

page 1of 10

Product name : MOVO H 46

TOTAL S.p.A

SECTION 1 IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY / UNDERTAKING VERSION N° 0 OF : 26th OCTOBER 2015

1.1 PRODUCT IDENTIFIER

PRODUCT NAME : **MOVO H 46** REACH N° : MIXTURE –COMPONENTS REGISTERED 01-2119484627-25

PRODUCT DESCRIPTION : HLP Hydraulic fluid

1. 2 RELEVANT IDENTIFIED USES OF THE SUBSTANCE OR MIXTURE AND USES ADVISED AGAINST

Identified Uses: Hydraulic fluid

As this product is not classified it may be used in ways other than the above. All product uses should be consistent with the safety guidance in this SDS.

Uses advised against: None unless specified elsewhere in this SDS.

1. 3 DETAILS OF THE SUPPLIER OF THE SAFETY DATA SHEET TOTAL S.p.A. 20090 SEGRATE (MI)

This material is not subject to Safety Data Sheet provision according to Article 31 of REACH.

SECTION 2HAZARDS IDENTIFICATION2.1 CLASSIFICATION OF THE SUBSTANCE OR MIXTURE

Classification and labelling have been determined according to EU Directives 67/548 EEC and 1999/45 EC (including

amendments) and take into account the intended product use .

Classification : Not classified

Classification according to Regulation EC 1272/2008 (CLP)

Classification : Not classified

2.2 LABEL ELEMENTS : No Label elements according to Regulation (EC) No 1272/2008

2.3 OTHER HAZARDS

Physical / Chemical Hazards : No significant hazards.



2. HAZARDS IDENTIFICATION

Health Hazards : High-pressure injection under skin may cause serious damage. Excessive exposure may result in eye, skin, or respiratory irritation.

Environment : The product meets the criteria for PBT or vPvB according to REACH Annex XIII.

See section 11 for more detailed information on health effects and symptoms

SECTION 3 COMPOSITION/INFORMATION ON INGREDIENTS

3.1 SUBSTANCE : Not applicable . This material is not defined as a substance

3.2 MIXTURE : This product is regulated as a mixture

DESCRIPTION	CAS N°	EINECS N°	%	CLASSIF.GHS/CLP	CLASSIF.67/548EC
Mixing of distillates (petroleum), solvent dewaxed heavy paraffinics (Baseh r° : 01 2110484627 25)			75 - 100	none	none
(Reach n° : 01-2119484627-25) Copolymers Zn dialkilthiophosfate (Reach n° : n.a.)		272-028-3	0-1	none Eye Dam.1H318 Aquatic Chronic 2H411	none Xi , R41 N; R 51/53

Annex I , Note L applies to the base oil in this product have .The classification as a carcinogen need not apply if it can be shown that the substance contains less than 3% DMSO extract as measured by IP 346 See Section 16

SECTION 4 FIRST AID MEASURES 4.1. DESCRIPTION OF FIRST AID MEASURES

INHALATION :

At ambient/normal handling temperatures, inhalation of vapours is normally not a problem. If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. If casualty is unconscious and: If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or

oxygen by trained personnel. Obtain medical attention if casualty has an altered state of consciousness or if symptoms do not resolve. Immediately obtain specialist medical assessment and treatment for the casualty.

EYE CONTACT :

Check for and remove any contact lenses .Immediately flush eyes with running water for at least 5 minutes, keeping eyelids open . If irritation , blurred vision or swelling occurs and persist , obtain medical advice from a specialist. SKIN CONTACT :

Remove contaminated clothing and shoes . Wash contaminated skin thoroughly with plenty of water, using soap if available. If skin irritation, swelling or redness develops and persists, get medical attention.

Accidental high pressure injection through the skin requires immediate medical attention. Do not wait for symptoms to develop. Wash with soap and water.

INGESTION:

First aid is normally not required. Seek medical attention if discomfort occurs.

4.2 MOST IMPORTANT SYMPTOMS AND EFFECTS, BOTH ACUTE AND DELAYED

Local necrosis as evidenced by delayed onset of pain and tissue damage a few hours after injection.

4.3 INDICATION OF ANY IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT NEEDED

The need to have special means for providing specific and immediate medical treatment available in the workplace is not expected.

4. FIRST AID MEASURES

PROTECTION OF FIRST- AIDERS :

No action shall be taken involving any personal risk or without suitable training

Before attempting to rescue casualties, isolate area from all potential sources of ignition including disconnecting electrical supply. Ensure adequate ventilation and check that a safe, breathable atmosphere is present before entry into confined spaces.

See section 11 for more detailed information on health effects and symptoms .

SECTION 5 FIRE-FIGHTING MEASURES

5.1 SUITABLE EXTINGUISHING MEDIA :

Foam, dry chemical powder, carbon dioxide. Water spray /mist may be used

5.1.2 EXTINGUISHING MEDIA WHICH MUST NOT BE USED FOR SAFETY REASONS : water jet , unless used by authorised people . (Stain risk caused by combustion)

5.2 SPECIAL HAZARDS ARISING FROM THE SUBSTANCE OR MIXTURE

FIRE AND EXPLOSION HAZARDS :

Combustible material, low hazard. The product can form flammable mixtures or can burn only on heating above the flash point. However, minor contamination by hydrocarbons of higher volatility may increase the hazard. HAZARDOUS COMBUSTION PRODUCTS :

Incomplete combustion is likely to give rise to a complex mixture of airborne solid and liquid particulates, gases, including carbon monoxide, (sulfur oxides) and unidentified organic and inorganic compounds.

5.3 PROTECTIVE EQUIPMENT :

ADVICE FOR FIREFIGHTERS

Respiratory and eye protection required for fire fighting personnel exposed to fumes or smoke with a full face-piece operated in positive pressure .Clothing for fire-fighters (including helmets, protective boots and gloves)conforming to European Standard EN 469 will provide a basic level of protection for chemical incidents .

SECTION 6 ACCIDENTAL RELEASE MEASURES

6.1 PERSONAL PRECAUTIONS , PROTECTIVE EQUIPMENT AND EMERGENCY PROCEDURES NOTIFICATION PROCEDURES

No action shall be taken involving any personal risk or without suitable training : Put on appropriate personal protective equipment (gloves and protective clothing and boots). Gloves made of polyvinyl acetate (PVA) are not water-resistant and are not suitable for emergency use. Remove contaminated clothes as soon as possible Stay upwind/keep distance from source. In case of large spillages, alert occupants in downwind areas.

6.2 ENVIRONMENTAL PRECAUTIONS :

Shut off source taking normal safety precautions. Prevent liquid from entering sewers, water courses or low lying areas; advise the relevant authorities if it has, or if it contaminates soil /vegetation. Take measures to minimise the effects on ground water.

6.3 METHODS AND MATERIAL FOR CONTAINMENT AND CLEANING UP

SMALL SPILL : Smaller spillage can be wiped up with paper clothes or normal antistatic working clothes are usually adequate.

LARGE SPILL : Recover by skimming or pumping using explosion-proof equipment, or contain spilled liquid with booms, sand, or other suitable absorbent(sand , earth, vermiculite or diatomaceous earth) and remove mechanically into containers. If the situation cannot be completely assessed, or if an oxygen deficiency is possible, only SCBA's should be used.

Consult an expert on disposal of recovered material and ensure to local disposal regulations .

Confine the spill immediately with booms. Warn other shipping. Notify port and other relevant authorities.

Remove from the surface by skimming or with suitable absorbents and place in container for disposal according to local regulations .

6.4. REFERENCES TO OTHER SECTIONS See Section 8 and 13



SECTION 7 HANDLING AND STORAGE

7.1 PRECAUTION FOR SAFE HANDLING :

Handle in accordance with good industrial hygiene and safety practices . Avoid contact with eyes, skin and clothing. Avoid breathing vapour or mist. Do not ingest ; wash hands after handling . If handled at temperatures or with high speed mechanical equipment , vapours or mists might be released and require a well-ventilated workplace . Use proper bonding and/or earthing procedures. However, bonding and earthing may not eliminate the hazard from static accumulation.

7.2. CONDITIONS FOR SAFE STORAGE, INCLUDING ANY INCOMPATIBILITIES

MATERIALS AND COATINGS SUITABLE : Carbon steel ,stainless steel ,polyethylene , teflon , polypropylene. Compatibility with plastic materials can vary ; we therefore recommend that compatibility is tested prior to use .

LOAD/UNLOADTEMPERATURE:Ambient to max. 40 °CSTORAGETEMPERATURE:Ambient to max. 40 °CSTATIC ACCUMULATOR : This material is a static accumulator

Store in accordance with local regulations .. Store in original container protected from direct sunlight in a dry , cool and well-ventilated area , away from incompatible materials and food and drink .

SPECIAL PRECAUTIONS : Keep containers closed when not in use. Prevent small spills and leakages to avoid slip hazard. Do not eat or drink while working Empty containers may retain residue and can be dangerous. Do not pressurise, cut ,weld ,braze , solder , drill , grind or expose such containers to heat , flame , sparks , static electricity , or other sources of ignition ; they may explode and cause injury or death .

7.3 SPECIFIC END USE RECOMMENDATIONS : Section 1 informs about identified end-uses. No industrial or sector specific guidance available.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1. CONTROL PARAMETERS

OCCUPATIONAL EXPOSURE LIMIT : Mixing of distillates (petroleum), solvent dewaxed heavy paraffinics : for oil mists and fume : 5 mg/m3 (8 h) ACGIH TLV inhalable fraction 10mg/m3 (15 minutes) ACGIH-STEL

For additives : data not available

8.1.2 DERIVED EFFECT LEVELS DNEL

Mixing of distillates (petroleum), solvent dewaxed heavy paraffinics : Workers : Chronic Exposure, Local Effects - Inhalation - : 5,4 mg/m³; Dermal N.A.; Oral N.A.

8.1.3 PREDICTED NO EFFECT CONCENTRATION (PNEC) Aqua, Sewage treatment plant, Sediment, soil : N.A

8.2 EXPOSURE CONTROLS

8.2.1 RECOMMENDED MONITORING PROCEDURES :

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider : No special requirements under ordinary conditions of use and with adequate ventilation.

Personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to EN 689 for methods for the assessment of exposure by inhalation to chemical agents and national guidance documents for the determination of hazardous substances .



8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.2.2 PERSONAL PROTECTION

HAND PROTECTION :

In open systems where contact is likely, wear safety goggles, chemical-resistant overalls, and chemically impervious gloves . Suitable gloves are neoprene ,nitrile or acrylonitrile -butadiene rubber or PVC.(Take notice of CEN 420/94,CEN 374/1-3/94 and CEN 388/94)

EYE PROTECTION :

Wear safety goggles/safe shield if splashes may occur. No other special precautions are necessary provided skin/eye contact is avoided.

RESPIRATORY PROTECTION :

If the product is heated under manual handling, use suitable mask with filter A 1 P2 or A2P2. Handling in automatic production lines, with exhaust or ventilation, will not require mask.

SKIN AND BODYPROTECTION :

Wear protective clothing if there is a risk of skin contact and change them frequently or when contaminated .

HYGIENIC MEASURES :

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

ENVIRONMENTAL CONTROLS

Comply with applicable environmental regulations limiting discharge to air, water and soil. Protect the environment by applying appropriate control measures to prevent or limit emissions.

SECTION 9PHYSICAL AND CHEMICAL PROPERTIES9.1. INFORMATION ON BASIC PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE : Clear amber liquid

ODOUR : hydrocarbons

ODOUR THRESOLD : No data available

pH: Not applicable

POUR POINT ASTM D 97 : - 30 °C

BOILING POINT ASTM D 86 :> 316 °C

FLASH POINT ASTM D 92 : ≥ 200 °C

FLAMMABLE LIMITS (Vol-% in air) : LEL 0.9 UEL 7.0

VAPOUR PRESSURE : < 0.01 kPa at 20 °C

VAPOR DENSITY (air = 1): no data available

RELATIVE DENSITY AT 15 $^{\circ}\mathrm{C}$ $\,$ ASTM D 4052 : Not available $\,$

SOLUBILITY IN WATER : negligible

PARTITION COEFFICIENT (n-octanol/water) : no data available

AUTOIGNITION TEMPERATURE : no data available

DECOMPOSITION TEMPERATURE : No data available

VISCOSITY : at 40 °C ASTM D 445 mm2/sec 44



9. PHYSICAL AND CHEMICAL PROPERTIES

EXPLOSIVE PROPERTIES : None

OXIDIZING PROPERTIES : None

9.2 OTHER INFORMATION

DENSITY : at 15 °C ASTM D 4052 Kg/L 0,87 (approx)

EXTRACT DMSO IP 346 : < 3%

SECTION 10 STABILITY AND REACTIVITY

10.1. REACTIVITY: See sub-sections below.

10.2. CHEMICAL STABILITY: Material is stable under normal conditions.

10.3. POSSIBILITY OF HAZARDOUS REACTIONS: Not expected.

10.4. CONDITIONS TO AVOID: Open flames and high energy ignition sources.

10.5. INCOMPATIBLE MATERIALS:

Avoid contact with strong oxidants such as liquid chlorine and concentrated oxygen. This may result in the evolution of harmful and flammable gases or vapours .

10.6 HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose at ambient temperatures.

SECTION 11 TOXICOLOGICAL INFORMATION 11.1 INFORMATION ON TOXICOLOGICAL EFFECTS ACUTE TOXICITY :

INHALATION :

Irritation:Negligible hazard at ambient/normal handling temperatures. Acute Toxicity : LC 50 > 5.53 mg/kg (mouse) 4 hour(s) . Minimally Toxic. Based on test data for structurally similar materials. Guideline OCSE 403 Calcium alkaryl sulfonate CL50 Vapour Inhalation (mouse) : >18 mg/L1 hours Additives : no data available **SKIN CONTACT :** Acute toxicity. LD 50 > 5000 mg/ kg (rabbit) Minimally Toxic. Based on test data for structurally similar materials. Guideline OCSE 402 Acute toxicity for Zn dialckildithiofosfate and Alkyl phenol and Calcium alkaryl sulfonate : LD50 (mouse) > 2.000 mg/kg, based on test data for structurally similar materials Skin Corrosion/Irritation (Rabbit): Negligible irritation to skin at ambient temperatures. EYE CONTACT : May cause redness and transient pain Guideline OCSE 405 Irritation/Corrosion : Non-irritating to the eyes. **INGESTION :** Low order of acute/systemic toxicity LD 50 > 5000 mg/kg (mouse) Minimally Toxic. Based on test data for structurally similar materials Guideline OCSE 401 May cause nausea and eventually vomiting and diarrhoea Acute toxicity for Zn dialckyldithiofosfate : LD50 (mouse) > 2.000 mg/kg , based on tests data for structurally similar materials Calcium alkaryl sulfonate DL50 Oral (mouse) : >5000 mg/kg Sensitisation Respiratory Sensitization: Not expected to be a respiratory sensitizer. Skin Sensitization: Not expected to be a skin sensitizer Additives : it could be a skin sensitizer Aspiration: Not expected to be an aspiration hazard. Based on physico-chemical properties of the material Germ Cell Mutagenicity: Not expected to be a germ cell mutagen. Based on test data for structurally similar materials Guideline OCSE471 473 474 476



11. TOXICOLOGICAL INFORMATION

CHRONIC EFFECTS :

Carcinogenicity: Not expected to cause cancer. Based on test data for structurally similar materials. Guideline OCSE 451 453

Reproductive Toxicity: Not expected to be a reproductive toxicant. Based on test data for structurally similar materials. Guideline OCSE 414 421

Lactation: Not expected to cause harm to breast-fed children.

Specific Target Organ Toxicity (STOT)

Single Exposure: Not expected to cause organ damage from a single exposure.

Repeated Exposure: Not expected to cause organ damage from prolonged or repeated exposure. Based on test data for structurally similar materials. Guideline OCSE 408 410 411 412 453

11.1.13 OTHER INFORMATION

For the product itself: Base oil severely refined: Not carcinogenic in animal studies. Representative material passes IP-346, Modified Ames test, and/or other screening tests. Dermal and inhalation studies showed minimal effects; lung non-specific infiltration of immune cells, oil deposition and minimal granuloma formation. Not sensitizing in test animals.

SECTION 12 ECOLOGICAL INFORMATION

12.1 ECOTOXICITY : Not expected to be harmful to aquatic organisms

For Zndialkyldithiophosfate : not easy biodegradable

12.2 PERSISTENCE AND DEGRADABILITY :

Expected to be inherently biodegradable

12.3 BIO-ACCUMULATION :

Has the potential to bioaccumulate, however metabolism or physical properties may reduce the bioconcentration or limit bioavailability.

12.4 MOBILITY IN SOIL:

Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids. Low potential to migrate through soil.

12.5 RESULTS OF PBT AND vPvB ASESSMENT : PBT and vPvB : No.

12.6 OTHER ADVERSE EFFECTS :

Spill may form a film on water surfaces causing physical damage to organisms. Oxygen transfer could also be impaired .

ECOLOGICAL DATA

Ecotoxicity for base oils

Test	Duration	Organism Type	Test Results
Aquatic - Acute Toxicity	96 hour(s)	Pimephales promelas	LL0 100 mg/l: data for similar materials
Aquatic - Acute Toxicity	48 hour(s)	Daphnia magna	EL0 1000-10000 mg/l: data for similar materials
Aquatic - Acute Toxicity	72 hour(s)	Pseudokirchneriella subcapitata	EL0 100 mg/l: data for similar materials
Aquatic - Chronic Toxicity	72 hour(s)	Pseudokirchneriella subcapitata	NOELR 100 mg/l: data for similar materials
Aquatic - Chronic Toxicity	21 day(s)	Daphnia magna	NOELR 10-1000 mg/l: data for similar materials

Persistence, Degradability and Bioaccumulation Potential

Media	Test Type	Duration	Test Results: Basis
Water	Ready Biodegradability	28 day(s)	Percent Degraded <60 : similar material



page 8of 10

TOTAL S.p.A

SECTION 13 DISPOSAL CONSIDERATIONS The generation of waste should be avoided or minimised wherever possible

13.1 WASTE TREATMENT METHODS

Methods of disposal : Where possible (e.g. in the absence of relevant contamination), recycling of used substance is feasible and recommended . Disposal can be carried out directly, or by delivery to qualified waste handlers. National legislation may identify a specific organization, and/or prescribe composition limits and methods for recovery or disposal.

Hazardous waste : The classification of the product may meet the criteria for a hazardous waste.

European Waste Code: 13 01 10 |PEWC : 15 01 10

This material is considered as hazardous waste pursuant to Directive 91/689/EEC on hazardous waste, and subject to the provisions of that Directive unless Article 1(5) of that Directive applies, 1357/2014 UE.

These codes can be given only as a suggestion, according to the original composition of the product, and its intended (foreseeable) use(s). The final user has the responsibility for the attribution of the most suitable code, according to the actual use(s) of the material, contaminations or alterations.

13.2 PACKAGING Methods of disposal : Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. When the barrel is no dripping send it for recycling . If the residue volume is more than 1 % send it for destruction of barrels . Empty barrels with < 1% residue is not dangerous goods . Notify local regulations.

Special precautions : Care should be taken when handling emptied containers that have not been cleaned or rinsed out.

SECTION 14 TRANSPORT INFORMATION INTERNATIONAL TRANSPORT REGULATIONS

USUAL SHIPPING CONTAINERS : Rail cars, tank trucks, drums. 14.1 – 14.6 This product is not regulated for carriage according to ADR/RID, IMDG ,ICAO/ IATA

14.7 SEA (MARPOL Convention - Annex II): Transport in bulk according to Annex II of MARPOL and the IBC Code Not classified according to Annex II Ship type required: n.a. Pollution category: not pollutant

TRANSPORT TEMPERATURE: Ambient to max. 40 °C

SECTION 15 REGULATORY INFORMATION 15.1. SAFETY, HEALTH AND ENVIRONMENTAL REGULATIONS/LEGISLATION SPECIFIC FOR THE SUBSTANCE OR MIXTURE

Applicable EU Directives and Regulations:

1907/2006 [... on the Registration, Evaluation, Authorization and Restriction of Chemicals ... and amendments thereto] 98/24/EC [... on the protection of workers from the risk related to chemical agents at work ...]. Refer to Directive for details of requirements

2004/42/CE [on the limitation of emissions of volatile organic compounds due to the use of organic solvents in certain paints and varnishes and vehicle refinishing products and amending Directive 1999/13/EC.]

1272/2008 [on classification, labelling and packaging of substances and mixtures.. and amendments thereto] The product is not subjected to Regl. 2037/2000 CE, 850/2004CE, 689/2008 CE

The product is not subjected to Regi. 2037/2000 CE, 850/2004CE, 689/2008 CE

Refer to the relevant EU/national regulation for details of any actions or restrictions required by the above Regulation(s)/Directive(s).



15. REGULATORY INFORMATION

15.2 CHEMICAL SAFETY ASSESSMENT :

Chemical Safety Assessment : has not been carried out for the substance(s) that make up this material or for the material itself.

EU Regulation n° 1907/2006 Annex XIV –List of substances subject to authorisation Substances of very high concern : None of the components are listed Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles : Not applicable This product is not VOC Italian poison data base ISS product code : not pertinent

SECTION 16 OTHER INFORMATION

EU REGULATIONS

CLASSIFICATION AND LABELLING ACCORDING TO REGULATION EC 1907/2006 E REGULATION EC 1272/2008 :

Product use : Industrial applications

Abbreviations and acronyms :

ATE : Acute Toxicity Estimate DNEL : Derived No Effect Level PNEC : Predicted No Effect Concentration PBT : Persistent, Bioaccumulable, Toxic vPvB : very Persistent, very Bioaccumulable SVHC : Substances of Very High Concern TLV : Threshold Limit Value (American Conference of Governmental Industrial Hygienists) UVCB : Substances of Unknown or Variable composition, Complex reaction products or Biological materials VOC : Composto Organico Volatile ISS : Istituto Superiore della Sanità LC : Lethal Concentration LD: Lethal Dose LL: Lethal Loading EC : Effective Concentration EL : Effective Loading NOEC : No Observable Effect Concentration NOELR : No Observable Effect Loading Rate

Library of Risk phrases listed in this document : R41 Causes serious eye irritation ; R51/53 Toxic to aquatic life with long lasting effects ; H317 May produce an allergic reaction ; R 52/53 :Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment ;H318 Causes serious eye irritation ;H411 Toxic to aquatic life with long lasting effects

REFERENCES: Sources of information used in preparing this SDS included one or more of the following: results from in house or supplier toxicology studies, CONCAWE Product Dossiers, publications from other trade associations, such as the EU Hydrocarbon Solvents REACH Consortium, U.S. HPV Program Robust Summaries, the EU IUCLID Data Base, U.S. NTP publications, and other sources, as appropriate.

The information contained here is based on our state of knowledge at the above-specified date. It refers only to the product indicated and constitutes no guarantee of particular quality. It is the duty of the user to ensure that this information is appropriate and complete with respect to the specific use intended. This MSDS cancels and replaces any preceding release.

16. OTHER INFORMATION

REVISION SUMMARY DATE OF PREVIOUS ISSUE : none VERSION : 0 SECTION MODIFIED :

In those sections, vertical bars will indicate in the margin the text that has been changed. If a section is listed, but does not show a vertical bar, it indicates that text has been removed.

Safety data sheet conforms to Reach Annex II (Reglm. 453/2010 EU) and Regl. 2015/830 UE

ANNEX

Annex not required for this material.