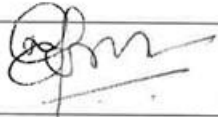




Raw Material Specification 42CrMo4 / DIN 1.7225 / AISI 4140 / EN 19C

Approved By: SHEQ Manager

Work Instructions

	Name	Job Title	Date	Signature/Stamp
Originator / Modified by:	Ilamuzhuthy Namadevan	SHT Supervisor, Operations	05/03/2020	
Reviewed by:	Kiran Kumar	Material Lab Engineer, SHEQ	05/03/2020	
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1 PURPOSE

- The purpose of this work instruction is to provide a detailed description Raw Material Specification of 42CrM04 / DIN 1.7225 / AISI 4140 / EN 19C

2 SCOPE

- This scope applies only to Material Specification 42CrM04 / DIN 1.7225 / AISI 4140 / EN 19C

3 CROSS REFERENCES

- N/A

4 ABBREVIATIONS & DEFINITIONS

ASTM:	American Society for Testing and Materials
AISI :	American Iron and Steel Institute
EN:	European Standard
NDT	Non Destructive Test
MTC	Material Test Certificate

5 RESPONSIBILITIES

- The “Material Lab Engineer” is responsible to implement and maintain this work instructions document.

6 RESOURCES:

- NA

7 BREAKDOWN AND ITEMS LIST

- NA

8 WORK INSTRUCTIONS

	Specification	Reference Standard																																													
Material	Hot Rolled Bar Steel 42CrMo4/(DIN 1.7225)/4140/EN19C	DIN EN 10083-3:2007 / ASTM A29																																													
Chemical Composition	<table><tr><th>Element</th><th>Symbol</th><th>42CrMo4/(DIN 1.7725Wt. %</th><th>AISI 4140</th><th>EN 19C</th></tr><tr><td>Carbon</td><td>C</td><td>0.38 – 0.45</td><td>0.38-0.43</td><td>0.40 to 0.45</td></tr><tr><td>Manganese</td><td>Mn</td><td>0.60 – 0.90</td><td>0.75-1.00</td><td>0.5 to 0.8</td></tr><tr><td>Sulfur</td><td>S</td><td>0.035 Max</td><td>0.040 Max</td><td>0.05 Max</td></tr><tr><td>Phosphorous</td><td>P</td><td>0.035 Max</td><td>0.035 Max</td><td>0.05 Max</td></tr><tr><td>Silicon</td><td>Si</td><td>0.40 Max</td><td>0.15-0.35</td><td>0.10 to 0.35</td></tr><tr><td>Chromium</td><td>Cr</td><td>0.90 – 1.20</td><td>0.80-1.10</td><td>0.9 to 1.2</td></tr><tr><td>Molybdenum</td><td>Mo</td><td>0.15 – 0.30</td><td>0.15-0.25</td><td>0.2 to 0.35</td></tr><tr><td>Iron</td><td>Fe</td><td>Balance</td><td>Balance</td><td>Balance</td></tr></table>	Element	Symbol	42CrMo4/(DIN 1.7725Wt. %	AISI 4140	EN 19C	Carbon	C	0.38 – 0.45	0.38-0.43	0.40 to 0.45	Manganese	Mn	0.60 – 0.90	0.75-1.00	0.5 to 0.8	Sulfur	S	0.035 Max	0.040 Max	0.05 Max	Phosphorous	P	0.035 Max	0.035 Max	0.05 Max	Silicon	Si	0.40 Max	0.15-0.35	0.10 to 0.35	Chromium	Cr	0.90 – 1.20	0.80-1.10	0.9 to 1.2	Molybdenum	Mo	0.15 – 0.30	0.15-0.25	0.2 to 0.35	Iron	Fe	Balance	Balance	Balance	
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Iron	Fe	Balance	Balance	Balance																																											
Melting	Melting by : Electric Arc Furnace +Refining/Degassing																																														
Shape and Size	Length and size as per the purchase order Dimensional Tolerance as per the Reference Standard	ASTM A484/ A484M																																													
Delivery Condition	<ul style="list-style-type: none">Quenched and TemperedHardness: 290 to 330 BHN (29 HRc to 33 HRc)Tensile Strength , Rm MPa 900 – 1200Yield Strength 0.2%, Rp MPa 650MinElongation: 11% MinV- Notch Impact properties 35J Min Room TempGrain Size :# 6 or Smaller	ASTM A370-12A ASTM E10 ASTM E112-12 ASTM E23																																													
Surface Defect	Shall be Free from any Surface Defects like Laps/ Seems, scabs, Slivers, crack or fissure																																														
Inspection Report	<ul style="list-style-type: none">The supplier shall provide the raw material certificate that includes the information below:<ul style="list-style-type: none">Material Specification.Dimensions of the Raw material.Heat NumberChemical CompositionHeat treatment condition cycle parameters (time and temperature).Mechanical properties(Hardness , Tensile, Impact)Metallographic TestGrain SizeCertificate of Compliance with reference to our Purchase Order.	EN 10204:2001 Inspection certificate 3.1																																													
NDT	Ultrasonic 100 % Inspection shall be carried out and	ASTM A388 M																																													

Inspection	reported in MTC Dimensional and Visual Inspection	
Packing	<ul style="list-style-type: none"> Each bar or block shall be permanently labeled with the material grade and Heat number. Bars shall be protected by oil and prepared for sea transportation. 	

9 RELATED RECORDS & REPORTS

FORM ID NUMBER	RECORD REPORT NAME
NA	NA

10 DISTRIBUTION OF DOCUMENT

No.	Receivers of document
1	Material Lab
2	HST
3	Procurement

11 DOCUMENT REVISION HISTORY

Revision	Page/ Paragraph	Changes description
00	-	Initial Issue