



## **GUIDELINES FOR THE APPROVAL**

### **OF NATURAL GAS APPLIANCE INSTALLATIONS IN ISRAEL**

#### **1 Scope**

These guidelines outline the regulatory and technical requirements and the roles and Responsibilities of the various industry participants involved in having natural gas appliance Installations approved for use in industrial premises.

The approval scheme for natural gas appliance installations is an inspection process designed to help to ensure the safety of people, plant and property.

The term 'gas appliance installation' refers to any natural gas appliance and natural gas-fired Process plant, from point of delivery of gas at the isolating main valve, at the connections of the gas supply piping system to the appliance, and including the appliance as a whole unit with its related accessories and sub systems.

This approval process, refers to any gas appliance, that is proposed to be installed, and in certain cases already installed, in industrial premises and includes, new, second-hand, converted, changeover equipment and to relocations and modifications of an approved gas appliance installation.

#### **2 Introduction**

These guidelines have been developed to outline the approval process and to assist factory operators to understand the regulatory and technical requirements and processes in having natural gas appliance installations in industrial premises approved for use in Israel.

Note: Each gas appliance proposed for installation or conversion must be separately submitted for approval.

It is essential that the factory operator uses this process to gain approval before buying or altering any equipment and before undertaking any associated work.



### **3 Terms used in this document, Roles and Responsibilities**

#### **Ministry**

The government department responsible for issuing the gas appliance installation permits, as was established by the government.

#### **SII**

The Standards Institute of Israel who have responsibility for operating and administering the approval process. As part of the approval process, SII will undertake inspections (of documentation and at site) of the gas appliance installation.

#### **Factory Operator**

Is the person requesting the approval of a gas appliance installation, either directly or via an Appointed agent, on behalf of the owner or operator of the appliances, that holds the responsibility of operating the appliance at the premises where it is installed.

The Factory Operator also has the responsibility to ensure the natural gas appliance installation is installed and commissioned by a Competent Body. The Factory Operator is responsible to accommodate and provide all installations needed, as well as Equipment to enable the test issued by SII on the site. His Competent Body will give any assistance and physical aids needed to perform those tests.

#### **Competent Body**

Is an individual, firm, corporation or company that either in person or through a representative is engaged in and is responsible for the connection, installation, commissioning, testing, repair, or servicing of appliances and equipment and:

- is experienced in such work and,
- is familiar with all precautions required and,
- has complied with all the requirements,
- Has the relevant licensee to make his work, under the Israeli laws.

Connection, installation, commissioning, testing, repair and servicing of gas appliance installations shall be performed by a Competent Body.

#### **Third-party certification**

Third-party certification involves an independent assessment declaring that specified requirements pertaining to a product or process have been met.



In this respect, a third-party is an accredited body which is entitled by an Accreditation Body, and holds certification as per ISO 17025 or ISO 17020, as required for the relevant standards and the personnel issuing the inspection, respectively. Upon definition of standards and regulations, the Accreditation Body may allow a Third-party to provide third-party certification and testing services. All this in order to ensure and assess compliance to the previously defined codes, but also to provide an official certification mark or a declaration of conformity.

In respect to this document, only Third-parties, that are accredited by one of the Accreditation Bodies (as is set in this document) and its headquarters is sited and registered in USA, EU or Israel are applicable.

### **Accreditation Body**

Organizations that issue credentials or certify third parties against official standards.

The accreditation process ensures that their certification practices are acceptable, typically meaning that they are competent to test and certify third parties, behave ethically and employ suitable quality assurance.

In respect to this document, only the following Accreditation Bodies, are applicable:

- United States Occupational Safety and Health Administration (OSHA), which designates Nationally Recognized Testing Laboratory (NRTL)
- Any Accreditation Body that is recognized and listed by The International Laboratory Accreditation Cooperation (ILAC MRA) as ISRAC (The Israel Laboratory Accreditation Authority)

## **4 Definitions**

### **Changeover**

Is the changeover of a fuel burning appliance to natural gas by exchanging a complete self-contained package of burner and control equipment. For example, on a boiler, changing an existing packaged burner system, with a replacement certificated packaged burner and control system operating on natural gas alone, dual or multi fuels.

### **Conversion**

Is the alteration of a fuel burning appliance to operate on natural gas. This may use standard available manufactured components and controls or require a bespoke design.



### **Relocation**

Is the movement of an approved gas appliance installation to a different position or location. The change in surroundings or environment will be re-assessed by the approval process.

### **Modification**

Is the alteration of an approved gas appliance installation which affects or deviates from the original approval. This could be a proposed change to the burner or control system which is required by changes to the output conditions of the gas appliance installation.

### **Commissioning**

Is the initial start-up of a gas appliance installation resulting in safe, reliable and efficient subsequent operation.

## **5 Approval Process**

The process applies to any gas appliance installation proposed to be installed, or in certain cases already installed, in industrial premises. This includes, new, second-hand (used), converted and change over equipment, as well as to relocations and modifications of approved gas appliance installations. The Standards which are used to assess the gas appliance installation are given in Appendix3.

It should be emphasized, that all on-site inspections made by SII, are all visual and if any means needed to run those tests are needed, they will be fully provided by the Factory Operator, excluding testing/measuring instruments that will be submitted by SII.

### **5.1 Application and approval Procedure**

a) Any proposed gas appliance- New, Second-hand, Change-over, Conversion, Relocation or Modification- must meet an acceptable standard (as per Appendix3), before it can be submitted for approval.

Appendix1 lists the gas appliance selection criteria which are acceptable to SII.

Gas appliances not meeting these criteria should not be submitted for approval.

General scheme of the procedure is given in block-diagram in Appendix5.

b) Acceptable gas appliances can be submitted for approval by submitting the application in the form given In Appendix2. If any appliance was previously approved, according to this process,



i.e. relocation or modification, then the approvals and any relevant documentation should be provided with the application, as part of the re-assessment of the existing appliance.

c) After inspecting the submitted information, SII will inform the Factory Operator if the gas appliance installation application is satisfactory.

d) When the appliance has been installed (without the gas supply connected) and is ready for inspection, SII shall be advised.

e) The gas appliance installation will be inspected by SII.

f) If the gas appliance installation is acceptable the results will be submitted to the Ministry and a **'permit for connection and commissioning' Only** will be issued, by the Ministry representative, to enable the gas appliance installation to be connected to the gas supply and commissioned.

The gas appliance installation shall not be further used until the inspection by SII.

g) SII should be advised when commissioning is to take place.

h) The installation will be inspected by SII at the time of or following commissioning.

i) If the installation is acceptable the results will be submitted to the Ministry and a **permit for use** will be issued, by the Ministry representative, to allow the gas appliance to be used, with a limit of time (usually not more than 3 years) to call the next periodic re-inspection and **renew the permit for use**.

j) SII may combine the two separate stages: commissioning and then final inspection, to one stage, and issue a final report, according to complexity or procedures of inspection.



### **Appendix1- Gas Appliance selection**

The following criteria have been developed to aid the identification of gas appliance which is acceptable for submission for installation approval in Israel.

This criterion is based on the fact that the majority of gas appliances will already have some form of approval for use within the European Community (EU) or USA, but recognizes the existence of equipment which is used elsewhere.

In all cases the gas appliance must be supplied with comprehensive installation, commissioning and operating instructions.

Guidance on the contents of a Technical File is given in Appendix4.

The following list of options is given in order of acceptability for use in Israel.

It should be recognized that appliances falling lower down the list will require more evidence to be supplied and in some cases some form of external validation.

#### **New or Used Gas, Change-Over and Conversion appliance, for use in industrial premises should be:**

1. Certificated to a European or American ,by an appropriate Third-party, for the type and size of appliance or plant for which certification is practicable.
2. Declared by the manufacturer of the appliance or plant to be in conformity with the essential requirements of the relevant EU Directives or American standards or codes requirements and evidenced, supported by relevant certifications in the Technical File. This declaration should be in addition to the above certifications.
3. Where appliances or plant and/or parts of an appliance or plant are involved for which no Certification, European Standard, American Standard, National Standard, or Code of Practice, Industry Standard exist, or where a certification exists, but in respect to standards that are out of the list given in Appendix3, then the appliance should be validated to the relevant standards and codes listed in Appendix3 by an appropriate Third-party, that will issue the certification needed, attached with the Technical File.
4. Any other case will be rejected.



## **Appendix2 - Information Required for**

### **Gas Appliance Installation Approval Application**

All this information will be provided in well-organized one hard copy application form, and with 3 copies of color-scanned, in PDF format, of the full application documentation

Business Name & Address:

Contact name & number:

Qualified Agents details:

Appliance/Process:

Category (New/Used/Conversion/Changeover/Dual-Fuel)

If Conversion/Changeover, from which fuel?

Type (boiler/oven/kiln/dryer etc.):

Make & Model:

Country of Manufacture (if indicated):

Rating given on data badge (kW/Btu/MJ stating: input or output and gross or net):

Burner type (natural draught/fanned air supply):

Condition (new/used/reconditioned):

Installation date (planned):

Electrical supply (voltage & single or 3-phase)

If Process:

Burner:

Controls:

Operating Temperature:

Isolation valves (number, size, make & model):



Flue:

Type (natural or forced):

Size:

Shared/dedicated:

Termination Point:

Use:

Indicate pattern of use (hours per day/days per week)

Process performance data (heating up time, throughput):

Gas Supply:

Supply Pressure:

Inlet pipework size:

If Dual or Mufti Fuel burners:

All supply and process specifications for fuels, and its modes of operation.

Location:

Outside (describe location):

Inside (describe room and use/occupancy):

Other Appliances:

Are other gas/oil/biomass fired appliances fitted in the same area?

**Additional Information:**

You **must** supply:-

Photograph of the appliance & burner data plate

Photograph of appliance/process and installation

Copy of appliance information

Copy of installation, commissioning & operating instructions

Any supplementary appliance information

Site plan showing position of appliance/process & flue and site layout (plans and photographs)

Process diagram of production relating directly to the appliance, with capacities, peripheral temperatures, air circulation, venting facilities, pits or floor obstacles, emergency outlets and other safety issues, fire extinguishers, and gas leak detectors, if exists and their type and specifications.

Safety and emergency breakouts of electric and gas supply in connection to the appliance/process.

Any additional information that can help the understanding of the appliance.

**In case of Pressure Vessel** – the applicant need to add the following documents:

1. A detailed drawing for every type of pressure vessel for our design approval.
2. Welding processes used during the production.
3. Welders and welder's operators certificates used during the production.
4. Steel mill certificates for the plates, heads and flanges, specifying the mechanical properties and chemical composition of the raw material.
5. Hydrostatic test certificate for every pressure vessel.
6. Pressure vessel's scheme bearing the following:
  - 6.1. Location of heads and steel plates including heat numbers.
  - 6.2. The welder's name and identification of the welding procedure for each seam.
  - 6.3. The location of the radiographic inspection (if needed) for every seam on the pressure vessel.
  - 6.4. The welding process identification for every seam.
7. The radiographic inspection results (if needed) for every seam.
8. Vacuum test certificate (if needed) including the diagram.
9. Heat treatment (if needed) including the diagram.
10. A photocopy of the name plate of the pressure vessel, including all details required by IS 4295 para 5.
11. The route card for the pressure vessel's production. The route card should be full and signed by the manufacturer and the inspection body, for every stage of the production.

**In case of Steam Boiler** – the applicant need to add the following documents:

1. A detailed technical drawing that includes among others the design standard, raw materials specification, design pressure, test pressure, details of welded joints, details of wps's, openings orientation, design temperature, joint efficiency, thermal treatment (if applicable), non-destructive tests.
2. Steam boiler design calculations that includes among others, wall thickness calculation of all pressure parts, openings calculations, lifting lugs, supports, wind loads, earthquakes.
3. Raw materials certificates of compliance.
4. All welding procedures (AWS / PQR) used for manufacturing.
5. Welders and welders' operators' qualification certificates.
6. The steam boiler scheme detailing the location of each raw material heat number, radiography location, location of each seam in term of welder's ID and WPS used.
7. Traveler (rout card) defining all production stages including all testing points done by the manufacturer. SII will review the traveler and input his hold points in it.
8. The steam boiler serial number.
9. Hydrostatic pressure test report (by the manufacturer).
10. All NDT's reports including interpretations.
11. All thermal treatments reports including temperature charts.
12. Internal inspection report.
13. A leak proof tests of all pressure vessels accessories (if any).
14. The name plate's photo copy.
15. A final certificate provided by the inspection body (third party).

**Appendix3 – Gas Appliance and Installation Standards & Codes**

The following lists, are not closed yet, and can be modified by SII. Any ISO or American or EN, or Israeli mandatory standard, that is missing from this list, on issues that are not covered, and is relevant for the specific case, will be taken in consideration as part of the recognition and the approval process, by SII for the approval process.

All standards & codes are of the latest edition.

<b>Machinery &amp; appliances as Stand-Alone OEM</b>			
	EN 746-1	Industrial thermo processing equipment— Part 1: Common safety requirements for industrial thermo processing equipment	
	EN746-2	Industrial thermo processing equipment- Part 2: Safety requirements for Combustion and fuel handling systems	Burners Multiple fuels Commissioning, start-up and operating procedures
	EN12953-7	Shell boilers—Part7:	Requirements for firing systems for liquid and gaseous fuels for the boilers
	EN12952-8	Water-tube boilers and auxiliary installations— Part 8:	Requirements for firing Systems for liquid and gaseous fuels for the boiler
	EN 303-3	Heating boilers – Part 3:	Gas-fired central heating boilers - Assembly comprising a boiler body and a forced draught burner
	EN 303-7	Heating boilers – Part 7:	GAS-FIRED CENTRAL HEATING BOILERS EQUIPPED WITH A FORCED DRAUGHT BURNER OF NOMINAL HEAT OUTPUT NOT EXCEEDING 1000 KW

	EN 1020	Non-domestic forced convection gas-fired air heaters	for space heating not exceeding a net heat input of 300 kW incorporating a fan to assist transportation of combustion air or combustion products
	BS EN-621	Non-domestic forced convection gas-fired air heaters	FOR SPACE HEATING NOT EXCEEDING A NET HEAT INPUT OF 300 KW, WITHOUT A FAN TO ASSIST TRANSPORTATION OF COMBUSTION AIR AND/OR COMBUSTION PRODUCTS
	BS 5990	Direct gas fired air heaters – 330kW to 2MW net	
	BS 5991	Indirect gas fired air heaters – 330kW to 2MW net	
	EN 676:2003	Automatic forced draught burners for gaseous fuels	
	UL795	Standard for Commercial-Industrial Gas Heating Equipment	BURNER ASSEMBLIES BOILERS, FURNACES AND HEATERS
	NFPA 86,	Standard for Ovens and Furnaces,	
	ANSI Z83.3,	Gas Utilization Equipment in Large Boilers	
	ANSI Z83.4/CSA 3.7	Non-Recirculating Direct Gas-Fired Industrial Air Heaters	
	UL 103	Chimneys, Factory-Built, Residential Type and Building Heating Appliances,	
	UL 1738	Venting Systems for Gas Burning Appliances, Categories II,III and IV,	

90/396/EEC GAD Appliances burning gaseous fuel:

- EN 88 Pressure governors for gas appliances for inlet pressures up to 200 mbar
- EN 125 Flame supervision devices for gas burning appliances - Thermo-electric flame supervision devices
- EN 126 Multifunctional controls for gas burning appliances
- EN 161 Automatic shut-off valves for gas burners and gas appliances
- EN 298 Automatic gas burner control systems for gas burners and gas burning appliances with or without fans
- EN 1643 Valve proving systems for automatic shut-off valves for gas burners and gas appliances
- EN 1854 Pressure sensing devices for gas burners and gas burning appliances
- EN 12067-1 Gas/air ratio controls for gas burners and gas burning appliances - Part 1: Pneumatic types
- EN 12067-2 Gas/air ratio controls for gas burners and gas burning appliances - Part 2: Electronic types
- EN 12078 Zero governors for gas burners and gas burning appliances
- EN 13611 Safety and control devices for gas burners and gas-burning appliances - General requirements

ASME Boiler and Pressure Vessel Code, Section IV- Rules for Construction of Heating Boilers  
 ASME Boiler and Pressure Vessel Code, Section VIII- Rules for Construction of Pressure Vessels

Pressure vessels and Steam Boilers – Mandatory standards in Israel :

IS 4295 - Pressure vessels

IS 4280 part 1 - Steam Boilers

**Installation/Commissioning and peripheral compliment to safety & environmental issues**

	<b>SI 5664 Pt 4</b>	Natural Supply System	<b>Israeli standard based on NFPA 54</b>
	<b>ANSI-Z223.1 NFPA 54</b>	- National Fuel Code	
	NFPA 96	Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations,	

	NFPA 85	BOILER AND COMBUSTION SYSTEMS HAZARDS CODE	NFPA 85 contributes to operating safety and prevents explosions and implosions in boilers with greater than 12.5 MMBTUH, pulverized fuel systems, and heat recovery steam generators
	Institution of Gas Engineers & managers (UK) :-		
	IGEM/UP/3	Gas Engines	
	IGEM/UP/4	Commissioning	
	IGEM/UP/6	Gas Compressors	
	IGEM/UP/9	Gas Turbines	
	IGEM/UP/10	Flued Gas Appliances	
	IGEM/UP/12	Gas process plant	
	BS 5546	Installation of gas water heating appliances not exceeding 70kW	
	BS 5864	Installation & maintenance of gas fired ducted air heaters up to 70kW	
	BS 6172	Installation of Gas cookers	
	BS 6173	Installation of Gas Catering appliances	
	BS 6230	Installation of Gas fired Air heaters over 60 kW	
	BS 6644	Installation of Boilers over 60kW	
	BS 6896	Installation of Overhead radiant heaters	
	EN 50154	Electrical installation in explosive atmospheres	

	EN 60079-10	Electrical apparatus for explosive gas atmospheres - Classification of hazardous areas	
	EN 60079-14	Electrical apparatus for explosive gas atmospheres - Electrical installations in hazardous areas	
	SI 60079- all parts		Israeli standard, based on EN 60079 (IEC 60079)
	NFPA 70+NFPA 58	Hazardous area classifications and Electrical installations in explosive gas atmospheres	
	ATEX 95 equipment directive 94/9/EC	Equipment and protective systems intended for use in potentially explosive atmospheres	
	ISO 12100  (The British version - BS EN ISO 12100 already incorporates ISO 14121 into ISO 12100)	Safety of machinery - General principles for design - Risk assessment and risk reduction	The concept of safety of machinery considers the ability of a machine to perform its intended function(s) during its life cycle where risk has been adequately reduced.  There are other specific Standards that are already incorporate the principles of this standard. In those cases one does not need to check his machine to this standard.
	ISO 14121	Safety of machinery — Risk assessment	Part 1: Principles Part 2: Practical guidance and examples of methods [Technical Report]

#### **Appendix4 –Technical Documentation (Technical File)**

This directive requires for many products that a Technical Documentation (Technical File) be prepared by the manufacturer. The Technical Documentation (Technical File) holds information that verifies that the testing was conducted properly and that the product complies with applicable standards.

#### **The technical file will include the following:**

A general description of the machinery,

A general description of the electrical equipment,

Design and manufacturing drawings plus diagrams of components, sub-assemblies, circuits, etc.,

Descriptions and explanations needed to understand the above mentioned drawings and diagrams plus the operation of the electrical equipment,

A list of the Standards used, in full or in part, and a description of the solutions employed to meet the safety aspects of this directive when Standards have not been applied,

The results of design calculations and of checks carried out, etc.,

Test reports (in fact, the test reports which may be available, established by a Third party).

The overall drawing of the machinery and drawings of the control circuits, as well as the pertinent descriptions and explanations necessary for understanding the operation of the machinery, full detailed drawings, accompanied by any calculation notes, test results,

Ventilation assessments as per relevant installation standards, of production halls, and confined spaces relevant to the appliance and its peripherals,

Certificates, etc., required to check the conformity of the machinery with the essential health and safety requirements,

Documentation on risk assessment demonstrating the procedure followed, including:

- A list of the essential health and safety requirements which apply to the machinery,
- The description of the protective measures implemented to eliminate
- Identified hazards or to reduce risks and, when appropriate, the indication of the residual risks associated with the machinery,
- The standards and other technical specifications used, indicating the essential health and safety requirements covered by these standards,

Any technical report giving the results of the tests carried out either by the manufacturer or, by a third body chosen by the manufacturer, or his authorized representative,

A copy of the instructions for the machinery, where appropriate, the declaration of incorporation for included partly completed machinery and the relevant assembly instructions for such machinery,

A copy of the Operations, Maintenance & Emergency instructions book, relevant to the specific appliances.

Where appropriate, copies of the EC or other National declarations of conformity of machinery or other products incorporated into the machinery,

For series manufacture, the internal measures that will ensure that the machinery remains in conformity with the provisions of this Directive.

The manufacturer must carry out necessary research and tests on components, fittings or the completed machinery to determine whether by its design or construction it is capable of being assembled and put into service safely. The relevant reports and results shall be included in the technical-file.

The electrical design will be analyzed to ensure it provides conformity with the following general requirements:

(a) That the electrical equipment meets the expected mechanical requirements in such a way that persons and property are not endangered;

(b) That the electrical equipment shall be resistant to non-mechanical influences in expected environmental conditions, in such a way that persons and property are not endangered;

(c) That the electrical equipment shall not endanger persons, domestic animals and property in foreseeable conditions of overload.

### **Pressure vessels and Steam Boilers**

In case of pressure vessels or steam boilers the plant shall provide SII all the necessary test reports, test certificates, documentation, drawings and information which proves that a particular pressure vessel or steam boiler comply with the requirements of the mandatory standards in Israel- IS 4295 and IS 4280 part 1 respectively. It should be clear that a pressure vessel or a steam boiler compliance with the a.m. requirements is essential for the appliance's approval.

Note: The Technical-File approach could also be used to support equipment falling outside the EU Directives or the USA Regulation.

**Appendix5 –Block Diagram presenting the approval process given in Section 5.1**



