



Exploration & Production

## GENERAL SPECIFICATION

### CIVIL WORKS

#### GS EP CIV 405

**Plumbing and sanitary for onshore and offshore installations**

|      |       |                                            |
|------|-------|--------------------------------------------|
| 03   | 10/07 | Update and Addition of References          |
| 02   | 10/05 | Addition of "EP" root to GS identification |
| 01   | 09/03 | Change of Group name and logo              |
| 00   | 11/01 | First issue                                |
| Rev. | Date  | Notes                                      |

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## 1. Scope

This specification covers studies relative to plumbing and sanitary, and is more specially meant for use by Engineering CONTRACTORS.

General Specifications define what the COMPANY considers as an acceptable minimum. Nonetheless, certain works may present particular problems. In such a case, the COMPANY reserves the right to modify General Specifications or supplement them with special specifications.

## 2. Reference documents

The reference documents listed below form an integral part of this General Specification. Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published at the EFFECTIVE DATE of the CONTRACT.

When local national standards, regulations and codes exist, all design, engineering, materials and construction shall conform to their latest requirements, which complete or modify the present specifications.

In case of lack of obligatory local national standards, international norms and standards will be applied.

In case of lack of international norms and standards, national norms and standards listed hereafter will be applied.

In all cases the system adopted shall be consistent, i.e. the various texts shall present no incompatibility. Any dispute shall be resolved by basing works on the most stringent text for the CONTRACTOR and at his expense.

The list of specifications and norms quoted is not exhaustive: the CONTRACTOR shall respect the secondary standards and regulations, which cover the works described in the present specification.

Certain specifications and norms may be indicated with an issue date. This is for information only and on the understanding that the most recent issue shall be used.

### Standards

International standards and codes

| Reference                  | Title                                                                                                                                                                                                                |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ISO 161-1 - 1996           | Thermoplastics pipes for the conveyance of fluids. Nominal Pressures – Part 1: Metric Series                                                                                                                         |
| ISO 162-2 - 1996           | Thermoplastics Pipes for the Conveyance of fluids – Nominal Outside Diameters and Nominal Pressures – Part 2: Inch-Based Series                                                                                      |
| ISO 264 - 1976 Add1 - 1982 | Unplasticized polyvinyl chloride (PVC) fittings with plain sockets for pipes under pressure - Laying lengths - Metric series                                                                                         |
| ISO 727-1 - 2002           | Fittings Made From Unplasticized Poly(Vinyl Chloride) (PVC-U), Chlorinated Poly(Vinyl Chloride) (PVC-C) or Acrylonitrile/Butadiene/Styrene (ABS) With Plain Sockets for Pipes Under Pressure - Part 1: Metric Series |

| Reference         | Title                                                                                                                                                                                                                  |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ISO 727-2 - 2005  | Fittings made from unplasticized poly(vinyl chloride) (PVC-U), chlorinated poly(vinyl chloride) (PVC-C) or acrylonitrile/butadiene/styrene (ABS) with plain sockets for pipes under pressure Part 2: Inch-based series |
| ISO 2045 - 1988   | Single sockets for unplasticized polyvinyl chloride (PVC-U) and chlorinated polyvinyl chloride (PVC-C) pressure pipes with elastic sealing ring type joint - Minimum depths of engagement                              |
| ISO 2048 - 1990   | Double-socket fittings for unplasticized polyvinyl chloride (PVC-U) pressure pipes with elastic sealing ring type joints - Minimum depths of engagement                                                                |
| ISO 3822-1 - 1999 | Acoustics. Laboratory tests on noise emission from appliances and equipment used in water supply installations. Part 1 : method of measurements                                                                        |
| ISO 3822-2 - 1995 | Acoustics. Laboratory tests on noise emission from appliances and equipment used in water supply installations. Part 2 : mounting and operating conditions for draw-off taps and mixing valves                         |
| ISO 3822-3 - 1997 | Acoustics. Laboratory tests on noise emission from appliances and equipment used in water supply installations. Part 3 : mounting and operating conditions for in-line valves and appliances                           |
| ISO 3822-4 - 1997 | Acoustics. Laboratory tests on noise emission from appliances and equipment used in water supply installations. Part 4 : mounting and operating conditions for special appliances                                      |
| ISO 6259-1 - 2002 | Thermoplastics pipes Determination of tensile properties Part 1: General test method                                                                                                                                   |

#### European standards and codes

| Reference    | Title                                                                                                           |
|--------------|-----------------------------------------------------------------------------------------------------------------|
| EN 26 - 2006 | Gas-fired instantaneous water heaters for the production of domestic hot water, fitted with atmospheric burners |
| EN 31 - 1999 | Pedestal wash basins - Connecting dimensions                                                                    |
| EN 32 - 1999 | Wall-hung wash basins - Connecting dimensions                                                                   |
| EN 33 - 2004 | Pedestal WC pans with close-coupled flushing cistern - Connecting dimensions                                    |
| EN 34 - 1992 | Wall hung WC pan - Wall hung WC pan with close coupled cistern - Connecting dimensions                          |
| EN 35 - 2001 | Pedestal bidets with over-rim supply - Connecting dimensions                                                    |
| EN 36 - 1999 | Wall-hung bidets with over-rim supply - Connecting dimensions                                                   |

| Reference        | Title                                                                                                                                                    |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| EN 37 - 1999     | Pedestal WC pans with independent water supply - Connecting dimensions                                                                                   |
| EN 38 - 1992     | Wall hung WC pan - Wall hung WC pan with independent water supply - Connecting dimensions                                                                |
| EN 161 - 2007    | Automatics shut-off valves for gas burners and gas appliances                                                                                            |
| EN 200 - 2005    | Sanitary tapware - Single taps and combination taps (PN 10) - General technical specification                                                            |
| EN 232 - 2003    | Bath - Connecting dimensions                                                                                                                             |
| EN 251 - 2003    | Shower trays - Connecting dimensions                                                                                                                     |
| EN 274-1 - 2002  | Waste fittings for sanitary appliances - Part 1 : requirements                                                                                           |
| EN 274-2 - 2002  | Waste fittings for sanitary appliances - Part 2 : test methods                                                                                           |
| EN 274-3 - 2002  | Waste fittings for sanitary appliances - Part 3 : quality control                                                                                        |
| EN 295-1 - 1999  | Vitrified clay pipes and fittings and pipe joints for drains and sewers                                                                                  |
| EN 295-2 - 1999  | Vitrified clay pipes and fittings and pipe joints for drains and sewers. Part 2 : quality control and sampling                                           |
| EN 295-3 - 1999  | Vitrified clay pipes and fittings and pipe joints for drains and sewers. Part 3 : test methods                                                           |
| EN 294-4 - 1995  | Vitrified clay pipes and fittings and pipe joints for drains and sewers. Part 4 : requirements for special fittings, adaptors and compatible accessories |
| EN 295-5 - 1999  | Vitrified clay pipes and fittings and pipe joints for drains and sewers - Part 5: Requirements for perforated vitrified clay pipes and fittings          |
| EN 295-6 - 1996  | Vitrified clay pipes and fittings and pipe joints for drains and sewers. Part 6 : requirements for vitrified clay manholes                               |
| EN 295-7 - 1996  | Vitrified clays pipes and fittings and pipe joints for drains and sewers. Part 7 : requirements for vitrified clay pipes and joints for pipe jacking     |
| EN 295-10 - 1996 | Vitrified clays pipes and fittings and pipe joints for drains and sewers. Part 7 : requirements for vitrified clay pipes and joints for pipe jacking     |
| EN 411 - 1995    | Sanitary tapware - Waste fittings for sinks - General technical specifications                                                                           |
| EN 695 - 1997    | Kitchen sinks - Connecting dimensions                                                                                                                    |
| EN 727 - 1995    | Plastics piping and ducting systems - Thermoplastics pipes and fittings - Determination of Vicat softening temperature (VST)                             |

| Reference        | Title                                                                                                                                                                     |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EN 877 - 2006    | Cast iron pipes and fittings, their joints and accessories for the evacuation of water from buildings - Requirements, test methods and quality assurance                  |
| EN 921 - 1995    | Plastics piping systems - Thermoplastics pipes - Determination of resistance to internal pressure at constant temperature                                                 |
| EN 997 - 2007    | WC pans and WC suites with integral trap                                                                                                                                  |
| EN 1057 - 2006   | Copper and copper alloys - Seamless, round copper tubes for water and gas in sanitary and heating applications                                                            |
| EN 1092-2 - 1997 | Flanges and their joints. Circular flanges for pipes, valves, fittings and accessories, PN designated. Part 2 : cast iron flanges                                         |
| EN 1111 - 1999   | Sanitary tapware - Thermostatic mixing valves (PN 10) - General technical specifications                                                                                  |
| EN 1112 - 1997   | Shower outlets for (PN 10) sanitary tapware                                                                                                                               |
| EN 1286 - 1999   | Sanitary tapware - Low pressure mechanical mixing valves - General technical specification                                                                                |
| EN 1287 - 1999   | Sanitary tapware - Low pressure thermostatic mixing valves - General technical specifications                                                                             |
| EN 1401-1 - 1998 | Plastics piping systems for non-pressure underground drainage and sewerage - Unplasticized poly vinylchloride (PVC-U) - Specifications for pipes, fittings and the system |
| EN 1452-1 - 2000 | Plastics piping systems for water supply – Unplasticized Polyvinyl Chloride (PVC-U) – Part 1: General                                                                     |
| EN 1452-2 - 2000 | Plastics Piping Systems for Water Supply - Unplasticized Poly (Vinyl Chloride) (PVC-U) - Part 2: Pipes                                                                    |
| EN 1452-3 - 2000 | Plastics Piping Systems for Water Supply - Unplasticized Poly (Vinyl Chloride) (PVC-U) - Part 3: Fittings                                                                 |
| EN 1452-4 - 2000 | Plastics Piping Systems for Water Supply - Unplasticized Poly (Vinyl Chloride) (PVC-U) - Part 4: Valves and Ancillary Equipment                                           |
| EN 1452-5 - 2000 | Plastics Piping Systems for Water Supply - Unplasticized Poly (Vinyl Chloride) (PVC-U) - Part 5: Fitness for Purpose of the System                                        |
| EN 1561 - 1997   | Founding - Grey cast irons                                                                                                                                                |
| EN 10233 - 1994  | Metallic materials - Tube - Flattening test                                                                                                                               |
| EN 10242 - 2004  | Threaded pipe fittings in malleable cast iron                                                                                                                             |

## French standards and codes

| Reference          | Title                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NF A 48-830 - 1983 | Foundry products. Spheroidal graphite cast iron fittings for PVC drinking water pipes under pressure                                                                                                                                                                                                                                                                     |
| NF A 48-851 - 1985 | <i>Tuyaux en fonte à graphite sphéroïdal pour canalisations avec pression - Revêtement extérieur polyuréthane</i><br>Spheroidal graphite cast iron pipes under pressure with external polyurethane coating                                                                                                                                                               |
| NF A 48-860 - 1981 | <i>Éléments de canalisations en fonte ductile pour conduite avec pression - Série à emboîtement - Joint express GS - Dimensions d'assemblage et</i><br>Spheroidal cast iron pipes for pressurised line - jointing line - express GS connection - dimensions                                                                                                              |
| NF A 48-870 - 1981 | <i>Éléments de canalisations en fonte ductile pour conduite avec pression - Série à emboîtement - Joint standard GS - Dimensions d'assemblage et accessoires de joint</i><br>Spheroidal graphite cast iron pipes for pressurised line – jointing line – standard GS connection - dimensions                                                                              |
| NF A 48-902 - 1985 | Foundry products. Ductile iron pipes for pressure pipelines. Centrifugal cement mortar internal lining. Composition controls of freshly applied mortar                                                                                                                                                                                                                   |
| NF A 49-147 - 1980 | <i>Tubes en acier - Tubes soudés longitudinalement à extrémités lisses pour canalisations et usages généraux - Aciers inoxydables austénitiques (dimensions - Conditions techniques de livraison)</i><br>Steel tubes - Plain-end longitudinally welded tubes for pipelines and general uses - Austenitic stainless steels - (Dimensions - Technical delivery conditions) |
| NF A 49-148 - 1980 | <i>Tubes en acier - Tubes soudés longitudinalement à extrémités lisses pour canalisations et usages généraux - Aciers inoxydables ferritiques (dimensions - Conditions techniques de livraison)</i><br>Steel tubes - Plain end longitudinally welded tubes for pipe lines and general uses - Ferritic stainless steels - (Dimensions - Technical delivery conditions)    |
| NF A 03-263 - 1983 | <i>Cuivre - Essai de cintrage des tubes ronds à braser par capillarité</i><br>Copper – Bend test on round tubes for capillary brazing                                                                                                                                                                                                                                    |
| NF C 73-221 - 1989 | <i>Appareils électrodomestiques et analogues - Aptitude à la fonction des chauffe-eau non instantanés</i><br>Non-instantaneous water heaters - functional tests                                                                                                                                                                                                          |

| Reference                            | Title                                                                                                                                                                                                                                     |
|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NF C 73-222 - 1987                   | <i>Chauffe-eau muraux verticaux fixes non instantanés - Cotes de fixation et de raccordement aux installations d'eau</i><br>Non-instantaneous water heaters - Dimensions for fixation and connection to water equipment                   |
| NF D 11-101 - 1987                   | <i>Lavabos en céramique sanitaire</i><br>Ceramic wash basins                                                                                                                                                                              |
| NF D 11-107 - 1987                   | <i>Bidets en céramique sanitaire</i><br>Ceramic bidets                                                                                                                                                                                    |
| NF D 11-112 - 1987                   | <i>Baignoires en matériaux émaillés</i><br>Glazed bathes                                                                                                                                                                                  |
| NF D 11-114 - 1979                   | <i>Urinoirs muraux sans siphon incorporé - Cotes de Raccordement</i><br>Wall hung urinals - Connecting dimensions                                                                                                                         |
| NF D 11-115 - 1979                   | <i>Urinoirs muraux - Cotes d'encombrement</i><br>Urinals - Clearance dimensions                                                                                                                                                           |
| NF D 11-124 - 1988                   | <i>Appareils sanitaires - Receveurs de douche en matériaux émaillés</i><br>Sanitary equipment - Glazed shower basins                                                                                                                      |
| NF D 12-101 - 1987                   | <i>Cuvette de W.C. En céramique sanitaire</i><br>Ceramic W.C. pan                                                                                                                                                                         |
| NF D 13-101 - 2006                   | Sanitary appliances – Vitreous enamelled sinks                                                                                                                                                                                            |
| NF D 14-501 to<br>NF D 14-510 - 1987 | <i>Appareils sanitaires - Contrôles dimensionnels - Essais.</i><br>Sanitary equipment - Size controls - Tests                                                                                                                             |
| NF D 18-001 - 1965                   | <i>Robinetterie sanitaire - Robinet simple d'appareil sanitaire –</i><br>Sanitary taps - Single taps                                                                                                                                      |
| NF D 18-202 - 1984                   | <i>Robinetterie sanitaire - Mitigeurs mécaniques - Spécifications techniques générales</i><br>Sanitary taps - Mechanical mixer taps - General technical specification                                                                     |
| NF D 18-205 - 1989                   | <i>Robinetterie sanitaire - Accessoires de douche - Spécifications techniques générales.</i><br>Sanitary taps - Showers accessories - General technical specification                                                                     |
| NF E 03-004 - 1981                   | <i>Filetages pour tuyauterie (dits "gaz") avec étanchéité dans le filet - Filetages extérieur conique et intérieur cylindrique.</i><br>Threading for pipes with tightness in thread – External conical and internal cylindrical threading |

| Reference          | Title                                                                                                                                                                                                         |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NF E 29-002 - 1982 | <i>Tuyauteries - Pressions et températures – Définitions</i><br>Pipes – Pressures and temperatures - definitions                                                                                              |
| NF E 29-010 - 1975 | <i>Tuyauteries industrielles - Guide méthodologique pour la conception d'une tuyauterie</i><br>Industrial pipes - Handbook for piping conceptual design                                                       |
| NF P 43-001 - 1985 | <i>Robinetterie de bâtiment - Robinets d'arrêt à soupape - Spécifications techniques générales</i><br>Valves and taps for building services - Stop valves – General technical specification                   |
| NF P 43-003 - 1983 | <i>Robinetterie de bâtiment - Robinet pour réservoir de chasse - Spécifications techniques générales</i><br>Valves and taps for building services - Stop valves for cistern – General technical specification |
| NF P 43-015 - 1985 | <i>Robinetterie de bâtiment - Robinets de puisage à soupape - Spécifications techniques générales.</i><br>Valves and taps for building services - Draw off taps - General technical specification             |
| NF E 29-539 - 1981 | <i>Tuyauterie - Éléments de raccords à visser à jonction sphéro-conique pour installation de chauffage - PN 16.</i><br>Pipes- screwed fittings with sphericonic connection for heating installation - NP16    |
| NF P 16-352 - 1987 | <i>Canalisations, assainissement, égouts - Éléments de canalisations en polychlorure de vinyle non plastifié pour l'assainissement</i><br>Unplasticized PVC pipes for sewage systems requirements             |
| NF P 41-102 - 1942 | <i>Terminologie - Évacuation des eaux usées,</i><br>Definitions – Water drainage system                                                                                                                       |
| NF Q 34-001 - 1984 | <i>Articles pour usages sanitaires et domestiques - Papiers hygiéniques - Caractéristiques</i><br>Sanitary and domestic items - Toilet papers - Characteristics                                               |
| NF T 54-002 - 1981 | <i>Plastiques - Éléments de canalisations en matières thermoplastiques - Définitions - Dimensions</i><br>Plastics - Thermoplastic piping components - Definitions - Dimensions                                |
| NF T 54-003 - 1984 | <i>Plastiques - Tubes en polychlorure de vinyle non plastifié - Spécifications générales</i><br>Plastics - Unplasticized PVC pipes - General Specification                                                    |