

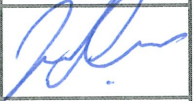


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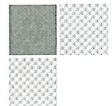
# Gaziray Commuter Train Project Resilient Block Technical Specification

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**IV. LIST OF ACRONYMS & ABBREVIATIONS**

<b>TCDD</b>	General Directorate of Turkish State Railways
<b>TÜRASAS</b>	Turkish Railway Vehicle Industry Inc.
<b>ADMINISTRATION</b>	TÜRASAS
<b>CLIENT</b>	Institution to use the train set
<b>BIDDER</b>	The company that will bid for this specification
<b>EMU</b>	Electrical Multiple Unit
<b>TSI</b>	Technical Specification for Interoperability
<b>EN</b>	European Norm
<b>NoBo</b>	Notified Body
<b>RAMS</b>	Reliability, Availability, Maintainability, Safety
<b>LCC</b>	Life Cycle Cost
<b>LRU</b>	Line Replaceable Unit
<b>FAI</b>	First Article Inspection
<b>N/A</b>	Not Applicable
<b>SAF</b>	Service Affecting Failure
<b>MTBF</b>	Mean Time Between Failures
<b>FPMK</b>	Failures per Million Kilometres
<b>MKBF</b>	Mean Kilometres Between Failure
<b>TBD</b>	To be Defined
<b>UIC</b>	Union International Chemin de Fer
<b>I/F</b>	Interfaces
<b>ISO</b>	International Organization of Standardization
<b>DeBo</b>	Designated Body



## 1 INTRODUCTION

### 1.1 SUBJECT

This document describes the technical requirements for the procurement of the “**Resilient Block**” to be installed on the Electrical Multiple Units (hereafter called EMU) produced by Turkish Railway Vehicles Industry Inc. (hereafter called TÜRASAŞ).

The Bidder shall offer a solution totally compliant with the requirements of this specification. After signing the contract, possible deviations from this specification or from other specifications and norms mentioned in this document, shall be validated by written agreements between TÜRASAŞ and the Supplier.

The Bidder shall make clause by clause comment into present technical specification together with their offer.

#### **IMPORTANT NOTE:**

The present document shall be examined by the Bidder, together with following document:

**TS-01.0139 –General Technical Specification**

in order to know general applicable requirements established at train level.

This Technical specification and its annexes already prepared in Turkish and English language. The Turkish language shall be prevailing in case of any discrepancy among them.

### 1.2 DEFINITIONS

Within this Technical System Specification, the following definitions are applied to the words reported below:

- “the Administration” means the Turkish Railway Vehicles Industry Inc. (hereafter called TÜRASAŞ)
- “the Supplier” means the company who wins the tender to supply the good object of this specification
- “documentation” means all or any specifications, drawings, reports, networks, operating and maintenance manuals and all other information whether on paper or on magnetic or other format which is prepared by the Supplier in the course of the contract
- “the Bidder” means the company who want to join to the tender to supply the good object of this specification

### 1.3 DOCUMENTS AND STANDARDS

The EMU shall be designed, assembled and tested according to the following international reference standards:

European Standards: TSI, EN;  
International standards: UIC; ISO; IEC;

System of units shall be SI.

Table 1 reports the Applicable Standards for the Scope of Supply.

Standard	Title
EN 12663-1:2010	Railway -applications - Structural requirements of railway vehicle bodies Part 1: Locomotives and passenger rolling stock (and alternative method for freight wagons)
EN 45545 1-2:2020	Railway applications - Fire protection on railway vehicles - Part 2: Requirements for fire behavior of materials and components
EN 50125-1:2014	Railway applications - Environmental conditions for equipment Part 1: Rolling stock and on-board equipment
EN ISO 14040:2006	Environmental management - Life cycle assessment - Principles and framework
IEC 61373:2010/AC:2017	Railway applications. Rolling stock equipment. Shock and vibration tests
UIC 566:1990	Loading of coach bodies and their components
UIC 651:2002	Layout of driver's cabs in locomotives, railcars, multiple units trains and driving trailers
ISO 9142:2003	Adhesive – Guide to the selection of standard laboratory ageing conditions for testing bonded joints
TSI LOC&PAS 1302:2014	TSI LOC&PAS on the technical specification for interoperability relating to the 'rolling stock - locomotives and passenger rolling stock' subsystem of the rail system in the European Union

**Table 1 – Applicable Standards**

If it is not differently specified, the applicable version of the standards mentioned in the text of the document is the one specified in Annex 1 of “TS-01.139 –General Technical Specification” or in the above table.

The Bidder shall review and confirm compliancy to the above list of applicable norms, any deviation shall be submitted to TÜRASAŞ for approval.

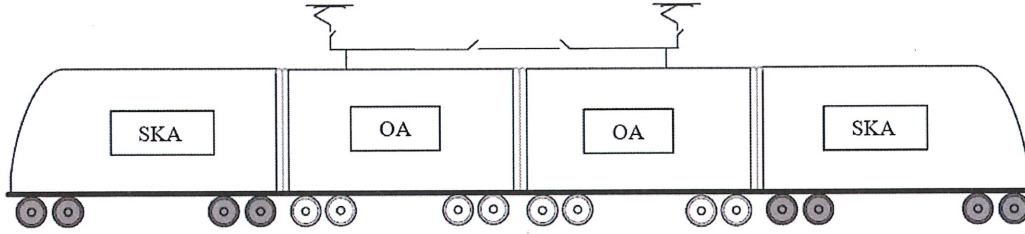
The Bidder shall declare if its system/equipment is compliant with other national/international or railroad administration standards not mentioned in the above list.

### 1.4 EMU TRAIN-SET CONFIGURATION

EMU is composed by:

- 4 cars: SKA car, OA car, OA car: SKA car





**Figure 1 – EMU train-set**

The types of car are hereafter:

SKA = Leading car with driver cab  
OA = Intermediate car

## **1.5 EMU TRAIN-SET MULTIPLE CONFIGURATION**

The configurations foreseen for the multiple unit operation are the following:

- 4 cars + 4 cars
- 4 cars + 4 cars + 4 cars (as to comply with GBB requirements)

## **2 SCOPE OF SUPPLY**

### **2.1 HARDWARE**

The Supplier shall provide all relevant components related to the manufacturing and assembly of the resilient block according to this technical specification including the fixing elements.

### **2.2 CONFORMITY TO THE PROJECT REQUIREMENTS**

The EMU train set shall be certified according to current version TSI PAS/LOC, TSI NOI, TSI PRM, TSI SRT and TSI CCS by Notified Body (NoBo) / Designated Body (DeBo). The Supplier shall provide whole calculations, drawings, analysis, test reports and other kind of documentation which is requested by TSIs for the present Scope of Supply.

The Supplier/Bidder shall provide the declaration of conformity of its Scope of Supply to the relevant technical specifications and applicable norms.

The documentation presented by the Supplier/Bidder relevant to the Conformity report with all conformity evidences and test reports will be examined for approval by the Notified Body / Designated Body (DeBo) in charge of TSI certification of the EMU nominated by the Company.

### **2.3 SCOPE OF SUPPLY PROJECT MANAGEMENT**

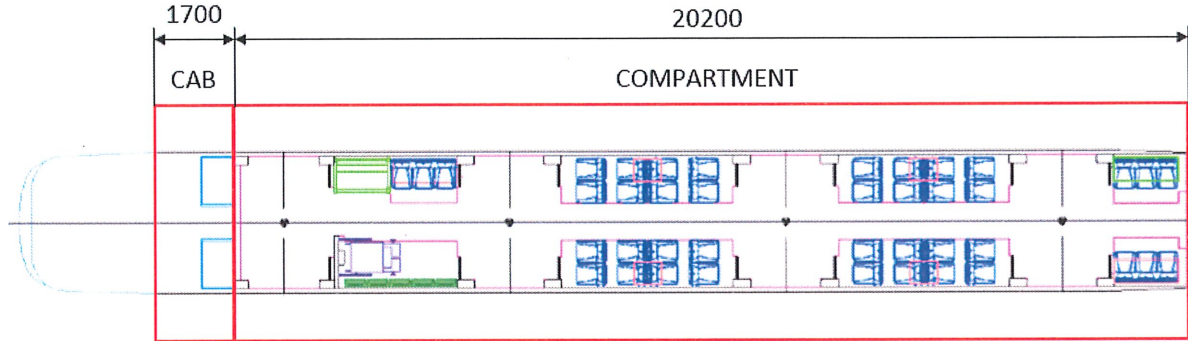
#### **2.3.1 Authorisation to start manufacturing**

Supplier shall submit a resilient block sample to the Administration. Following the reciprocal meeting, the approval of the submitted sample by the Administration will be authorized to start production.

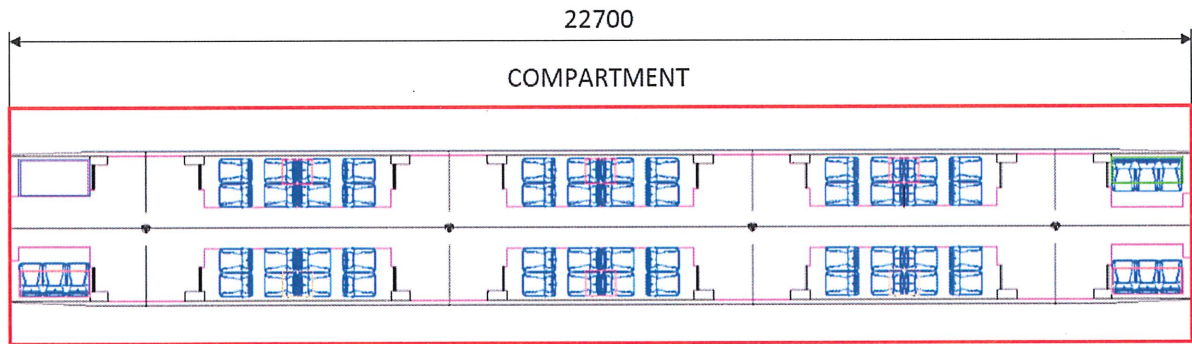
### 3 TECHNICAL REQUIREMENTS

#### 3.1 INTRODUCTION

##### 3.1.1 Coaches layout area



**Figure 2 – SKA floor layout**



**Figure 3 – OA floor layout**

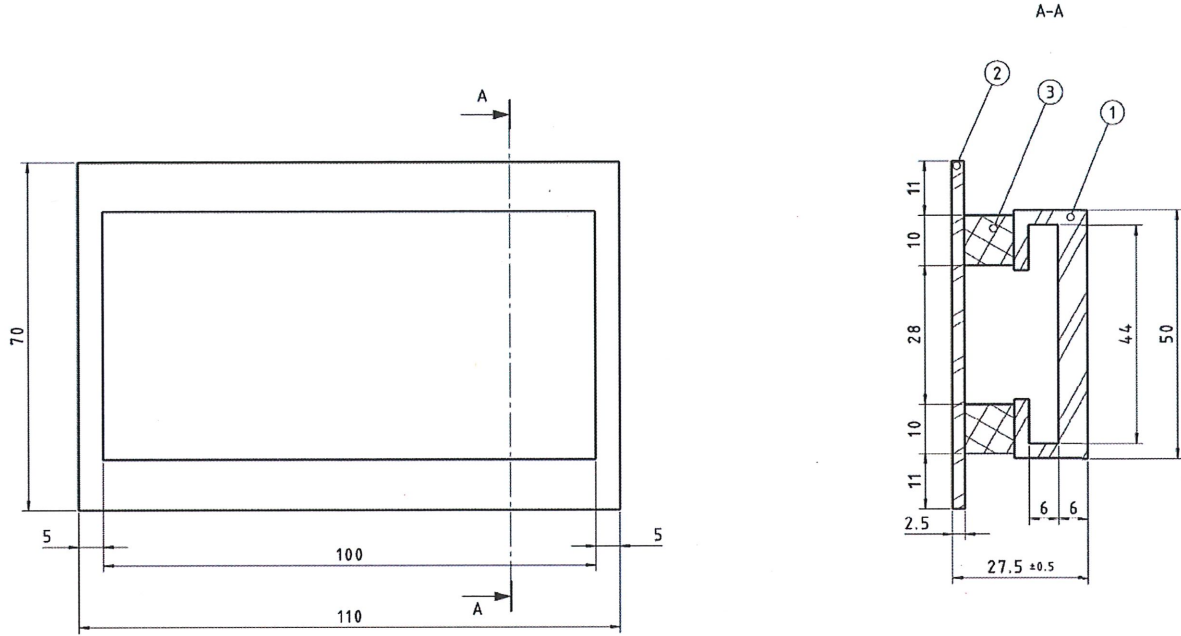
#### 3.2 PRODUCT DEFINITION

A data sheet with the dimensions and the characteristics of the anti-vibration mounts is shown in the figure below.

Technical features:

- Static rigidity 109 daN/mm  $\pm$ 15 (displacement measured between 0.5 mm and 1 mm)
- Dynamic rigidity: 182 daN/mm  $\pm$ 20 with a frequency  $f=25$  Hz
- Natural frequency with a load  $L=70$  kg:  $f= 25$  Hz





**Figure 4 – Anti-vibration mount dimensions**

**Note:** The undefined dimensions will be given in the 3D data in the Appendix.

- Pos. 1: AW 6005A T6
- Pos. 2: AW 5754 H22
- Pos. 3: Elastomer: Chloroprene rubber according to standard EN45545-2 R10 HL2, Shore Hardness 45±5 ShA

### 3.2.1 Anti-vibration mounts quantity

The approximate quantity of anti-vibration mounts is listed in the table below:

Number of anti-vibration mounts			
Cabin	SKA (except cabin)	OA	Total 1 Train Set
45	560	630	2470

**Table 2 – Quantity of anti-vibration mounts**

The exact number of anti-vibration mounts will be defined in detail phase.

### 3.2.2 Structural requirements

The antivibration mounts shall comply with EN 12663-1 for passenger train Category P-II. For the loads not specified in EN 12663-1 the reference is the load stated in UIC 566.

## 3.3 WEIGHT

The target weights for a single anti-vibration mount shall be 0.200 kg.

### 3.4 MATERIAL REQUIREMENT

#### 3.4.1 Fire Resistance Behaviour

The train-set has been classified into Category A for rolling stock fire safety, according to TSI 2014/1302/EU LOC&PAS for interoperability operation.

The supplied system/equipment/components including all their elements therefore shall be compliant to the applicable sections of EN 45545 family norms (-1, -2, -3, -4, -5, -6).

In particular according to EN 45545-1 and -2 the train-set is ranked as 2N (or N2) where:

- 2 indicates the operation category
- N indicates the design category

The fire performance requirements established for materials are given by means of R(n) index reported by the EN 45545-2 “table 5”.

These performances requirements of materials and components depend not only on their intrinsic nature but also on the location, the shape and the layout, the surface exposure, the relative mass and the thickness of considered material. In “table 2” of the EN 45545-2 are listed different products and their location on the train-set to identify the relevant R(x) requirements.

The Bidder shall follow the instruction of paragraph 4.2 “General” and paragraph 4.3 “Grouping rules” with the flowchart of Figure 1 “Assessment Process – grouping rules” of EN 45545-2 not only to identify all the material eventually not mentioned hereafter or not mentioned at all in the “table 2”, but also to verify if the requirements are applicable or not (i.e. in case of small quantity, small mass, small exposed areas and so on).

To complete the punctual requirements identification in table 5, the Hazard Level “HL2” shall be used. This hazard level has been determined on the basis train-set classification 2N and it identifies the relevant tests pass-no-pass condition.

Concerning the materials used for the Scope of Supply of present Technical Specification following requirements have been identified.

Standart	Hazard Level	Requirement
EN45545:2020	HL2	R10 or R1 or R22

**Table 3 – Material Fire Requirements**

The Bidder/Supplier shall adopt materials with required characteristic and also identify other materials not mentioned above. The above R(x) list is not definitive; the Bidder/Supplier shall complete it according the materials used in the Scope of Supply.

The Bidder/Supplier shall give the list of the inflammable materials used with material type, quantity and fire resistance behaviour tests.

The documentation presented by the Bidder or the Supplier relevant fire performance will be examined for approval by the Notified Body / Designated Body in charge of certification of the Gaziray Project nominated by the TURASAS. The Supplier/Bidder shall be responsible to perform all necessary activities which are required by Notified Body / Designated Body.



## **4 GENERAL REQUIREMENT**

### **4.1 WARRANTY**

#### **4.1.1 Warranty conditions**

Supplier shall guarantee the quality of products within the scope of this specification against malfunctions, failures and assembly and workmanship defects.

While the warranty period is limited to 30 months starting with the date of delivery of the products to TÜRASAŞ, it is 24 months starting with the commercial commissioning of the EMU set.

The responsibility of performing preventive maintenance on the normally used parts and the protective maintenance in cases where it is evidently clear that the root cause is not the own malfunctions of the unit, shall belong to TÜRASAŞ.

Throughout the warranty period, following the notification by TÜRASAŞ of any malfunction, the Supplier shall respond to that malfunction within three (3) working days and replace the malfunctioning parts and equipment or repair and fix the malfunction.

### **4.2 ACCEPTANCE**

#### **4.2.1 Final Acceptance**

The final acceptance report will be published by the Administration after all products within the scope of the specification and all the documents specified in this specification or the standards referred to are delivered to the Administration.

### **4.3 PACKAGING, LABELLING AND STORAGE**

#### **4.3.1 Packaging**

System/equipment/components shall be delivered in suitable packages with adequate strength to be resistant against shocks and transportation damages including effects of dust, rain, snow, solar, wind etc. in the climatic conditions foreseen by the TŞ-01.139 Gaziray Commuter Train - General Technical Specification.

Packing boxes shall be convenient for stacking one on another and shall allow easy lifting by fork-lift truck (where reasonably applicable) or travelling bridge-crane

Following information shall be reported on the package (in a legible, non-erasable and non-removable mean).

- Name, address and registered logo of the manufacturer.
- Assembly Part Number and applicable Tech. Specification reference.
- Date of manufacturing and serial number (if applicable).
- Date and number of the contract.

Furthermore, if the content of a box consists of more than one component, a components list shall be added inside and outside of the box and each individual component shall be labelled. Definition of the content of these boxes shall be done with the participations of TÜRASAŞ. Lists of the boxes shall be finalized after approval of the lists by TÜRASAŞ. A copy of each list shall be sent to TÜRASAŞ at the beginning of the shipment.

**4.3.2 Labels/Marking**

The system/equipment/components supplied shall be provided with technical markings, in order to fulfil requirements of electrical safety, and provide information to maintenance personnel. Wherever required for health and safety purposes, including where necessary to comply with legislation, parts shall be fitted with suitable safety and warning signs.

In particular the parts supplied, including all replaceable parts, shall be identified by a label showing:

- Serial number.
- Data of manufacture.
- Supplier's part number (if any).
- Revision level.
- Company's part number (if any).

Format and positioning of all labels/markings shall be subject to approval by TÜRASAŞ. Wherever possible, the position shall be such that any company information (Logo and brand etc.. ) cannot be viewed when the relevant part is installed within the vehicle. All labels shall be permanent and indelible.

Any additional marking shall be by agreement between the supplier and TÜRASAŞ.

**4.3.3 Storage Conditions**

The Supplier shall provide any useful information it is deemed necessary for the correct storage of the goods delivered.

**4.3.4 Mounting and handling**

All the components shall be supplied ready for installation and possibly already mounted and pre-regulated.

Special care is requested to the Supplier to list all the necessary tools for mounting and maintenance.

**4.4 DOCUMENTATION TO BE SUPPLIED TO TÜRASAŞ**

The following tables report the list of requested documents (with schedule) to be supplied to TÜRASAŞ.

Table 4 shows the documentation which shall be given by the Bidders in the offer phase.

Table 5 shows the documentation which shall be provided by the Supplier for the Detail Technical Review respectively.

<b>Id.</b>	<b>Stage 1 -OFFER Phase</b>	<b>Time Schedule</b>	<b>Language</b>
1.1	Clause by Clause commentary of present Tech. Specification	With offer	Turkish
1.3	IRIS Certification or ISO 16949 of the Bidder (If the Bidder is an agency of the manufacturer, the Bidder shall show the manufacturer's certificate)		English

**Table 4 – Stage 1 Offer Phase: list of requested documents and due date**



Id.	Stage 2 - DETAIL Review	Time Schedule	Language
2.1	Certificates of the fire.smoke behaviour of non-metal materials and electric cables	Within 1 month after signing the contract	English

**Table 5 – Stage 2 list of requested documents and due date**

The Bidder shall review and confirm the above lists of documents for all the phases of the project. Any deviation shall be submitted to TÜRASAŞ for approval.

Notes:

- 3D models shall be provided in .step format.
- 2D drawings shall be provided in .dwg/dxf format.
- Electrical schemes shall be provided in .dwg/dxf format.
- Other documents shall be provided in an editable format and in .pdf format.
- In the documentation, the Turkish version shall prevail in case of utilisation both Turkish and English languages.
- All documents in stage 1 shall be provided as hardcopy and softcopy in “CD” or “USB”

**Annex 1 – Reference Documents**

Code	Document Description
TŞ-01.139	Gaziray Commuter Train Project - General Technical Specification
	3D Drawing

**END of DOCUMENT**