. |

| QUALIFICATIONS   |                                                   |
|                 |                                                   |

<table>
<thead>
<tr>
<th>HEAT TREATMENT/DELIVERY CONDITION</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEMICAL COMPOSITION</td>
<td></td>
</tr>
<tr>
<td>TENSILE TESTING</td>
<td></td>
</tr>
<tr>
<td>EXTENT OF TESTING</td>
<td></td>
</tr>
<tr>
<td>DIMENSIONS/TOLERANCES</td>
<td></td>
</tr>
<tr>
<td>NON DESTRUCTIVE TESTING (NDT)</td>
<td></td>
</tr>
<tr>
<td>SURFACE PROTECTION</td>
<td>The surface of the material shall comply to Rustgrade A or B or better according to ISO 8501-1.</td>
</tr>
<tr>
<td>MARKING</td>
<td></td>
</tr>
<tr>
<td>CERTIFICATE</td>
<td>EN 10 204 Type 3.1B.</td>
</tr>
<tr>
<td>TYPE OF MATERIAL: Structural Steel,</td>
<td></td>
</tr>
<tr>
<td>-----------------------------------</td>
<td></td>
</tr>
<tr>
<td><strong>PRODUCT</strong></td>
<td><strong>STANDARD</strong></td>
</tr>
<tr>
<td>Cold formed tubulars</td>
<td>EN 10 219-1</td>
</tr>
<tr>
<td><strong>SCOPE</strong></td>
<td>This MDS specifies the selected options in the referred standard and modified requirements which shall supersede the corresponding requirements in the referred standard. The thickness is limited to 16 mm.</td>
</tr>
<tr>
<td><strong>QUALIFICATIONS</strong></td>
<td></td>
</tr>
<tr>
<td><strong>HEAT TREATMENT/DELIVERY CONDITION</strong></td>
<td></td>
</tr>
</tbody>
</table>
| **CHEMICAL COMPOSITION** | S max 0.015  
P max 0.025  
CEV max 0.39 |
| **TENSILE TESTING/IMPACT TESTING** | The Charpy V-value to be min 50 J |
| **EXTENT OF TESTING** | |
| **DIMENSIONS/TOLERANCES** | |
| **NON DESTRUCTIVE TESTING (NDT)** | |
| **SURFACE PROTECTION** | The surface of the material shall comply to Rustgrade A or B or better according to ISO 8501-1. |
| **MARKING** | |
| **CERTIFICATE** | EN 10 204 Type 3.1B |
NORSOK Standard

MATERIAL DATA SHEET  MDS - Y20  Rev. 3

**TYPE OF MATERIAL:** Structural Steel with documented through thickness properties

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>STANDARD</th>
<th>GRADE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plates</td>
<td>prEN 10225, Oct. 00</td>
<td>S355G10+N/G10+M</td>
</tr>
</tbody>
</table>

**SCOPE**
This MDS specifies the selected options in the referred standard and modified requirements which shall supersede the corresponding requirements in the referred standard.

**QUALIFICATIONS**
Base material information, shall be submitted with the bid/ be established prior to delivery.

The documentation of base material shall cover both delivered and PWHT condition and shall include strain ageing tests (ref. option 12), typical tensile test results for plates and weldability tests according to Annex E (option 18) within each of the following thickness ranges that are relevant for the order:
- \(25 < t < 40\) mm
- \(40 < t < 63\) mm
- \(63 < t < 100\) mm
- \(100 < t < 150\) mm

Other thickness ranges related to same chemistry and manufacturing process may apply. In such cases the thickest material in the range shall be tested. The results from PWHT condition shall also meet the specified requirements.

CTOD testing shall be included and shall meet a requirement of min. 0.25 mm in as welded condition, and min 0.20 in PWHT condition unless lower values have been accepted by the purchaser.

**HEAT TREATMENT/ DELIVERY CONDITION**
Quenched and Tempered is also accepted.

**CHEMICAL COMPOSITION**
Option 6

**TENSILE TESTING**
Option 13

**DIMENSIONS / TOLERANCES**

**NON DESTRUCTIVE TESTING (NDT)**

**SURFACE PROTECTION**
All surfaces shall receive a preliminary protective primer coat. Blast cleaning shall comply with ISO 8501-1 Sa 2½ and the surface shall remain at Sa 2½ until application of the primer. The primer shall consist of 1 coat zinc ethyl silicate primer with 15 microns. Measured on a plane polished steel or glass test plate the DFT shall be maximum 25 microns.

**MARKING**
Unique marking as defined in the purchase order.

**CERTIFICATE**
EN 10 204 Type 3.1B
**MATERIAL DATA SHEET**  
**MDS - Y21**  
**Rev. 3**

**TYPE OF MATERIAL:** Structural Steel with documented through thickness properties

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>STANDARD</th>
<th>GRADE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rolled Sections</td>
<td>prEN 10225, Oct.00</td>
<td>S355G12+ N/G12+ M</td>
</tr>
</tbody>
</table>

**SCOPE**

This MDS specifies the selected options in the referred standard and modified requirements which shall supersede the corresponding requirements in the referred standard.

**QUALIFICATIONS**

Base material information, shall be submitted with the bid/ be established prior to delivery.

The documentation of base material shall include strain ageing tests (ref. option 12), typical tensile test results and weldability tests according to Annex E (option 18) for sections with thickness approximately 20 mm or the greatest thickness required in the purchase order.

CTOD testing shall only be included for thickness above 25 mm and shall meet a requirement of min. 0.25 mm in as welded condition unless lower values have been accepted by the purchaser.

**HEAT TREATMENT/DELIVERY CONDITION**

**CHEMICAL COMPOSITION**

Option 6 and 9

**TENSILE TESTING**

Option 13

**DIMENSIONS/TOLERANCES**

Option 21, Class 21

**NON DESTRUCTIVE TESTING (NDT)**

All surfaces shall receive a preliminary protective primer coat. Blast cleaning shall comply with ISO 8501-1 Sa 2½ and the surface shall remain at Sa 2½ until application of the primer. The primer shall consist of 1 coat zinc ethyl silicate primer with 15 microns. Measured on a plane polished steel or glass test plate the DFT shall be maximum 25 microns.

**SURFACE PROTECTION**

Unique marking as defined in the purchase order.

**CERTIFICATE**

EN 10 204 Type 3.1B
# Material Data Sheet

**Type of Material:** Structural Steel with documented through thickness properties

<table>
<thead>
<tr>
<th><strong>Product</strong></th>
<th><strong>Standard</strong></th>
<th><strong>Grade</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Seamless tubulars (Seamless hollow sections)</td>
<td>prEN 10225, Oct.00</td>
<td>S355G15+ Q/G15+ N</td>
</tr>
</tbody>
</table>

**Scope**
This MDS specifies the selected options in the referred standard and modified requirements which shall supersede the corresponding requirements in the referred standard.

**Qualifications**
Base material information, shall be submitted with the bid/ be established prior to delivery.

The documentation of base material shall include strain ageing tests (ref. option 12), typical tensile test results and weldability tests according to Annex E (option 18) for tube thickness approximately 20 mm or the greatest thickness required in the purchase order.

CTOD testing shall only be included for thickness above 25 mm and shall meet a requirement of min. 0.25 mm in as welded condition unless lower values have been accepted by the purchaser.

**Heat Treatment/ Delivery Condition**

**Chemical Composition**
Option 6
The chemical composition in Table 10 shall be modified as follows: $C_{\text{max}} : 0.16\%$ (option 7)

**Tensile Testing**
Option 13

**Dimensions / Tolerances**

**Non Destructive Testing (NDT)**
Option 22.

**Surface Protection**
All surfaces shall receive a preliminary protective primer coat. Blast cleaning shall comply with ISO 8501-1 Sa 2½ and the surface shall remain at Sa 2½ until application of the primer. The primer shall consist of 1 coat zinc ethyl silicate primer with 15 microns. Measured on a plane polished steel or glass test plate the DFT shall be maximum 25 microns.

**Marking**
Unique marking as defined in the purchase order.

**Certificate**
EN 10 204 Type 3.1B
## NORSOK Standard

### MATERIAL DATA SHEET MDS - Y25 Rev. 3

**TYPE OF MATERIAL:** Structural Steel

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<thead>
<tr>
<th>PRODUCT</th>
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</tr>
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<tbody>
<tr>
<td>Plates</td>
<td>prEN 10225, Oct.00</td>
<td>S355G9+N/G9+M</td>
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**SCOPE**

This MDS specifies the selected options in the referred standard and modified requirements which shall supersede the corresponding requirements in the referred standard.

**QUALIFICATIONS**

Base material information, shall be submitted with the bid/ be established prior to delivery.

The documentation of base material shall cover both delivered and PWHT condition and shall include strain ageing tests (ref. option 12), typical tensile test results for plates and weldability tests according to Annex E (option 18) within each of the following thickness ranges that are relevant for the order:

- $25 < t < 40$ mm
- $40 < t < 63$ mm
- $63 < t < 100$ mm
- $100 < t < 150$ mm

Other thickness ranges related to same chemistry and manufacturing process may apply. In such cases the thickest material in the range shall be tested. The results from PWHT condition shall also meet the specified requirements.

CTOD testing shall be included and shall meet a requirement of min. 0,25 mm in as welded condition, and min 0,20 in PWHT condition unless lower values have been accepted by the purchaser.

**HEAT TREATMENT/ DELIVERY CONDITION**

Quenched and Tempered is also accepted.

**CHEMICAL COMPOSITION**

Option 6.

**TENSILE TESTING**

**EXTENT OF TESTING**

**DIMENSIONS / TOLERANCES**

**NON DESTRUCTIVE TESTING (NDT)**

**SURFACE PROTECTION**

All surfaces shall receive a preliminary protective primer coat. Blast cleaning shall comply with ISO 8501-1 Sa 2½ and the surface shall remain at Sa 2½ until application of the primer. The primer shall consist of 1 coat zinc ethyl silicate primer with 15 microns. Measured on a plane polished steel or glass test plate the DFT shall be maximum 25 microns.

**MARKING**

Unique marking as defined in the purchase order.

**CERTIFICATE**

EN 10 204 Type 3.1B
# NORSOK Standard

**MATERIAL DATA SHEET MDS - Y26**  
**Rev. 3**

**TYPE OF MATERIAL:** Structural Steel

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<th>PRODUCT</th>
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<tr>
<td>Rolled Sections</td>
<td>prEN 10225, Oct.00</td>
<td>S355G11+N/G11+M</td>
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**SCOPE**  
This MDS specifies the selected options in the referred standard and modified requirements which shall supersede the corresponding requirements in the referred standard.

**QUALIFICATIONS**  
Base material information, shall be submitted with the bid/ be established prior to delivery.

The documentation of base material shall include strain ageing tests (ref. option 12), typical tensile test results and weldability tests according to Annex E (option 18) for sections with thickness approximately 20 mm or the greatest thickness required in the purchase order.

CTOD testing shall only be included for thickness above 25 mm and shall meet a requirement of min. 0.25 mm in as welded condition unless lower values have been accepted by the purchaser.

**HEAT TREATMENT/ DELIVERY CONDITION**

**CHEMICAL COMPOSITION**  
Option 6 and 9

**TENSILE TESTING**

**EXTENT OF TESTING**

**DIMENSIONS / TOLERANCES**

**NON DESTRUCTIVE TESTING (NDT)**

**SURFACE PROTECTION**  
All surfaces shall receive a preliminary protective primer coat. Blast cleaning shall comply with ISO 8501-1 Sa 2½ and the surface shall remain at Sa 2½ until application of the primer. The primer shall consist of 1 coat zinc ethyl silicate primer with 15 microns. Measured on a plane polished steel or glass test plate the DFT shall be maximum 25 microns.

**MARKING**  
Unique marking as defined in the purchase order.

**CERTIFICATE**  
EN 10 204 Type 3.1B
# Material Data Sheet

**Type of Material:** Structural Steel

<table>
<thead>
<tr>
<th>Product</th>
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<th>Grade</th>
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</thead>
<tbody>
<tr>
<td>Seamless tubulars (Seamless hollow sections)</td>
<td>prEN 10225, Oct.00</td>
<td>S355G14+ Q/G14+ N</td>
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</table>

**Scope:**
This MDS specifies the selected options in the referred standard and modified requirements which shall supersede the corresponding requirements in the referred standard.

**Qualifications:**
Base material information, shall be submitted with the bid/ be established prior to delivery.

The documentation of base material shall include strain ageing tests (ref. option 12), typical tensile test results and weldability tests according to Annex E (option 18) for sections with thickness approximately 20 mm or the greatest thickness required in the purchase order.

CTOD testing shall only be included for thickness above 25 mm and shall meet a requirement of min. 0.25 mm in as welded condition unless lower values have been accepted by the purchaser.

**Heat Treatment/Delivery Condition:**

**Chemical Composition:**
Option 6
The chemical composition in Table 10 shall be modified as follows: \( C_{\text{max}} : 0.16\% \) (option 7)

**Tensile Testing:**

**Extent of Testing:**

**Dimensions/Tolerances:**

**Non Destructive Testing (NDT):**

**Surface Protection:**
All surfaces shall receive a preliminary protective primer coat. Blast cleaning shall comply with ISO 8501-1 Sa 2½ and the surface shall remain at Sa 2½ until application of the primer. The primer shall consist of 1 coat zinc ethyl silicate primer with 15 microns. Measured on a plane polished steel or glass test plate the DFT shall be maximum 25 microns.

**Marking:**
Unique marking as defined in the purchase order.

**Certificate:**
EN 10 204 Type 3.1B
# MATERIAL DATA SHEET

**TYPE OF MATERIAL:** Structural Steel

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<tr>
<th>PRODUCT</th>
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<tbody>
<tr>
<td>Welded tubulars (Welded hollow sections)</td>
<td>prEN 10225, Oct.00</td>
<td>S355G13+ N</td>
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</tbody>
</table>

**SCOPE**

This MDS is applicable for high frequency electric resistance welded hollow sections up to and including 20 mm thick. This MDS specifies the selected options in the referred standard and modified requirements which shall supersede the corresponding requirements in the referred standard.

**QUALIFICATIONS**

Establishment of WPS, qualification of welding procedures and qualification of welding operators shall be in accordance with the NORSOK standard M-101, "Structural Steel Fabrication". With regard to charpy impact testing the following modifications to M-101 shall apply:
- Test temperature: -40°C
- Notch positions: Fusion Line (FL), FL + 2 mm, FL + 5 mm
- Minimum average energy value: 36 J
- Minimum individual energy value: 26 J

Qualified thickness range shall be in accordance with EN 288-3, Table 5

Base material information, with typical results from chemical composition and mechanical testing, shall be submitted with the bid/ be established prior to delivery.

**HEAT TREATMENT/ DELIVERY CONDITION**

**CHEMICAL COMPOSITION**

Option 6

**TENSILE TESTING**

**EXTENT OF TESTING**

**DIMENSIONS / TOLERANCES**

**NON DESTRUCTIVE TESTING (NDT)**

In accordance with section 8.4.3.3 of the standard, modified as follows:
- Thickness equal to and above 10 mm: prEN 10246-8/U4
- Thickness less than 10 mm: prEN 10246-3/E4 or prEN 10246-8/U4

**SURFACE PROTECTION**

All surfaces shall receive a preliminary protective primer coat. Blast cleaning shall comply with ISO 8501-1 Sa 2½ and the surface shall remain at Sa 2½ until application of the primer. The primer shall consist of 1 coat zinc ethyl silicate primer with 15 microns. Measured on a plane polished steel or glass test plate the DFT shall be maximum 25 microns.

**MARKING**

Unique marking as defined in the purchase order.

**CERTIFICATE**

EN 10 204 Type 3.1B
**MATERIAL DATA SHEET**  

**TYPE OF MATERIAL:** Structural Steel, with documented through thickness properties

<table>
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<tr>
<th>PRODUCT</th>
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<tbody>
<tr>
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**SCOPE**

This MDS specifies the selected options in the referred standard and modified requirements which shall supersede the corresponding requirements in the referred standard.

**QUALIFICATIONS**

Base material information, shall be submitted with the bid/ be established prior to delivery.

The documentation of base material shall cover both delivered and PWHT condition and shall include strain ageing tests (ref. option 12), typical tensile test results for plates and weldability tests according to Annex E (option 18) within each of the following thickness ranges that are relevant for the order:

- $25 < t < 40$ mm
- $40 < t < 63$ mm
- $63 < t < 100$ mm
- $100 < t < 150$ mm

Other thickness ranges related to same chemistry and manufacturing process may apply. In such cases the thickest material in the range shall be tested. The results from PWHT condition shall also meet the specified requirements.

CTOD testing shall be included and shall meet a requirement of min. 0.25 mm in as welded condition, and min 0.20 in PWHT condition unless lower values have been accepted by the purchaser.

**HEAT TREATMENT/ DELIVERY CONDITION**

**CHEMICAL COMPOSITION**

Option 6 and 9

**TENSILE TESTING**

Mechanical properties given in Table 5b shall be modified as follows:

- **Yield Strength (min.)**: 420 MPa (all thicknesses)
- **Tensile Strength**: 500-660 MPa (all thicknesses)

**EXTENT OF TESTING**

Option 13

**DIMENSIONS / TOLERANCES**

**NON DESTRUCTIVE TESTING (NDT)**

All surfaces shall receive a preliminary protective primer coat. Blast cleaning shall comply with ISO 8501-1 Sa 2½ and the surface shall remain at Sa 2½ until application of the primer. The primer shall consist of 1 coat zinc ethyl silicate primer with 15 microns. Measured on a plane polished steel or glass test plate the DFT shall be maximum 25 microns.

**MARKING**

Unique marking as defined in the purchase order.

**CERTIFICATE**

EN 10 204 Type 3.1B
**MATERIAL DATA SHEET**  
**MDS - Y31**  
**Rev. 3**

**TYPE OF MATERIAL:** Structural Steel with documented through thickness properties

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<tr>
<td>Rolled Sections</td>
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**SCOPE**  
This MDS specifies the selected options in the referred standard and modified requirements which shall supersede the corresponding requirements in the referred standard.

**QUALIFICATIONS**  
Base material information, shall be submitted with the bid/ be established prior to delivery.

The documentation of base material shall include strain ageing tests (ref. option 12), typical tensile test results and weldability tests according to Annex E (option 18) for sections with thickness approximately 20 mm or the greatest thickness required in the purchase order.

CTOD testing shall only be included for thickness above 25 mm and shall meet a requirement of min. 0.25 mm in as welded condition unless lower values have been accepted by the purchaser.

**HEAT TREATMENT/ DELIVERY CONDITION**  
Quenched and Tempered and Normalised may also be accepted.

**CHEMICAL COMPOSITION**  
Option 6 and 9

**TENSILE TESTING**  
Mechanical properties given in Table 7 shall be modified as follows:

- Yield Strength (min.) : 420 MPa (all thicknesses)
- Tensile Strength : 500-660 MPa (all thicknesses)

**EXTENT OF TESTING**  
Option 13

**DIMENSIONS / TOLERANCES**

**NON DESTRUCTIVE TESTING (NDT)**  
Option 21, Class 21

**SURFACE PROTECTION**  
All surfaces shall receive a preliminary protective primer coat. Blast cleaning shall comply with ISO 8501-1 Sa 2½ and the surface shall remain at Sa 2½ until application of the primer. The primer shall consist of 1 coat zinc ethyl silicate primer with 15 microns. Measured on a plane polished steel or glass test plate the DFT shall be maximum 25 microns.

**MARKING**  
Unique marking as defined in the purchase order.

**CERTIFICATE**  
EN 10 204 Type 3.1B
**TYPE OF MATERIAL:** Structural Steel with documented through thickness properties

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<tr>
<th>PRODUCT</th>
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<tbody>
<tr>
<td>Seamless tubulars (Seamless hollow sections)</td>
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<td>S420G6+ Q(mod)</td>
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**SCOPE**
This MDS specifies the selected options in the referred standard and modified requirements which shall supersede the corresponding requirements in the referred standard.

**QUALIFICATIONS**
Base material information, shall be submitted with the bid/ be established prior to delivery.

The documentation of base material shall include strain ageing tests (ref. option 12), typical tensile test results and weldability tests according to Annex E (option 18) for sections with thickness approximately 20 mm or the greatest thickness required in the purchase order.

CTOD testing shall only be included for thickness above 25 mm and shall meet a requirement of min. 0.25 mm in as welded condition unless lower values have been accepted by the purchaser.

**HEAT TREATMENT/ DELIVERY CONDITION**
Normalised may also be accepted.

**CHEMICAL COMPOSITION**
Option 6

**TENSILE TESTING**
Mechanical properties given in Table 11 shall be modified as follows:
- Yield Strength (min.) : 420 MPa (all thicknesses)
- Tensile Strength : 500-660 MPa (all thicknesses)

**EXTENT OF TESTING**
Option 13

**DIMENSIONS / TOLERANCES**

**NON DESTRUCTIVE TESTING (NDT)**
Option 22

**SURFACE PROTECTION**
All surfaces shall receive a preliminary protective primer coat. Blast cleaning shall comply with ISO 8501-1 Sa 2½ and the surface shall remain at Sa 2½ until application of the primer. The primer shall consist of 1 coat zinc ethyl silicate primer with 15 microns. Measured on a plane polished steel or glass test plate the DFT shall be maximum 25 microns.

**MARKING**
Unique marking as defined in the purchase order.

**CERTIFICATE**
EN 10 204 Type 3.1B
**MATERIAL DATA SHEET**  
**MDS - Y35**  
**Rev. 3**

**TYPE OF MATERIAL:** Structural Steel

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**SCOPE**  
This MDS specifies the selected options in the referred standard and modified requirements which shall supersede the corresponding requirements in the referred standard.

**QUALIFICATIONS**  
Base material information, shall be submitted with the bid/ be established prior to delivery.

The documentation of base material shall cover both delivered and PWHT condition and shall include strain ageing tests (ref. option 12), typical tensile test results for plates and weldability tests according to Annex E (option 18) within each of the following thickness ranges that are relevant for the order:

- $25 < t < 40$ mm
- $40 < t < 63$ mm
- $63 < t < 100$ mm
- $100 < t < 150$ mm

Other thickness ranges related to same chemistry and manufacturing process may apply. In such cases the thickest material in the range shall be tested. The results from PWHT condition shall also meet the specified requirements.

CTOD testing shall be included and shall meet a requirement of min. $0.25$ mm in as welded condition, and min $0.20$ in PWHT condition unless lower values have been accepted by the purchaser.

**HEAT TREATMENT/ DELIVERY CONDITION**

**CHEMICAL COMPOSITION**  
Option 6 and 9

**TENSILE TESTING**  
Mechanical properties given in Table 5b shall be modified as follows:

- **Yield Strength (min.):** 420 MPa (all thicknesses)
- **Tensile Strength:** 500-660 MPa (all thicknesses)

**EXTENT OF TESTING**

**DIMENSIONS / TOLERANCES**

**NON DESTRUCTIVE TESTING (NDT)**

**SURFACE PROTECTION**  
All surfaces shall receive a preliminary protective primer coat. Blast cleaning shall comply with ISO 8501-1 Sa 2½ and the surface shall remain at Sa 2½ until application of the primer. The primer shall consist of 1 coat zinc ethyl silicate primer with 15 microns. Measured on a plane polished steel or glass test plate the DFT shall be maximum 25 microns.

**MARKING**  
Unique marking as defined in the purchase order.

**CERTIFICATE**  
EN 10 204 Type 3.1B
**MATERIAL DATA SHEET**  
**MDS - Y36**  
**Rev. 3**

**TYPE OF MATERIAL:** Structural Steel

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**SCOPE**
This MDS specifies the selected options in the referred standard and modified requirements which shall supersede the corresponding requirements in the referred standard.

**QUALIFICATIONS**
Base material information, shall be submitted with the bid/ be established prior to delivery.

The documentation of base material shall include strain ageing tests (ref. option 12), typical tensile test results and weldability tests according to Annex E (option 18) for sections with thickness approximately 20 mm or the greatest thickness required in the purchase order.

CTOD testing shall only be included for thickness above 25 mm and shall meet a requirement of min. 0.25 mm in as welded condition unless lower values have been accepted by the purchaser.

**HEAT TREATMENT/ DELIVERY CONDITION**
Quenched and Tempered and Normalised may also be accepted

**CHEMICAL COMPOSITION**
Option 6 and 9

**TENSILE TESTING**
Mechanical properties given in Table 7 shall be modified as follows:
- Yield Strength (min.) : 420 MPa (all thicknesses)
- Tensile Strength : 500-660 MPa (all thicknesses)

**EXTENT OF TESTING**

**DIMENSIONS / TOLERANCES**

**NON DESTRUCTIVE TESTING (NDT)**

**SURFACE PROTECTION**
All surfaces shall receive a preliminary protective primer coat. Blast cleaning shall comply with ISO 8501-1 Sa 2½ and the surface shall remain at Sa 2½ until application of the primer. The primer shall consist of 1 coat zinc ethyl silicate primer with 15 microns. Measured on a plane polished steel or glass test plate the DFT shall be maximum 25 microns.

**MARKING**
Unique marking as defined in the purchase order.

**CERTIFICATE**
EN 10 204 Type 3.1B
**MATERIAL DATA SHEET**  
**MDS - Y37**  
**Rev. 3**

**TYPE OF MATERIAL:** Structural Steel

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<tr>
<td>Seamless tubulars (Seamless hollow sections)</td>
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**SCOPE**  
This MDS specifies the selected options in the referred standard and modified requirements which shall supersede the corresponding requirements in the referred standard.

**QUALIFICATIONS**  
Base material information, shall be submitted with the bid/ be established prior to delivery.

The documentation of base material shall include strain ageing tests (ref. option 12), typical tensile test results and weldability tests according to Annex E (option 18) for sections with thickness approximately 20 mm or the greatest thickness required in the purchase order.

CTOD testing shall only be included for thickness above 25 mm and shall meet a requirement of min. 0,25 mm in as welded condition unless lower values have been accepted by the purchaser.

**HEAT TREATMENT/ DELIVERY CONDITION**  
Normalised may also be accepted.

**CHEMICAL COMPOSITION**  
Option 6

**TENSILE TESTING**  
Mechanical properties given in Table 11 shall be modified as follows:

- Yield Strength (min.): 420 MPa (all thicknesses)
- Tensile Strength: 500-660 MPa (all thicknesses)

**EXTENT OF TESTING**

**DIMENSIONS / TOLERANCES**

**NON DESTRUCTIVE TESTING (NDT)**

**SURFACE PROTECTION**  
All surfaces shall receive a preliminary protective primer coat. Blast cleaning shall comply with ISO 8501-1 Sa 2½ and the surface shall remain at Sa 2½ until application of the primer. The primer shall consist of 1 coat zinc ethyl silicate primer with 15 microns. Measured on a plane polished steel or glass test plate the DFT shall be maximum 25 microns.

**MARKING**  
Unique marking as defined in the purchase order.

**CERTIFICATE**  
EN 10 204 Type 3.1B
**MATERIAL DATA SHEET**

**MDS - Y40**

**Rev. 3**

**TYPE OF MATERIAL:** Structural Steel, with documented through thickness properties

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<tr>
<td>Plates</td>
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</tr>
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</table>

**SCOPE**

This MDS specifies the selected options in the referred standard and modified requirements which shall supersede the corresponding requirements in the referred standard.

**QUALIFICATIONS**

Base material information, shall be submitted with the bid/ be established prior to delivery.

The documentation of base material shall cover both delivered and PWHT condition and shall include strain ageing tests (ref. option 12), typical tensile test results for plates and weldability tests according to Annex E (option 18) within each of the following thickness ranges that are relevant for the order:

- $25 < t < 40$ mm
- $40 < t < 63$ mm
- $63 < t < 100$ mm
- $100 < t < 150$ mm

Other thickness ranges related to same chemistry and manufacturing process may apply. In such cases the thickest material in the range shall be tested. The results from PWHT condition shall also meet the specified requirements.

CTOD testing shall be included and shall meet a requirement of min. 0.25 mm in as welded condition, and min 0.20 in PWHT condition unless lower values have been accepted by the purchaser.

**HEAT TREATMENT/ DELIVERY CONDITION**

**CHEMICAL COMPOSITION**

Option 6 and 9

**TENSILE TESTING**

Mechanical properties given in Table 5C shall be modified as follows:

- Yield Strength (min.) : 460 M Pa (all thicknesses)
- Tensile Strength : 550-700 M Pa (all thicknesses)

**EXTENT OF TESTING**

Option 13

**DIMENSIONS / TOLERANCES**

**NON DESTRUCTIVE TESTING (NDT)**

**SURFACE PROTECTION**

All surfaces shall receive a preliminary protective primer coat. Blast cleaning shall comply with ISO 8501-1 Sa 2½ and the surface shall remain at Sa 2½ until application of the primer. The primer shall consist of 1 coat zinc ethyl silicate primer with 15 microns. Measured on a plane polished steel or glass test plate the DFT shall be maximum 25 microns.

**MARKING**

Unique marking as defined in the purchase order.

**CERTIFICATE**

EN 10 204 Type 3.1B
# NORSOK Standard

## MATERIAL DATA SHEET MDS - Y41 Rev. 3

### TYPE OF MATERIAL:
Structural Steel with documented through thickness properties

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<tr>
<th>PRODUCT</th>
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<tbody>
<tr>
<td>Rolled Sections</td>
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<td>S460G4+ M</td>
</tr>
</tbody>
</table>

### SCOPE
This MDS specifies the selected options in the referred standard and modified requirements which shall supersede the corresponding requirements in the referred standard.

### QUALIFICATIONS
Base material information, shall be submitted with the bid/ be established prior to delivery.

The documentation of base material shall include strain ageing tests (ref. option 12), typical tensile test results and weldability tests according to Annex E (option 18) for sections with thickness approximately 20 mm or the greatest thickness required in the purchase order.

CTOD testing shall only be included for thickness above 25 mm and shall meet a requirement of min. 0.25 mm in as welded condition unless lower values have been accepted by the purchaser.

### HEAT TREATMENT/DELIVERY CONDITION
Quenched and Tempered may also be accepted.

### CHEMICAL COMPOSITION
Option 6 and 9

### TENSILE TESTING
Mechanical properties given in Table 7 shall be modified as follows:
- Yield Strength (min.) : 460 MPa (all thicknesses)
- Tensile Strength : 550-700 MPa (all thicknesses)

### EXTENT OF TESTING
Option 13

### DIMENSIONS/TOLERANCES

### NON DESTRUCTIVE TESTING (NDT)
Option 21, Class 22

### SURFACE PROTECTION
All surfaces shall receive a preliminary protective primer coat. Blast cleaning shall comply with ISO 8501-1 Sa 2½ and the surface shall remain at Sa 2½ until application of the primer. The primer shall consist of 1 coat zinc ethyl silicate primer with 15 microns. Measured on a plane polished steel or glass test plate the DFT shall be maximum 25 microns.

### MARKING
Unique marking as defined in the purchase order.

### CERTIFICATE
EN 10 204 Type 3.1B
**MATERIAL DATA SHEET**  
**MDS - Y42**  
**Rev. 3**

**TYPE OF MATERIAL:** Structural Steel with documented through thickness properties

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**SCOPE**  
This MDS specifies the selected options in the referred standard and modified requirements which shall supersede the corresponding requirements in the referred standard.

**QUALIFICATIONS**  
Base material information, shall be submitted with the bid/ be established prior to delivery.

The documentation of base material shall include strain ageing tests (ref. option 12), typical tensile test results and weldability tests according to Annex E (option 18) for sections with thickness approximately 20 mm or the greatest thickness required in the purchase order.

CTOD testing shall only be included for thickness above 25 mm and shall meet a requirement of min. 0,25 mm in as welded condition unless lower values have been accepted by the purchaser.

**HEAT TREATMENT/ DELIVERY CONDITION**  
Option 6

**CHEMICAL COMPOSITION**  
Mechanical properties given in Table 11 shall be modified as follows:
- **Yield Strength (min.)**: 460 MPa (all thicknesses)
- **Tensile Strength**: 550-700 MPa (all thicknesses)

**TENSILE TESTING**  
Option 13

**DIMENSIONS / TOLERANCES**  
Option 22

**NON DESTRUCTIVE TESTING (NDT)**  
All surfaces shall receive a preliminary protective primer coat. Blast cleaning shall comply with ISO 8501-1 Sa 2½ and the surface shall remain at Sa 2½ until application of the primer. The primer shall consist of 1 coat zinc ethyl silicate primer with 15 microns. Measured on a plane polished steel or glass test plate the DFT shall be maximum 25 microns.

**SURFACE PROTECTION**  
Unique marking as defined in the purchase order.

**CERTIFICATE**  
EN 10 204 Type 3.1B
# NORSOK Standard

## MATERIAL DATA SHEET MDS - Y45 Rev. 3

### TYPE OF MATERIAL:
Structural Steel

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>STANDARD</th>
<th>GRADE</th>
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</thead>
<tbody>
<tr>
<td>Plates</td>
<td>prEN 10225, Oct.00</td>
<td>S460G1+ Q/G1+ M</td>
</tr>
</tbody>
</table>

### SCOPE
This MDS specifies the selected options in the referred standard and modified requirements which shall supersede the corresponding requirements in the referred standard.

### QUALIFICATIONS
Base material information, shall be submitted with the bid/ be established prior to delivery.

The documentation of base material shall cover both delivered and PWHT condition and shall include strain ageing tests (ref. option 12), typical tensile test results for plates and weldability tests according to Annex E (option 18) within each of the following thickness ranges that are relevant for the order:

- 25 < t ≤ 40mm
- 40 < t ≤ 63mm
- 63 < t ≤ 100mm
- 100 < t ≤ 150mm

Other thickness ranges related to same chemistry and manufacturing process may apply. In such cases the thickest material in the range shall be tested. The results from PWHT condition shall also meet the specified requirements.

CTOD testing shall be included and shall meet a requirement of min. 0.25 mm in as welded condition, and min 0.20 in PWHT condition unless lower values have been accepted by the purchaser.

### HEAT TREATMENT/ DELIVERY CONDITION

### CHEMICAL COMPOSITION
Option 6 and 9.

### TENSILE TESTING
Mechanical properties given in Table 5C shall be modified as follows:

- Yield Strength (min.) : 460 MPa (all thicknesses)
- Tensile Strength : 550-700 MPa (all thicknesses)

### EXTENT OF TESTING

### DIMENSIONS / TOLERANCES

### NON DESTRUCTIVE TESTING (NDT)

### SURFACE PROTECTION
All surfaces shall receive a preliminary protective primer coat. Blast cleaning shall comply with ISO 8501-1 Sa 2½ and the surface shall remain at Sa 2½ until application of the primer. The primer shall consist of 1 coat zinc ethyl silicate primer with 15 microns. Measured on a plane polished steel or glass test plate the DFT shall be maximum 25 microns.

### MARKING
Unique marking as defined in the purchase order.

### CERTIFICATE
EN 10 204 Type 3.1B
# MATERIAL DATA SHEET  MDS - Y46  Rev. 3

## TYPE OF MATERIAL: Structural Steel

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<td>S460G3+ M</td>
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## SCOPE
This MDS specifies the selected options in the referred standard and modified requirements which shall supersede the corresponding requirements in the referred standard.

## QUALIFICATIONS
Base material information, shall be submitted with the bid/ be established prior to delivery.

The documentation of base material shall include strain ageing tests (ref. option 12), typical tensile test results and weldability tests according to Annex E (option 18) for sections with thickness approximately 20 mm or the greatest thickness required in the purchase order.

CTOD testing shall only be included for thickness above 25 mm and shall meet a requirement of min. 0,25 mm in as welded condition unless lower values have been accepted by the purchaser.

## HEAT TREATMENT/
DELIVERY CONDITION
Quenched and Tempered may also be accepted

## CHEMICAL COMPOSITION
Option 6 and 9

## TENSILE TESTING
Mechanical properties given in Table 7 shall be modified as follows:
- Yield Strength (min.) : 460 MPa (all thicknesses)
- Tensile Strength : 550-700 MPa (all thicknesses)

## EXTENT OF TESTING

## DIMENSIONS /
TOLERANCES

## NON DESTRUCTIVE
TESTING (NDT)
All surfaces shall receive a preliminary protective primer coat. Blast cleaning shall comply with ISO 8501-1 Sa 2½ and the surface shall remain at Sa 2½ until application of the primer. The primer shall consist of 1 coat zinc ethyl silicate primer with 15 microns. Measured on a plane polished steel or glass test plate the DFT shall be maximum 25 microns.

## MARKING
Unique marking as defined in the purchase order.

## CERTIFICATE
EN 10 204 Type 3.1B
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<td>Seamless tubulars (Seamless hollow sections)</td>
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<td><strong>SCOPE</strong></td>
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<td><strong>QUALIFICATIONS</strong></td>
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<td><strong>HEAT TREATMENT/ DELIVERY CONDITION</strong></td>
</tr>
<tr>
<td><strong>CHEMICAL COMPOSITION</strong></td>
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<tr>
<td><strong>TENSILE TESTING</strong></td>
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<td><strong>EXTENT OF TESTING</strong></td>
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<td><strong>DIMENSIONS / TOLERANCES</strong></td>
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<td><strong>NON DESTRUCTIVE TESTING (NDT)</strong></td>
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# NORSOK Standard

## MATERIAL DATA SHEET MDS - Y50 Rev. 3

### TYPE OF MATERIAL: Structural Steel with documented through thickness properties

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<tr>
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<td>S500G2+Q/G2+ M 1)</td>
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</table>

### SCOPE
This MDS specifies the selected options in the referred standard and modified requirements which shall supersede the corresponding requirements in the referred standard.

### STEEL GRADE
Grade S460G2+Q/G2+M shall be modified to Grade S500G2+Q/G2+M as specified by this MDS.

### QUALIFICATIONS
Base material information, shall be submitted with the bid/ be established prior to delivery.

The documentation of base material shall cover both delivered and PWHT condition and shall include strain ageing tests (ref. option 12), typical tensile test results for plates and weldability tests according to Annex E (option 18) within each of the following thickness ranges that are relevant for the order:

- 25 < t ≤ 40mm
- 40 < t ≤ 63mm
- 63 < t ≤ 100mm
- 100 < t ≤ 150mm

Other thickness ranges related to same chemistry and manufacturing process may apply. In such cases the thickest material in the range shall be tested. The results from PWHT condition shall also meet the specified requirements.

CTOD testing shall be included and shall meet a requirement of min. 0,25 mm in as welded condition, and min 0,20 in PWHT condition unless lower values have been accepted by the purchaser.

### HEAT TREATMENT/ DELIVERY CONDITION

### CHEMICAL COMPOSITION
Option 6 and 9 Ni content may be raised to max 1,0%

### TENSILE TESTING
Mechanical properties given in Table 5c for Grade S460G2+Q/S460G2+M shall be modified as follows:

- Yield Strength (min.) : 500 - 580 M Pa (thicknesses ≤ 75 mm)
- Tensile Strength : 600-750 M Pa (thicknesses ≤ 75 mm)

### EXTENT OF TESTING
Option 13

### DIMENSIONS / TOLERANCES

### NON DESTRUCTIVE TESTING (NDT)

### SURFACE PROTECTION
All surfaces shall receive a preliminary protective primer coat. Blast cleaning shall comply with ISO 8501-1 Sa 2½ and the surface shall remain at Sa 2½ until application of the primer. The primer shall consist of 1 coat zinc ethyl silicate primer with 15 microns. Measured on a plane polished steel or glass test plate the DFT shall be maximum 25 microns.

### MARKING
Unique marking as defined in the purchase order.

### CERTIFICATE
EN 10 204 Type 3.1B

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1) Note. This steel grade is not included in prEN 10225.
**MATERIAL DATA SHEET**

**MDS - Y51**

**Rev. 3**

**TYPE OF MATERIAL:** Structural Steel with documented through thickness properties

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<tr>
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<td>S500G4+M ¹</td>
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**SCOPE**

This MDS specifies the selected options in the referred standard and modified requirements which shall supersede the corresponding requirements in the referred standard.

**STEEL GRADE**

Grade S460G4+M shall be modified to Grade S500G4+M as specified by this MDS.

**QUALIFICATIONS**

Base material information, shall be submitted with the bid/ be established prior to delivery.

The documentation of base material shall include strain ageing tests (ref. option 12), typical tensile test results and weldability tests according to Annex E (option 18) for sections with thickness approximately 20 mm or the greatest thickness required in the purchase order.

CTOD testing shall only be included for thickness above 25 mm and shall meet a requirement of min. 0.25 mm in as welded condition unless lower values have been accepted by the purchaser.

**HEAT TREATMENT/ DELIVERY CONDITION**

Quenched and Tempered may also be accepted

**CHEMICAL COMPOSITION**

Option 6 and 9

**TENSILE TESTING**

Mechanical properties given in Table 7 for Grade S460G4+M shall be modified as follows:

- Yield Strength (min.) : 500 MPa (thicknesses ≤ 40 mm)
- Tensile Strength : 600-750 MPa (thicknesses ≤ 40 mm)

**EXTENT OF TESTING**

Option 13

**DIMENSIONS / TOLERANCES**

**NON DESTRUCTIVE TESTING (NDT)**

Option 21, Class 22

**SURFACE PROTECTION**

All surfaces shall receive a preliminary protective primer coat. Blast cleaning shall comply with ISO 8501-1 Sa 2½ and the surface shall remain at Sa 2½ until application of the primer. The primer shall consist of 1 coat zinc ethyl silicate primer with 15 microns. Measured on a plane polished steel or glass test plate the DFT shall be maximum 25 microns.

**MARKING**

Unique marking as defined in the purchase order.

**CERTIFICATE**

EN 10 204 Type 3.1B

¹ Note. This steel grade is not included in prEN 10225.
## MATERIAL DATA SHEET  MDS - Y52  Rev. 3

### TYPE OF MATERIAL:
Structural Steel, with documented through thickness properties

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<th>PRODUCT</th>
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<td>S500G6+ Q(mod)(^1)</td>
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### SCOPE
This MDS specifies the selected options in the referred standard and modified requirements which shall supersede the corresponding requirements in the referred standard.

### STEEL GRADE
Grade S460G6+ Q(mod) shall be modified to Grade S500G6+ Q(mod) as specified by this MDS.

### QUALIFICATIONS
Base material information, shall be submitted with the bid/ be established prior to delivery.

The documentation of base material shall include strain ageing tests (ref. option 12), typical tensile test results and weldability tests according to Annex E (option 18) for sections with thickness approximately 20 mm or the greatest thickness required in the purchase order.

CTOD testing shall only be included for thickness above 25 mm and shall meet a requirement of min. 0.25 mm in as welded condition unless lower values have been accepted by the purchaser.

### CHEMICAL COMPOSITION
Option 6

### TENSILE TESTING
Mechanical properties given in Table 11 for Grade S460G6+ Q shall be modified as follows:

- **Yield Strength (min.):** 500 M Pa (thicknesses ≤ 40 mm)
- **Tensile Strength:** 600-750 M Pa (thicknesses ≤ 40 mm)

### EXTENT OF TESTING
Option 13

### DIMENSIONS / TOLERANCES

### NON DESTRUCTIVE TESTING (NDT)
Option 22

### SURFACE PROTECTION
All surfaces shall receive a preliminary protective primer coat. Blast cleaning shall comply with ISO 8501-1 Sa 2½ and the surface shall remain at Sa 2½ until application of the primer. The primer shall consist of 1 coat zinc ethyl silicate primer with 15 microns. Measured on a plane polished steel or glass test plate the DFT shall be maximum 25 microns.

### MARKING
Unique marking as defined in the purchase order.

### CERTIFICATE
EN 10 204 Type 3.1B

---

\(^1\) Note. This steel grade is not included in prEN 10225.
**TYPE OF MATERIAL:** Structural Steel

<table>
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<tr>
<th>PRODUCT</th>
<th>STANDARD</th>
<th>GRADE</th>
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<tbody>
<tr>
<td>Plates</td>
<td>prEN 10225, Oct.00</td>
<td>S500G1+Q/G1+M ¹</td>
</tr>
</tbody>
</table>

**SCOPE**

This MDS specifies the selected options in the referred standard and modified requirements which shall supersede the corresponding requirements in the referred standard.

**STEEL GRADE**

Grade S460G1+Q/G1+M shall be modified to Grade S500G1+Q/G1+M as specified by this MDS.

**QUALIFICATIONS**

Base material information, shall be submitted with the bid/ be established prior to delivery.

The documentation of base material shall cover both delivered and PWHT condition and shall include strain ageing tests (ref. option 12), typical tensile test results for plates and weldability tests according to Annex E (option 18) within each of the following thickness ranges that are relevant for the order:

- \(25 < t < 40\) mm
- \(40 < t < 63\) mm
- \(63 < t < 100\) mm
- \(100 < t < 150\) mm

Other thickness ranges related to same chemistry and manufacturing process may apply. In such cases the thickest material in the range shall be tested. The results from PWHT condition shall also meet the specified requirements.

CTOD testing shall be included and shall meet a requirement of min. 0.25 mm in as welded condition, and min 0.20 in PWHT condition unless lower values have been accepted by the purchaser.

**HEAT TREATMENT/ DELIVERY CONDITION**

**CHEMICAL COMPOSITION**

Option 6 and 9 Ni content may be raised to max 1.0%.

**TENSILE TESTING**

Mechanical properties given in Table 5c for Grade S460G1+Q/S460G1+M shall be modified as follows:

- Yield Strength (min.) : 500 - 580 MPa \((t < 75\) mm\)
- Tensile Strength : 600-750 MPa \((t < 75\) mm\)

**SURFACE PROTECTION**

All surfaces shall receive a preliminary protective primer coat. Blast cleaning shall comply with ISO 8501-1 Sa 2½ and the surface shall remain at Sa 2½ until application of the primer. The primer shall consist of 1 coat zinc ethyl silicate primer with 15 microns. Measured on a plane polished steel or glass test plate the DFT shall be maximum 25 microns.

**MARKING**

Unique marking as defined in the purchase order.

**CERTIFICATE**

EN 10 204 Type 3.1B

¹ Note. This steel grade is not included in prEN 10225.
**TYPE OF MATERIAL:** Structural Steel

### PRODUCT

| Rolled Sections | prEN 10225, Oct.00 | S500G3+ M |

### SCOPE

This MDS specifies the selected options in the referred standard and modified requirements which shall supersede the corresponding requirements in the referred standard.

### STEEL GRADE

Grade S460G3+ M shall be modified to Grade S500G3+ M as specified by this MDS.

### QUALIFICATIONS

Base material information, shall be submitted with the bid/ be established prior to delivery.

The documentation of base material shall include strain ageing tests (ref. option 12), typical tensile test results and weldability tests according to Annex E (option 18) for sections with thickness approximately 20 mm or the greatest thickness required in the purchase order.

CTOD testing shall only be included for thickness above 25 mm and shall meet a requirement of min. 0.25 mm in as welded condition unless lower values have been accepted by the purchaser.

### HEAT TREATMENT/ DELIVERY CONDITION

Quenched and Tempered may also be accepted

### CHEMICAL COMPOSITION

Option 6 and 9

### TENSILE TESTING

Mechanical properties given in Table 7 for Grade S460G3+ M shall be modified as follows:

- **Yield Strength (min.)** : 500 MPa (thicknesses < 40 mm)
- **Tensile Strength** : 600-750 MPa (thicknesses < 40 mm)

### EXTENT OF TESTING

### DIMENSIONS / TOLERANCES

### NON DESTRUCTIVE TESTING (NDT)

### SURFACE PROTECTION

All surfaces shall receive a preliminary protective primer coat. Blast cleaning shall comply with ISO 8501-1 Sa 2½ and the surface shall remain at Sa 2½ until application of the primer. The primer shall consist of 1 coat zinc ethyl silicate primer with 15 microns. Measured on a plane polished steel or glass test plate the DFT shall be maximum 25 microns.

### MARKING

Unique marking as defined in the purchase order.

### CERTIFICATE

EN 10 204 Type 3.1B

---

1) **Note.** This steel grade is not included in prEN 10225.
<table>
<thead>
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<th>TYPE OF MATERIAL: Structural Steel</th>
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<tbody>
<tr>
<td><strong>PRODUCT</strong></td>
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<td>Seamless tubulars (Seamless hollow sections)</td>
</tr>
</tbody>
</table>

**SCOPE**
This MDS specifies the selected options in the referred standard and modified requirements which shall supersede the corresponding requirements in the referred standard.

**STEEL GRADE**
Grade S460G6+ Q shall be modified to Grade S500G6+ Q as specified by this MDS.

**QUALIFICATIONS**
Base material information, shall be submitted with the bid/ be established prior to delivery.

The documentation of base material shall include strain ageing tests (ref. option 12), typical tensile test results and weldability tests according to Annex E (option 18) for sections with thickness approximately 20 mm or the greatest thickness required in the purchase order.

CTOD testing shall only be included for thickness above 25 mm and shall meet a requirement of min. 0.25 mm in as welded condition unless lower values have been accepted by the purchaser.

**HEAT TREATMENT/DELIVERY CONDITION**
Option 6

**CHEMICAL COMPOSITION**
Option 6

**TENSILE TESTING**
Mechanical properties given in Table 11 for Grade S460G6+ Q shall be modified as follows:
- **Yield Strength (min.)**: 500 MPa (thicknesses < 40 mm)
- **Tensile Strength**: 600-750 MPa (thicknesses ≤ 40 mm)

**EXTENT OF TESTING**

**DIMENSIONS/TOLERANCES**

**NON DESTRUCTIVE TESTING (NDT)**

**SURFACE PROTECTION**
All surfaces shall receive a preliminary protective primer coat. Blast cleaning shall comply with ISO 8501-1 Sa 2½ and the surface shall remain at Sa 2½ until application of the primer. The primer shall consist of 1 coat zinc ethyl silicate primer with 15 microns. Measured on a plane polished steel or glass test plate the DFT shall be maximum 25 microns.

**MARKING**
Unique marking as defined in the purchase order.

**CERTIFICATE**
EN 10 204 Type 3.1B

<sup>11</sup> Note. This steel grade is not included in prEN 10225.
**TYPE OF MATERIAL:** Structural Steel,

**STANDARD**

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<th>GRADE</th>
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**SCOPE**

This MDS specifies the selected options in the referred standard and modified requirements which shall supersede the corresponding requirements in the referred standard.

**QUALIFICATIONS**

Base material information, shall be submitted with the bid/ be established prior to delivery.

The documentation of base material shall cover both delivered and PWHT condition and shall include strain ageing tests (ref. option 12), typical tensile test results for plates, Tekken-test and weldability tests according to Annex E (option 18) within each of the following thickness ranges that are relevant for the order:

- $25 < t < 40$ mm
- $40 < t < 63$ mm
- $63 < t < 100$ mm
- $100 < t < 150$ mm

Other thickness ranges related to same chemistry and manufacturing process may apply. In such cases the thickest material in the range shall be tested. The results from PWHT condition shall also meet the specified requirements.

The following additional procedure requirements apply:

Dehydrogenation shall be performed prior to CTOD testing. Heat input to be 0.7 and 2.5 kJ/mm for SMAW and SAW respectively. For other processes heat input shall be agreed.

The following additional requirements apply:

CTOD testing shall be included and shall meet a requirement of min. 0.25 mm in as welded condition, and min 0.20 in PWHT condition unless lower values have been accepted by the purchaser.

The minimum average and individual Charpy values at -40°C in strain aged condition shall be 70J and 44J respectively.

The maximum hardness in HAZ shall be 400 HV10.

**HEAT TREATMENT/ DELIVERY CONDITION**

Quenched and tempered

**CHEMICAL COMPOSITION**

Se page 2

**TENSILE TESTING**

Re: min 690 M Pa and max 780 M Pa for thicknesses $< 80$ mm

Re/Rm ratio: max 0.95 for $40 \leq t < 80$ and 0.96 for $t < 40$

**IMPACT TESTING**

Charpy V: Average min 100J at -40°C in transverse direction. Min single value 70%

**EXTENT OF TESTING**

Option 13

**DIMENSIONS / TOLERANCES**

**NON DESTRUCTIVE TESTING (NDT)**

**SURFACE PROTECTION**

All surfaces shall receive a preliminary protective coat. Blast cleaning shall comply with ISO 8501-1 Sa 2 1/2 and the surface shall remain at Sa 2 1/2 until application of the primer. The primer shall consist of 1 coat zinc ethyl silicate primer with 15 microns. Measured on a plane polished steel or glass test plate the DFT shall be maximum 25 microns

**MARKING**

Unique marking as defined in the purchase order

**CERTIFICATE**

EN 10 204 Type 3.1B

Note: Other requirements may be accepted based on special design evaluation.
### MDS Y70 - Chemical composition

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CEV 0,66  
Pcm 0,32

N.i.a.: Not intentionally added

Other systems of chemical composition may be accepted after special agreement.