**TECHNICAL SPECIFICATIONS FOR INTERNAL COMBUSTION ENGINE**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **1** | **General:** | | | |
| Make | **:** |  | |
| Model | **:** |  | |
| Type | **:** |  | |
| Name & address of manufacturer | **:** |  | |
| Name & address of applicant | **:** |  | |
| Country of origin | **:** |  | |
| Year of manufacture | **:** |  | |
| Engine serial No | **:** |  | |
| Max. Torque, Nm | **:** |  | |
| Speed at max. Torque, rpm | **:** |  | |
| Maximum Power, kW | **:** |  | |
| Rated power, kW | **:** |  | |
| Maximum torque, N-m | **:** |  | |
| **Engine speed (Manufacturer’s Recommended settings), rpm:** | | | |
| Maximum speed at no load | **:** |  | |
| Rated speed | **:** |  | |
| Low idle speed | **:** |  | |
| Engine speed corresponding to Max. Power | **:** |  | |
| Engine speed corresponding to Rated Power | **:** |  | |
| Engine speed corresponding to maximum torque | **:** |  | |
| Max. Engine oil temperature, °C | **:** |  | |
| Max. Coolant/liner wall temperature, °C | **:** |  | |
| Compliance with Emission Norms (Yes/ No) | **:** |  | |
| If yes, then specify valid Emission Certificate No. and upload copy of the certificate |  |  | |
| **2** | **Cylinder and cylinder head:** | | | |
| Number | **:** |  | |
| Disposition | **:** |  | |
| Bore/Stroke ,mm | **:** |  | |
| Capacity , cc | **:** |  | |
| Compression ratio | **:** |  | |
| Type of cylinder head | **:** |  | |
| Type of cylinder liner | **:** |  | |
| Type of combustion chamber | **:** |  | |
| Arrangement of valves | **:** |  | |
| **Valve clearance, mm:** |  |  | |
| -Inlet | **:** |  | |
| -Exhaust | **:** |  | |
| **3** | **Fuel system:** | **:** |  | |
| Type of fuel system | **:** |  | |
| Capacity of fuel tank, l | **:** |  | |
| **3.1** | **Fuel feed pump:** |  |  | |
| Type | **:** |  | |
| Make & model/group combination number of feed pump |  |  | |
| Provision of sediment bowl | **:** |  | |
| **3.2** | **Fuel filter:** |  |  | |
| Type | **:** |  | |
| Make & model/group combination number of fuel filter | **:** |  | |
| Numbers | **:** |  | |
| Type of element | **:** |  | |
| Capacity of final stage filter, l | **:** |  | |
| **3.3** | **Ignition:** |  |  | |
| Type | **:** |  | |
| Magneto contact breaker point gap, mm | **:** |  | |
| Ignition timing | **:** |  | |
| **3.4** | **Fuel Injection pump:** | | | |
| Make & model group combination number | **:** |  | |
| Type | **:** |  | |
| Serial number | **:** |  | |
| Method of drive | **:** |  | |
| **3.5** | **Fuel injector:** | **:** |  | |
| Make & Model group combination number | **:** |  | |
| Type | **:** |  | |
| Manufacturer’s production pressure setting , Mpa | **:** |  | |
| Injection timing | **:** |  | |
| Firing order | **:** |  | |
| **3.6** | **Governor:** | **:** |  | |
| Make & Model | **:** |  | |
| Type | **:** |  | |
| Governed range of engine speed, rpm | **:** |  | |
| Rated speed, rpm | **:** |  | |
| **3.7** | **Spark plug (if applicable):** | | | |
| Make | **:** |  | |
| Electrode gap, mm | **:** |  | |
| **3.8** | **Carburettor (if applicable):** |  |  | |
| Make | **:** |  | |
| Type | **:** |  | |
| **4** | **Air intake system:** | **:** |  | |
| Type | : |  | |
| **4.1** | **Pre-cleaner:** |  |  | |
| Type | **:** |  | |
| Make & model | **:** |  | |
| Number | **:** |  | |
| Location | **:** |  | |
| **4.2** | **Air cleaner:** |  |  | |
| Type | **:** |  | |
| Make & model | **:** |  | |
| Number | **:** |  | |
| Location | **:** |  | |
| No. & type of element | **:** |  | |
| Oil capacity (Oil bath type),l | **:** |  | |
| Recommended grade of oil | **:** |  | |
| Recommended service schedule, h | **:** |  | |
| **Size of element (dry type), mm:** |  | **Primary (outer)** | **Secondary (inner)** |
| -ID/OD | **:** |  | |
| -Length |  |  | |
| Provision of service indicator | **:** |  | |
| Provision of dust unloading valve | **:** |  | |
| Range of suction pressure at maximum power, kPa | **:** |  | |
| **5** | **Exhaust:** |  |  | |
| Type | **:** |  | |
| Make & model | **:** |  | |
| Number | **:** |  | |
| Location | **:** |  | |
| Shape & Size of muffler | **:** |  | |
| Provision of spark arresting device/any other device | **:** |  | |
| Range of exhaust gas pressure at maximum power, kPa | **:** |  | |
| **5.1** | **Details of turbo charger:** |  |  | |
| Make & model | **:** |  | |
| Part No. | **:** |  | |
| No. of fan/wheel | **:** |  | |
| No. of blades: |  |  | |
| -Turbine wheel | **:** |  | |
| -Compressor wheel | **:** |  | |
| Method of drive | **:** |  | |
| Means of lubrication | **:** |  | |
| **5.2** | **Charged air cooler (CAC) unit:** |  |  | |
| Type | **:** |  | |
| Make | **:** |  | |
| Size( L×W×H), mm | **:** |  | |
| No of Tubes | **:** |  | |
| **5.3** | **EGR:** |  |  | |
| Make | **:** |  | |
| Type | **:** |  | |
| Part No. | **:** |  | |
| **5.4** | **Exhaust treatment system:** |  |  | |
| **5.4.1** | **Diesel Oxidation Catalyst (DOC):** |  |  | |
| Make | **:** |  | |
| DOC description | **:** |  | |
| Part No. | **:** |  | |
| Location | **:** |  | |
| **5.4.2** | **Selective catalyst Reduction (SCR):** |  |  | |
| Make | **:** |  | |
| Description | **:** |  | |
| Location | **:** |  | |
| **5.4.3** | **Details of diesel exhaust fluid tank:** |  |  | |
| Capacity, l | **:** |  | |
| Location | **:** |  | |
| Material of construction | **:** |  | |
| Provision of draining | **:** |  | |
| Recommended diesel exhaust fluid | **:** |  | |
| **6** | **Lubrication system:** | **:** |  | |
| Type | **:** |  | |
| Type of lubricating oil pump | **:** |  | |
| Lubricating oil pump speed corresponding to rated engine speed , rpm |  |  | |
| Capacity of lubricating oil pump at rated engine speed, l/min | **:** |  | |
| Relief valve pressure setting, kg/cm2 | **:** |  | |
| Oil sump capacity, l |  |  | |
| Recommended grade of lubricating oil | **:** |  | |
| Oil change period, h | **:** | First change after….......hrs then subsequent changes after every …... hours of operation | |
| Minimum permissible lubricating oil pressure, kg/cm2 | **:** |  | |
| Maximum permissible lubricating oil temperature, oC | **:** |  | |
| Method of oil cooling | **:** |  | |
| **6.1** | **Oil cooler:** |  |  | |
| Type | **:** |  | |
| Make & model |  |  | |
| Part No. | **:** |  | |
| No. of plates | **:** |  | |
| **6.2** | **Filter:** |  |  | |
| Type | **:** |  | |
| Number | **:** |  | |
| Location | **:** |  | |
| Type of element | **:** |  | |
| **7** | **Cooling System:** |  |  | |
| Type | **:** |  | |
| **7.1** | **Water pump/blower:** |  |  | |
| Type | **:** |  | |
| Make | **:** |  | |
| Size of impeller/blower, mm | **:** |  | |
| No. of vanes/blades | **:** |  | |
| Method of drive | **:** |  | |
| **7.2** | **Details of fan:** |  |  | |
| Type | **:** |  | |
| Material | **:** |  | |
| No. of blades | **:** |  | |
| Diameter, mm | **:** |  | |
| **7.3** | **Radiator:** |  |  | |
| Make | **:** |  | |
| Part No. | **:** |  | |
| Sr. No. | **:** |  | |
| Size of radiator (W × H × T), mm | **:** |  | |
| No. of tubes | **:** |  | |
| Type of radiator cap | **:** |  | |
| Radiator cap pressure | **:** |  | |
| Means of temperature control | **:** |  | |
| Type of thermostat | **:** |  | |
| Bare radiator capacity, l | **:** |  | |
| Total coolant capacity | **:** |  | |
| Type of coolant recommended | **:** |  | |
| Coolant water ratio recommended | **:** |  | |
| Type of radiator grill | **:** |  | |
| Means of grill cleaning | **:** |  | |
| Maximum permissible coolant temperature, oC | **:** |  | |
| **8** | **Air compressor** | **:** |  | |
| **9** | **Starting system:** |  |  | |
| Type | **:** |  | |
| Aid for cold starting | **:** |  | |
| Any other device for easy starting | **:** |  | |
| **10** | **Electrical System:** |  |  | |
| **10.1** | **Battery:** |  |  | |
| Make & model | **:** |  | |
| Number & Type | **:** |  | |
| Capacity & rating | **:** |  | |
| Location | **:** |  | |
| **10.2** | **Starter motor:** |  |  | |
| Make | **:** |  | |
| Type | **:** |  | |
| Model | **:** |  | |
| Capacity/power | **:** |  | |
| Sr. No./Part No. | **:** |  | |
| Location | **:** |  | |
| **10.3** | **Alternator:** |  |  | |
| Make | **:** |  | |
| Type | **:** |  | |
| Model | **:** |  | |
| Output rating | **:** |  | |
| Sr. No./Part No. | **:** |  | |
| Location | **:** |  | |
| Method of drive | **:** |  | |
| **11** | **Overall dimensions, mm:** |  |  | |
|  | -Length | **:** |  | |
|  | -Width | **:** |  | |
|  | -Height | **:** |  | |
| **12** | **Weight, kg** | **:** |  | |
| **13** | **Colour** | **:** |  | |
| **14** | **Labelling plate:** |  |  | |
|  |  |  |  | |

**SELECTED PERFORMANCE AND OTHER CHARACTERISTICS AS PER IS 15806-2018**

**(TO BE DECLARED BY THE APPLICANT IF THE INTENDED USE OF ENGINE IS FOR COMBINE HARVESTER)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **S. No** | **Characteristics** | | **Category (Evaluative/Non evaluative)** | **Requirement** | **Tolerance** | **Declarati-on by applicant** | **Remarks** |
| **1** | **2** | | **3** | **4** | **5** | **6** | **7** |
| **1.** | **Prime mover performance:** | | | | | | |
|  | **a)** | Max. Power (absolute) - Average max. power observed during 2 hrs. max. power test in natural ambient condition, kW | Evaluative | To be declared by manufacturer | Declared value to be achieved with a tolerance of ±5% |  |  |
| **b)** | Max. power observed during test after adjusting the no load engine speed as per recommendation of the manufacturer for field work, kW | Evaluative | To be declared by manufacturer | -do- |  |  |
| **c)** | Power at rated engine speed, kW (under natural ambient condition) | Non-Evaluative | To be declared by manufacturer | -do- |  |  |
| **d)** | Specific fuel consumption corresponding to average maximum power under 2h maximum power test, g/kWh. | Evaluative | -do- | +5%(Max.) |  |  |
| **e)** | Max. smoke density (Bosch no.) at 80 percent load between the speed at max. power and 55 percent of speed at max. power or 1000 rpm whichever is higher. | Evaluative | As per CMV rules. | Nil | - |  |
| **f)** | Max. crank shaft torque, (Nm) observed during the test after no load engine speed is adjusted as per manufacturer’s recommendation for field work | Evaluative | To be declared by manufacturer | ±8% |  |  |
| **g)** | Back up torque, % | Evaluative | 7 percent, (Min.) | Nil | - |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1** | **2** | | **3** | **4** | | **5** | | **6** | | **7** |
|  | **h)** | **Max. Operating temperature, 0C:** | | | | | | | | |
| **i)** | Engine oil | Evaluative | To be declared by manufacturer | | Nil | |  | The observed value under the high ambient condition should not exceed maximum safe value specified by the oil company which will be provided by the applicant | |
| **ii)** | Coolant | Evaluative | To be declared by manufacturer | | Nil | |  | The declared value should not exceed the boiling temperature of coolant under the pressurized or otherwise and the observed value under high ambient condition should not exceed the declaration. | |
| **i)** | Lubrication oil consumption, g/kWh | Evaluative | Not exceeding 1 % of specific fuel consumption at maximum power under high ambient condition | | Nil | |  | The value would be based on the test conducted under high ambient condition | |
| **2. Air cleaner oil pull over:** | | | | | | | | | | |
|  | **i)** | Max. oil pull over in percentage when tested in accordance with IS: 8122. (Part-2)-2000 | Evaluative | | 0.20% max. | Nil |  | |  | |
| **3** | **Discard Limits :** | | | | | | | | | |
|  | **a)** | Cylinder bore diameter, mm | Evaluative | | To be declared by manufacturer | Should not exceed the values declared by the manufacture |  | |  | |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **1** | **2** | | **3** | **4** | **5** | **6** | **7** |
|  | **b)** | Piston diameter, mm | Evaluative | To be declared by manufacturer | -do- |  |  |
|  | **c)** | Piston to cylinder liner clearance at skirt, mm | Evaluative | To be declared by manufacturer | -do- |  |  |
|  | **d)** | Ring end gap, mm  i) Top compression ring  ii) 2nd compression ring  iii) Oil ring | Evaluative | To be declared by manufacturer | -do- |  |  |
|  | **e)** | Ring groove clearance, mm  i) Top compression ring  ii) 2nd compression ring  iii) Oil ring | Evaluative | To be declared by manufacturer | -do- |  |  |
|  | **f)** | Diametrical and axial clearance of big end bearing, mm  Diametrical  Axial | Evaluative | To be declared by manufacturer | -do- |  |  |
|  | **g)** | Diametrical and axial clearance of main bearings, mm  Diametrical  Crank shaft end float | Evaluative | To be declared by manufacturer | -do- |  |  |

**Place: Signature------------------------------------------**

**Date:** Name of the applicant---------------------------

Designation---------------------------------------

Address-------------------------------------------