

INTERNATIONAL STANDARD

ISO 16165

First edition
2001-04-01

Ships and marine technology — Marine environment protection — Terminology relating to oil spill response

*Navires et technologie maritime — Protection de l'environnement marin —
Terminologie relative à la réponse aux déversements de pétrole*



Reference number
ISO 16165:2001(E)

© ISO 2001

PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

© ISO 2001

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.ch
Web www.iso.ch

Printed in Switzerland

Contents

Page

Foreword.....	iv
Introduction	v
1 Scope	1
2 Terms and definitions	1
2.1 Oil/oil slick properties	1
2.2 Oil classification	2
2.3 Environmental conditions.....	3
2.4 Assessment techniques.....	4
2.5 Sampling.....	4
2.6 Containment (based on ASTM F 818-93)	5
2.7 Recovery	9
2.8 Dispersant use	11
2.9 Removal by <i>in situ</i> burning.....	12
2.10 Shoreline cleanup.....	13
2.11 Disposal	17
2.12 Spill management	17
Bibliography	23
Index	25

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 16165 was prepared by Technical Committee ISO/TC 8, *Ships and marine technology*, Subcommittee SC 2, *Marine environment protection*.

Introduction

Communication is important in the implementation of an effective spill response and this communication will be the most effective if there is a common understanding of the terms used.

Many of the terms and definitions listed here have been widely used for many years, while others are the results of recent experience. The gradual evolution of our understanding of oil spill behaviour and response and response measures means that oil spill terminology will continue to develop.

© ISO 2001. All rights reserved.

Ships and marine technology — Marine environment protection — Terminology relating to oil spill response

1 Scope

This International Standard contains terms and definitions relating to oil spills and their control. The objective of this International Standard is to provide standardized terminology relating to oil spill response, defined as the broad range of activities related to spill cleanup, including surveillance and assessment, containment, recovery, dispersant-use, in-situ burning, shoreline cleanup and disposal.

2 Terms and definitions

2.1 Oil/oil slick properties

2.1.1

crude oil

naturally occurring form of petroleum, mainly occurring in a porous underground formation such as sandstone

[ISO 1998-99:2000]

2.1.2

emulsification

process in which microscopic droplets of water are mixed into the oil or are dispersed throughout the water

2.1.3

emulsion

mixture of oil and water in which droplets of water are dispersed throughout the oil or vice versa, formed when fluids are mixed by mechanical action

NOTE Emulsions are more precisely referred to as water-in-oil or oil-in-water emulsions. Water-in-oil emulsions are occasionally referred to as "mousse" or "chocolate mousse".

2.1.4

environmental fate

form and location of a material resulting from transport and transformation

[ASTM E 943-95]

2.1.5

heavy shoreline oiling

pooled deposits or a layer of surface oil

[AURIS 1994]

2.1.6

moderate/light shoreline oiling

sheen or film of surface oil

[AURIS1994]

ISO 16165:2001(E)

2.1.7

petroleum oil

material consisting of, or derived from, a mixture of liquid or semi-solid organic compounds, principally hydrocarbons

[ISO 1998]

2.1.8

relative viscosity

measured viscosity of an emulsion (in any convenient unit) at a given shear rate divided by the measured viscosity of the oil at the same shear rate

NOTE 1 It is important to report the shear rate used in the viscosity measurements of the emulsion and the water free oil.

NOTE 2 Adapted from ASTM F 873-84 (88).

2.1.9

pour point

lowest temperature at which a sample of petroleum product will continue to flow when it is cooled under specified standard conditions

[ISO 3016:1994]

2.1.10

sheen

very thin oil slicks with a silvery or rainbow-coloured appearance and with a thickness of less than 0,001 mm

2.1.11

specific gravity

ratio of the mass of a given volume of liquid at 15 °C to the mass of an equal volume of fresh water at the same temperature

[ASTM D 4410-95]

2.1.12

viscosity

measure of the resistance to flow or deformation of a liquid

[ISO 3104:1994]

2.1.13

windrows

narrow bands of oil, generally aligned with the wind direction, typical of an oil slick after several hours of exposure (or days for very large spills)

2.2 Oil classification

2.2.1

group I oil

non-persistent oil

petroleum-based oil that consists of hydrocarbon fractions, at least 50 per cent of which distill at a temperature of 340 °C and at least 95 per cent of which distill at a temperature of 370 °C

2.2.2

group II oil

persistent oil with a specific gravity of less than 0,85

2.2.3**group III oil**

persistent oil with a specific gravity equal to or greater than 0,85 and less than 0,95

2.2.4**group IV oil**

persistent oil with a specific gravity greater than 1,00

2.2.5**group V oil**

persistent oil with a specific gravity greater than 1,00

2.2.6**persistent oil**

petroleum-based oil that does not meet the distillation criteria for a group I oil

2.3 Environmental conditions**2.3.1****air temperature**

average or point temperature of the air measured at or near the ground or water surface (°C)

[ASTM F 625-94]

2.3.2**current**

average water speed and direction (i.e. velocity) relative to a fixed reference point (m/s)

[ASTM F 625-94]

2.3.3**debris**

solid or semisolid substance that could interfere with the operation of a spill control system

[ASTM F 625-94]

2.3.4**significant wave height**

average height, measured crest to trough, of the one-third highest waves, considering only short-period waves (i.e. period less than 10 seconds) (m)

[ASTM F 625-94]

2.3.5**significant wave period**

average period of the one-third highest waves, measured in seconds as the elapsed time between crests of succeeding waves past a fixed point(s)

[ASTM F 625-94]

2.3.6**water temperature**

average or point temperature of a water body as measured within the top 300 mm (°C)

[ASTM F 625-94]

2.3.7**wind direction**

direction from which the wind is blowing

[ASTM F 625-94]

2.4 Assessment techniques

2.4.1

ladder search

aerial surveillance to find and delineate oil slicks, carried out in a direction perpendicular to the wind in order to increase the probability of locating slicks and windrows

2.4.2

oil spill modelling

mathematical prediction of the environmental fate and/or behaviour of an oil spill

2.4.3

remote sensing

use of sensors to find delineate oil slicks, mounted on a variety of platforms such as ships, aircraft and satellites

2.4.4

surveillance

response activities with the purpose of detecting a spill, determining the extent and behaviour of a spill, optimizing countermeasures and/or predicting spill movements and effects

2.5 Sampling

2.5.1

chain-of-custody documentation

chronological evidence defining the history of an item, such as a sample, and identifying an individual responsible for custody of the item at each point in time

[ASTM D 4840-95]

2.5.2

custody

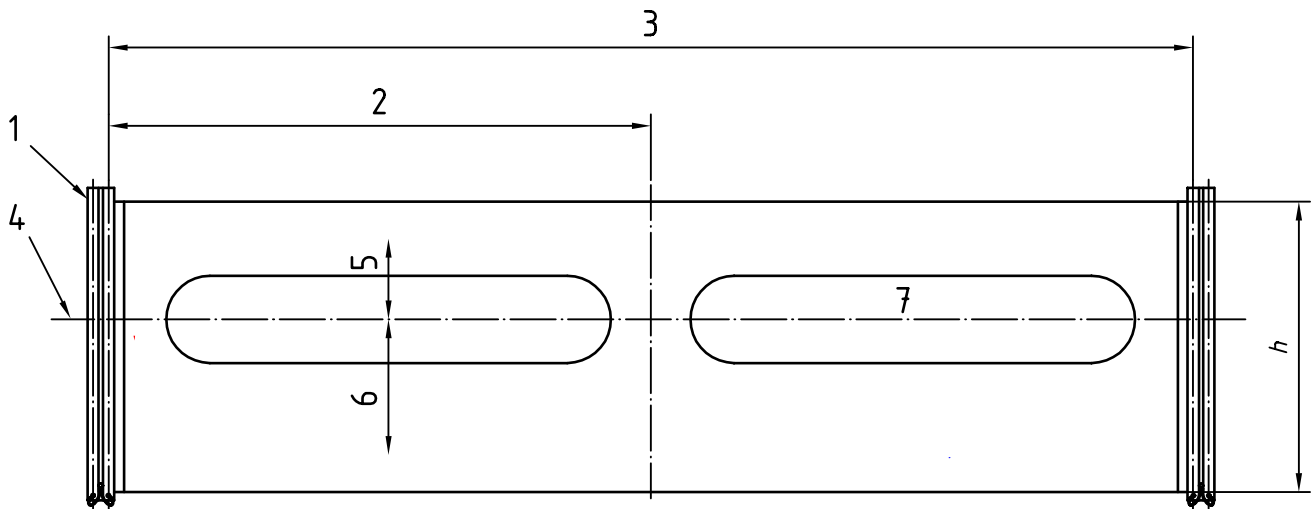
physical possession or control

NOTE 1 A sample is under custody if it is in an individual's possession or under the immediate control of an individual to prevent alteration of characteristics.

NOTE 2 Adapted from ASTM D 4840-95.

2.6 Containment (based on ASTM F 818-93)

2.6.1 Floating boom equipment terminology



Key

- 1 Boom end connector
- 2 Boom segment
- 3 Boom section
- 4 Water line
- 5 Freeboard
- 6 Draught
- 7 Flotation chamber
- h* Overall height

Figure 1 — Containment boom equipment

2.6.1.1

anchor point

structural point on the end connector or along the length of a boom section designed for the attachment of anchor or mooring lines

2.6.1.2

barrier

method of controlling the movement of oil or other substances on the water surface or in the water column

2.6.1.3

boom

floating mechanical barrier used to control the movement of substances that float

2.6.1.4

boom section

length of boom between two end connectors

2.6.1.5

boom segment

repetitive and similar portion of the boom section

2.6.1.6

bridle

device attached to a boom to distribute the load exerted by towing or anchoring the boom

ISO 16165:2001(E)

2.6.1.7

curtain type boom

boom consisting of a flexible skirt supported by vertical centreline flotation

2.6.1.8

end connector

device attached to the boom used for joining boom sections to one another or to other accessory devices

2.6.1.9

"fence type" boom

boom consisting of a self-supporting or stiffened membrane supported by floating devices

2.6.1.10

fire resistant boom

boom intended for containment of burning oil slicks

2.6.1.11

inflatable boom

boom that uses inflatable chambers, self-inflatable or manually, as the flotation device

2.6.1.12

shore seal boom

boom that, when grounded, seals against the shoreline

2.6.1.13

sorbent boom

material contained or arranged in the form of a boom that has absorptive or adsorptive capabilities

2.6.1.14

special purpose boom

boom that departs from the general characteristics of "fence type" and "curtain type" booms, either in design or intended use

2.6.2 Engineering terminology

2.6.2.1

buoyancy chamber

enclosed compartment of air or other buoyant material providing flotation for the boom

2.6.2.2

gross buoyancy

weight of fresh water displaced by an entire boom section when totally submerged

2.6.2.3

gross buoyancy to weight ratio

gross buoyancy divided by boom weight

2.6.2.4

operational draft

minimum vertical depth of the boom below the water-line

2.6.2.5

operational freeboard

minimum vertical height of the boom above the water-line

2.6.2.6

operational height

sum of operational draft and operational freeboard

2.6.2.7**overall height**

maximum vertical dimension of boom

2.6.2.8**reserve buoyancy**

gross buoyancy minus boom weight

2.6.3 Operational terminology**2.6.3.1****boom planing**

heeling over of a boom and a loss of draught

2.6.3.2**boom submergence**

containment failure due to loss of freeboard

2.6.3.3**bridging failure**

portions of a boom emerging from the water due to poor wave conformance, with resulting containment failure

2.6.3.4**cascading booms**

booming configuration formed by positioning two or more booms in a deflection mode such that successive booms progressively move oil into the desired area

2.6.3.5**catenary configuration**

booming configuration formed by towing or anchoring each end of a length of boom resulting in a characteristic "J" or "U" shape

2.6.3.6**catenary drag force**

longitudinal load imposed on a boom, deployed in a catenary configuration, resulting from towing, current and/or wind forces

2.6.3.7**diversion mode**

placement of a boom to redirect the movement of a floating substance

2.6.3.8**drainage loss**

oil lost due to the accumulation or pooling against the boom skirt and escaping with the flow of the water down and along the skirt

NOTE Accumulated oil is the cause for loss rather than water flow.

2.6.3.9**entrainment loss**

oil released from the underside of an oil slick at the boom by the flow of water (e.g. high current conditions)

2.6.3.10**exclusion booming**

placement of a boom to protect an area from the entry of a floating substance

ISO 16165:2001(E)

2.6.3.11

first-loss tow current velocity

minimum tow/current velocity measured perpendicular to the boom at which oil escapes past a boom

2.6.3.12

gap ratio

sweep width divided by boom length

2.6.3.13

loss rate

rate at which oil is lost past a boom (m^3/h)

2.6.3.14

splash-over

oil passing over the top of the boom

2.6.3.15

straight line drag force

longitudinal drag force that results from towing a boom from one end

2.6.3.16

structural failure

failure that occurs when any external force acting on the boom exceeds the tensile strength of the boom

2.6.3.17

sweep width

width intercepted by a boom in collection mode, the projected distance perpendicular to the direction of travel or current between the ends of a boom deployed in a "U", "V" or "J" configuration

2.6.3.18

tear resistance

force required to separate boom parts

NOTE Tear resistance is relevant for attachments to the fabric and is also an important measure of boom fabric strength.

2.6.3.19

tensile strength

force required to stretch boom material to the point where it fails and tears apart

2.6.3.20

vortex loss

oil escaping past a boom due to drainage vortices produced at the boom

2.6.3.21

"J" configuration

catenary configuration

boom positioned in a "J" shape

2.6.3.22

"U" configuration

boom positioned in a "U" shape

2.6.3.23

"V" configuration

boom positioned in a "V" shape

2.7 Recovery

2.7.1 Equipment terminology

2.7.1.1

dedicated response equipment

spill response equipment dedicated to an area, port, facility or any other designated place or organization

2.7.1.2

skimmers

mechanical devices used to remove oil from the water surface

[API 1995]

2.7.1.3

sorbent

material used to recover fluids through the mechanism of absorption or adsorption or both

[ASTM F 1127-88]

2.7.1.4

vessel-of-opportunity

watercraft which normally have duties other than spill response, but are pressed into service as available

2.7.2 Performance terminology

2.7.2.1

derating factor

reduction factor, applied to nameplate recovery rates, to account for less than optimum performance due to less than ideal oil slick and environmental conditions

2.7.2.2

fluid recovery rate

total volume of fluid recovered by the skimmer per unit time (m^3/h)

2.7.2.3

nameplate recovery rate

maximum volume of fluid that can be recovered by a skimmer per unit time, as stated by the manufacturer (m^3/h)

2.7.2.4

oil recovery rate

volume of water-free oil removed from the water surface by the skimmer, per unit time (m^3/h)

[ASTM F 808-83 (88)]

2.7.2.5

oil slick

oily fluid floating on the surface of the water

2.7.2.6

oil slick encounter rate

volume of oil slick per unit time actively encountered by the oil spill response system, and therefore available for containment and recovery (m^3/h)

[ASTM F 1688-96]

2.7.2.7

oil slick recovery efficiency

ratio, expressed as a percentage, of the oil slick recovery rate to the total volumetric rate of fluids recovered

[ASTM F 808-83 (88)]

ISO 16165:2001(E)

2.7.2.8

oil slick recovery rate

volume of oil slick removed from the water surface by the skimmer, per unit time (m³/h)

[ASTM F 808-83 (88)]

2.7.2.9

oil spill recovery system

combination of devices that operate together to recover spilled oil

NOTE 1 The system would include, but is not limited to, some or all of the following components:

- a) floating boom;
- b) skimmer;
- c) support vessels to deploy and operate the boom and skimmer;
- d) discharge/transfer pumps;
- e) oil/water separator;
- f) temporary storage devices;
- g) shore based storage/disposal.

NOTE 2 Adapted from ASTM F 1688-96.

2.7.2.10

recovery efficiency

ratio, expressed as a percentage, of the volume of oil recovered to the volume of total fluids recovered

[ASTM F 631-93]

2.7.2.11

response time

time interval between the time of notification of a spill incident and the start of cleanup operations

2.7.2.12

throughput efficiency

ratio, expressed as a percentage, of the volume of oil recovered to the volume of oil encountered

[ASTM F 631-93]

2.7.3 Storage terminology

2.7.3.1

temporary storage device

receptacle used to hold recovered fluids until they can be disposed of permanently

[ASTM F 1599-95]

2.7.3.2

open pool

open-topped container used to store recovered fluids

[ASTM F 1599-95]

2.7.3.3**pillow tank**

closed, generally rectangular or round coated fabric receptacle

[ASTM F 1599-95]

NOTE Pillow tanks can be floated and/or land based.

2.7.3.4**towable flexible tank**

receptacle that is characterized by flexibility along its length

[ASTM F 1599-95]

2.7.3.5**towable open tank**

open, inflatable, barge-type vessel that resembles a large inflatable boat, characterized by a portion of the top surface being open to atmosphere

[ASTM F 1599-95]

2.8 Dispersant use**2.8.1****application rate**

volume of dispersant applied per unit area (m^3/km)

2.8.2**application efficiency**

proportion of the volume of dispersant applied that is deposited on the target slick

2.8.3**approved dispersant**

dispersant accepted and listed for use by authorized regulatory agencies

2.8.4**dispersant**

surface-active agent used to decrease the interfacial tension between oil and water and to enhance the dispersion of the oil into fine droplets into the water column

[CONCAWE 1981]

2.8.5**dispersant effectiveness**

for a given oil slick or area, the percentage of oil that is dispersed into the water column

2.8.6**dispersant exclusion zone**

areas in which dispersant is not permitted due to possible detrimental environmental effects or other factors

2.8.7**dosage ratio**

volume of dispersant applied per volume of oil

2.8.8**effects monitoring**

measurement of effects on specified target species resulting from dispersant application

2.8.9

effectiveness monitoring

visual or other observations to determine the effectiveness of the dispersant application

2.8.10

emulsion breakers

chemicals used to break emulsions

2.8.11

herding

collection of floating oil into a smaller surface area caused by increasing surface tension exerted by the dispersing applied chemical

[Exxon 1994]

2.8.12

pre-approved zones

areas that have received pre-approval (perhaps with specified conditions) for the use of dispersants, bioremediation agents, in-situ burning or other response techniques on marine oil spills, having met certain criteria for possible environmental effects

2.8.13

spray drift

movement of airborne spray particles from the intended application (target) area

[ASTM E 609-81(91)]

2.9 Removal by *in situ* burning

2.9.1

burn rate

rate at which an oil slick is combusted per unit area ($\text{m}^3/\text{m}^2/\text{h}$)

2.9.2

combustion promoter

substance added to an oil slick to increase the efficiency of *in situ* burning

NOTE These substances typically act as either a wicking agent or an insulator between the water substrate, or a combination of the two.

2.9.3

controlled burning

in situ burning application that is started and can be stopped by human intervention

2.9.4

igniter

device or system used to initiate an *in situ* burn

2.9.5

ignition promoter

substance added to an oil slick to increase the ignitability of the slick or to promote spreading of flame over the surface of un-ignited oil

2.9.6

***in situ* burning**

burning of marine oil spills "in place" on the water surface

2.9.7***in situ* burning efficiency**

ratio, expressed as a percentage, of the volume of oil that was removed by burning compared to the total volume of oil that was originally ignited

NOTE This value is calculated as the initial volume of oil less the volume remaining as residue, divided by the initial volume.

2.9.8***in situ* burn residue**

the material remaining after an *in situ* burn

2.9.9**overall burning removal rate**

volume of oil burned per unit time for a given burn application (m³/h)

2.10 Shoreline cleanup**2.10.1 Shoreline terminology****2.10.1.1****asphalt pavement**

naturally formed cohesive mixture of weathered oil and sediments

NOTE 1 Sediments in the mixture are usually in the sand/granule/pebble size range. In appearance, natural asphalt pavement may resemble the mixture artificially created to surface roads.

NOTE 2 Adapted from ASTM F 1687-96.

2.10.1.2**ecological recovery**

progressive change of an ecosystem towards the natural range of dominance, diversity, abundance and zonation characteristics of the local unaffected ecosystems

NOTE 1 A shore is in a "recovered" condition when the natural biota has been established and is within the range and diversity and abundance expected for the habitat.

NOTE 2 Adapted from AURIS 1994.

2.10.1.3**ecosystem**

combination of populations of different species that live together and interact with each other and the physical and chemical factors making up its environment

2.10.1.4**environmental sensitivity**

susceptibility of a local environment or area to any disturbance which might decrease its stability or result in either short or long-term adverse effects

NOTE 1 Environmental sensitivity generally includes physical, biological and socio-economic parameters.

NOTE 2 Adapted from BASICS 1979.

2.10.1.5**sediment sizes****2.10.1.5.1****boulder**

component of a sediment with a diameter > 256 mm

ISO 16165:2001(E)

2.10.1.5.2

cobble

component of a sediment with a diameter of 64 mm to 256 mm

2.10.1.5.3

pebble

component of a sediment with a diameter of 4 mm to 64 mm

2.10.1.5.4

granule

component of a sediment with a diameter of 2 mm to 4 mm

2.10.1.5.5

sand

component of a sediment with a diameter of 0,06 mm to 2 mm

2.10.1.5.6

mud

component of a sediment with a diameter < 0,06 mm

2.10.1.5.7

silt

component of a sediment with a diameter < 0,06 mm

2.10.1.5.8

clay

component of a sediment with a diameter < 0,06 mm

2.10.1.6

special use habitat

area of critical concern due to the presence of marine mammals, birds or endangered species

NOTE 1 Its designation may be seasonal.

NOTE 2 Adapted from API 1995.

2.10.1.7

shore zones

2.10.1.7.1

foreshore zone

area below mean low tide

2.10.1.7.2

intertidal zone

shoreline between the low tide mark and the high tide mark which is covered by water at some time during the tide cycle

NOTE 1 The size of the intertidal zone varies with the tidal characteristics of a given region as well as the shoreline characteristics.

NOTE 2 Adapted from BASICS 1979.

2.10.1.7.3

supratidal zone

area above the mean high tide that experiences wave activity occasionally

NOTE 1 Also known as backshore zone.

NOTE 2 Adapted from ASTM F 1687-96.

2.10.1.8**weathered oil**

oil that has had an alteration of physical or chemical properties, or both, through a natural process such as evaporation, dissolution, oxidation, emulsification and biodegradation

2.10.2 Cleanup methods terminology**2.10.2.1****bioaugmentation**

addition of microorganisms (predominantly bacteria) to increase the biodegradation rate of target pollutants

[ASTM F 1600-95a]

2.10.2.2**biodegradation**

chemical alteration and breakdown of a substance to usually smaller products caused by microorganisms or their enzymes

[ASTM F 1481-94]

2.10.2.3**bioremediation**

enhancement of biodegradation

[ASTM F 1600-95a]

2.10.2.4**bioremediation agents**

inorganic and organic compounds and microorganisms that enhance biological degradation processes, predominantly by micro-organisms decomposition

[ASTM F 1481-94]

2.10.2.5**cleaning stage 1**

initial phase in a shoreline treatment operation involving the removal of bulks of oil and oiled beach sediments

2.10.2.6**cleaning stage 2**

intermediate phase in a shoreline treatment operation involving the removal of the majority of oil beach sediments and floating oil

2.10.2.7**cleaning stage 3**

final or cosmetic treatment phase in a shoreline treatment operation

2.10.2.8**cleaning level 1**

shoreline condition that results from a decision not to clean

2.10.2.9**cleaning level 2**

shoreline condition that results from a decision to clean to a minimum level

NOTE Removal of floating and bulk of oil is an example of cleaning to a minimum level.

2.10.2.10**cleaning level 3**

shoreline condition that results from a decision to clean to full restoration

2.10.2.11

cleaning level 4

shoreline condition that results from a decision to clean to a pristine level

NOTE This is cleaning beyond the existing background concentration for oil on the shoreline.

2.10.2.12

high pressure flushing

removing oil from a shoreline with water streams at a pressure high enough to cause transport of beach sediments and organisms

NOTE 1 This is generally more than 0,7 Mpa.

NOTE 2 Adapted from API 1995.

2.10.2.13

low pressure flushing

removing oil from a shoreline using water streams at a pressure low enough that beach sediments and organisms are not moved

NOTE 1 This is generally less than 0,7 Mpa.

NOTE 2 Adapted from API 1995.

2.10.2.14

manual removal

removal of oil and contaminated debris by hand tools such as rakes, scrapers, hoses, shovels and buckets

[API 1995]

2.10.2.15

natural biodegradation

type of natural cleansing characterized by the reduction in concentration of chemical(s) of concern through naturally occurring microbial activity

[E 1739-95]

2.10.2.16

natural cleansing

natural physical, chemical or biological mechanisms such as wind and wave action, sunlight and natural microbial action that promote the removal, breakdown and dispersal of oil

[API 1995]

2.10.2.17

shoreline cleanup

actions taken to remove oil from a shoreline with the objective of enhancing the process of ecological recovery

NOTE Shoreline cleanup options could include flushing and removal of oil, displacement or removal of oiled sediments or natural cleansing.

2.10.2.18

steam cleaning

using steam or high temperature water under pressure to remove oil from solid surfaces

[API 1995]

2.10.2.19

substrate displacement

moving oiled sediment to the lower intertidal zone to be reworked and cleaned by natural processes

[API 1995]

2.10.2.20**substrate removal**

use of equipment such as bulldozers, backhoes and graders to remove oiled substrate

NOTE 1 Oiled material is subsequently transported to a disposal site.

NOTE 2 Adapted from API 1995.

2.11 Disposal**2.11.1****incineration**

controlled burning of waste products or other combustible material in an incinerator or similar apparatus

2.11.2**incinerator**

device constructed for the purpose of disposing of material through thermal oxidation

2.11.3**land farming**

controlled method of spreading a known amount of oil in a nominally uniform layer thickness into a designated land area for the purpose of biological decomposition

NOTE This decomposition process is accelerated by mixing the oil layer with the top few inches of soil, aerating the soil by occasional ploughing and adding fertilizers that include nitrogen and potassium to increase the oil decomposition rate.

2.11.4**landfill**

land disposal technique that uses excavated pits to contain the oil spill waste material

NOTE The waste is placed in the excavation, covered over and left to degrade.

2.11.5**open burning**

process of burning a material without the aid of an incinerator

2.11.6**recycling**

disposal method that uses oil spill waste material in some manner other than returning it to a marketed product

NOTE Examples are road oiling and direct use as a fuel supplement.

2.11.7**reprocessing**

reclaimed spilled oil by some type of treatment technique that returns the oil into a product that can be sold

NOTE Reprocessing is defined as recycling in Europe.

2.12 Spill management**2.12.1 Contingency planning****2.12.1.1****area contingency plan**

initial governmental organization structure and mode provided for the spill response

[ASTM 1644-95]

2.12.1.2

contingency plan

plan of action prepared in anticipation of an oil spill

NOTE 1 A contingency plan usually consists of guidelines developed for a specific industrial facility or an entire region to increase the effectiveness, efficiency and speed of cleanup operations in the event of an oil spill, and, simultaneously, to protect areas of biological, social and economic importance.

NOTE 2 Adapted from BASICS 1979.

2.12.1.3

oil pollution incident

occurrence or series of occurrences having the same origin, which results or may result in a discharge of oil and which poses or may pose a threat to the marine environment or to the coastline related interests of one or more areas and which requires emergency action or other immediate response

NOTE Adapted from OPRC 1991.

2.12.1.4

oil spill cooperative

organization in a given area for the purpose of pooling equipment and training personnel to combat oil spills

[BASICS 1979]

2.12.1.5

public information officer

person nominated by the emergency operations centre (EOC) who disseminates appropriate and timely information

[ASTM D 1268-90]

2.12.1.6

sensitivity maps

maps used by the oil spill response team which designate areas of biological, social and economic importance in a given region

NOTE 1 These maps often rank sensitive areas so that in the event of an extensive spill these areas can be protected or cleaned up first.

NOTE 2 Sensitivity maps usually contain other information useful to the response team such as the location of shoreline access areas, landing strips, roads, communities and the characteristics of the shoreline area.

NOTE 3 Maps of this type form an integral part of local or regional contingency plans.

NOTE 4 Adapted from BASICS 1979.

2.12.2 Incident Command System

2.12.2.1

chain of command

series of management positions within an organization in order of authority

2.12.2.2

command

act of directing and/or controlling resources within an organization by virtue of explicit legal or delegated authority

2.12.2.3

delegation of authority

statement to the Incident Commander by the Executive delegating authority and assigning responsibility

NOTE 1 The Delegation of Authority can include objectives, priorities, expectations, constraints and other considerations or guidelines as needed.

NOTE 2 Many agencies require written Delegation of Authority prior to their assuming command on larger incidents.

2.12.2.4

emergency operations centre

EOC

pre-designated facility established by an agency or jurisdiction to coordinate the overall agency or jurisdictional response and support to an emergency

2.12.2.5

finance/administration section

pre-designated facility established by an agency or jurisdiction to coordinate the overall agency or jurisdictional response and support to an emergency

2.12.2.6

function

five major activities in an incident command system, i.e. command, operations, planning, logistics and finance/administration

NOTE The term "function" is also used when describing the activity involved, for example the planning function.

2.12.2.7

incident

occurrence, caused by a human or natural phenomenon, that requires action by emergency service personnel to prevent or minimize loss of life or damage to property and/or natural resources

2.12.2.8

incident action plan

objectives reflecting the overall incident strategy and specific tactical actions and supporting information for the next operational period

NOTE The plan may be oral or written. When written, the plan may have a number of forms as attachments (e.g. traffic plan, safety plan, communications plan, map, etc.).

2.12.2.9

incident commander

individual responsible for the management of all incident operations at the incident site

2.12.2.10

incident command post

ICP

location at which the primary command functions are executed

NOTE The ICP may be collocated with the incident base or other incident facilities.

2.12.2.11

incident command system

ICS

standardized on-scene emergency management concept specifically designed to allow its user(s) to adopt an integrated organizational structure equal to the complexity and demands of single or multiple incidents, without being hindered by jurisdictional boundaries

2.12.2.12

incident objectives

statements of guidance and direction necessary for the selection of appropriate strategy(s) and tactical direction of organizational resources

ISO 16165:2001(E)

NOTE Incident objectives are based on realistic expectations of what can be accomplished when all allocated resources have been effectively deployed. Incident objectives are achievable and measurable, yet flexible enough to allow for strategic and tactical alternatives.

2.12.2.13

logistics section

section responsible for providing facilities, services and materials for the incident

2.12.2.14

mutual aid agreement

written agreement between agencies and/or jurisdictions and/or organizations in which they agree to assist one another upon request by furnishing personnel and equipment resources

2.12.2.15

operations section

section responsible for all tactical operations at the incident

2.12.2.16

planning section

section responsible for the collection, evaluation and dissemination of tactical information related to the incident, and for the preparation and documentation of incident action plans

NOTE The section also maintains information on the current and forecasted situation and on the status of resources assigned to the incident.

2.12.2.17

staging area

locations set up at an incident where resources can be placed while awaiting a tactical assignment

NOTE The operations section manages staging areas.

2.12.2.18

unified command

unified team effort which allows all agencies with responsibility for the incident, either geographical or functional, to manage an incident by establishing a common set of incident objectives or strategies

NOTE This is accomplished without losing or abdicating agency authority, responsibility or accountability.

2.12.3 Safety

2.12.3.1

ceiling limit

exposure which shall not be exceeded during any part of the working day

NOTE 1 If instantaneous monitoring is not feasible, then the ceiling limit shall be assessed as a time-weight average exposure of 15 minutes not to be exceeded at any time over a working day, except for substances which cause immediate irritation upon short exposure.

NOTE 2 Adapted from ASTM E 1542-93.

2.12.3.2

green zone

support zone

minimal exposure area maintained as an uncontaminated location for support functions

NOTE 1 Food service, clean equipment storage and financial offices are examples of a green zone.

NOTE 2 Adapted from ASTM E 1644-95.

2.12.3.3**confined space**

enclosed space or area, such as a tank, compartment or pit where ventilation or access, or both, may be limited

[ASTM F 1644-95]

2.12.3.4**red zone****early response zone**

area where there are potential exposure hazards

NOTE 1 Airborne concentrations of hazardous substances may require respiratory protection in addition to other personal protective equipment.

NOTE 2 Adapted from ASTM F 1644-95.

2.12.3.5**hyperthermia**

medical condition involving an abnormally high body temperature caused by exposure to elevated temperatures or radiant heat or both

[ASTM F 1644-95]

2.12.3.6**hypothermia**

medical condition involving an abnormally low body temperature caused by exposure to cold air or water

[ASTM F 1644-95]

2.12.3.7**occupational exposure limit**

maximum time-weighted average (TWA) concentration to which nearly all workers may be repeatedly subjected for a normal working day of 8 h to 10 h and a normal working week of 40 h without known adverse effects

NOTE 1 These concentrations are determined by national legislation.

NOTE 2 Adapted from ASTM E 1542-93.

2.12.3.8**personal protective equipment****PPE**

equipment used to shield or insulate a person from a chemical, physical or thermal hazard

NOTE 1 Personal protective equipment is available for skin, eyes, face, hands, feet, ears and the respiratory system, as appropriate.

NOTE 2 Adapted from ASTM F 1644-95.

2.12.3.9**short-term exposure limit****STEL**

time-weighted average exposure of 15 min not to be exceeded at any time during a working day, even if the occupational exposure limit is not exceeded

NOTE 1 Exposures above the occupational exposure limit up to the STEL should not be any longer than 15 min and should not occur more than four times per day. The minimum interval between these exposures should be 60 min.

NOTE 2 Adapted from ASTM E 1542-93.

2.12.3.10

site safety and health plan

framework that defines safety and health considerations and strategy for a specific site

[ASTM F 1644-95]

2.12.3.11

site safety and health supervisor

individual in the field responsible for ensuring that the site safety and health plan is implemented as prescribed

[ASTM F 1644-95]

2.12.3.12

yellow zone

contamination reduction zone

area where oil is present but in a generally weathered state

NOTE 1 In addition to decontamination and equipment decommissioning areas, contaminated shorelines containing weathered oil with vapour levels below respiratory protective equipment requirements are considered yellow zones for purposes of this guide.

NOTE 2 Adapted from ASTM F 1644-95.

.....

Bibliography

In developing this International Standard, an attempt was made to use existing definitions wherever possible. For example, comprehensive terminology is available on containment booms, performance of recovery skimmers and on bioremediation, as provided by the publications of the American Society for Testing and Materials (ASTM) Committee F20 on Hazardous Substances and Oil Spill Response.

Other areas had less coverage by standards organizations and gaps were filled through a review of a variety of sources. In this International Standard, whenever another published source serves as the primary basis for a definition, this source is indicated by an abbreviated code. The complete cites for these codes are provided below.

- [1] ISO 3016:1994, *Petroleum Products — Determination of pour point*.
- [2] ISO 3104:1994, *Petroleum Products — Transparent and opaque liquids — Determination of kinematic viscosity and calculation of dynamic viscosity*.
- [3] ISO/FDIS 14050, *Environmental management — Vocabulary*.
- [4] ISO 1998-99:2000, *Petroleum industry — Terminology — Part 99: General and index*.
- [5] ASTM D 4410-95, *Terminology for fluvial sediment*, American Society for Testing & Materials.
- [6] ASTM D 4840-99, *Standard guide for sampling chain-of-custody procedures*, American Society for Testing & Materials.
- [7] ASTM E 609-81 (97), *Standard terminology relating to pesticides*, American Society for Testing & Materials.
- [8] ASTM E 943-00, *Standard terminology relating to biological effects and environmental fate*, American Society for Testing & Materials.
- [9] ASTM E 1542-93, *Standard terminology relating to occupational health and safety*, American Society for Testing & Materials.
- [10] ASTM E 1739-95, *Standard guide for risk-based corrective action applied at petroleum release sites*, American Society for Testing & Materials.
- [11] ASTM F 625-94, *Standard practice for classifying water bodies for spill control systems*, American Society for Testing & Materials.
- [12] ASTM F 631-99, *Standard guide for collecting skimmer performance data in controlled environments*, American Society for Testing & Materials.
- [13] ASTM F 818-93 (1998), *Standard terminology relating to spill response barriers*, American Society for Testing & Materials.
- [14] ASTM F 873-84 (1996), *Standard guide for incinerating oil spill wastes at temporary field locations*, American Society for Testing & Materials.
- [15] ASTM F 1127-88 (1996), *Standard guide for containment by emergency response personnel of hazardous material spills*, American Society for Testing & Materials.
- [16] ASTM F 1481-94, *Standard guide for ecological considerations for the use of bioremediation in oil spill response — sand and gravel beaches*, American Society for Testing & Materials.
- [17] ASTM F 1599-95, *Standard guide for collecting performance data on temporary storage devices*, American Society for Testing & Materials.

- [18] ASTM F 1600-95a, *Standard terminology relating to bioremediation*, American Society for Testing & Materials, American Society for Testing & Materials.
- [19] ASTM F 1644-95, *Guide for health and safety training of oil spill responders*, American Society for Testing & Materials.
- [20] ASTM F 1687-97, *Standard guide for terminology and indices to describe oiling conditions on shorelines*, American Society for Testing & Materials.
- [21] API 1995, *Oil spill response: options for minimizing adverse ecological impacts*, **4398** American Petroleum Institute (API) publication, Washington, D.C.
- [22] AURIS 1994, *Scientific criteria for optimizing oil spill clean-up operations and effort*. AURIS Environmental, Aberdeen, Scotland.
- [23] CONCAWE 1981, *A field guide to coastal oil spill control and clean-up techniques*, CONCAWE report **9** 1981, CONCAWE, The Hague.
- [24] Exxon 1994, *Exxon dispersant guidelines*, Exxon Research & Engineering, Florham Park, N.J.
- [25] BASICS 1979, FINGAS M.F., DUVAL W.S. and STEVENSON G.B. *The basics of oil spill cleanup*, Environmental Emergency Branch, Environment Canada, Ottawa.
- [26] ICS, National Wildfire Co-ordination Group, 1994, *Incident command system national training curriculum — ICS glossary*, National Interagency Fire Center, Boise, Idaho.
- [27] ITOPE, 1986, *Response to marine oil spills*, The international Tanker Owners Pollution Federation Ltd., London.
- [28] OPRC, 1991, *International convention on oil pollution preparedness, response and co-operation*, 1990, International Maritime Organization, London.
- [29] USCG, 1986, United States Federal Register, volume 61, **41**, 96.02.29, Department of Transportation, Washington, D.C.

Index

- A**
- air temperature 2.3.1
 - anchor point 2.6.1.1
 - application efficiency 2.8.2
 - application rate 2.8.1
 - approved dispersant 2.8.3
 - area contingency plan 2.12.1.1
 - asphalt pavement 2.10.1.1
 - assessment techniques 2.4
- B**
- barrier 2.6.1.2
 - bioaugmentation 2.10.2.1
 - biodegradation 2.10.2.2
 - bioremediation 2.10.2.3
 - bioremediation agents 2.10.2.4
 - boom 2.6.1.3
 - boom planing 2.6.3.1
 - boom section 2.6.1.4
 - boom segment 2.6.1.5
 - boom submergence 2.6.3.2
 - boulder 2.10.1.5.1
 - bridging failure 2.6.3.3
 - bridle 2.6.1.6
 - buoyancy chamber 2.6.2.1
 - burn rate 2.9.1
- C**
- cascading booms 2.6.3.4
 - catenary configuration 2.6.3.21
 - catenary configuration 2.6.3.5
 - catenary drag force 2.6.3.6
 - ceiling limit 2.12.3.1
 - chain of command 2.12.2.1
 - chain-of-custody documentation 2.5.1
 - clay 2.10.1.5.8
 - cleaning level 1 2.10.2.8
 - cleaning level 2 2.10.2.9
 - cleaning level 3 2.10.2.10
 - cleaning level 4 2.10.2.11
 - cleaning stage 1 2.10.2.5
 - cleaning stage 2 2.10.2.6
 - cleaning stage 3 2.10.2.7
 - cleanup methods terminology 2.10.2
 - cobble 2.10.1.5.2
 - combustion promoter 2.9.2
 - command 2.12.2.2
 - confined space 2.12.3.3
 - containment 2.6
 - contamination reduction zone 2.12.3.12
 - contingency plan 2.12.1.2
 - contingency planning 2.12.1
 - controlled burning 2.9.3
- crude oil** 2.1.1
- current** 2.3.2
- current velocity** 2.6.3.11
- curtain type boom** 2.6.1.7
- custody** 2.5.2
- D**
- debris 2.3.3
 - dedicated response equipment 2.7.1.1
 - delegation of authority 2.12.2.3
 - derating factor 2.7.2.1
 - dispersant 2.8.4
 - dispersant effectiveness 2.8.5
 - dispersant exclusion zone 2.8.6
 - dispersant use 2.8
 - disposal 2.11
 - diversion mode 2.6.3.7
 - dosage ratio 2.8.7
 - drainage loss 2.6.3.8
- E**
- early response zone 2.12.3.4
 - ecological recovery 2.10.1.2
 - ecosystem 2.10.1.3
 - effectiveness monitoring 2.8.9
 - effects monitoring 2.8.8
 - emergency operations centre 2.12.2.4
 - emulsification 2.1.2
 - emulsion 2.1.3
 - emulsion breakers 2.8.10
 - end connector 2.6.1.8
 - engineering terminology 2.6.2
 - entrainment loss 2.6.3.9
 - environmental conditions 2.3
 - environmental fate 2.1.4
 - environmental sensitivity 2.10.1.4
 - EOC 2.12.2.4
 - equipment terminology 2.7.1
 - exclusion booming 2.6.3.10
- F**
- “fence type” boom 2.6.1.9
 - finance/administration section 2.12.2.5
 - fire resistant boom 2.6.1.10
 - first-loss tow 2.6.3.11
 - floating boom equipment terminology 2.6.1
 - fluid recovery rate 2.7.2.2
 - foreshore zone 2.10.1.7.1
 - function 2.12.2.6
- G**
- gap ratio 2.6.3.12
 - granule 2.10.1.5.4
 - green zone 2.12.3.2
 - gross buoyancy 2.6.2.2
 - gross buoyancy to weight ratio 2.6.2.3
 - group I oil 2.2.1
 - group II oil 2.2.2
 - group III oil 2.2.3
 - group IV oil 2.2.4
 - group V oil 2.2.5
- H**
- heavy shoreline oiling 2.1.5
 - herding 2.8.11
 - high pressure flushing 2.10.2.12
 - hyperthermia 2.12.3.5
 - hypothermia 2.12.3.6
- I**
- ICP 2.12.2.10
 - ICS 2.12.2.11
 - igniter 2.9.4
 - ignition promoter 2.9.5
 - incident 2.12.2.7
 - incident action plan 2.12.2.8
 - incident command post 2.12.2.10
 - Incident Command System 2.12.2
 - incident command system 2.12.2.11
 - incident commander 2.12.2.9
 - incident objectives 2.12.2.12
 - incineration 2.11.1
 - incinerator 2.11.2
 - inflatable boom 2.6.1.11
 - in situ* burn residue 2.9.8
 - in situ* burning 2.9.6
 - in situ* burning efficiency 2.9.7
 - intertidal zone 2.10.1.7.2
- J**
- “J” configuration 2.6.3.21
- L**
- ladder search 2.4.1
 - land farming 2.11.3
 - landfill 2.11.4
 - logistics section 2.12.2.13
 - loss rate 2.6.3.13
 - low pressure flushing 2.10.2.13

- M**
- manual removal 2.10.2.14
 - moderate/light shoreline oiling 2.1.6
 - mud 2.10.1.5.6
 - mutual aid agreement 2.12.2.14
- N**
- nameplate recovery rate 2.7.2.3
 - natural biodegradation 2.10.2.15
 - natural cleansing 2.10.2.16
 - non-persistent oil 2.2.1
- O**
- occupational exposure limit 2.12.3.7
 - oil classification 2.2
 - oil pollution incident 2.12.1.3
 - oil recovery rate 2.7.2.4
 - oil slick 2.7.2.5
 - oil slick encounter rate 2.7.2.6
 - oil slick recovery efficiency 2.7.2.7
 - oil slick recovery rate 2.7.2.8
 - oil spill cooperative 2.12.1.4
 - oil spill modelling 2.4.2
 - oil spill recovery system 2.7.2.9
 - oil/oil slick properties 2.1
 - open burning 2.11.5
 - open pool 2.7.3.2
 - operational draft 2.6.2.4
 - operational freeboard 2.6.2.5
 - operational height 2.6.2.6
 - operational terminology 2.6.3
 - operations section 2.12.2.15
 - overall burning removal rate 2.9.9
 - overall height 2.6.2.7
- P**
- pebble 2.10.1.5.3
 - performance terminology 2.7.2
 - persistent oil 2.2.6
 - personal protective equipment 2.12.3.8
 - petroleum oil 2.1.7
- pillow tank** 2.7.3.3
- planning section** 2.12.2.16
- pour point** 2.1.9
- PPE** 2.12.3.8
- pre-approved zones** 2.8.12
- public information officer** 2.12.1.5
- R**
- recovery 2.7
 - recovery efficiency 2.7.2.10
 - recycling 2.11.6
 - red zone 2.12.3.4
 - relative viscosity 2.1.8
 - remote sensing 2.4.3
 - removal by *in situ* burning 2.9
 - reprocessing 2.11.7
 - reserve buoyancy 2.6.2.8
 - response time 2.7.2.11
- S**
- safety 2.12.3
 - sampling 2.5
 - sand 2.10.1.5.5
 - sediment sizes 2.10.1.5
 - sensitivity maps 2.12.1.6
 - sheen 2.1.10
 - shore seal boom 2.6.1.12
 - shore zones 2.10.1.7
 - shoreline cleanup 2.10
 - shoreline cleanup 2.10.2.17
 - shoreline terminology 2.10.1
 - short-term exposure limit 2.12.3.9
 - significant wave height 2.3.4
 - significant wave period 2.3.5
 - silt 2.10.1.5.7
 - site safety and health plan 2.12.3.10
 - site safety and health supervisor 2.12.3.11
 - skimmers 2.7.1.2
 - sorbent 2.7.1.3
 - sorbent boom 2.6.1.13
 - special purpose boom 2.6.1.14
 - special use habitat 2.10.1.6
 - specific gravity 2.1.11
 - spill management 2.12
 - splash-over 2.6.3.14
 - spray drift 2.8.13
- staging area** 2.12.2.17
- steam cleaning** 2.10.2.18
- STEL** 2.12.3.9
- storage terminology** 2.7.3
- straight line drag force** 2.6.3.15
- structural failure** 2.6.3.16
- substrate displacement** 2.10.2.19
- substrate removal** 2.10.2.20
- support zone** 2.12.3.2
- supratidal zone** 2.10.1.7.3
- surveillance** 2.4.4
- sweep width** 2.6.3.17
- T**
- tear resistance 2.6.3.18
 - temporary storage device 2.7.3.1
 - tensile strength 2.6.3.19
 - throughput efficiency 2.7.2.12
 - towable flexible tank 2.7.3.4
 - towable open tank 2.7.3.5
- U**
- “U” configuration 2.6.3.22
 - unified command 2.12.2.18
- V**
- “V” configuration 2.6.3.23
 - vessel-of-opportunity 2.7.1.4
 - viscosity 2.1.12
 - vortex loss 2.6.3.20
- W**
- water temperature 2.3.6
 - weathered oil 2.10.1.8
 - wind direction 2.3.7
 - windrows 2.1.13
- Y**
- yellow zone 2.12.3.12

ISO 16165:2001(E)

ICS 01.040.13; 13.020.40; 47.020.99

Price based on 26 pages

© ISO 2001 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS

Not for Resale